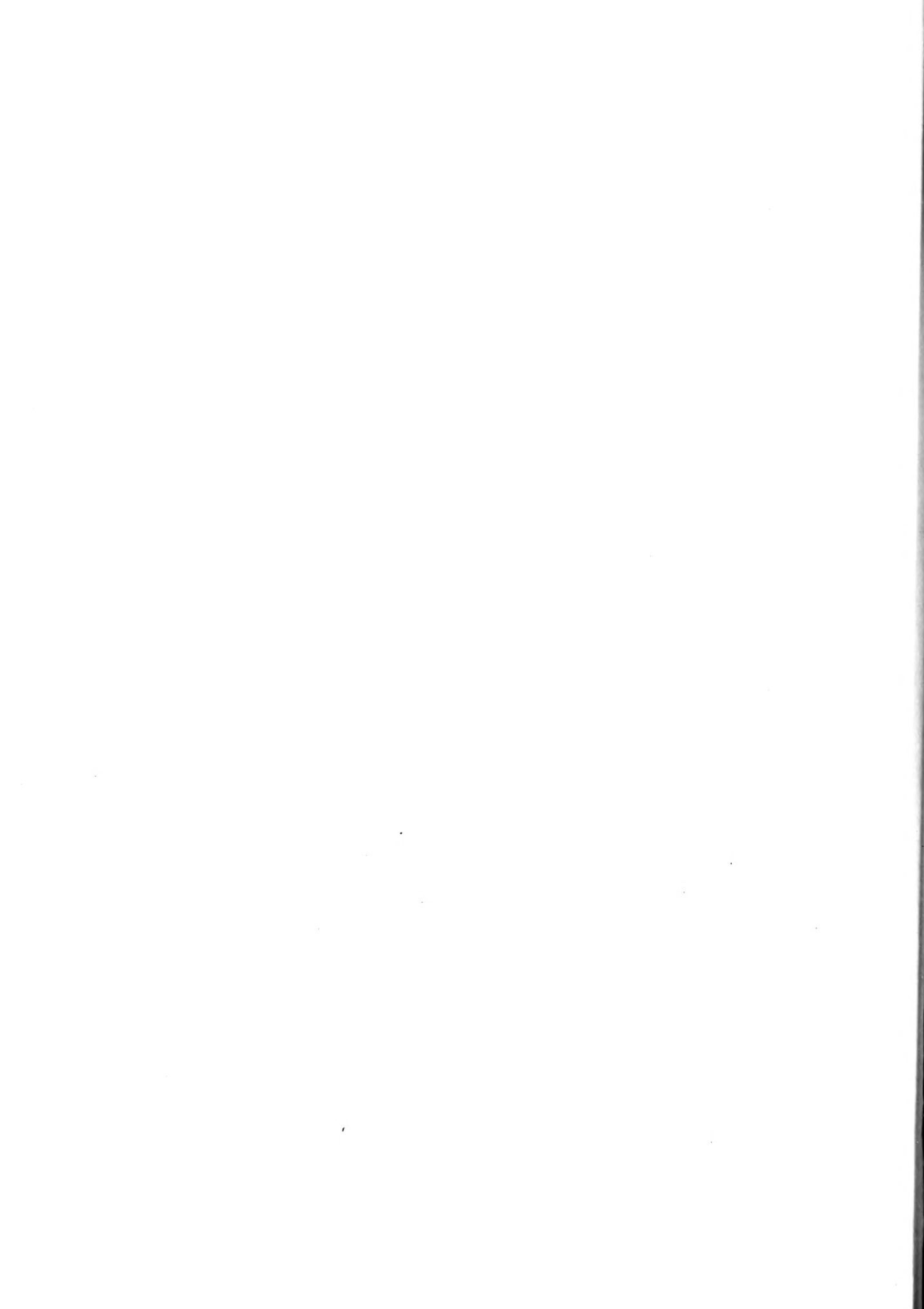




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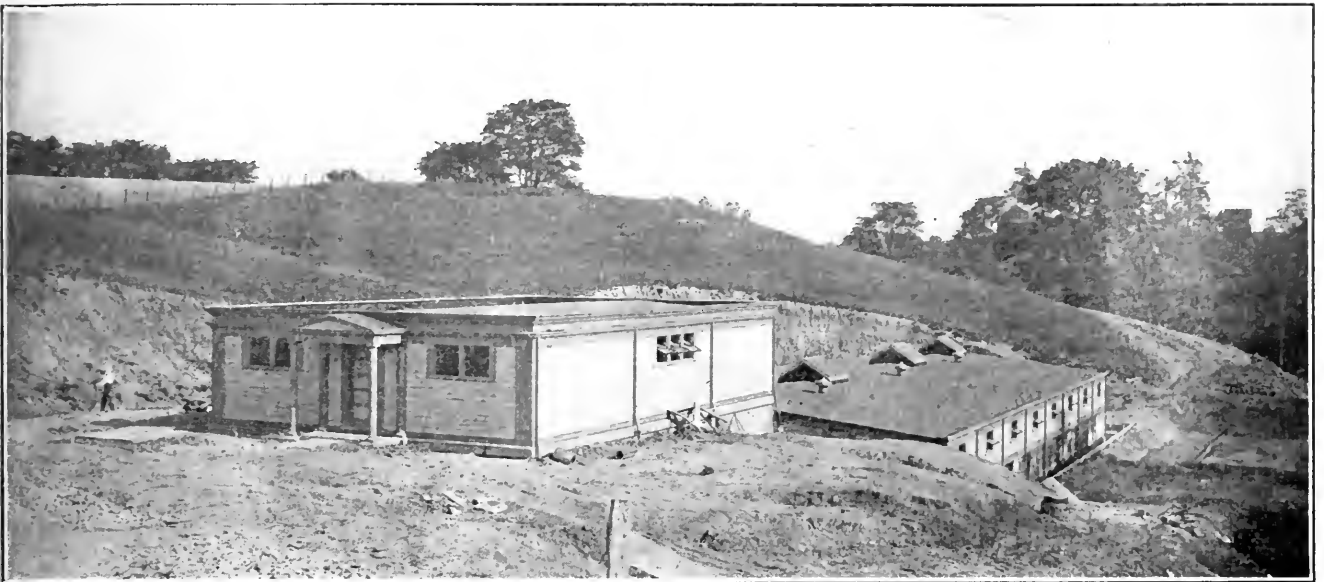
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GENERAL VIEW OF SEWAGE PURIFICATION PLANT. PRIMARY SEDIMENTATION BASINS IN FOREGROUND

SPRINKLING FILTER PLANT FOR SUBURBAN COMMUNITY

Filters Enclosed in Building—Provision for Two Hundred Thousand Gallons a Day—Preliminary and Final Sedimentation Basins and Dosing Tanks—Details of the Plan—Cost of Construction

By PAUL HANSEN, Assoc. Mem. Am. Soc. C.E., State Sanitary Engineer of Kentucky

In June, 1910, there was completed and placed in operation a small sewage purification plant of the sprinkling filter type at the village of College Hill, a residence suburb of the City of Cincinnati. This little installation involves no new principles or novelties of design not hitherto known to the sanitary engineering profession, but it does present a rather interesting object lesson in the solution of a sewage disposal problem.

GENERAL CONSIDERATIONS

The village of College Hill lies about one mile to the northward of the northern corporation line of Cincinnati. It is built on a rather level tableland of the highlands bordering the valley of Mill Creek, a fairly large stream which discharges into the Ohio River within the Cincinnati borders. The natural drainage of College Hill is toward the southward into a number of deep ravines which have hilly slopes and are generally sparsely inhabited. Most of the drainage within the built-up portion of the village may be readily conducted toward one of these ravines, which reaches nearly to the central part of the village. A small water course (see photo, page 2) occupies

this ravine, and after flowing a distance of about two and one-half miles discharges into Mill Creek. The ravine has been taken advantage of for the location of an electric traction line which follows the general course of the stream.

The present population of College Hill is estimated at 2,000. In the way of public improvements there is a public water supply obtained from the Cincinnati Water Works, a number of miles of good sidewalks, and many roadways paved with well constructed macadam. The village in general presents a very picturesque and attractive appearance and is one of the most popular of the more recently developed suburban towns.

One of the necessary requirements of a suburban community near Cincinnati is a good sanitary sewerage system, and it was to meet this requirement that early in 1908 the village authorities took active steps toward the installation of such a system.

SEWERAGE SYSTEM

While the sewage purification works form the subject matter of this article, yet a brief description of the sewerage system



STREAM WHICH RECEIVES EFFLUENT

proper is essential to an understanding of certain phases of the purification problem. The sewers are, of course, built upon the strictly separate plan, that is to say, all wastes that are not offensively putrescible are conveyed through storm water drains to the nearest water course, while only house sewage is permitted to enter the sanitary sewers. The sanitary system is designed to ultimately meet the demands of a population of 10,000, but the present installation covers only about half of the territory that may ultimately be covered. The design is such that all the sewage is conveyed by gravity into a main trunk sewer occupying the ravine above described.

While the sanitary sewerage system is, for the most part, substantially constructed, no attempt was made to underdrain the sewers in wet ground. For this reason the sewers receive a considerable quantity of ground water leakage which averages about 30,000 gallons per 24 hours. It seems that most of the ground water enters at one point on the main sewer and may, therefore, be eliminated at comparatively small expense. The village officials in charge of the sewerage system have had great difficulty on account of numerous rain water leader connections to the sanitary sewers, and a determined effort is now being made to eliminate these connections.

SEWAGE PURIFICATION

Owing to the inadequacy of the small stream occupying the ravine into which the main trunk sewer is carried for sufficiently diluting the sewage flow to prevent a nuisance, it was at once evident that sewage purification works were necessary. The problem of selecting the type of purification works now presented itself, and it was soon found that the peculiar local conditions would constitute the determining factors in the solution of this problem.

Based upon experience in other Ohio villages similarly located, the assumption was made that purification works capable of caring for the sewage of 2,000 persons tributary to the sewers and representing a sewage flow of perhaps 200,000 gallons per 24 hours would meet the needs of the village for about ten years. The growth of the village, however, has been so very rapid and the general desire for sewerage facilities is so great that it now appears that a safer assumption would have placed the time required to make the sewerage system available to 2,000 persons at five years instead of ten years. The quantity of sewage flow will probably also exceed the assumed quantity on account of ground water leakage, permitted by the absence of underdrains, even though the worst places be reconstructed. In considering possible future extensions it was assumed that the ultimate population that can be made tributary to the sewers is 10,000, representing a sewage flow of 1,000,000 gallons per day. It is not expected that these conditions will obtain before fifty years hence, and moreover, before this period has expired connections will have

been made with the steadily widening sewerage system of the City of Cincinnati. Consequently a doubling or trebling of the present installation is all that need be looked forward to.

Having determined upon the capacity of the first installation and the possibility of future extensions it next became necessary to decide in a general way upon the degree of purification that must be obtained in order to place limiting conditions upon the type of purification devices that might be considered. Fortunately conditions were such that no rigorous restrictions were imposed by this aspect of the problem. While the stream which receives the sewage effluent is small, yet it has a rapid fall so as to cause the water to pass over a series of small cascades. Further the ravine contains but a few houses, and these are at considerable distance from the stream, nor is the water of the stream used for cattle watering or any other purpose until it has reached a distance of two and one-half miles from the village. Such facts as these led to the conclusion that all that could be reasonably demanded was a merely non-putrescible effluent practically free from suspended matter.

In considering the type of plant it was, of course, recognized that intermittent sand filtration for a community of this size and character would prove the most all around satisfactory method of purification that could be adopted, but this method was ruled out of consideration almost at the start, for the reason that there was no site available which could be utilized without involving an excessive amount of excavation and grading, and this mostly in difficult material.

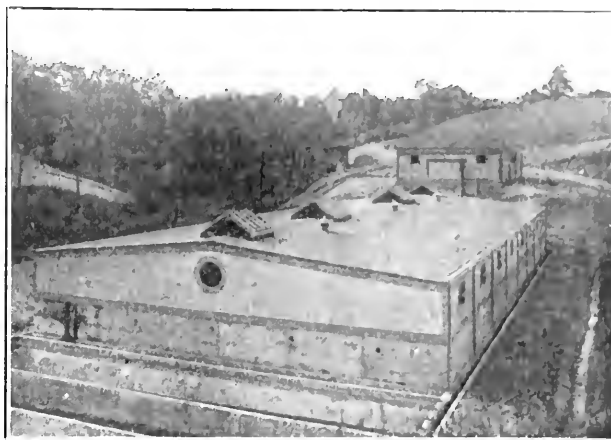
The use of contact beds, assuming the necessity of using one-tenth acre of bed 5 ft. in depth, for each 500 or 600 persons tributary to the sewers, was considered as practicable, but even this involved a large amount of excavating and grading. Moreover, there had to be taken into consideration the difficulty of conveying materials during construction to any available site, for this involved a long and difficult wagon haul from the nearest steam railroad siding.

While sprinkling or percolating filters are not likely to give best results for small communities, owing to their relative complexity of design as compared with intermittent sand filtration and contact beds, yet it appeared that this type of plant was the only one that could be built without excessive expense. There were several considerations which further encouraged the adoption of sprinkling or percolating filters. First was the fact that the village of College Hill is a moderately wealthy community and can afford to employ a competent person to operate the plant; and, moreover, the character of the citizenship is such that public utilities are not likely to suffer neglect. In the second place, a recently enacted law enables the State Board of Health to effectively demand the proper operation of all water purification and sewage purification works. All things considered, therefore, a sprinkling filter plant was deemed most suitable.

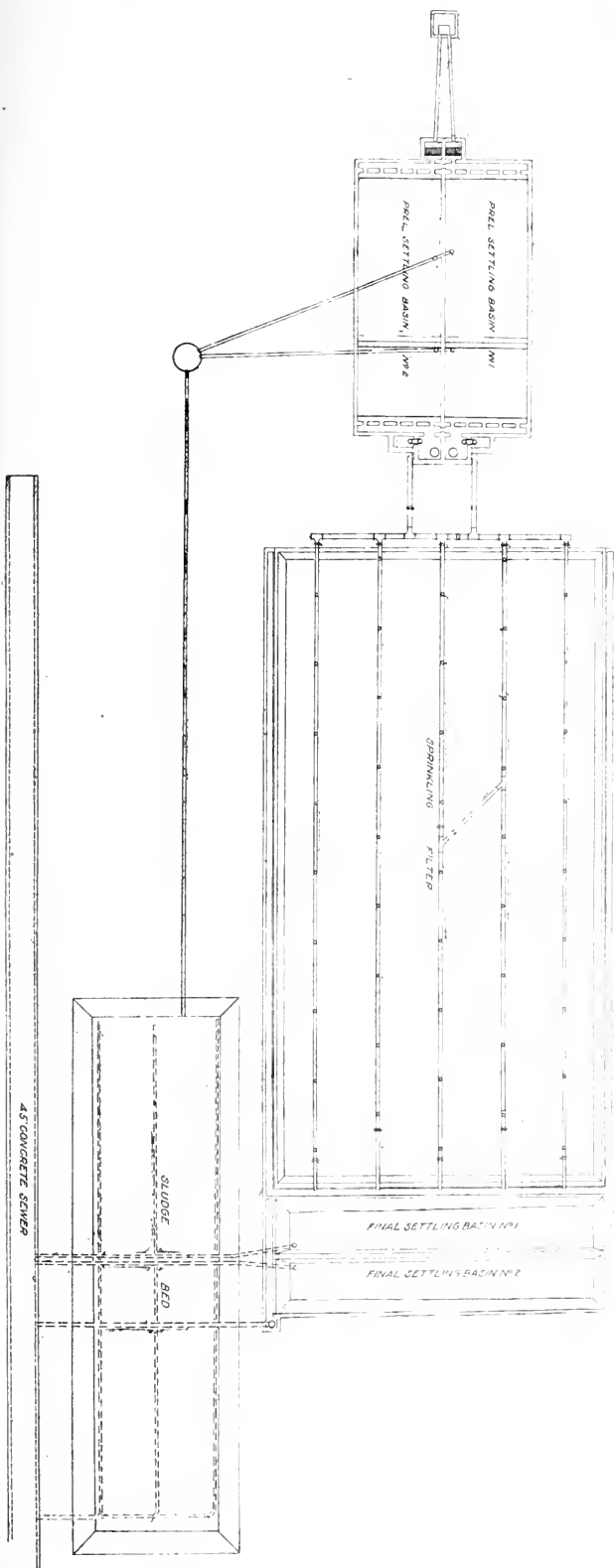
There was selected as the most suitable site for the construction of the purification works a plot of land near the upper end of the ravine, at a point where one side of the ravine has a comparatively gentle slope. This site is not a good one in one important respect, namely: it is rather too near the buildings of a sanatorium, the nearest of these buildings being about 300 ft. distant. In addition there are twenty residences within a radius of 1,000 feet of the plant. While it was doubtful whether odors from contact beds or intermittent sand filters would be carried 300 feet, it was a certainty that odors from sprinkling filters would be carried a much greater distance than this. Computation, however, showed that this type of plant on the site selected would still prove by far the most economical, even though it became necessary to cover the filters. Accordingly superstructures were decided upon which thus far have been eminently successful in confining odors to the immediate neighborhood of the plant. The striking feature of the superstructures is that while they are not unreasonably expensive, they have been designed with such artistic skill as to render this plant one of the most sightly of the smaller plants in the country.

GENERAL ARRANGEMENT OF PURIFICATION WORKS

Before proceeding with a description of the several parts of the purification works it will be well to make a brief statement of the general arrangement. The plant occupies an area of about 210 ft. by 65 ft. and lies in such a position that its capacity may be increased in the future by moderate additions on either side and by longitudinal extensions. Sewage enters the plant by gravity from the main trunk sewer and is received into one or both of two small screen chambers. After screening, the sewage passes to one or both of two sedimentation tanks and thence into syphon chambers, from which it is rapidly discharged at intervals by means of automatic syphonic



PURIFICATION PLANT. FINAL SETTLING BASINS AND FILTER HOUSE IN FOREGROUND



GENERAL PLAN OF PURIFICATION PLANT

apparatus. The discharge of the syphonic apparatus is into so-called equalizing chambers, which are of such shape as to equalize the distribution of the sewage over the surface of the filter beds by the sprinkling nozzles. The effluent from the sprinkling filter is collected in suitable channels and conveyed to final sedimentation basins designed to retain the coarser suspended matters. A sludge bed is provided for draining and drying the sludge from the primary sedimentation tanks.

Screen Chambers. The two screen chambers are each 3 ft. by 3 ft. in plan and 2 ft. 6 in. in depth, inside dimensions. Each chamber is provided with two screens placed at an angle of 60 degrees to the horizontal and sloping backward from the incoming sewage. These screens are built of wrought iron bars of $\frac{3}{8}$ -in. circular sections and spaced with $\frac{3}{8}$ -in. clear openings. The design of the screen chambers might have been improved upon by making them considerably longer, thus giving greater accessibility to the screens. A valuable accessory to screen chambers of this sort is stop plank grooves which may serve to support a measuring weir.

Preliminary Sedimentation Basins. The two preliminary sedimentation basins are built of reinforced concrete, each 45 feet long, 15 feet wide and 10 feet in total depth. The depth to the flow line is 7 feet 6 inches. The basins thus each have a capacity of 50,000 gallons, representing a flow period of 6 hours or a total flow period of 12 hours based upon the nominal capacity of the plant. The tanks involve no novel features of arrangement, but the design of the reinforced concrete is such as to require for the structure a minimum of excavation. Provision is made for distributing the inflow evenly across the width of the tanks by means of distributing channels provided with a number of gate-controlled openings into the tanks and equidistantly spaced. A similar channel is provided for drawing off the sewage from the outlet end. The distribution of sewage across the tanks is further assisted by hanging baffles placed 2 feet from inlet and outlet ends. At a point two-thirds distant from the inlet to the outlet ends is placed one hanging and one submerged baffle within a foot of each other for the purpose of intercepting sludge and scum and thereby preventing in a measure ebullition near the outlet of the tanks. Suitable sludge drains are provided near the center of the bottoms of the tanks. In order to prevent the dissemination of odors the tanks are covered with a superstructure which is designed primarily to give ready accessibility to all parts of the tanks as well as the automatic apparatus. The satisfactory appearance of the exterior of the superstructure has already been commented upon.

Dosing Tanks. There are two dosing tanks each 4 feet by 4 feet in plan and 2 feet 6 inches in depth to the flow line; the capacity of each is thus 300 gallons. Based upon the average rate of flow when the plant is operating at its nominal capacity, these tanks would be filled every 5.4 minutes when both are in use, or once in every 2.7 minutes when one is in use. Under ordinary operating conditions it is proposed that

only one tank be used and the other held in reserve for use in case of break-down or stoppage. In order to permit a free discharge of the syphons uninfluenced by the back pressure from the sprinkling nozzles on the filters, and furthermore to assist in the equal distribution of the sewage by the nozzles over the surface of the filter, an equalizing chamber was provided for receiving the syphon discharge from each dosing chamber. The syphonic apparatus used is that manufactured by the Merritt Company of Philadelphia, Pa.

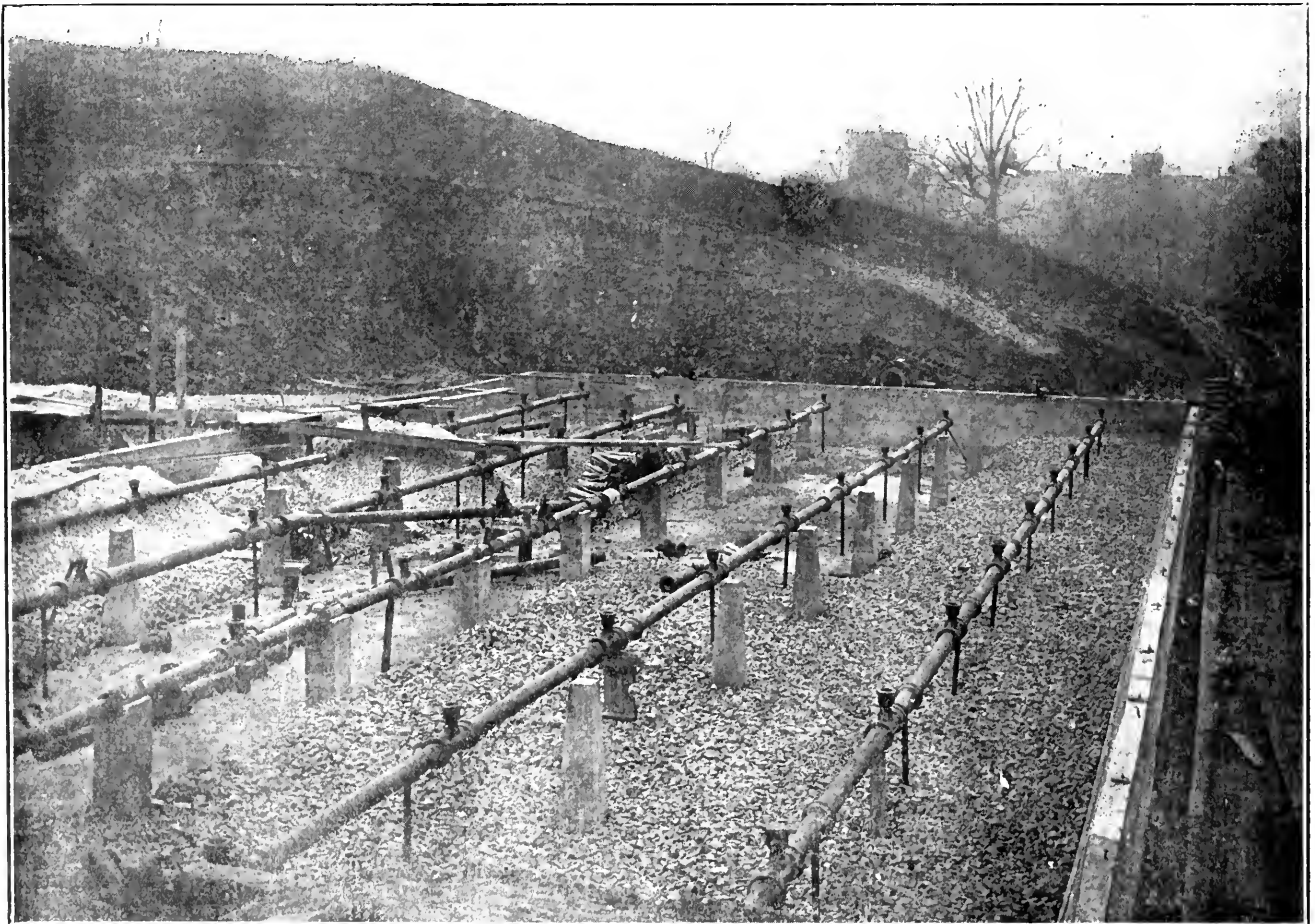
The proper shape for the equalizing chamber was a matter which could not be definitely settled without some preliminary experimentation. Accordingly, under the general direction of the writer, a small experimental plant was devised which comprised in prototype a small dosing chamber and an equalizing chamber of sufficient size to supply a single nozzle. One side of the equalizing chamber was made adjustable in order to secure some indication of the best form to give this chamber. The funds and time available did not permit of these experiments being exhaustive in character, but they did serve to furnish practical assistance in arriving at the design ultimately to be adopted. The above experiments also were utilized to obtain data which would assist in the selection of the type of nozzle to be used. Inasmuch as the experimental methods and results are of considerable interest they will be made the subject of another article by Mr. W. H. Dittoe, Assistant Engineer of the Ohio State Board of Health, under whose immediate supervision the experiments were carried out.

Sprinkling Filter. The sprinkling filter is rectangular in plan, 115 feet long and 60 feet wide, which gives an area of 6,900 square feet or 0.158 acre. Based upon the nominal capacity of the plant, namely, a capacity for treating the sewage of 2,000 persons, the above area would represent one acre for each 12,660 persons tributary to the sewers. The filtering material, for the most part, consists of broken stone such as will pass a 3 inch ring and be retained by a $\frac{1}{2}$ inch ring. The lower

12 inches of filtering material is made somewhat coarser than this to facilitate drainage. The total depth of the filtering material is 5 feet. The bottom of the filter consists of a concrete floor 4 inches in thickness with a slope of one foot in 90 in either direction from a central ridge.

The underdrains consist of 6-inch half tile 2 feet in length and provided with notches at the sides to permit the ready entrance of the effluent. The design of the underdrains is quite similar to that used at Columbus, O., but the ends of the pipe are provided with half bells which permits of an over lapping of the joints which facilitates obtaining alignment of the pipe and possibly prevents more or less solid material from entering them. Unfortunately the mistake was made of having the tile burnt after they were split. This resulted in excessive warping so that but few of the tile lie with an even bearing. While it is likely that a great many of the tile will be broken by the weight of the stone, it is not probable that underdrainage will be greatly interfered with since the effect of the warping will be to cause the pipes to break transversely rather than longitudinally. To secure the best results with half tile underdrains in sprinkling filters the writer would recommend floating the surface of the floor of the filter with $\frac{1}{2}$ to $\frac{3}{4}$ of an inch of cement mortar and, placing the drain tile while the cement is still soft, pressing the edges down into the cement until they have an even bearing. This method not only insures the drain tile against breakage by superincumbent weight but also holds them firmly in alignment while the filtering material is being placed and provides smooth channels for carrying off the effluent. By all means the tile should be burnt whole and split afterwards.

The walls surrounding the filter are made of concrete. The underdrains are carried directly under the wall and discharged into open gutters extending longitudinally along either side of the filter. This arrangement permits of accessibility to the under drains for cleaning by flushing or other means.

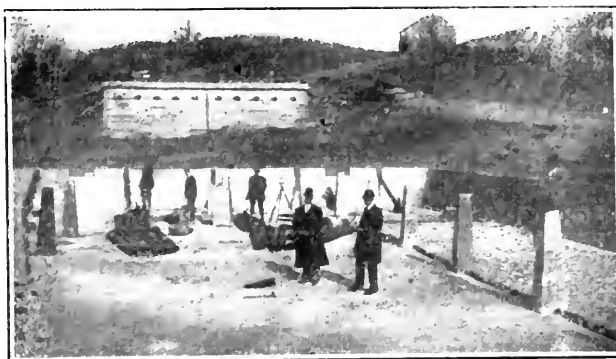


SPRINKLING FILTER DURING CONSTRUCTION

The sewage from the equalizing chamber is conveyed to the filter through a system of cast iron pipe. The main pipe leading from the equalizing chambers are 10 inches in diameter; these in turn enter a header, also 10 inches in diameter, which extends across the upper end of the filter just outside the filter wall. Leading off from this header are five lines of 6-inch and 8-inch cast iron lateral pipe extending longitudinally across the filter bed and at a depth of 12 inches below the surface of the stone. The laterals have a spacing, center to center, of 11 feet 3 inches. An interval of 12 feet 6 inches along these are placed uprights which rise to a few inches above the filtering material and support the sprinkling nozzles. The spacing of the nozzles brought about by the above described arrangement brings the nozzles approximately at the vertices of the equilateral triangles into which the bed is thus divided. The several laterals are provided with valves at both ends. Those next the headers will permit the laterals to be used independently, and those at the opposite ends permit of the laterals being flushed out. It may be mentioned that the laterals extend through the filter walls, as shown in the accompanying photograph. A valve-controlled cross-over between the central and one of the adjacent laterals permits an even division of the filter into two parts. A valve in the header permits the independent operation of the two equalizing chambers.

The elevation of the orifices of the sprinkling nozzles is such that they will operate under a head varying from a maximum of $7\frac{1}{2}$ feet down to zero. The equalizing chamber has its bottom 2 feet above the nozzles, so that practically the entire discharge through the nozzles takes place above this head.

Final Sedimentation Basins. The effluent from the sprinkling filter is conveyed by means of the troughs already mentioned to the final sedimentation basins. There are two of these basins, built of concrete, each 59 feet 6 inches long, 10 feet wide and 4 feet 6 inches deep to the flow line. The basins each have a capacity, making due allowance for sloping sides, of 7,000 gallons, thus giving a total capacity of 14,000 gallons, which represents a flow period, based upon the nominal capacity of the plant, of a little over 2 hours. The effluent is admitted to one end of the sedimentation basins by means of a distributing channel having four rectangular 8-inch openings equi-distantly spaced across the width of each basin. The effluent is drawn off at the opposite end over weirs extending the entire width of the basins. The flow from the weirs falls into a collecting trough of concrete which in turn discharges into a 12-inch vitrified pipe which conveys the sewage to the creek. Provision was made for cleaning the basins by placing 6-inch



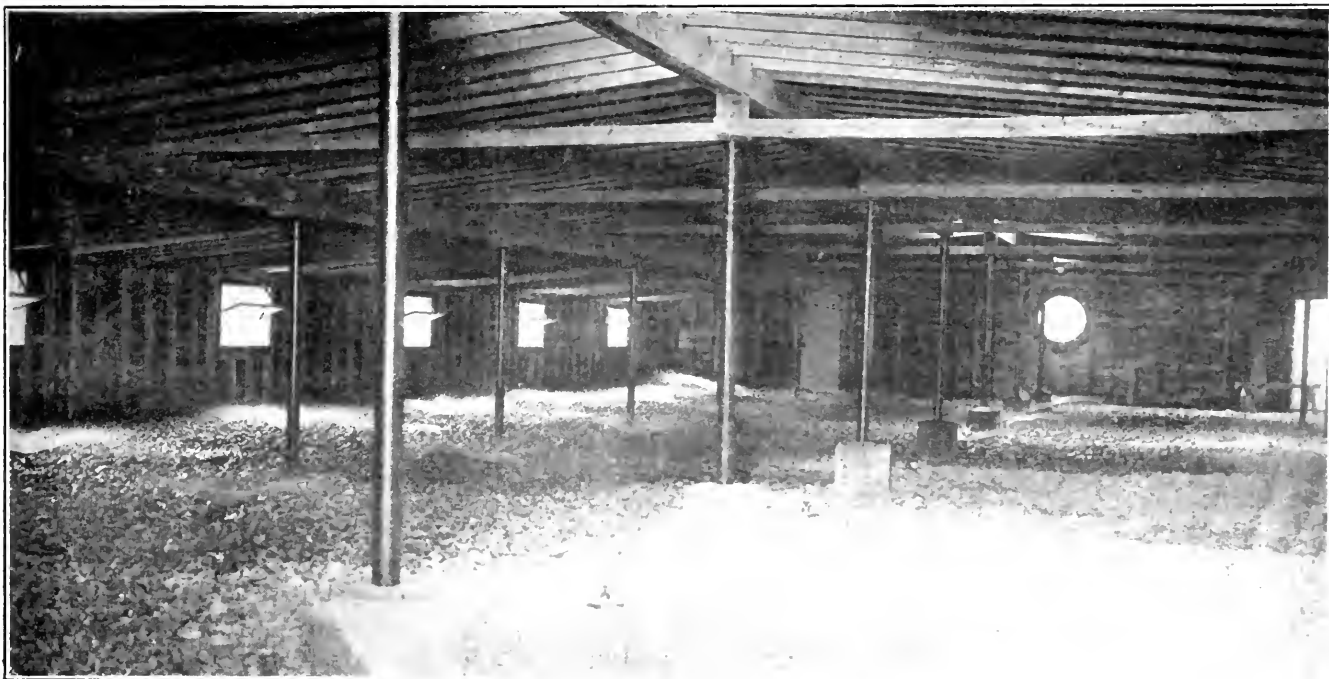
SPRINKLING FILTER. WALLS AND SOME TIERS IN PLACE

sludge outlets in the bottoms, which outlets in turn have connecting pipes leading to the creek. Cleaning of the final sedimentation basins will not be attempted except at times when the stream is carrying a large volume of water.

Sludge Bed. The sludge bed is located near the lower end and at one side of the purification works. This bed is simply a sand filter constructed essentially the same as would be an intermittent sewage filter. It is 30 feet by 100 feet in plan at the sand line, thus giving it an area of 3,000 square feet. This area is such that it may receive the entire contents of one of the preliminary sedimentation tanks without covering it to a depth greater than $1\frac{3}{4}$ feet. If the bed is kept in proper condition the thin liquid will pass through in the course of a few hours and leave the sludge to dry. It is to be expected that the process of removing sludge from the preliminary sedimentation tanks will be accompanied by some odor, but if the process is well managed, this odor need not result in an objectionable nuisance.

OPERATION.

At the present time it is estimated that there are 800 persons tributary to the sewerage system at College Hill and the flow, as measured on Nov. 28th, 1910, was 92,400 gallons per 24 hours. The maximum rate observed was 105,000 gallons per 24 hours and the minimum 82,000. As these measurements extended but from 1 P. M. to 4 P. M. the actual minimum for the day was not obtained, but this minimum presumably occurred during the early morning hours. When it is considered that about 30,000 gallons of the day's flow is clear ground water the comparative weakness of the crude sewage as shown in the accompanying table of analyses will be under-



INTERIOR OF SPRINKLING FILTER HOUSE. SPRINKLERS IN OPERATION

stood. Three-fifths of the filter area was in use at the time of the test and while this does not represent a rate of treatment for which the plant was nominally designed yet the results as indicated by the analyses may be taken as an indication that the plant is good for a much heavier burden than is now being imposed upon it. The analyses of the water from the stream into which the effluent is discharged are interesting as showing the practically negligible effect which the sewage has on the character of the water.

Costs.

The total cost of the sewerage system proper was \$44,522.00. The cost of the disposal works was \$20,700.00. The unit costs of the purification works as presented in the bid of the contractor are given in the following table:

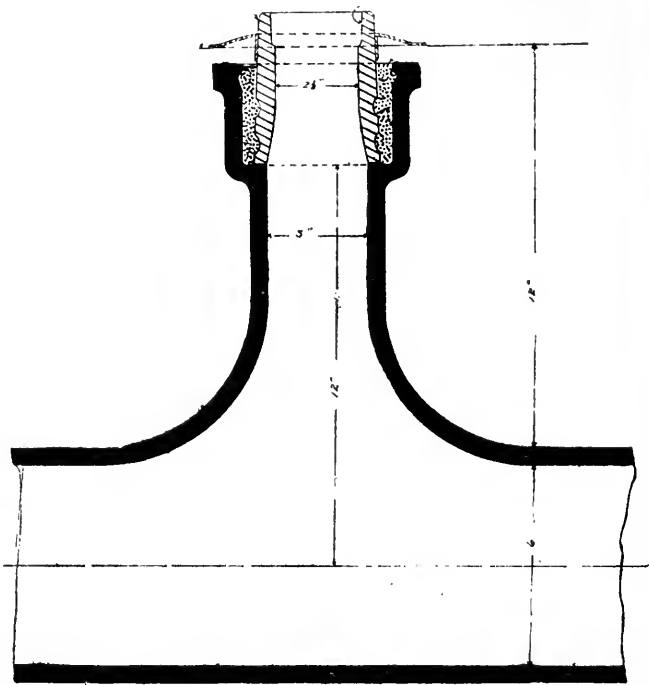
STATEMENT OF COST OF SEWAGE DISPOSAL PLANT

10,300 cu. yds. grading, at 49c. per cu. yd.....	\$5,047.00
1,890 cu. yds. broken stone, at 52c. per cu. yd.....	982.80
317 cu. yds. sand, at \$1.60 per cu. yd.....	507.20
404 cu. yds. plain concrete, at \$4.55 per cu. yd.....	1,838.20
158 cu. yds. reinforced concrete, at \$6.50 per cu. yd....	1,027.00
507 lin. ft. 6-in. vitrified pipe, at 21c. per lin. ft.....	106.47
161 lin. ft. 8-in. vitrified pipe, at 32c. per lin. ft.....	51.52
334 lin. ft. 12-in. vitrified pipe, at 55c. per lin. ft.....	183.70
7,000 lin. ft. 6-in. split pipe, at 10c. per cu. yd.....	700.00
31.61 tons cast iron pipe, at \$49 per ton.....	1,548.89
7.50 tons special castings, at \$25 per ton.....	187.50
7.50 tons special castings, at \$50 per ton.....	375.00
(Allowance for error in bid.)	
1 fire hydrant, at \$19 each.....	19.00
6 8-in. shear valves, at \$18 each.....	108.00
20 6-in. shear valves, at \$13.75 each.....	275.00
3 10-in. gate valves, at \$47 each.....	141.00
11 6-in. gate valves, at \$18 each.....	198.00
2 extra valves, at \$34 each.....	68.00
6 8-in. flap valves, at \$17.75 each.....	106.50
1 superstructure for settling basin, at \$1,415 each.....	1,415.00
1 superstructure for filter bed, at \$3,114 each.....	3,114.00
2 manholes, round, at \$35 each.....	70.00
4 screens, at \$14.50 each.....	58.00
6 baffles, at \$30 each.....	180.00
1 sludge distributor, at \$40 each.....	40.00
5 cast iron covers, at \$12.50 each.....	62.50
45 sq. ft. cement walk, at 16c. per sq. ft.....	7.20
50 sq. ft. cement steps, at 29c. per sq. ft.....	14.50
EXTRA BILLS ALLOWED.....	215.10
TOTAL CONTRACT ITEMS.....	\$18,647.08
Eng. and supt. construction.....	1,118.82
Topographical survey, 10-acre tract.....	240.00
Nozzles.....	200.00
Dosing siphons.....	400.00
Printing, etc.....	94.10
TOTAL COST OF IMPROVEMENT.....	\$20,700.00

An examination of the above figures will show that the bid

was unbalanced—the price for concrete is especially low. It may be noted that the contract price was a close one and that in all probability the contractor lost two or three thousand dollars. Moreover, the contractor, after the death of one member of the firm, proved unenterprising and it was with great difficulty that the engineers could force him to complete the work. It is unfortunate also that some of the work suffered in quality, due to the inefficiency of the contractors; but except for the placing of some soft and friable stone in the filter beds it is not likely that any of these defects in construction will materially affect the results obtainable.

Mr. J. A. Stewart of Cincinnati was consulting engineer, and Mr. C. A. Riggs, also of Cincinnati, was assistant engineer in direct charge of the work. The contractors were Meridith & Deckebach of Cincinnati. Some of the early work in connection with preliminary inspections and preparation of plans was done in co-operation with the writer, then of the engineering department of the Ohio State Board of Health.



DETAIL OF CONNECTION FOR SPRINKLER NOZZLE

6 x 3 cast-iron tee, carrying in bell a bitumenized nozzle tip with tapered opening for nozzle. Tip is fastened in bell with water-proof joint and provided with drip bib

Results of Analysis of Sewage, Sewage Effluent and Creek Water at College Hill, Ohio

Field Number	No. 1 Composite crude sewage	No. 2 Preliminary sedimentation effluent	No. 3 Filter effluent	No. 4 Final sedimentation effluent	No. 5 Stream above outlet	No. 6 Stream below outlet	No. 7 Stream 2,000 ft. below effluent outlet
No. of sample.....	1078	1079	1085	1081	1082	1083	1084
Temperature.....	48	50	40	38	38	38	38
Color.....	45	36	36	35	18	32	35
Turbidity.....	250	110	68	43	25	22	22
Sediment.....	Distinct	Distinct	Distinct	Distinct	Slight	Trace	Trace
Odor.....	Sewage	Strong sewage	Mouldy	Earthy	Earthy	Earthy	Slt. Earthy
Dissolved oxygen.....	2.4	0.0	4.5	4.5	5.7	5.5	6.0
Oxygen consumed.....	7.4	27.75	19.	13.2	6.9	10.9	9.3
Total Kjeldahl.....	34.5	33.3	15.6	10.3	4.	6.9	5.9
Nitrogen as:							
Am. free.....	12.4	13.	8.	5.	.14	4.2	3.6
Nitrites.....	.040	.300	.240	.240	.008	.200	.150
Nitrates.....	.4	.4	4.4	5.6	1.6	5.	4.6
Chlorine.....	62.	51.	54.	53.	35.	47.	45.
Alkalinity.....	288.	248.	216	206.	260.	220.	216.
Total solids.....	915.	654.	660.	636.	593.	613.	605.
Loss on ignition.....	236.	104.	111.	142.	113.	100.	91.
Dissolved solids.....	743.	597.	606.	607.	586.	595.	585.
Loss on ignition.....	125.	79.	94.	95.	85.	91.	86.
No. bacteria per c.c.....	.....	.....	.....	730,000	90,000	120,000	48,000
Colon bacillus.....	.....	.....	.....	Pos., 1 c.c.	Pos., 1 c.c.	Pos., 1 c.c.	Pos., 1 c.c.

SEWERAGE AND SEWAGE DISPOSAL

Materials Used for Sewers and Joints—Pipe Tests—Amount of Sewage Purification Necessary—Methods Available—Possibilities and Limitations of Each—Most Recent Developments

IN the line of sewerage, aside from sewage disposal, there has been little change in ideas during the past few years. The removal of household wastes in underground pipes by gravity will undoubtedly continue to be practically the only method employed for many years to come; a very potent reason for this, if there were no other, being that the ever-increasing use of water in city buildings calls for conduits for removing it after such use (by which time it has become more or less polluted), and for this the ordinary water carriage sewer seems to be the best practicable means.

A generation ago there was a public scare about the dangers of sewer gas, but investigations made in the light of more advanced scientific knowledge indicated that this was largely imaginary. Again about a year or so ago an English investigator announced that he had learned by experiments that pathogenic bacteria could be carried into dwellings through house connections with sewer air. Further and apparently more practical experiments indicated, however, that the danger of this was infinitesimal. It appears from our present knowledge that sewer air is as dangerous as, but no more so than, other foul air; but it is objectionable and should certainly be excluded from all residences. A much greater danger lies in the possibility of flies coming in contact with excremental matter in sewers or elsewhere, since thus disease germs may become attached to the flies and be brought into contact with human food. This furnishes a very powerful argument in favor of sewerage systems in all communities.

In the construction of pipe sewers, vitrified clay is the standard, but there is an increasing tendency toward the use of concrete in the larger sizes, and in this reinforcement is being employed with more intelligence as its possibilities and limitations are more generally understood. For the smaller sizes of sewers—say, up to 3 or 4 feet in diameter—there appears to be little, if any, economy or other benefit in the use of reinforcement, while the practical difficulties in its use are much greater in these smaller sizes. In the construction of concrete sewers much improvement along the line of economy is noticed, the most important examples being in the use of mixers better adapted to this work and the carrying of the concrete from the mixer to its place in the sewer through troughs or by other labor-saving devices.

The use of reinforced concrete pipe (made outside the trench in 2 to 5-foot sections) is becoming more general, and improvements in its manufacture have been arrived at by experience. The weak place in any pipe sewer is the joint, and concrete sewer pipes have this disadvantage, as compared to monolithic sewer construction. On the other hand, the pipe has the advantage that it can be laid in wet trenches, even those in which water enters under a head, under which conditions monolithic construction is very difficult. In Toronto a tight line of concrete pipe conduit was obtained last year by covering the joints on the outside with alternate layers of building paper and hot tar, and finally with a strip of burlap bound with two iron wires, one on each side of the joint. Several materials for making water-tight joints with vitrified pipe sewers have been placed upon the market, the one which has appeared this year being really a pipe dip composed of vulcanized linseed oil, which is said to have given very promising results in two or three towns. With the increasing number of purification plants and of pumping plants, the matter of water-tight sewers is becoming of more and more importance.

In the specifications for sewer pipe of various kinds, requirements as to smoothness of surface and trueness of form are common, but few contain any requirements as to strength of the pipe. During the past few months committees of two or three societies, notably the Society for Testing Materials, have

been endeavoring to formulate special requirements covering this, and such requirements have already been embodied in the specifications of Brooklyn, N. Y., where they originated, and quite recently in those of one or two other cities. These tests were described in our issue of Feb. 2, 1910.

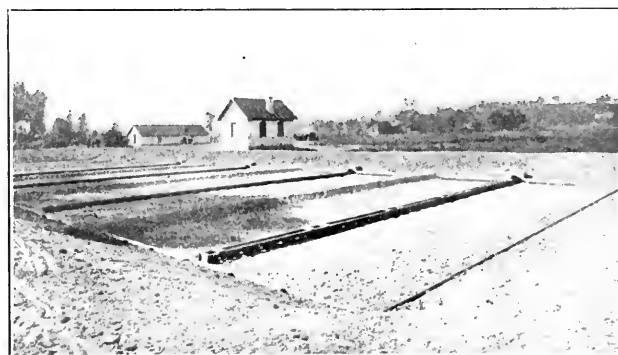
SEWAGE DISPOSAL.

The growth of communities both in size and in number is making more intense the difficulties in the way of disposing of sewage; and especially in view of the advanced stand being taken by more States every year in requiring purification of sewage to a greater or less extent before discharging it into streams.

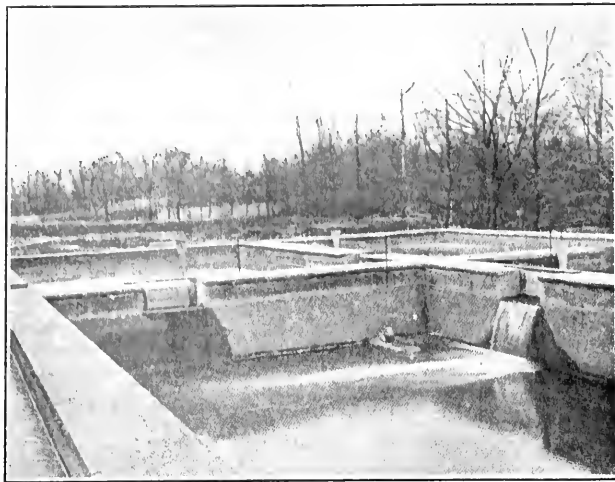
Perhaps the most important and significant development in sewage purification ideas during the past year or so has been the almost unanimous agreement among sanitarians that it is not practicable—perhaps not even so desirable as it was at one time thought to be—to bring sewage effluents to a high degree of purification before being discharged into streams. The consensus of opinion among the leaders in sanitation appears to have practically reached the point foreshadowed in this journal editorially for a year or two past—that the most generally economical and logical treatment of the combined subjects of sewage and water purification was to consider the aim of sewage purification to be the preventing of all nuisance, and looking to the filtration of water supplies for the elimination of pathogenic bacteria or any other causes of disease which might exist in a stream or other source of supply. The old theory that no individual or city had any right to pollute a stream in any way is no more tenable in a densely populated country than that an individual has no right to pollute the air of a public building, although he does so with every breath exhaled.

In the matter of sewage purification a great deal has been done quite recently in the way of clearing the field of misconceptions, of determining the possibilities and limitations of various devices and methods, and of assigning to each of these its proper place in the general field of sewage purification. It is now pretty well realized that there is no one system or plan which is best under all conditions, but that there are a dozen or more of the methods which have been devised during the past twenty-five years which have most excellent features, each of which is probably best under certain conditions.

In general, it may be said that there are three aims in sewage purification—the removal of suspended matter so as to leave a clear effluent; the removal of practically all organic matter so as to give a comparatively pure effluent; and the elimination of pathogenic bacteria. The first is almost always necessary; the second almost never so; the third is necessary under certain



INTERMITTENT FILTER BEDS AT WAUWATOSA, WIS.



GLENNVILLE, G., PRECIPITATION TANKS
Coke and sand filters in background. Population, 10,000

conditions, such as the presence of beds of oysters or other shell fish below the outlet, propinquity of water-works intakes, etc. "Purification" as used in connection with sewage should be recognized to mean "removal of impurities" and not "rendering pure." Almost any plant will do the former to a greater or less degree; no process practicable outside of the laboratory can effect the latter. Parties who claim, as some have done during the past year, that they can construct septic tanks which will furnish an effluent suitable for drinking are worthy of no reliance whatever, but are either the greatest of fools or are intentionally deceiving those to whom they are endeavoring to sell their processes.

In too many cases the city official becomes persuaded that a certain purification process, because it is working satisfactorily in or has been advised by experts for a neighboring city, is therefore the one which should be adopted for his own; whereas, as stated above, there is no one method which is best for all cities, and only a study of the conditions affecting the

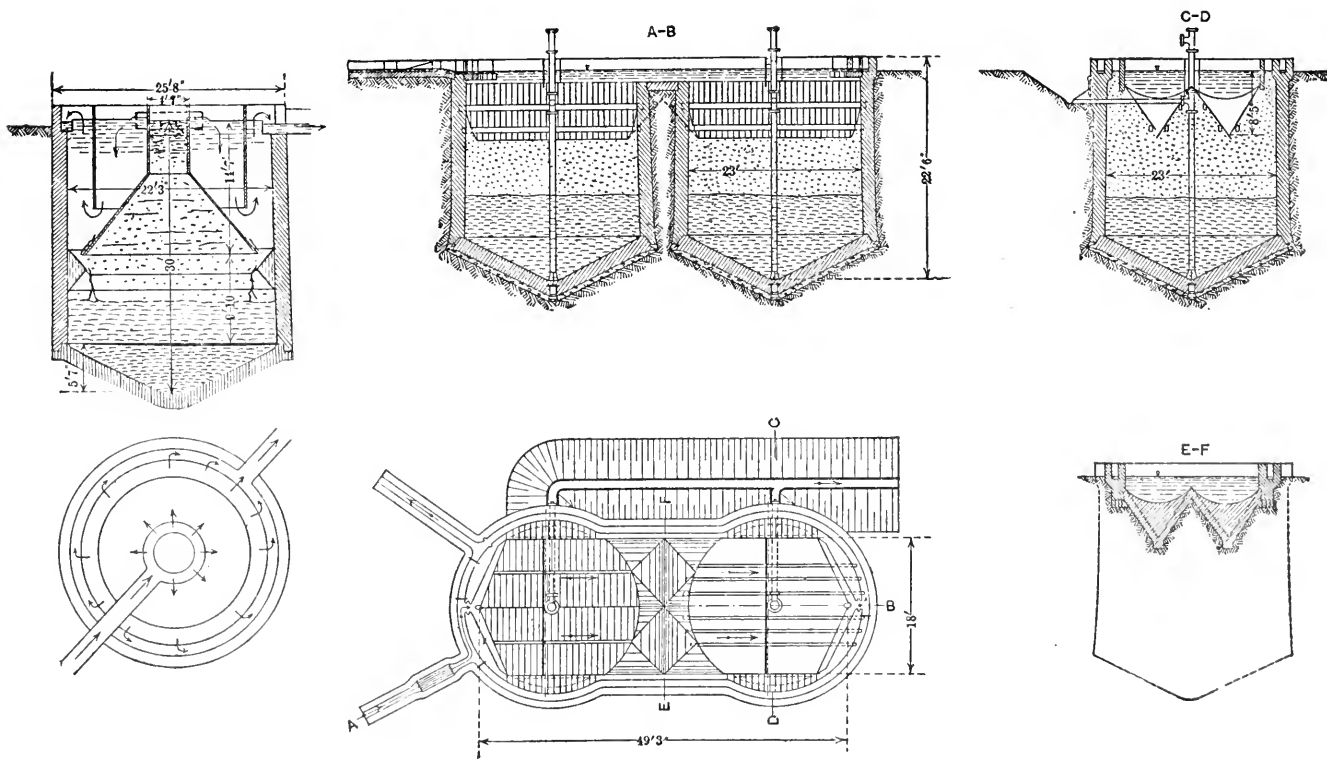
problem in the locality in question can enable even an expert to determine which is best adapted for it.

A greater or less clarification is given by every purification process, but the producing of an effluent even comparatively pure would seem to be practicable only by the use of intermittent sand filters. These require larger areas than are practical for most cities of any size.

The destruction of bacteria, pathogenic and others, can be secured by the use of hypochlorites; also by other agencies which at the present time appear to be less effective and less economical; but it appears to be necessary to remove a considerable proportion of the suspended matter before applying the hypochlorite if favorable results are to be obtained.

For removing suspended matter and delivering a clear and non-putrescible effluent we have available precipitation tanks (including the modifications known as the septic tank, the Emscher tank, etc.), contact beds and sprinkling filters. The last named requires preliminary clarification, its special purpose being that of producing non-putrescibility; while the contact bed works to much better advantage on a liquid at least partially clarified.

All tank methods, whether septic, Emscher or plain precipitation, give only a partially purified effluent and seldom one which is non-putrescent. But unless a large area for comparatively low-rate filtration is available anything better than a tank effluent can be secured only by processes which require tank treatment as a preliminary. The primary function of the tank is the removal of suspended matter by sedimentation. Any other service performed by it is along the line of assisting in the problem of disposing of the matter which settles out—the sludge—either by changing it into a liquid form or by getting it into a more compact and less offensive form, so that it can be more readily disposed of. The best that the septic tank can be expected to do is to liquefy two-thirds of the suspended matter, leaving one-third to be disposed of otherwise. The chief advantage of the Emscher tank appears to be that the sludge (which may be slightly less than that produced by the septic tank) is in a form more readily handled and less offensive.



EMSCHER TANK FOR POPULATION OF 5,000.

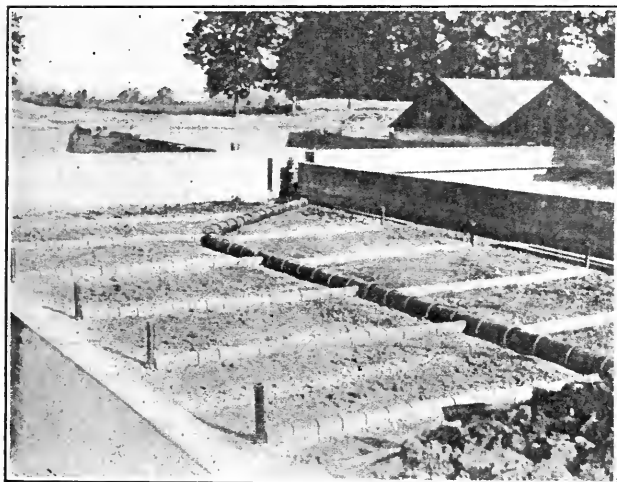
EMSCHER DOUBLE TANK FOR POPULATION OF 10,000.

GENERAL PLANS OF EMSCHER TANKS

We see, therefore, that all plants, except sand filtration, produce a resultant sludge which remains to be disposed of, and this is the most serious problem of sewage disposal yet remaining to be solved. In fact, even the sand filter produces almost as much residuum as the septic tank, but surrenders it in a dry and inoffensive form, so that it can be used for filling, with little danger of objectionable features.

Probably only two or three distinctly novel ideas have been advanced recently, and these are but variations on much older ones. The greatest prominence has been given to the Emscher tank of Mr. Imhoff, which has been used in Germany for two years or more. One or two experimental tanks of this kind have been under operation in this country, and the year 1911 will probably see two or more put into actual service. Another idea which is being tentatively adopted and experimented with is that of artificial aeration of filters or tanks by the introduction of air either by blowers or by outside air currents blowing into ventilating cowls.

More thoroughly established than these, although not quite so new, are sprinkling filters, several of which have been put into operation during the past few months in both large and small plants. One such installation is described in this issue. The difficulty due to freezing of the spray from the sprinklers (which, however, does not appear to have been a serious one at Columbus) has been avoided in two or three of the small plants by enclosing the sprinkler beds in superstructures. The principal feature of the sprinkling filter plants which requires further study and improvement is the matter of the sprinkler



MARION, O., CONTACT FILTERS
Showing underdrains in place. Population, 20,000

itself. No sprinkler head has yet been found which gives an entirely satisfactory, uniform distribution of sewage over the entire surface of the bed. Even theoretically this seems possible only by the use of movable sprinklers similar to those used in most of the English plants; but so far we believe no attempt has been made to use such movable sprinklers in this country. The objection to these usually offered is the danger of the probable interference of ice with the movement of the sprinkler arm or trough; but enclosing the sprinklers would seem to meet this objection.

This suggests ideas which have not been sufficiently considered in this country—the influence of climate upon the action and availability of the several sewage purification methods. There are a number of methods found or believed to be impracticable in the northern section of the country which it seems probable would give excellent results in more southerly climates, where the temperature seldom falls much below the freezing point. Outdoor sprinkling filters and the providing of abundant air of outdoor temperature in various ways are two features which find conditions more favorable for success in a southern than in a northern climate.

SEWAGE DISPOSAL PROBLEMS

Necessity for Reliable Automatic Hypochlorite Apparatus— Better Sprinkler Nozzles—Intensive Sand Filtration —Disposal of Sludge—Utilization

In December, 1910, a discussion was had before the Institute of Chemical Engineers in New York City on the general subject of sewage disposal, papers being read by Messrs. Rudolph Hering, George C. Whipple and C. E. A. Winslow. The last entitled his paper "Unsolved Problems of Sewage Disposal," and gave in connection therewith some information concerning recent experiments which is of more than usual interest. An abstract of his paper is given below.

The first unsolved problem which he mentioned is in connection with the use of bleaching powder for disinfecting sewage. In this, he says: "There is one difficulty which deserves the serious attention of the engineer. In a large plant it is comparatively simple to arrange automatic devices which will deliver a fairly constant supply of bleaching powder solution, and in such plants attendants are usually at hand to make up for any deficiencies which do arise. In a small plant, on the other hand, it is impossible to secure constant supervision. We must rely to some extent on automatic apparatus. It is exceedingly difficult, however, to apply a strong solution of bleach in small amounts without using devices which are liable to be frequently out of order. Small holes quickly clog, small weirs crust over, and it is a common experience to find such chlorine plants stopped up and entirely inoperative. Improvements along this line are greatly to be desired.

"The problem of distribution on the trickling filter is still, of course, a mooted one. The English moving distributors of various types give good results, but are costly and frequently out of order. Fixed sprinkler nozzles, if of small opening like that used at Birmingham, require much care (the constant attention of one man to an acre and a half of beds). Nozzles of large opening, like that devised at Columbus, give imperfect distribution and discharge such a large volume of liquid that they must be operated under a variable head. If the necessity for intermittency be granted (and the writer is not acquainted with any large-orifice nozzle which gives even distribution without it), it seems more logical to adopt a nozzle like the one worked out at Waterbury by Mr. Taylor, which is particularly designed to discharge in a thin restricted sheet which, under intermittent operation, moves back and forth over the wetted area. The gravity distributor, designed at the sewage experiment station of the Massachusetts Institute of Technology, in which the sewage drops down onto a concave disk from which it splashes upward and outward, seems to have justified itself as an alternative to the nozzle system which is worthy of consideration. Mr. Hammond at Mt. Vernon has made an important improvement in the splashing disk by turning it over at the edge; and the plant now in operation at Mt. Vernon shows that the gravity system may yield excellent results in practice and on a large scale.

"One other point which deserves attention in future studies of the oxidizing phase of sewage purification concerns the intensive possibilities of the intermittent sand filter. The original experiments at Lawrence pointed to a maximum rate of 100,000 gallons per acre per day, and in practice the Massachusetts plants have fallen below this figure except perhaps at Gardner and at Worcester. Many of them have operated at less than one-half this rate. With the Massachusetts practice of applying crude sewage to the beds, such low rates are necessary, for the winter clogging sets a sharp limit to their capacity. If, however, suspended solids were removed by proper preliminary treatment it seems probable that a much higher efficiency could be maintained. A dose of 100,000 gallons on an acre corresponds to a depth of less than 4 inches of sewage. With a clean bed of fairly coarse sand, well leveled and equip-

ped with good distributors, such a dose disappears in half an hour and may be repeated once in every six hours without the slightest interference with nitrification. In the Middle Western States (as at Wauwatosa, Wis., for example) plants designed on this principle, with a septic tank preceding the sand filter, are said to operate with success at a rate of 400,000 gallons per acre per day. Analytic data are, unfortunately, in most cases not available." Mr. Winslow then described an experimental outdoor sand filter studied at the sewage experimental station of the Massachusetts Institute of Technology. This was under the charge of Professor Phelps and himself. From August, 1909, to May, 1910, septic effluent was applied to a rectangular bed 21 x 22 feet, containing 3.5 feet in depth of beach sand having an effective size of 0.36 mm. The rate was between 220,000 and 340,000 gallons per acre per day, applied in doses six hours apart. The effluent averaged 3.1 parts per million of free ammonia, 5.9 parts of organic ammonia and 19.1 parts of nitrates, with a relative stability of over 96. During the ten months the sewage of the bed was raked six times, but no material was removed nor was there any apparent deterioration in the character of the surface. From these experiences he believed that the possibility of considerably multiplying the rated efficiency of sand filters was certainly worth further investigation.

The removal of suspended solids from sewage he believed to be the problem which still presents the most serious difficulties. For the destruction of pathogenic bacteria and the oxidation of putrescible organic matter there is a choice between alternative promising methods; but for the disposing of the solid constituents of sewage there is no method which has been developed to a point of real efficiency, in this country at least. In fact, at many plants in this country the whole problem is ignored as if it did not exist.

The difficulty is not so much in separating the solids from the liquid as in disposing of the resultant sludge. Even in sand filtration from five to ten tons of dried sludge per million gallons is strained out and must be disposed of. The watery sludge from sedimentation processes amounts to fifteen or twenty tons when chemicals are used and from ten to fifteen with plain sedimentation, with a minimum of five tons with the most successful septic tanks. Maritime cities can carry this sludge to sea; those on large rivers may perhaps discharge it into these during floods; but for the majority of inland cities disposing of it is a serious problem. Land disposal is available for small plants, for a time at least; large plants have adopted mechanical drying or pressing followed by land disposal or burning. But all these are expensive and objectionable in other ways.

Mr. Winslow considers the possibility of obtaining more perfect liquefaction as being the most apparent possible solution. He states that, of fourteen septic tanks of which careful records have been kept, both in this country and in England, "Five show a solution of deposited solids of 30 per cent or less, four are between 30 and 40 per cent, three between 40 and 50 per cent, and only two over 50 per cent." Theoretically the percentage should be much higher and experiments have indicated that the most important factor in checking the liquefaction was the accumulating of the waste products of the septic process itself; and experiments were conducted by Professors Winslow and Phelps with a view of determining some method for continuing the liquefying action much further; those during the past year or two having been with a tank of the Dortmund shape, or one having a conical bottom, with the inflow at the bottom and the outflow at the top; the sludge, which collects at the bottom, thus being constantly washed in a current of fresh sewage so that the products of decomposition may be removed. Sludge has been removed from this only once in fifteen months, and then only for the purpose of analysis. The effluent has not suffered in quality from passing through the sludge, and the tank removes 50 per cent of the total solids it received. This effluent was the one used in the intensive sand filter experiments just described. Analysis of the sludge and tank contents for eight months of operation (most of them during cold weather) showed that 72 per cent of the

total deposited solids and 80 per cent of the deposited organic solids had been liquefied.

In commenting on the Imhoff tank Mr. Winslow stated that exactly the opposite principle appears to be applied here, in that fresh sewage is cut off as much as possible from the sludge; in spite of which fact it is reported that liquefaction is carried out to a very satisfactory degree and the sludge is well digested. He suggests, however, that the frequent removal of sludge—twice a week or oftener in some cases—accomplishes the same results by removing the inhibiting septic products and also by the greater or less stirring up of the remaining sludge which takes place. At any rate, the quiescence found in the ordinary septic tank appears to be unfavorable for complete liquefying action.

Concerning utilization of sewage Mr. Winslow expressed some ideas different from those which have been commonly entertained. He said: "With the improvements which are being made in drying and separating machinery nothing can be called impossible. The disposal of factory wastes is already recognized as primarily a problem of utilization rather than of disposal. Even ordinary domestic sewage sludge contains, when dried, two or three per cent of nitrogen and five to ten per cent of fat, and on distillation yields ammonia, tar, oil and a more or less luminous gas. There is a field which I am inclined to believe may yet at some future time be occupied by the industrial chemist." Garbage contains about the same percentage of grease, but is twenty to thirty per cent solid matter, whereas sewage sludge contains only about one-fourth as much solid matter. The grease recovered from garbage makes the utilization of the latter more or less profitable. Whether or not equal profit could be derived from the treatment of sewage sludge, with its very much larger percentage of water, is one of the important problems to be solved by the chemist and other investigators along these lines.

CONCRETE PAVEMENT IN BOZEMAN

In our issue of March 10, 1909, there was described the method of constructing a concrete pavement in Bozeman, Mont., in 1908. Last year another section of concrete pavement was laid as a continuation of the 1908 construction. This new section was one block, or 540 feet long and contained 3,313 sq. yds. The work was constructed by S. Birch & Sons Construction Company of Salt Lake City, the prices being: excavation, 50 cts. per cubic yard; gravel fill, \$1.50 per cubic yard, and concrete pavement (not including excavation or fill), \$2.05 per square yard. The total cost was \$2.39 per square yard. Red Devil cement was used, manufactured by the Three Forks Portland Cement Company at Trident, Mont., and costing \$2.50 per barrel. Sand cost \$2.50 to \$2.75 per cubic yard, and gravel from \$1.25 to \$1.50. Labor was \$2.50 per day of eight hours.

After grading, the street was rolled with a ten-ton roller. Grade stakes were driven to the finished grade and from three to four inches of gravel was then placed on the rolled surface and tamped and gaged, allowing seven inches for the concrete. Templates of inch boards which exactly fitted the crown of the street were then placed every 50 feet at right angles to the curb; these being withdrawn after the placing of the concrete to provide expansion joints. Concrete was then laid to a depth of 5½ inches mixed 1 cement to 6 of natural gravel in which the stones were limited to 2½ inches diameter. Before the concrete had set, the grade stakes were withdrawn and a 1½-inch top finish was applied of 1 cement, 1 sand and 1 pea gravel, the latter limited to 1½ inches diameter. This wearing surface was not trowled or marked, but was given a rough float finish. The expansion joints were filled with an asphaltum compound and the pavement covered with sand and earth and traffic kept from it for three weeks. Both concrete and top coat were mixed very wet and placed with wheel-barrow.

According to city engineer Will S. Hartman, this pavement is not so noisy nor so slippery as the 1908 one, which was trowled and marked off into blocks. Moreover the pavement laid this year was constructed in continuous strips across the street, while the other was not, and wear is occurring at the longitudinal joints.

PURIFICATION OF WATER SUPPLY

Methods Available—Slow and Rapid Sand Filters—Where Each is Most Effective—Cleaning Filter Sand—Double Filtration and "Prefilters"—Coagulation—Hypochlorite Sterilization—Ozone Treatment

THE past two or three years have seen considerable advance in the matter of water purification, both improvements in the methods previously in use and also the devising and practical adoption of new methods. The first methods to be employed in American cities were sedimentation and, more commonly, that ordinarily known as slow sand filtration; which were followed by mechanical or rapid sand filtration. These three were used for a number of years as practically the only methods of purifying municipal water supplies. Recently, however, coagulation (which is essential with rapid sand filtration) has been used to assist sedimentation. For certain classes of water intermittent or non-submerged filters have been recommended by European sanitarians but have not been adopted in this country. For sterilizing water, either filtered or unfiltered, hypochlorite of lime has come into very extensive use within the last year or two. Ozone treatment for the same purpose as well as for removing color and even a certain amount of suspended organic matter has been widely advertised, but there are no plants in this country, and probably only one or two in the world, which are successfully treating municipal supplies by this method.

A brief review of the present knowledge concerning these various processes is given below. In preparing this we have drawn largely on a report on "Purifying the Water Supply of Montreal," published a short time ago by Hering and Fuller, because in this has been collected together probably the best recent summary of the latest information on this subject.

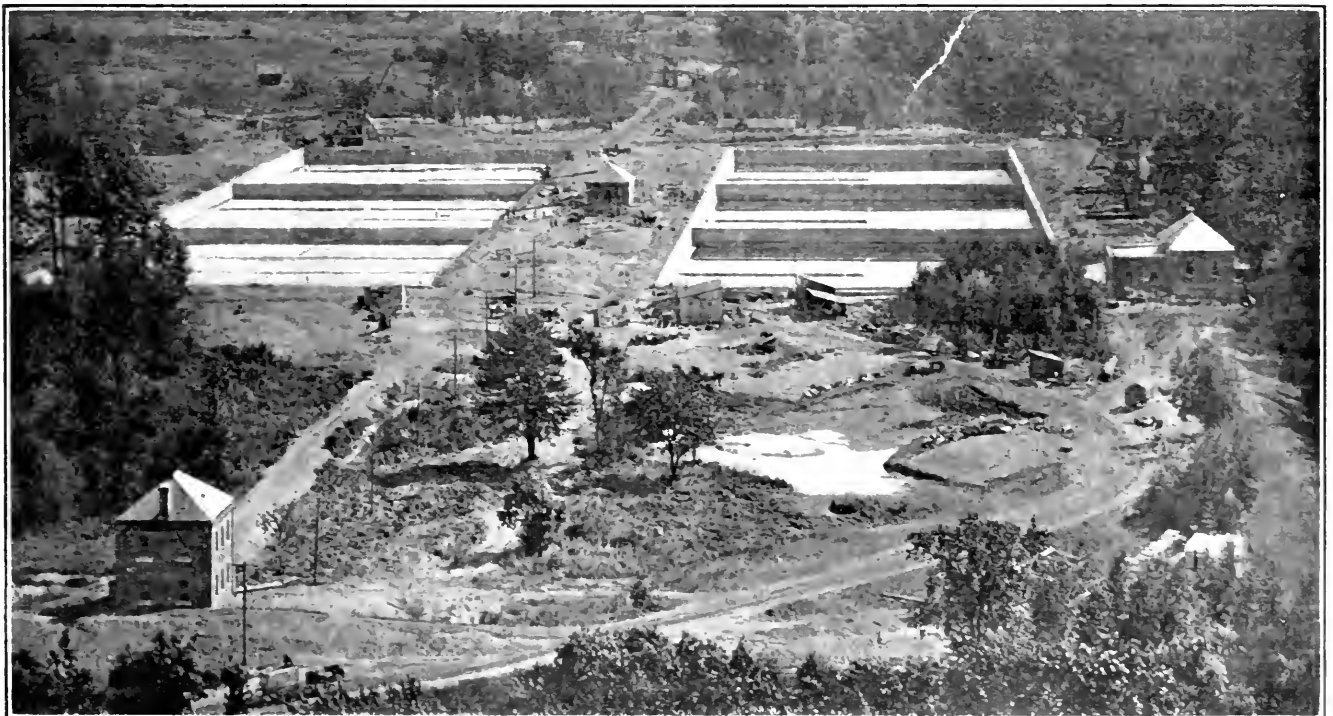
Sand filtration has been practised for about eighty years in Europe and thirty-five years in some American cities. It was until very recently considered that the velocity of flow through these could not exceed two or at the most three million gallons per acre per day with satisfactory results. Recent experiments and improvements, however, have demonstrated the practicability of securing the best of results with a flow of two and one half to five million gallons, and this has been carried up to even six or eight million gallons when the water has

been given preliminary treatment. Slow sand filters contain sand usually to a depth of 36 to 60 inches. Except in the smaller plants they are usually divided into beds of about one acre each.

While slow sand filters are not germproof, they are very nearly so under favorable conditions of construction and operation. They are especially adapted to the purification of waters which contain but little vegetable stain or color and which are comparatively free from mud. They will ordinarily remove from 20 to 30 per cent of the vegetable color or stain from a water. They will regularly remove turbidity to the extent of some 50 to 75 parts per million, and for short periods will remove quantities considerably in excess of this. They are not capable, however, of coping with the muddy waters of the Central West and Southern portions of the United States, unless the water is first subjected to expensive clarification methods. Such filters ordinarily show a removal of some 98 to 99 per cent of the bacteria contained in the unfiltered water.

Mechanical or rapid sand filters are frequently known as American filters, the type having been developed in the United States. These are especially applicable to the treatment of muddy waters and those deeply stained with vegetable matters. Its field of usefulness, however, extends to nearly all types of water, and it offers especial advantages where land is very expensive or that available is limited in area. These filters consist of sand layers 30 to 36 inches deep of a very uniform sized grain. They are arranged in comparatively small units, generally less than 1,000 square feet each, through which water is passed at a much more rapid rate than is the case with slow sand filters; the ordinary rate for mechanical filters being 125 million gallons per acre per day, which is equivalent to about 16 feet of vertical velocity per hour.

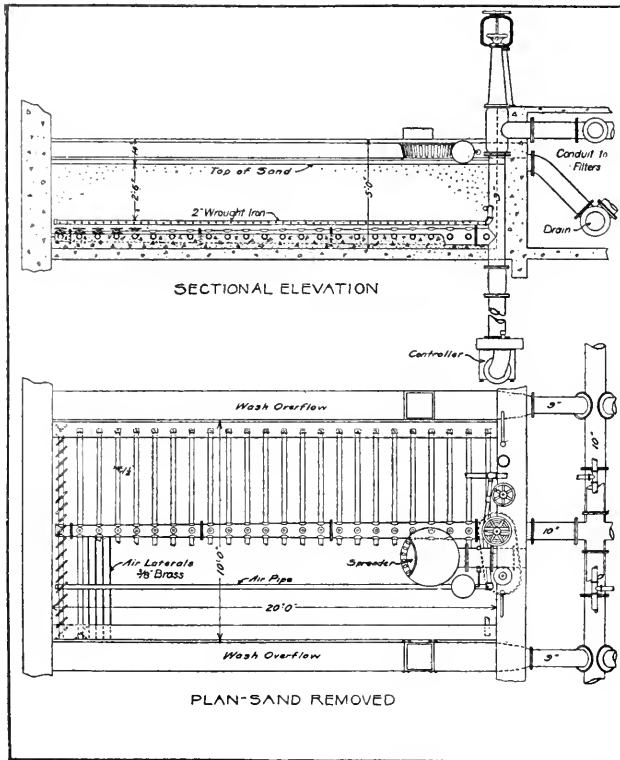
This type of filter depends very largely for its efficiency upon the gelatinous precipitate obtained from the decomposition in the water of a small quantity of sulphate of alumina or iron



GENERAL VIEW OF PROVIDENCE, R. I., WATER FILTRATION PLANT. POPULATION 220,000.

(about one grain per gallon). The resulting precipitate of alumina hydrate forms the necessary gelatinous films so as to permit the bacteria to be retained there until removed later by the process of sand cleaning or washing.

There are now in service in America for the treatment of municipal supplies approximately 350 mechanical or rapid sand filtration plants; this in addition to a number of other such plants, some of them of considerable size, for industrial establishments, clubs, etc. About fifty of these cities have a population of 50,000 or more. Some of the best known filters of this type are those at Little Falls, N. J., New Milford, N. J., Watertown, N. Y., Binghamton, N. Y., York, Pa., Harrisburg, Pa., South Pittsburg, Pa., Youngstown, Columbus, Cincinnati and Toledo, O., Louisville, Ky., Birmingham, Ala., and New Orleans, La.



GRAVITY MECHANICAL FILTER, MARIETTA, O.

One of eight units, each 20 x 10 feet and one-half million gallons daily capacity, or 109 million gallons per acre. Air wash

The use of slow sand filters has resulted in a very considerable decrease in typhoid death rates in most if not all cities where they have been installed; three such instances being those of Lawrence, Mass., where the typhoid death rate per 100,000 was reduced from 114 for the seven years before filtration was introduced to 25 for the fifteen years following; Albany, N. Y., where the death rate was reduced from an average of 90 for the ten years preceding filtration to an average of 22 for the nine years following its introduction; and Pittsburg, Pa., where an average rate of 133 for the eight years preceding filtration was reduced to 47 in the year following the introduction of filters for purifying a part of the supply only.

Well built and well operated rapid sand filters not only reduce turbidity and color but remove bacteria as well and thus greatly reduce the typhoid death rate, as is shown by the experience of several cities, among them being Binghamton, N. Y., where the death rate per 100,000 was reduced from an average of 47 for the five years before filtration to an average of 15 for the five years following its introduction; Cincinnati, O., where the death rate was reduced from an average of 50 for the four years before to 16 the year following; Columbus, O., where the rate was reduced from 78 for the eleven years before to 20 for the year following; Paterson, N. J., where the rate was reduced from an average of 32 for the five years before to an average of 10 for the seven years following; Watertown, N. Y., from an average of 109 for the five years previous to an average

of 38 for the five years following; York, Pa., a reduction from an average of 76 for the two years before to an average of 22 for the eight years following.

Possibly in no other branch of investigation has more money from city treasuries been expended than in that of filtration, and to this expenditure is largely due the advance which has been made in knowledge of the subject. During the past few years more than half a million dollars has been spent in water purification investigations which have been conducted by Louisville, Ky., Pittsburg, Pa., Cincinnati, O., Washington, D. C., New Orleans, La., Philadelphia, Pa., Harrisburg, Pa., Providence, R. I., West Superior, Wis., Richmond, Va., and New Orleans, La.

In several cities water has been subjected to double filtration, generally for the purpose of removing more or less turbidity from waters which seem to occupy an intermediate class between the clear waters which can be treated at high rates in slow sand filters and the muddy waters of the South and West which require constant coagulation. Among the earliest of these to attract attention were those at the lower Roxborough filtration plant of the city of Philadelphia, at Lancaster, Pa., and at Wilmington, Del. All of the purification plants in Philadelphia have been provided with preliminary filters substantially equivalent to rapid sand filters in which no coagulant is used; the effluent from these being further treated in slow sand filters operated at practically double the ordinary rate. Preliminary filters have recently been completed at Albany, N. Y., embodying the latest ideas in preliminary filtration. A careful estimate of the costs and relative rates of purification shows that, while equally good results might have been possible in most of these cases by single filtration, the higher rates thus made possible have effected an economy in the total process.

Coagulation, which is one of the essential features of rapid sand filters, has also been employed in several plants as an auxiliary of sedimentation. This is accomplished ordinarily by the use of sulphate of alumina and objection has been entertained in some cities against the "dosing of water with chemicals," although this material can hardly be considered any more of a "chemical" than the salt used in cooking. The use of this material for coagulation in an effort to clarify water dates back for several thousand years. It has been used for a number of years in the south and by the armies of European countries for clarifying muddy or polluted water when no better was available for drinking. Its use is generally recognized by experts in this country as being perfectly safe, and urgently necessary for many very muddy and highly colored waters. Its use preliminary to treatment in slow sand filters is carried on successfully in Springfield, Mass., Ferncliff and Poughkeepsie, N. Y., Washington, D. C., Indianapolis, Ind., and is included in the plans for the slow sand filter for the Croton supply of New York City. Coagulation alone, without the use of sand filters, is used at Omaha, Neb., Leavenworth, Kan., Kansas City, Mo., St. Louis, Mo., Nashville, Tenn. The basin in which sedimentation assisted by coagulation is to take place ordinarily holds a flow of 18 hours; although the capacity may vary with the nature of the material to be precipitated.

The hypochlorite of lime treatment and several plants in which it is used have been described in a number of issues of MUNICIPAL JOURNAL AND ENGINEER during 1910. Strictly speaking it is not a new process, but has been employed fifteen or eighteen years for eliminating the effect of sewage pollution from certain tributaries of the New York Croton supply. It was used at the time of a cholera epidemic at Hamburg in 1892 and as an emergency treatment in several places in Europe and Asia. It is only within the past two years, however, that substantial progress has been made in our understanding of the nature and accomplishments of this treatment for public water supplies, both alone and in connection with filtration. The material used is what is known commercially as chloride of lime or bleaching powder. Its action is largely if not wholly that of oxidation, its introduction into water being followed by several chemical changes, among which is the formation of hydrogen oxychloride, which is a most powerful oxidizing agent. As a

by-product calcium chloride and several more or less inert compounds are formed. The method is now used in more than 100 cities of the United States, this widespread use dating from the early autumn of 1908, when it was applied to the Boonton supply of the Jersey City, N. J., water supply and at the filtration plant of the Union Stock Yards at Chicago. Among the cities where it is now being used are Milwaukee, Minneapolis, Omaha, Council Bluffs, Indianapolis, Nashville, Cincinnati, Columbus, Pittsburg, Harrisburg, Philadelphia, and numerous other smaller cities.

It should be understood that this treatment is not a substitute for filtration in the removal of turbidity, color, tastes or odors, but only for destroying bacteria and a certain amount of suspended organic matter. Its special advantages are that it can be applied at little expense and on a few hours' notice as an emergency treatment when a water becomes suddenly polluted with disease germs; and also that it can be used as an additional precaution, permitting rapid filtration when a slower rate would be demanded for the purpose of bacterial reduction only.

There are a number of electrolytic processes which have been or are being used for the purification of water supplies. These in most cases rely largely if not wholly upon the electrolytic decomposition of salts in the water and the formation of hypochlorites. While there may be instances where electric current is so cheap and commercial hypochlorite so expensive that the electrolytic process is cheaper than the hypochlorite, in the majority of sections this is not the case. There are however, certain advantages in connection with electrolytic processes which would make them even more desirable than the use of bleaching powder if they can be made economically practicable.

OZONE TREATMENT

Much interest has been displayed, especially among the non-technical public at large, in the ozone treatment of water. As this is one of the most recent processes, and one concerning which it is difficult to obtain unprejudiced statements, we quote in full the Hering and Fuller report on this subject.

Ozone is a modified form of oxygen, and serves as a most powerful oxidizing agent for the destruction of organic matter, including living bacterial cells. It is found more or less in nature, particularly after thunderstorms, and is manufactured commercially through the use of electricity discharged through the atmosphere under very high voltage. It has been actively before the people as a prospective water purifying method for some fifteen years, and has attracted widespread attention.

We have followed its developments closely from the beginning, and have personally inspected its standing in Europe, particularly at Paris in 1900, 1905, 1906, 1908 and 1910.

Ten years ago this process was considered capable of sterilizing a water which was substantially free from readily oxidizable organic matter at a cost in the neighborhood of \$5 to \$6 per million Imperial gallons. There is no question as to the efficiency of ozone under suitable conditions in destroying bacterial life. There are some questions as to the degree of concentration of the ozone which must be present in the ozonized air which is to be mixed intimately with the water to be treated. The expense of the ozone treatment seems to increase materially with increases in the concentration of ozone in the ozonized air.

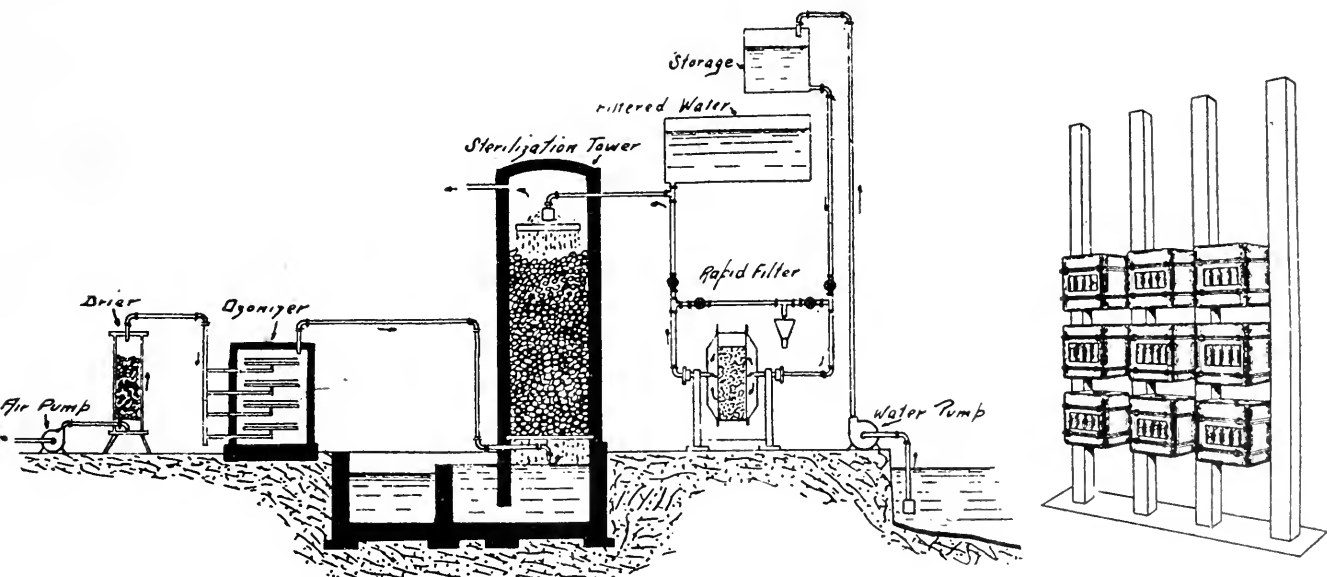
Marked progress has recently been made in perfecting ozonizers so as to render their performance cheaper and also much more reliable. Investigations as to the use of ozone were conducted at the Jerome Park Reservoir in New York City in 1907-08, but the result was unsatisfactory, partly owing to the irregularity with which the ozonizers performed, and partly on account of the prohibitive expense of the treatment.

In Europe there has been comparatively little development on a working basis in the past decade. Plants in regular service on a commercial scale are practically confined to the small town of Paderborn, in Westphalia. We have also seen a small plant in commercial operation at Breda, a small village in Holland. Another plant is at Wiesbaden, Germany, where it is held in reserve for the treatment, in case of emergency, of water from certain wells near the Rhine which contain contaminated water and which are not used regularly.

While numerous investigations at various places in Europe have been made with ozone, developments have been practically confined to the places above mentioned, and at St. Maur, one of the suburbs of Paris, where is located a sand filtration plant from which, after treatment with ozone, a portion of the city water supply is derived. The source of this water is the River Marne, a tributary of the Seine. For a dozen years or so St. Maur has been the scene of almost uninterrupted investigations as to the utilization of ozone for the treatment of the Paris water supply. Its use is proposed in connection with what are called preliminary filters, or roughing filters of the Puech-Chabal type. These preliminary filters are intended to act simply as clarifying devices, and it is the ozone which is relied upon to remove the bacteria.

A year or two ago it was decided to install at St. Maur an ozonization plant with a capacity of 20 million Imperial gallons daily. Plans for the installation of this plant, with a division of the contract equally between the De Frise and Otto systems, have been approved by the Minister of the Interior and by the Superior Council of Public Hygiene, but they have not been ratified by the Municipal Council. That is to say, no contract has been closed for these ozone devices. At present the works at St. Maur are temporarily out of service owing to damage caused by the recent severe flood, but are under process of repair. It is understood that still further tests are to be made, or are being made now, at St. Maur, on the Gerard system of ozonization, and that if this method or device proves satisfactory the 20-million-gallon contract will be divided equally among the three companies instead of the two above mentioned.

The construction cost of ozonization at Paris, according to the different systems, runs from \$6,000 to \$15,000 per million gallons daily capacity. The operating cost is estimated at



SIEMENS' LAYOUT FOR STERILIZING WATER

BATTERY OF SIEMENS' OZONIZERS

about \$6 to \$7 per million gallons, these figures being set forth in a report by Colmet-Daage, City Engineer of Paris.

There is no doubt about the Paris authorities being determined to get the best water obtainable from the local river water as distinguished from further developments of distant gravity sources, and that there has been substantial progress made there as to the use of ozone as an adjunct to filtration.

Comparing the cost and reliability of ozone with the electrolytic decomposition of salt in order to obtain hypochlorite of soda, or upon comparing it with hypochlorite of lime, we see no justification whatever on the ground of cost, to say nothing of irregularity of performance, to recommend the ozone treatment at this stage of development. We formally reported to that effect to the Water Commissioners at Niagara Falls, N. Y., last February. Mention is made of this fact as illustrating our conviction in this regard for a project where electric power is available in large quantities at prices which can scarcely be lower elsewhere.

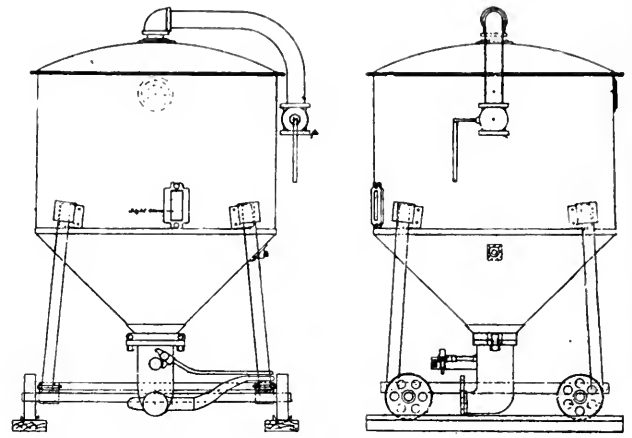
In our investigations of the Montreal project we have taken occasion to visit with Mr. Janin the ozone plants at Lindsay, Ont., and Ann Arbor, Mich. We consider them to be interesting plants, showing that ozonizers can be built and operated with fewer interruptions than we were led to believe possible from our observations of the developments three years ago at Jerome Park Reservoir, New York City. They are now being used at these towns above mentioned with filtration devices which are very crude and inexpensive. At Lindsay the Provincial Board of Health authorities of Ontario, under date of February 8, 1910, unqualifiedly condemned the ozone plant as a sterilizing process. They reported it to be unreliable, and attributed substantially all of the success of the plant to the arrangements and devices other than the ozone. At Ann Arbor it is claimed that the bacterial results obtained are on a more satisfactory basis than at Lindsay, but official reports have not been made public. At both of these places the ozone gives no indication of having any practical efficiency in the removal of color or vegetable stain from the water. At Ann Arbor the final treated water had a noticeable amount of vegetable stain, notwithstanding that use is made of a slight quantity of sulphate of alumina in the unfiltered water. Our experience with the use of oxidizing agents leads us to believe that ozone as a decolorizing agent offers practically no hope for successful results at a reasonable cost.

While we are keenly interested in the development of the ozone process we have no hesitancy in stating to you in unqualified terms that it has not reached a state of development where a city of the size of Montreal can afford to figure on its installation under present conditions.

NEW IDEAS IN FILTER CLEANING

One of the great novelties introduced during the past few years in connection with slow sand filtration is in the method of washing the sand. Originally the sand was scraped from slow sand filters by hand and removed by wheelbarrows to a point outside the filter, where it was washed and removed to the filter in the same way. In 1900 the city of Philadelphia began the design of the largest filtration works in the world and in doing so provided for the removal of the dirty sand by portable ejectors, employing water under pressure for transporting the sand to the sand washer. This method of ejecting sand has been copied by practically all the filter plants built since that time. Since 1909 the city of Washington has also been returning the washed sand to the filters by ejector hoppers similar to those used in removing it from the filters; a slow upward movement of filtered water through the sand in the bed being maintained while the washed sand is being placed by this process.

Since 1907 there has been used at the small filter plants in the Borough of Brooklyn the so-called "Brooklyn method." In this the water is allowed to fall in the filter until it stands



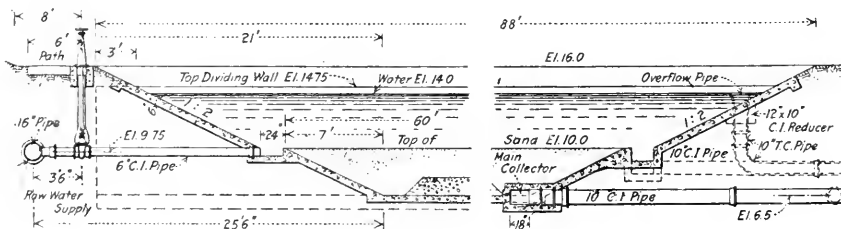
NICHOLS SEPARATOR FOR WASHING FILTER SAND

but a few inches above the sand surface, when outlets are opened which permit the water remaining above the surface to go to waste. The wash water is then applied at one end of the bed and is allowed to flow over the surface of the sand and escape into the drains, the direction of the flow being guided by boards set on edge, forming channels about 15 feet wide. As the water flows over the sand the surface is raked by men standing on the sand, this continuing until the wash water flows clear. Water is then applied through the usual inlets and filtration is resumed.

Since then two other methods have come into use for washing sand without removing it from the filter. The Nichols method, adopted at some of the Philadelphia filters in 1909, consists of ejecting dirty sand and water by an ordinary movable ejector hopper into a separator which is moved into the filter during the process of cleaning. This separator consists of a closed cylinder having a cone-shaped bottom in which are placed a valve and hose connections through which the sand is forced from the separator. The interior of the separator is arranged with a system of baffles and a disc, so that there is a down-flowing stream of sand and an up-flowing stream of wash water, and these are so proportioned that practically no sand is carried away in the wash water, which passes out at the top of the separator and is removed to a drain. The clean sand is discharged from the separator through a hose onto the surface of the filter from which the dirty sand has been removed. The separator is mounted on wheels and is moved from point to point in the filter as the cleaning progresses.

A third method of cleaning the sand without removing it is known as the Blaisdell method. It was first tried at Yuma, Ariz., then at the experimental filtration plant at Jerome Park reservoir, New York, and is now in use at the recently completed filtration works at Wilmington, Del. The plans for the filtration of New York's Croton water supply, which will be the largest plant in the world, are designed to provide for the use of the Blaisdell method. In this there is a washing machine consisting of an inverted box which is sunk under the water in the filter to the filtering surface and is held in position and operated from a movable platform supported from the walls or piers of the filter. This box contains a revolving hollow axle and head from which perforated teeth project into the filter any desired distance. The box can be raised or

lowered and the platform moved longitudinally or laterally, all motions being electrically operated and controlled by one man. The box is moved over the surface of the filter while at the same time the teeth are made to revolve slowly. Water under pressure is introduced through the axle, head and teeth, passing in fine streams into the box through the holes in the teeth. A centrifugal pump connected with the top of the box drains away a little more water than is supplied through the teeth and discharges it to a drain.



SAND FILTER IN BROOKLYN, N. Y., ARRANGED FOR CLEANING BY THE "BROOKLYN METHOD"

STREET CLEANING AND REFUSE DISPOSAL

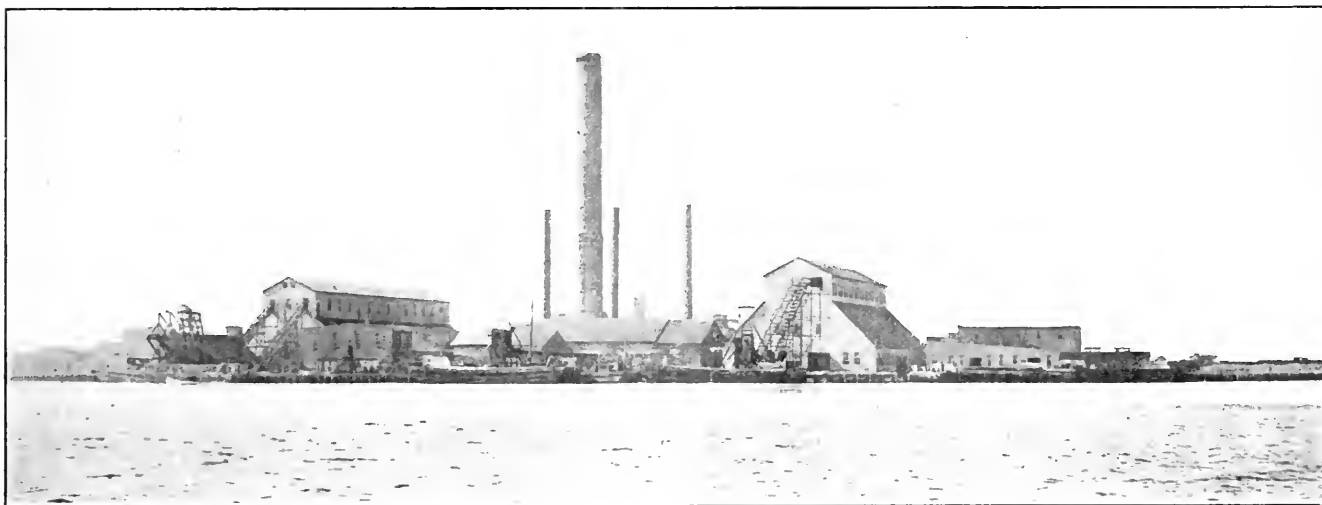
Flushing Methods of Cleaning—Collecting Ashes and Garbage—Refuse Destruction by High and Low Temperature Furnaces—Garbage Utilization—Disposal Methods for Small Cities

In the matter of street cleaning the most important developments during the year have been the increasing number of cities which have adopted the use of water for removing street dirt to the gutters, this ordinarily being effected by the use of special flushing machines. The principal advantages claimed for this are three—that it removes the dirt from the pavement without creating dust; that it removes the fine dust much more completely than does any method of sweeping, and that it is cheaper. Certain city officials have objected to their use, however, claiming that deposits are formed in the sewers and that the flushing washes filler from between the paving blocks of whatever substance and hastens their destruction. It is to be hoped that within another year some actual data on these points may be obtainable; also on the matter of cost, only a few cities apparently having made accurate estimates of the relative costs of the different processes. New York City has made extensive tests of this, which appear to demonstrate the lower cost of the flushing method of cleaning.

Every few months sees patents obtained for more or less complicated machines for both collecting and removing street dirt; the general principal in all being that of a revolving brush which sweeps the dirt onto a moving belt, moving buckets or some such contrivance, which raises it and deposits it into cans, which are removed from the wagon when full; or in some cases the dust is thrown by the broom to the bottom of

from each house the can as well as the garbage it contains has, we believe, been abandoned because of the great cost of the system due to the capacity and number of collecting wagons required, and the necessity of duplicate sets of cans. The city of Minneapolis requires all garbage to be drained and then wrapped in paper before being placed in the cans. This both prevents the garbage from decomposing rapidly and to a considerable extent keeps the can clean, thus minimizing the odors. We do not know that this idea has been adopted by any other cities.

Considerable progress is being made, in the larger cities at least, in systematizing the removal of city refuse of all kinds and reducing to a minimum the amount of street haul required. This is effected by establishing a number of collecting stations throughout the city, each in the center of a fixed area to which all the refuse from that area is conveyed by horse-drawn or motor wagons. At these stations the material is discharged into cars drawn by either steam or electric motors, as branches of either a trolley road or a steam road, and in these cars is taken to some one point for treatment or to a distant section for use in filling land or otherwise being disposed of. With open garbage carts and uncovered dust carts this would make each collecting station a nuisance to the neighborhood; but, if properly covered carts are employed, this can be avoided, the station itself being a fully enclosed and ventilated building.

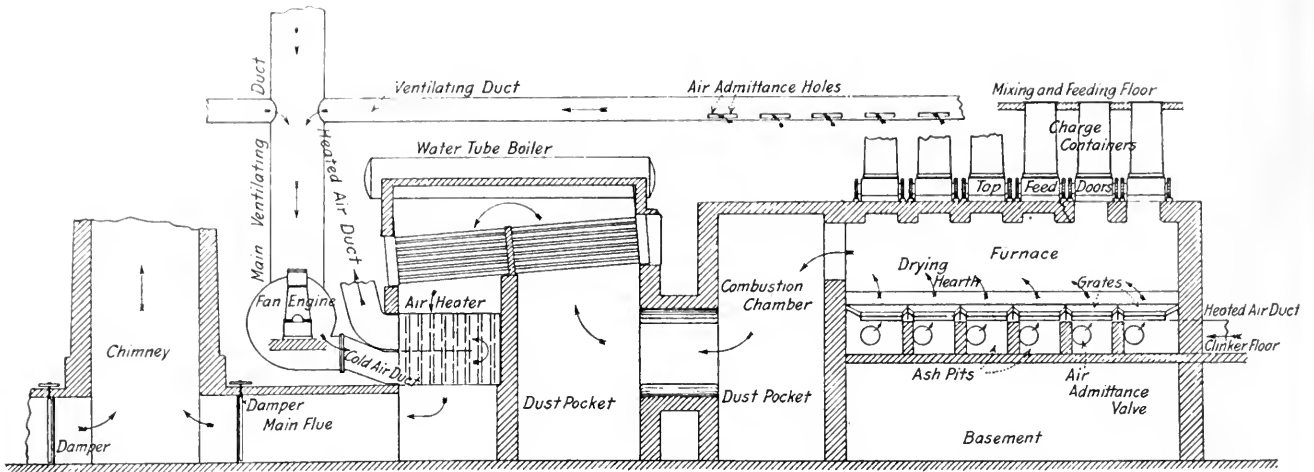


BARREN ISLAND REFUSE DISPOSAL PLANT, NEW YORK

a suction pipe, where it is drawn up by air suction and collects in tanks either by gravity or precipitated by fine spray. So far as we can learn, only one or two of these various machines have met with any success—in fact, most of them have never been actually tried. This journal is continually receiving inquiries concerning such machines, however, indicating that when one arrives which is really practicable and economical it will find considerable sale.

In the matter of collection of ashes and garbage some progress is being made, but not nearly as much as is desirable: one of the greatest nuisances now encountered in city streets being the dust from the ash collecting wagon and the unpleasant odors from garbage wagons. In this line also some inventions are being made, however: two or three wagons having been described by us which are so designed as to make it almost impossible to uncover the garbage wagon at any time except when the buckets are being emptied therein; but these have not come into general use outside of the cities where they originated. The method tried in two or three cities of removing

More change is perhaps being made in the practice of disposing of refuse than in the methods of collecting and transporting; the most important one being the increasing use of the English high temperature furnaces, or those in which the temperature is raised to at least 1,500 to 1,700 degrees, as compared with furnaces in which the temperature seldom reaches 1,000 degrees; it being claimed by the advocates of the former that such high temperature is necessary to prevent the clinker from containing organic matter not fully incinerated, and the discharge of gases from the stack not entirely deprived of their odors. Such plants have been established at the Borough of Richmond, N. Y., Seattle, Wash., Montreal and Vancouver, Can., Milwaukee, Wis., and Montgomery, Ala., and bids for the same for the city of San Francisco were received a few weeks ago. In each of these it is claimed as one of the advantages that a part of the heat created by the burning of the refuse can be utilized for power purposes; but so far the Montreal plant appears to be the only one on this side of the Atlantic where any real use has been made of this heat.



MILWAUKEE REFUSE INCINERATOR. LONGITUDINAL SECTION OF ONE UNIT

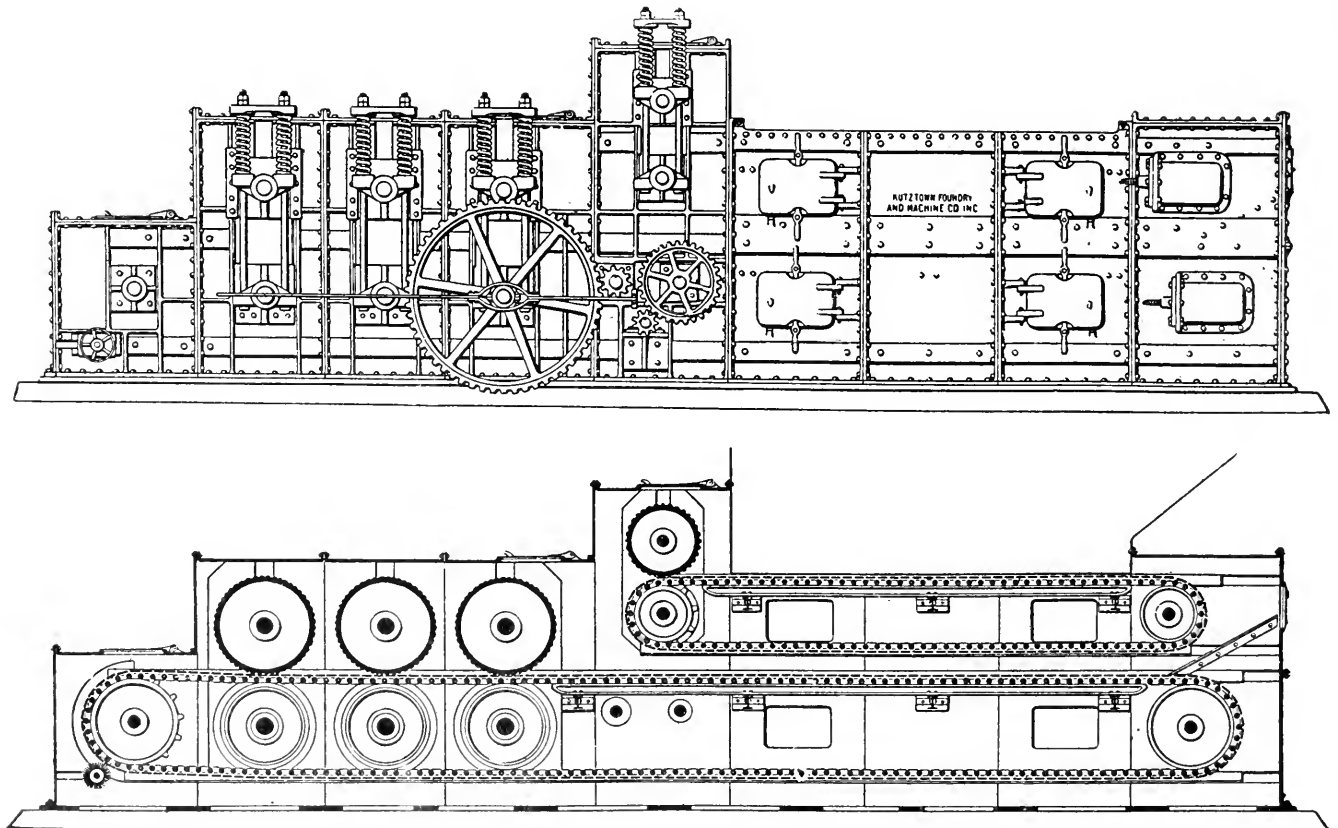
A method of disposing of garbage which seems to be practicable for large cities only is reduction by which the grease contained in the garbage is separated out and used for high-grade soaps, and the remaining portion is used by fertilizer manufacturers. The plants for this process are expensive, but when the amount of garbage to be treated is sufficiently great to keep a large plant in full service, there appears to be some actual profit in its operation. Most of these plants are in private hands, and receive a payment from the city for disposing of the garbage. However, two large cities now own utilization plants, Cleveland, O., having purchased one four or five years ago and later enlarged it, and Columbus having constructed one outright from plans prepared by experts.

In our issue of March 30th other methods of utilizing garbage were suggested, one of these, a plan employed in France, being that of composting and compressing garbage to be used by farmers as fertilizer, which might be adopted in the large cities of this country where market gardeners might find use for such fertilizer in intensive farming. Another idea is that

of using the combined ashes, garbage and rubbish for the manufacture of producer gas, which gas could then be used for operating electric lighting or power plants. So far as we know, this method has never been tried.

In general it may be said that the methods of incinerating garbage or utilizing it by extracting the grease can be employed only by large cities where the quantities of garbage are considerable; or else—an idea which we believe has not yet been put into practice—of collecting the garbage from a number of small towns into special railway cars, which could be filled at a collection station located in each town, these cars then being carried by rail to a centrally located utilization or incinerating plant operated either in common by the several municipalities, or by a company which should arrange with these municipalities for such service.

For the smaller cities, say those of less than 25,000 to 40,000 population, other methods must generally be found for disposing of the refuse; although it may be said that low temperature furnaces have been used by much smaller communities,



SIDE ELEVATION AND LONGITUDINAL SECTION OF CONTINUOUS ROLLER PRESS FOR GARBAGE

their use being common in the army posts of the United States, and when properly operated, these small furnaces have given very good satisfaction. For the small community, however, methods are available which are ordinarily cheaper than incineration or utilization, but which would not be practicable for the large city. The only ones which can be commended are burying in the soil and feeding to hogs. If fed to hogs, the garbage should be fresh when so fed, which means that it must be collected regularly at intervals of not more than two or three days in winter and daily in summer, and must be fed to the hogs without being stored on the farmer's premises long enough to even begin putrefaction. Some small communities in New England and also in Great Britain find this method satisfactory. When buried in the soil the garbage may be either spread broadcast and plowed under as a fertilizer, or it may be deposited in trenches to a depth of one or two feet and then covered with about 12 inches of soil, which may be that excavated from a parallel trench a few feet away. Garbage thus covered will slowly be reduced without offensive odors, the comparatively light covering of earth permitting the access of some oxygen. This reduction underground requires some time. If garbage is covered with a considerable depth of earth, ashes, etc., it may not reach a stable condition for many years and it would be unsafe to build residences upon land filled in in this way.

Experience of practically all cities seems to have demonstrated that it is very difficult to permit garbage to be collected by farmers and other private parties and so regulate

collectors that collections will be made regular and that no nuisance will be created in the city streets. It is therefore generally found that collection by the municipality is desirable, even where the garbage is privately disposed of or is taken by farmers; some cities collecting the garbage and delivering the same to farmers at stations along the outskirts of the city.

It is becoming quite generally recognized that practice along any lines which can be considered as progressive demands the study of the problem by those who have more knowledge of the subject than can be possessed by a city official, unless he himself has previously made a special study of the subject. It is consequently desirable that the question be submitted to engineers or other practical men who have had wide experience or made broad investigation of the subject. This should include not only the designing of plants, but also the location of them and the methods of collecting the refuse. These last are especially important since the cost of collecting refuse and transporting it to the furnace or incinerator is usually greater than the cost of disposing of it at these plants, and the difference between a proper and improper location of plant and method of disposal may mean a difference of thousands of dollars each year in the demands upon the city treasury. But most important of all, perhaps, in connection with incineration, is the skillful operation of the plant. The majority of plants fall far short of their intended efficiency and economy because they are put in charge of inexperienced, careless and ignorant men, who will work for low salaries, but do not earn even those.

STREET ILLUMINATION

Increasingly General Adoption of Electricity—Disadvantages of Gas—Efficiency of Electric Lamps Doubled in Last Five Years—Proportioning Illumination to Street Needs—Location of Lamps

PROGRESS during the past year or two has been made in the efficiency of street lights used, in the brilliancy of illumination and in the more effective general illumination of city streets. The greater part of the brilliant illumination has been confined to business streets and is largely due to private initiative, and in the majority of cases is supported by private funds.

Although in several respects gas lamps give a more pleasing light and are better adapted to units of low illuminating power than electricity, improvements during the past few years in styles of lamps and what may be called the mechanical side of electric lighting generally has so increased the efficiency and decreased the cost of this kind of lighting that in the majority of cities gas cannot compete with it on equal terms. In spite of the introduction of the gas arc and the incandescent mantle for street illumination, these have not been adopted as generally during the past year as was the case a few years ago. The mantle gives greater brilliancy at less cost than the open flame, but the cost of replacing mantles and the greater care necessary in lighting and attention to keeping the lamps in order largely offset this advantage. The facility with which wires can be strung at low cost for installing new electric lights where wanted, as compared to the cost of laying gas mains and the delay and tearing up of streets required, are additional arguments in favor of electric lighting. Partly on account of the same objections, various kinds of lamps burning gas generated at each lamp from gasoline or other liquid are employed more or less commonly for outlying sections of cities and small communities not provided with electric plants.

One illustration of the competition which electric lighting companies are furnishing, as compared with gas lighting, is the fact that they can now furnish tungsten street lamps of the same candle-power as gas mantle burners at the same or lower cost. The tungsten incandescent lamps are made of various sizes for street lighting, generally from 32 to 250 horizontal candle-power. They can be used on ordinary standard series street lighting currents, the same as are already

used for series arc and incandescent lamps; their introduction is therefore a simple matter in most cities and does not require a complete reconstruction of the plant.

For brilliant lighting, several improvements in the electric arc have been made and brought to a point of commercial practicability quite recently. The first change from the old open arc lamp was the enclosed arc, which came into general use about ten or twelve years ago. This has a small enclosing globe around the arc, which makes the carbons last longer, makes the light more steady, and, although the total amount of light is reduced by the double globe, it gives somewhat greater candle-power for the same amount of energy in directions a little below the horizontal, which directions are most effective for street lighting. The latest arcs, the flaming and magnetite, are referred to at length in another article in this issue. The electrodes are not composed of carbon, but, in the case of the magnetite, one is of copper and the other of various metallic salts, including magnetite. It seems unquestionable that the latter is a much more effective light, both as to actual brilliancy and in the number of candle-power, than the enclosed arc; but its general introduction is greatly retarded by the fact that its adoption in old plants requires a complete change in the whole installation. The most common practice with the older arcs is the use of a 6.6 or 7.5 ampere alternating circuit current, whereas the magnetite arc is generally used on a 4-ampere constant current direct-current circuit. The change to magnetite lamp therefore involves new transformers at the generator plant and expensive mercury vapor rectifying apparatus for changing alternating to direct current at the power station.

Another arc which is just beginning to bid for popular favor is the titanium carbide arc. This is more efficient than the magnetite, but the electrodes are more expensive, and, although it is adapted to operation on an alternating current circuit, existing alternating current standard transformers cannot be used, because these give a larger volume of current than is necessary for the titanium carbide arc.

It is safe to say in general that the efficiency of the illuminants now available is about double that of those used five years ago, with the same cost per lamp—that is, the same appropriation per mile can now secure double the illumination.

There are two general elements of street lighting, aside from the lamps to be used, which should receive more attention—in fact, which have not been sufficiently studied to make available the data needed for correct solution. One of these is the proportioning of illumination to the requirements of each street; the other is the location of the individual lamps. In designing a sewerage or water supply system, engineers carefully consider the population to be supplied or other factors going to determine the local demands upon the system, and regulate the sizes of mains accordingly. Something the same study should be made in designing a lighting system. To draw a partial parallel between this and a water distribution system, the use of light as an aid to policing the streets may be compared to the fire protection afforded by the water system; and the difficulty or importance of policing a given street should be recognized as an important factor in deciding upon the amount of illumination to be furnished. Streets frequented by a more or less unruly class or those where the temptations to robbery are greatest should be brightly lighted, even though the residents upon them do not ask or even wish this. In general, however, it may be said that probably the chief factor in deciding the amount of light should be the number of people using the street in question at night, such number occupying a similar place in this calculation to the population drawing upon the street mains in the case of water distribution system. The use of brilliant lighting on business streets, more than that necessary to permit safe and convenient use of the sidewalks and roadways, is largely a demand of merchants for advertising purposes and usually is and probably should be paid for by them.

In estimating upon the number or intensity of lights required, the point considered should not be that at the lamp, where the light is brightest, but rather the points midway between lamps, where there is the least illumination. Moreover, the fact that the eye is so constituted that the point fairly well illuminated may appear dark when one is facing a bright light or has just passed one should be borne in mind; and this calls for as uniform illumination as possible. The exact amount of minimum illumination necessary for streets of various degrees of importance, as well as the relation between this and the intensity of the lights employed, are subjects which have never received the study which they deserve. It is to be hoped that some of our wealthier cities will appropriate funds and employ experts for making a systematic study of this point, as has been done in the case of sewage and water purification, for instance.

In the matter of location of lights, there are three general classes of localities, each with its own problem. In the open park or square the illumination is desired equally on all sides of one or more points which may be established for the location of lights. On the business or other streets devoid of trees the space which it is desired to illuminate is bounded by the houses on two sides, but is unlimited lengthwise of the street. In streets provided with shade trees the problem becomes much more difficult because of the interference of these with the diffusion of the light. In general, it may be said that the first is especially favorable for the use of high-power lights; that, in the second, lights of medium high intensity can be employed to advantage, but in the case of the third the interference of trees necessitates the multiplication of centers of illumination and consequently lower intensities.

One thing which is not sufficiently realized is the fact that the modern brilliant lights should be placed much higher above the sidewalk than they usually are, this both because the greater altitude permits a wider distribution of the light and consequently more illuminating efficiency, at the same time increasing the uniformity of illumination, and also because in this way is avoided much of the glare in the eyes of those on the street level, which glare is not only unpleasant, but tends to make less effective to the observer the illumination

of the street which is actually secured. Modern arc lights should be not less than approximately 25 feet above the surface; abroad 30 to 35 feet is common practice. Even the incandescent gas lamps are usually placed too low, the temptation to economize by substituting them for the old open flame lamps on the same posts being largely responsible for the almost universal failure to give them the desired elevation.

For outlying streets probably the best location for the brightest lights is at the intersection of the roadway centers, where the illumination can be carried in all four directions; the brighter the light, the greater its height. Where the blocks are so long or the lights of such low candle-power that intermediate lamps are needed, these should ordinarily be of less intensity and placed lower, the presence of shade trees frequently making it desirable to use lamps of quite low candle-power placed along the curb and below the over-hanging branches. Under such conditions it will frequently, however, furnish better illumination, we believe, and be even more economical to provide separate lamps for roadway and sidewalk, suspending, say, one 60 to 100 candle-power tungsten lamp at considerable height in the center of the roadway midway of the block, and placing along the inside of each sidewalk as many low candle-power lamps as may be necessary for lighting it. Forty candle-power tungstens may be used where it is not desired to do much more than provide markers for the pathway; but 60 or 80 candle-power tungstens would give much better illumination at little increased cost.

STREET LIGHTING DURING 1910

Lighting by Private Enterprise—Decorative Lighting—
Arches, Lamp Clusters and Brilliant Arcs—Tung-
sten, Flaming Arc and Magnetite Lamps

By E. L. ELLIOT, Editor The Illuminating Engineer

THE movement for better public lighting which began some five or six years ago has steadily gained in impetus until it has become so widespread as to amount almost to a public fad.

Several factors have contributed to this general result. The marvelously impressive illuminations of the several world's fairs held in this country since 1893; the rapid growth and development of the electric sign; the large use made of illumination in decorations for carnivals and civic celebrations, and the commercial introduction of electric lamps of vastly greater candle-power and efficiency than the older forms have all contributed to the common result.

On the other hand, the time was ripe—even a little over-ripe perhaps—for a general reform in the matter of public lighting. America had undoubtedly fallen behind in this civic improvement as compared with European countries. Furthermore, exterior lighting had been neglected, as compared with interior lighting, in which America unquestionably leads the world.

Perhaps the most remarkable feature of the case is the extent to which the new public lighting has been installed and maintained by private enterprise. It seems that the public became convinced of its value so suddenly and so completely that it was too impatient of results to await the delays requisite to that degree of public education necessary to bring about the reform through the regular channels of politics and civic government. By far the larger part of all the installations of the new type that have been put in for the past five years owe their existence to the initiative of private citizens and civic organizations.

It is worthy of note in this respect that during the past year there have been several definite attempts to turn over lighting installations that had been put in and maintained by private contributions to the charge of the cities in which they are located. This is the logical outcome of the general movement; sooner or later it is inevitable that the public lighting installations that are now being maintained by private enterprise will become a public charge, the same as other civic improvements.

The difference between this and ordinary civic reforms is simply that private enterprise was willing to educate the public by actual object-lessons instead of waiting to persuade by argument alone. Decorative, or, as it is frequently called, "White Way," lighting accomplishes two definite purposes—it furnishes a better illumination, which facilitates trade and traffic, and it acts as a general advertisement for a city. Both of these purposes pertain to the city as a whole, and the expense involved is therefore properly chargeable to the public account.

Minneapolis was one of the first large cities to put in an extensive decorative street lighting system as the result of private subscriptions. The installation has been increased from year to year, and it is generally conceded that it has enhanced real estate values in the sections lighted to such an extent as to make it profitable for the city to take over its maintenance on the basis of increased taxation alone, and an effort has been recently made to have the city take such action, the private citizens who contributed the installation being willing to donate it to the city.

Philadelphia is the most conspicuous example of a large city that has remodeled its lighting along modern lines within the past two years, almost entirely at public expense. New York City, which contains the original "Great White Way" and more miles of fine, modern street lighting systems than perhaps any other city in the world, is seldom given any special consideration, probably because it is a matter of course in the metropolis, and has not been used as a means of publicity, for the reason that New York does not need to use any special means of general advertising, the fact that it is the social and financial capital of America being sufficient. But this argument applies to no other American city, and it is quite as legitimate for the city or town to advertise itself as it is for the individual or corporation.

What may be called the new public lighting has thus far been accomplished by three different methods—viz., arches or festoons of incandescent lamps over the streets; decorative lamp posts supporting clusters of tungsten lamps; and the new high-power arc lamps on decorative lamp posts placed along the curbs.

One of the first, if not the first, decorative lighting system in the country was of the first-mentioned type—the arch, or festoon—and was put up in Columbus, Ohio, as the result of a temporary illumination for a public celebration. In the first years of the new street lighting movement a number of installations of this kind were put in, but the method has very generally been discarded. It possesses several serious objections—the arches, or festoons, during the daytime cannot possibly be made decorative, and are usually positively ugly. In the evening the rows of light-sources give the street the appearance of being roofed over, thus creating the effect of a long, low-roofed building. While this arrangement of lights is satisfactory for street fairs and carnivals, it lacks the dignified effect which should characterize permanent municipal improvements. Very few installations of this kind have been put in during the year, and it is probable that the method will be entirely dropped in the near future.

The use of lamp posts or standards of a more or less ornate design, according to the funds available, supporting a cluster (usually five) of tungsten lamps, has been most favored during the past year. The tungsten lamp has proven very satisfactory in its performance as a street lighting unit, and its use in the manner described meets the demand for decorative effect very fully. As commonly designed, the posts are provided with four projecting arms at the top, each supporting a lamp in a globe of diffusing glass, with a single lamp in the center. In the smaller towns the posts are so wired that the four lamps may be switched off at midnight, or any hour desired, and the single central lamp left burning for the remainder of the night. The effect of an installation of these posts placed fairly close together along the curbs is satisfactory both by day and by night. By daylight they suggest a long colonnade, which is more or less impressive, according to the character of the standards, and in any case is an embellishment to the street. At night the lamps add greatly to the effect of perspective,

producing a vista that would be lost with the old methods of illumination; the numerous light-sources, furthermore, add greatly to the general decorative effect, lending an air of dignified festivity to the scene. It is a significant fact that every installation of this kind that has been put in thus far has led to the extension of the system, which is the surest proof of its intrinsic merit.

In considering the third system it may be of interest to state that at about the same time the new tungsten incandescent lamp made its appearance two new forms of arc lamps were also put upon the market. The first one to appear was the so-called "flaming arc," which was introduced from Germany. In this lamp the carbon electrodes used are charged with certain chemicals, which are volatilized in the arc, producing a vapor filled with suspended particles, both of which become intensely luminous. With the carbons generally provided the color of the light is a deep, golden yellow. Lamps of this type not only produce five or six times as much light for a given amount of current as the old form of carbon arc, but give individually a proportionately greater volume of light. Owing to their distinct color and enormous light-power, these lamps are conspicuous objects wherever they are placed. Their one shortcoming is the fact that they require frequent trimming, a single set of carbons lasting from 15 to 17 hours, which means daily attention if they are to be run all night, or trimming every other day at the furthest. This has been one condition that has tended to retard their use for street illumination in this country, where labor is expensive. There has been a greater tendency shown to consider this lamp for the past year than any time previous, and there are now several quite extensive installations. Newark, N. J.; Atlanta, Ga., and some smaller Western cities have such installations, the first two dating back more than a year, however. Where brilliant illumination of the pavement and surrounding objects is desired rather than a multitude of light-sources, the flaming arc stands at the head of all electric lamps.

The distinctly yellow color of the light of the flaming arc as generally used has met with some objection as giving too great a contrast with the carbon arc and the tungsten lamp, both of which are often in close proximity in private installations; and also as being too near to the lurid and spectacular. The use of carbons giving a nearly pure white light, which harmonizes perfectly with the tungsten lamp, is consequently coming into favor. Trial installations of this kind have been put up in the two open squares at the termini of the White Way section of Broadway and are eminently satisfactory. Copley Square, Boston, is another example of flaming arc illumination which demonstrates the special adaptability of this type of lamp to the lighting of large open spaces. Efforts are being made to obviate the one fault of the short life of the carbons of the flaming arc, with much promise of success; and if this can be accomplished the flaming arc will rapidly forge ahead as a luminaut for wide streets and open squares. Even with its present handicap, it can successfully compete with all other light-sources for this class of lighting.

The latest of the new electric lamps, the so-called "luminous arc," or magnetite lamp, has made rapid strides in public use during the past year. In this lamp the electrodes are of two different substances—the positive, which is the source of light, consisting of an iron tube filled with magnetite (black oxide of iron); the negative being a simple copper rod. In efficiency of light production the luminous arc stands about midway between the carbon arc and the flaming arc. It has the advantage, however, of being of the long-burning type, and this has done much to bring it into favor with the lighting companies. This is partly offset by the fact that it can be used only on direct-current circuits, which necessitates certain additional expenses in transmission. The luminous arc has one very serious fault, from the illuminating engineering, or, perhaps we would better say, the hygienic standpoint; it is the most intensely glaring of all commercial light-sources. The light is a cold, blue-white color and contains a large amount of violet and ultra-violet rays, which are the most trying of all radiations to the eyes. The ultra-violet—invisible—rays are largely filtered out by the

glass globe with which the lamps are provided; but it is a remarkable fact, in view of the known danger of glare of any kind, and especially from light of this quality, that in most installations of this type of lamp clear globes are used. As a result, what otherwise might be a brilliant but soft white illumination is only a blinding glare of intolerably dazzling lights. Without the use of a heavily frosted or fairly dense opal globe the luminous arc lamp is unfit for use as an illuminant. Toledo, St. Louis, Baltimore and Syracuse are among the cities having large installations of luminous arcs.

One of the curious aspects of the movement for better public lighting in this country is the complete monopoly of the field by the electric light; gas has been entirely sidetracked. This is the more curious from the fact that the most brilliant public lighting in the world is produced by gas—in Berlin, Germany; and gas fully holds its own for this purpose throughout Europe. Notwithstanding the revolutionary improvements in electric lamps, the modern gas lamp—which also represents some substantial if not so spectacular improvements—still has a decided lead over its electrical competitors in point of economy of cost, while in quality of illumination it has never had a superior. The explanation of this fact may probably be found

in certain commercial conditions which prevail in America and also to the lack of enterprise on the part of the gas companies, who have let the case go by default. While there are some signs that gas may make a showing in this field in the future, it is not likely to regain any large portion of the ground already surrendered. Those who are looking over the various available light-sources for decorative public lighting should not leave gas out of the list, however, for it is not out of the race by reason of its own limitations.

While we have spoken only of the progress of decorative, or spectacular, lighting, it must not be inferred that the less conspicuous but equally important field of general street lighting has been neglected during the year. It is inevitable that the public interest aroused by special installations should result in general improvements; and such has been the case. One notable innovation is the extension of street lighting to interurban country roads. A beginning has been made in this direction, and where the ending will be it were rash to prophesy.

In conclusion, it may be said that the movement for better public lighting has shown steady progress during the year just past, and that the year to come is sure to witness a continuation of this very desirable improvement.

PAVING STREETS AND ROADS

Materials in Common Use, and Where Each Is Most Effective—Improvements in Construction Details—
Bituminous Binders for Broken Stone Roads—Experience Not yet Crystallized—Importance of Aggregate

CONSIDERABLE progress has been made during the past few months in certain details of several of the older pavements; also a better understanding of the conditions under which each of these is most applicable and serviceable. In general it may be said that for very heavy hauling there is no substitute for granite block pavements. For ordinary heavy hauling, sandstone block, the best construction of brick, wood block and concrete are particularly fitted. For medium heavy traffic, sheet asphalt and asphalt block, brick (which may be given a lighter construction than when used for the heaviest traffic), wood block, or bitulithic are generally selected; wood block where noiselessness is an important consideration. Granite, sandstone and concrete can be used satisfactorily on any ordinary city grades; brick also can be so used, especially if beveled edges or depressed joints be used on the steeper grades. Wood block and asphalt, since they both present a very smooth surface without joint depressions, are apt to give trouble on grades of over 3 to 5 per cent. Asphalt block is in some cases used as being less slippery than sheet asphalt; and bitulithic is generally even less slippery than asphalt block.

For light traffic city streets and suburban roads, brick and bitulithic are used where a fairly expensive construction is warranted by the amount of traffic; but in the majority of cases broken stone is used, generally combined with a bituminous binder in the form of so-called bituminous macadam or bituminous concrete in the more recent construction. For ordinary country roads bituminous macadam is now being commonly used, the bitumen being either mixed with the aggregate or applied upon the surface, or as the cheapest improvement, either bituminous or hygroscopic dust layers are applied to ordinary broken stone roads.

In the matter of details of construction, there are certain improvements in practice which have been adopted more or less generally during the past few months. In the case of granite block pavement, the best pavements are now being laid with blocks squared much more truly than heretofore and laid with comparatively close joints, the same being filled flush with the pavement with Portland cement grout. These pavements are much smoother and less noisy than the old rough granite block pavements, and probably will prove more durable also.

In the laying of other block pavements, whether of stone, brick, wood or asphalt, it is doubtful whether any conditions warrant the use of sand for filling the joints, but Portland cement or bituminous filler should be used in all cases. The only possible exceptions would be where the paving is confessedly laid as a temporary one with the idea of replacing it within a year or two.

It is the function of all these materials to take the wear and the blows and transmit the pressure of traffic to the foundation, but not themselves to carry the loads. Consequently, unless the soil is a solid, compact one which has never been disturbed or, if disturbed, has been thoroughly settled, a concrete foundation should be used; and this is also necessary where excavations for house connections or other trenches are to be dug and pavement replaced over them. In streets where there is little of such excavating, and where the soil is fairly firm, however, pavements of brick or stone blocks laid without a concrete foundation have given good satisfaction, especially if the soil be compacted by the addition of more or less gravel and a thorough rolling with a heavy steam roller; or, better still, if a foundation of macadam be laid.

Brick street construction has practically been reduced to standard uniform methods, but effort is being made to improve the methods of testing the brick themselves, and it is hoped that during the coming year a much more satisfactory rattler test will have been settled upon.

The construction of sheet asphalt pavements some years ago reached the point where a general standard was universally adopted. However, during the past few years artificial asphalts, or those obtained by distillation from asphaltic oils, have come into quite general use and modifications of the mixtures employed have necessarily been adapted to the different forms and grades of such artificial asphalts.

Wood block paving has been increasing in popularity during the past year more than ever before, and there are many more firms competing for the business. As has been the case from the first, southern yellow pine is the most popular wood (originally long leaf yellow pine was demanded, but there is little of this now available and, moreover, it is generally believed that the short leaf gives practically as good service). Certain other

woods have appeared as competitors with yellow pine, however, for paving blocks, the most promising of these in the north being tamarack. None of these, however, has stood the test of sufficient time to demonstrate its worth. In the matter of the preservative to be used for wood blocks there is a radical disagreement and animated dispute among experts and manufacturers, the principal points of difference being as to the desirability of permitting the use of any creosote except that derived from pure coal tar, and the specific gravity which should be demanded, whether this should be slightly below or slightly above 1.10. It is claimed by certain manufacturers (and denied by others) that the creosote preservative required by certain of the more recent specifications is a monopoly in this country and can be obtained from only one firm, if indeed it is obtainable at all.

While these details leading to more perfect use and adaptation of old paving materials are of great importance, the greatest amount of attention in the paving field has recently been devoted to the use of bituminous substances as binders and dust layers in connection with broken stone roads. The entire matter is still in the experimental stage, although this does not mean that there is any doubt as to the possibility of securing excellent results under proper manipulation. The questions which have not been satisfactorily settled are the proper principles of selection and manipulation of materials under varying conditions and requirements. In many cases bituminous treatment has given the best of satisfaction, in many others it has proved almost a total failure. It would seem that the determining factors must lie in the nature of the bitumen, the nature of the aggregate and the manner in which the two are combined. So far, each one of these has entered into the problem in different localities affected by so many varying conditions that no satisfactory solution has yet been reached. Little attention has been paid to the question of the aggregate, and it is possible that a more painstaking study of this may offer considerable help toward the solution. It cannot be said as yet, however, that there is any general unanimity of opinion as to the desirable characteristics of the bituminous binder to be used under any of the various conditions, nor as to the methods and proportions of applying this to or combining it with the aggregate. The United States Department of Agriculture, departments and bureaus of several of the States, together with many county and town highway departments, the engineers connected with companies making a business of road construction, chemical engineers and others are all working on the problem with more or less intelligence and with comparison of results among themselves, and it is hoped that the next year or two will see something like definite agreement on most points in place of the more or less chaotic conflict of opinions which appears to exist at present.

PRIVATE STREET LIGHTING UNSATISFACTORY

Girard, Kans., with a population of 2,800, for more than a year lighted its streets with 34 arc lights and numerous private lights on porches, in yards or over the sidewalks, the current for the latter being furnished by a municipal plant. There were still too many dark spots, however, and the cost of supplying current for the private lamps was disproportionately great, partly because these lamps were consuming current during several hours each day before dark and after dawn. The city is being conducted under the commission form of government, with a mayor and two commissioners, and owns and operates its own water and light plants. The commissioner of public utilities is now endeavoring to increase both the effectiveness and the economy of street illumination by discontinuing the private lights, and installing in place of them 100-watt tungsten street series lights, one at each street intersection. These lamps cost less than \$5 each and are operated on the arc light circuits. The cost in current consumption is approximately one fifth of that required for the arc lamps, while it gives a more satisfactory light. We are indebted to city clerk Fred A. Gerken for this information, which indicates commendably intelligent enterprise for so small a city.

OHIO EXPERIMENTAL ROAD TESTS

Results on Columbus Experimental Road—Seventeen Materials and Methods Tested—Condition After a Year—Additional Experiments

The Highway Department of Ohio, of which Mr. James C. Wonders is Commissioner, has recently issued a bulletin describing the appearance early in the fall of this year of the several sections of an experimental road which was constructed by the department on Nelson avenue, Columbus. This is one of a number of experimental roads which have been built in various sections of the country, and several of which have been described in this journal. If properly conducted there should be much valuable information obtainable from such experimental roads, and their construction in various sections of the country is by no means unnecessary duplication of efforts, since methods or materials probably will not all act in the same way in different sections of the country where climate, traffic and even the mineral substances available for road metal may all differ.

So far the public have been informed concerning the construction of several of these, but little information has yet been available concerning the results obtained. This report is an excellent one not only because of the definiteness with which the condition is described, but also because of the excellent illustrations accompanying the same, being reproductions of photographs taken of the road material itself and not, as is the case with most photographs of roadway improvements, a picture of the scenery and surroundings of the road with little to indicate the condition of the surface itself unless this may be unusually uneven. The report contains photographs of each of the seventeen kinds of treatment, of which we produce the nine of which the photographs were the clearest, together with the report in full, which is as follows:

THE experimental road on Nelson avenue was constructed during the summer of 1909, and was described in Bulletin No. 12 of the State Highway Department. The real value of this work will be found in the information that may be obtained as to the wearing qualities of the different methods of construction that entered into it. At the end of a year's service most of the sections are in good condition, and in order that we may clearly present this condition to the reader, photographs have been made of typical parts of the surface of each section. These photographs were made by placing the camera vertically over the surface and at a height of about three feet. It is believed that a better idea can be obtained from these pictures than it will be possible to present by written words. There was but little dust on any of the sections, but before making the photographs the surface was swept clean so as to clearly show the arrangement of the stones in the surface of the road and the manner in which the binder is holding them. A six-inch scale is shown on the plates.

A description of the present condition of these sections follows:

EXPERIMENT NO. 1—GLUTRIN

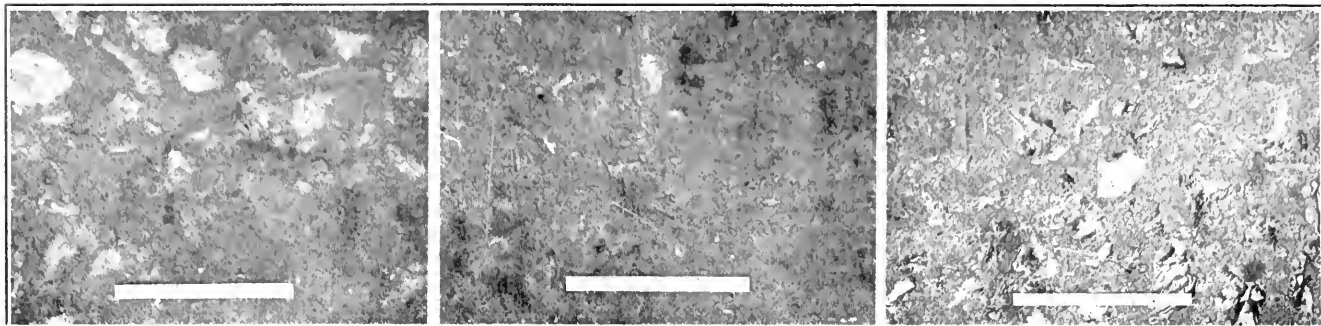
Except for a brownish discoloration, this work has the appearance of water-bound macadam. Undoubtedly the application of Glutrin hardened the surface at the time it was applied, but by the end of the winter this condition had disappeared. Good results could doubtless be obtained by the application of this material each year.

EXPERIMENT NO. 2—STANDARD ASPHALT BINDER

This section is in good condition. The asphalt has exuded to the extent that it covers about one-half of the surface and shows plainly the marks of the horses' shoes.

EXPERIMENT NO. 3—PIONEER ASPHALT

In this section all of the pieces of stone are perfectly bound. No excess of binder is in evidence, the surface is smooth, and its whole condition is excellent.



EXPERIMENT 1—GLUTRIN

EXPERIMENT 2—STANDARD MACADAM ASPHALT BINDER

EXPERIMENT 5—TARVIA B

EXPERIMENT NO. 4—TARVIA "X"

The stones are all well bound in this section, and no excess of tar appears on the surface.

EXPERIMENT NO. 5—TARVIA "B"

This was the only bituminous surface treatment applied, and the result far surpassed our expectations. A thin coat of tar remains over the surface of the road. Its appearance is fine and it has been more nearly dustless than any of the other tar or asphalt-treated sections.

EXPERIMENT NO. 6—LIQUID ASPHALT

On this section the stone forms the wearing surface, but it is all firmly bound in place. Its condition is very similar to that of Experiment No. 3.

lar to that of a sheet asphalt pavement on an extremely warm day. The part thus covered is dustless and provides an ideal road surface.

EXPERIMENT NO. 10—WADSWORTH MACADAM

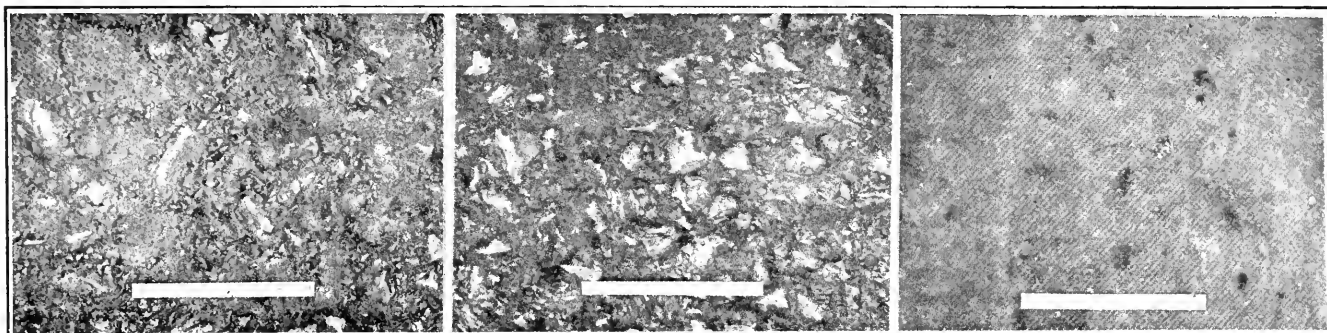
This section is surfaced with Kentucky Rock Asphalt, and at the present time is in as fine a condition as the best sheet asphalt pavement, and it is in better condition than when first constructed.

EXPERIMENT NO. 11—CARBO VIA

This section is in good condition, in appearance being very similar to Experiment No. 4.

EXPERIMENT NO. 12—CONCRETE MACADAM

This section has the appearance of a water-bound macadam,



EXPERIMENT 6—LIQUID ASPHALT

EXPERIMENT 9—ASPHALTOLENE

EXPERIMENT 10—WADSWORTH MACADAM

EXPERIMENT NO. 7—UGITE

In the construction of this section the binder was applied on part of the work in one coat and on the remainder in two coats, but at the present time no difference in its condition can be observed. The stone now furnishes the wearing surface; each piece is firmly bound and the condition of the section is very satisfactory.

EXPERIMENT NO. 8—FAIRFIELD ASPHALTIC CEMENT

This section is in perfect condition, with the surface very similar to that of Experiment No. 3.

EXPERIMENT NO. 9—ASPHALTOLENE

About one-half of the surface of this section is covered with the binder, and on the remaining part the stone furnishes the wearing surface. Where the binder covers the surface of the road, the imprints of the horses' shoes show in a manner simi-

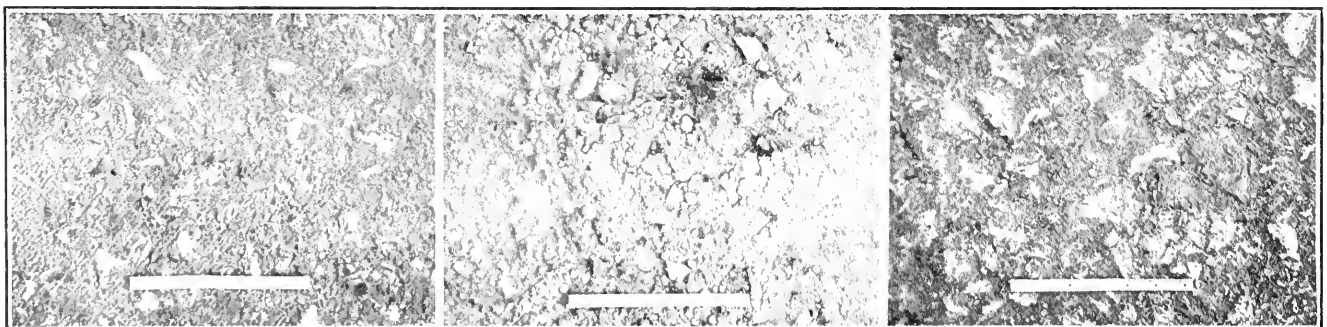
and the addition of the cement to the binder has not produced any apparent benefit.

EXPERIMENT NO. 13—TAROID

The traveled surface of this section is in excellent condition. There seems to have been an excess of tar used as it has been bleeding at the sides until the surface of the ground is covered to a width of about two feet.

EXPERIMENT NO. 14—PETROLITHIC PAVEMENT

With the beginning of the warm weather this summer, the asphalt exuded on the surface of this section to such an extent that vehicles avoided it, traveling in the ditches on both sides of the road. Its condition became so objectionable and so many complaints were received that we were obliged to have it repaired. It was accordingly covered to a depth of about two inches with screened gravel ranging in size from



EXPERIMENT 13—TAROID

EXPERIMENT 14—PETROLITHIC

EXPERIMENT 17—WATER-BOUND MACADAM

one-eighth of an inch to one inch, which was well rolled with a ten-ton macadam roller. The cost of this repair, exclusive of the rolling, was \$50.15.

At the present time the road is rutted by the vehicles that pass over it. Outside of the line of ruts the gravel still covers the surface.

EXPERIMENT NO. 15—LIMESTONE CONCRETE

A few places at the joining of different days' work in this section are beginning to show the effects of wear. About one-half of the section is in a very good condition, and it indicates that a satisfactory road could be produced by the methods used in its construction.

EXPERIMENT NO. 16—GRAVEL CONCRETE

This section is in good condition and shows but very little signs of wear. The surface is sufficiently rough to afford a good footing for horses.

The transverse cracks that developed last winter do not up to this time show any greater wear than the other parts of the road, the cracks showing only as lines across the surface. This section is dustless, and it is one of the most interesting of these experiments.

EXPERIMENT NO. 17—WATER-BOUND MACADAM

The automobile travel has removed all of the binder that was left on the surface of this section. The larger stones in the macadam provide the wearing surface. They are all perfectly bound and the condition of the road is satisfactory.

In order to provide a record of the wear on the different sections, levels were taken over the road soon after the completion of the work. The points at which the levels were taken were carefully located so that it is possible to ascertain the amount of wear by releveling at any time. Readings were taken on the center line, and at four feet and eight feet, both east and west of centers, at five stations on each section, making a total of twenty-five readings on each section of four hundred feet.

The work was relevelled in September of this year, and the result shows approximately a year's wear. The wear is shown in hundredths of a foot in the annexed table, and the amounts are the average at five points in each section.

Table Showing Wear on the Nelson Avenue Experimental Road One Year After Its Construction

Section.	8 ft. east.	4 ft. east.	Center line.	4 ft. west.	8 ft. west.
1. Glutrin	.07 ft.	.07 ft.	.00 ft.	.00 ft.	.00 ft.
2. Standard asphalt	.02 ft.	.06 ft.	.06 ft.	.08 ft.	.09 ft.
3. Pioneer asphalt	.07 ft.	.07 ft.	.05 ft.	.03 ft.	.03 ft.
4. Tarvia "X"	.02 ft.	.04 ft.	.04 ft.	.05 ft.	.03 ft.
5. Tarvia "B"	.08 ft.	.04 ft.	.03 ft.	.00 ft.	.00 ft.
6. Indian asphalt	.01 ft.	.03 ft.	.01 ft.	.03 ft.	.02 ft.
7. Ugite	.04 ft.	.05 ft.	.05 ft.	.03 ft.	.05 ft.
8. Fairfield asphalt	.04 ft.	.04 ft.	.04 ft.	.05 ft.	.00 ft.
9. Asphaltolene	.05 ft.	.04 ft.	.04 ft.	.05 ft.	.03 ft.
10. Rock asphalt	.00 ft.	.00 ft.	.02 ft.	.03 ft.	.04 ft.
11. Carbo-Via	.03 ft.	.09 ft.	.07 ft.	.08 ft.	.07 ft.
12. Concrete Macadam	.04 ft.	.05 ft.	.05 ft.	.01 ft.	.00 ft.
13. Taroid	.02 ft.	.01 ft.	.03 ft.	.00 ft.	.00 ft.
14. Petrolithic	.03 ft.	.01 ft.	.06 ft.	.00 ft.	.00 ft.
15. Limestone Concrete	.04 ft.	.06 ft.	.02 ft.	.00 ft.	.00 ft.
16. Gravel Concrete	.00 ft.	.00 ft.	.00 ft.	.00 ft.	.01 ft.
17. Water-bound Macadam	.01 ft.	.03 ft.	.03 ft.	.01 ft.	.01 ft.

A census of the travel was also taken from July 31 to August 13, 1910, and the results are recorded in the table at the foot of this page.

DARKE COUNTY EXPERIMENTAL ROAD

The department has this year constructed another experimental road in which it has experimented with tar and asphalt in binding the gravel of Darke County, taking for this purpose a section of road opposite the fair grounds at Greenville. This work was begun on July 20 and continued up to August 13 of

the present year. Nine hundred gallons of tarvia X and the same amount of Indian Refining Company's asphalt were used in the work. The only roller available was one weighing fifteen tons, without water or coal, belonging to the city of Greenville. A ten-ton roller would, it was believed, have given better results, but none was available. The surface treated was uniformly 16 feet wide. There was a good bed of gravel on the old road and this was prepared for receiving the top course by spiking up the surface with the steam roller and harrowing and grading to bring it to the proper cross section, after which it was thoroughly rolled and watered.

Six hundred feet of road was treated in six sections, these varying in length from 72 to 130 feet. The tarvia was applied at a temperature of 340 deg. to 400 deg. Fahr. and the asphalt at from 400 deg. to 450 deg.

In the first section three inches of washed gravel was spread and rolled, and then about 1½ gallons per square yard of tarvia X was applied. This was then covered with about one inch of ½-inch to 1-inch gravel, which was allowed to stand over night and then rolled until buckling commenced. Three-fourths of a gallon of tarvia per square yard was then poured over the surface and a ½-inch layer of ⅛ to ½-inch gravel was applied, and after standing over night this was rolled for one and one-half hours. Whenever tarvia was found to be "bleeding" in spots sufficient gravel was applied to these to take up the tar.

In the second section the first two courses were prepared as in the first section, except that on top of the second course about one-half of the section was covered with one gallon per square yard of equal parts of tarvia and unrefined coal tar mixed, and the other half with three-quarters of a gallon per square yard of asphalt binder. The former was covered with ¾ inch of ⅛ to ½-inch gravel and the latter with ½ inch of boulder chips. This was rolled the next morning as in section one.

The third section had a bottom course similar to the first section, except that 1¾ gallons of tarvia X per square yard was used in place of 1½ gallons. This was covered with ¾ inch of ⅛ to ¾-inch gravel and rolled the next morning and then covered with ¾ gallon per square yard of tarvia X and this covered ¾ inch with ⅛ to ½-inch gravel, which was rolled for two hours.

The fourth section had a bottom course of 4½ inches of 1 to 2-inch gravel with 30 per cent of broken boulders. This was poured with 2½ gallons of asphalt binder covered with 1½ inches of ½ to 1½-inch gravel and rolled the next morning for half an hour. It was then poured with ¾ gallon of asphalt binder and the north one-half was covered with ⅛-inch to ½-inch gravel and the southern half with ¼ to 1-inch boulder chips. This was rolled the next morning for about one-half hour.

The fifth section had a bottom course of 1-inch to 2-inch crushed boulders spread four inches thick and partly filled with a clay filler, the filling being completed with limestone dust rolled in with the steam roller until all voids were completely filled. This bottom course was then thoroughly watered and rolled until a grout appeared on the surface. Next day it was again watered and rolled thoroughly, sand being added during the rolling.

The sixth section consisted of one course four inches deep composed of 1-inch to 2-inch watered gravel to which 30 per cent of crushed boulders had been added. The filling, watering and rolling were similar to that of the fifth section.

In the case of the first four sections the rolling was con-

Table Showing the Daily Travel on Nelson Avenue Experimental Road from July 31 to August 13, 1910, Between the Hours of 7 A. M. and 8 P. M.

Days	31	1	2	3	4	5	6	7	8	9	10	11	12	13	Total
One-horse buggy	132	88	65	62	88	72	105	98	77	57	83	74	77	86	1,164
Two-horse carriage	2	3	2	1	3	1	1	2	0	0	3	0	1	1	20
One-horse wagon	16	46	58	46	43	39	83	11	45	57	63	48	50	71	679
Two-horse wagon	1	16	26	22	29	21	17	2	14	27	24	29	27	23	278
Runabout automobile	63	39	28	27	27	21	19	30	24	14	27	31	36	23	409
Touring car	70	55	59	45	66	45	53	83	61	14	44	65	70	40	770
Motor cycle	21	5	8	5	12	14	5	9	4	1	11	8	1	6	110
Horseback rider	6	1	1	4	2	0	2	0	3	2	1	0	0	3	39
Total	311	253	247	212	270	213	285	235	228	172	261	255	271	236	3,169

tinued in each case until buckling commenced. In addition to the rolling mentioned, the roller was run over the completed work each day until the last section was finished. One month after completion all of the road was in perfect condition except two or three small spots which had raveled in the part where unrefined tar had been mixed with the tarvia.

The total cost of the experimental road work was \$669.70. The gravel was furnished by the Greenville Gravel Company free of charge on board cars at their plant. The roller was hired from the city. The Indian Refining Company made no charge for the asphalt furnished by it.

CITY AS A BUSINESS PROPOSITION

Assessment of Percentage of "Unearned Increments" in Land Values Proposed—Dividends Instead of Taxes—American and European Examples

UNDER the title "Conservation in Municipalities," Hon Wm. Dudley Foulke, in a paper before the 1910 convention of the National Municipal League, presented arguments in favor of a city's profiting by the appreciation in value of the land within its boundaries due to its own growth. The justice of this and method of carrying out the idea he illustrated as follows:

If my own city of Richmond, Ind., were not built the land on which it rests might be worth, for farm purposes, \$100 or \$150 an acre. Practically the whole present value of the land is conferred by the city, and if the city merely charged rent or interest upon the value it conferred it could collect more than our entire taxes and could give a considerable dividend, not only to land holders, but to those citizens who owned no land at all. All a city needs to do, if it starts out right, is to assess a proper percentage upon the unearned increment of the land it occupies. Now, what is that unearned increment? If I own a cheap lot in a remote suburb and do nothing with it, but the city expands in that direction and people build all around me, this adds to its value many times. I have done nothing myself to make it worth any more, but the people who come and build around me have done it all. Yet I get the increased value which I have not earned, and the city whose growth gave the value gets nothing except a trifling tax from year to year. The city ought to have that increase and make me pay rent upon it, instead of taxing other things which I earn myself. In other words, if the city taxes what the city gives at its proper value there need be no taxes imposed on what it does not give—upon the product of industry, such as buildings, improvements and personal property.

I learned upon investigation that a city actually exists in this country where there are no taxes, and where all charges for necessary expenses are met in this manner. That is the city of Fairhope, on Mobile Bay.

A few emigrants from Iowa settled there on a sandy beach. As others joined them they formed a corporation and they adopted the initiative and the referendum. The land was owned by the city as a whole, and leased to the citizens. When one of these paid into the treasury the annual ground rent for his leasehold and the cost of installing a telephone there were no further taxes. After a decade and a half that city is said to be prospering under this system. There are free schools, a water system without rates, a public dock, a free library and a telephone service with no charges, all established out of the ground rent after paying state and county taxes and the cost of administration and improvements.

But our experience in this country is very meager compared with that of Europe. Orson, a town in Sweden, imposes no taxes. Moreover, the local railway is free to every citizen, and there is no charge for telephone service, schools, libraries and the like. This state of affairs is due to the wisdom of a former generation that planted trees on all available ground. During the last thirty years the town authorities have sold young trees and timber to pay the city's expenses, and judicious replantings have provided for a similar income in the future.

An article by R. Ockel, in the *Westminster Review*, states that in Germany no fewer than 1,500 towns and villages own so much common land that their inhabitants pay neither rates nor taxes, and 500 of these have so great a rental from their lands that they can pay each citizen on New Year's day a bonus of from \$25 to \$100. Much of this income is derived from communal forest land. In Forbach, for instance, the communal church was built with a forest nursery and is supported by a forest estate producing an income of \$15,000 to \$20,000 annually. In these European municipalities the trees are

not cut faster than they are replaced by the growth of new timber, yet even thus the forest of the Swiss city of Zurich yields an annual income of \$12 an acre.

In general, a city without taxation can exist only where the municipality owns a considerable portion of its land and takes advantage of increased values. The city must be "caught young" to make such a result possible. Our American cities have not been caught young enough for that, but is there therefore nothing we can do to approximate such a consummation? If we cannot eliminate taxes can we not lessen them by the profitable investment and management of what the city yet owns or can acquire? It owns its streets, and these, under proper management, ought to be constantly increasing sources of revenue. The right to use these streets for telegraphs, for telephones, for heating and lighting purposes, for water mains, for street car tracks, in short, for any profitable purpose, ought to be carefully guarded and the utmost possible secured by franchise from any person or corporation who uses them. In the past we have always been so eager to get the new system, gas, electricity, tramway or whatever it might be, that we have granted franchises with little regard to the future growth in the value of our streets. This must now cease. There is just as much unearned increment in a system of street car tracks, of water mains or gas pipes as there is in a city lot. Each year its value increases with the growth of the city, the increase of patrons and the establishment of new connections. The franchise which ties up for a long period this use of the streets for a fixed sum is pretty certain to be one from which the city in the lapse of years is bound to lose. The term of a franchise ought therefore not to be too long, and the price demanded ought to be graduated so as to increase with the increasing value of the thing granted. The immediate result may seem unimportant, but it will not be long before the city begins to enjoy the providence which thus insures the participation of the public in the increased values that the city itself confers. If we cannot catch our cities very young let us catch them before they grow any older than they are. Many of the most important franchises are still to be granted and should be guarded in accordance with the best models, not only of our own country, but of cities abroad, where they do these things much better than we do them in America.

A side light on the effect of population in increasing land values, and on the value of a life to the city, is shown by some remarks recently made by Mr. Frederic C. Howe, member of the Cleveland, O., Board of Assessors. He stated:

We found that in ten years' time land values increased \$177,000,000, and that the population in the same time increased by 172,000. That is, that for every man, woman and child who came into the city during that period \$1,000 was added to the value of the land. That is a fact of substantial value to the single taxer. We confirmed the estimate which has been frequently made that land values not only respond to population, but respond in a definite and discoverable ratio.

CITIES HAVING COMMISSION GOVERNMENT

We are continually receiving letters asking for the names of cities which have adopted the commission form of government, and offer the following list on the authority of the Short Ballot Organization. If there are any omissions we would be glad to be informed of them.

Alabama: Birmingham. *California:* Berkeley, Modesto, Riverside. *Colorado:* Colorado Springs, Grand Junction. *Idaho:* Boise, Lewiston. *Iowa:* Burlington, Cedar Rapids, Des Moines, Fort Dodge, Keokuk, Marshalltown, Sioux City. *Kansas:* Abilene, Anthony, Coffeyville, Cherryvale, Caldwell, Emporia, Girard, Hutchinson, Independence, Iola, Kansas City, Leavenworth, Marion, Newton, Neodesha, Parsons, Pittsburg, Topeka, Wichita, Wellington. *Louisiana:* Shreveport. *Massachusetts:* Gloucester, Haverhill, Lynn, Taunton. *Michigan:* Port Huron. *Minnesota:* Mankato. *Mississippi:* Hattiesburg. *Missouri:* St. Joseph. *New Mexico:* Roswell. *North Carolina:* Charlotte. *North Dakota:* Bismarck, Mandan, Minot. *Oklahoma:* Ardmore, Bartlesville, Duncan, Enid, Miami, McAlester, Muskogee, Sapulpa, Tulsa, Wagoner. *South Carolina:* Columbia. *South Dakota:* Dell Rapids, Huron, Pierre, Rapid City, Sioux Falls, Vermilion, Yankton. *Tennessee:* Bristol, Clarksville, Etowah, Memphis, Richard City. *Texas:* Austin, Beaumont, Corpus Christi, Dallas, Denison, El Paso, Fort Worth, Galveston, Greenville, Houston, Kenedy, Lyford, Marshall, Marble Falls, Palestine, Port Lavaca, Sherman, San Antonio, Waco. *Washington:* Tacoma (modified). *West Virginia:* Bluefield, Huntington. *Wisconsin:* Eau Claire.

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233 West Thirty-ninth Street, New York
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A. PRESCOTT FOLWELL, Editor
F. E. PUFFER, Assistant Editor

Business Department
S. W. HUME, President
J. T. MORRIS, Manager. A. PRESCOTT FOLWELL, Secretary

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Subscribers are requested to notify us of changes of address,
giving both old and new addresses.

Contributions suitable for this paper, either in the form of
special articles or of letters discussing municipal matters, are
invited and paid for.

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are requested to call upon MUNICIPAL JOURNAL AND ENGI-
NEER, which has unusual facilities for furnishing the same, and
will do so gladly and without cost.

JANUARY 4, 1911

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General Review and Outlook

A LARGE part of this issue is devoted to a general statement
of the present condition of knowledge and practice in connec-
tion with the more important municipal utilities and functions.
This, it appeared to us, would be more useful—especially to the
new officials, whom in particular we had in mind—than a
mere review of what had been done along each line during
the year. In each case an effort has been made to explain
what the most recent experiences have demonstrated can be
done, and how.

In every branch of municipal construction, invention and

enterprise are more active than ever before. City officials
are continually having urged upon them new methods and de-
vices, many of them untried, and are at a loss how to choose.
The only safe way is to obtain the decision of an unprejudiced
expert. But it is believed that the synopses here presented
will indicate what practices are unquestionably safe and what
dangerous to adopt.

Our Aims and Purposes

As this issue comes out at a time when a great many
municipal officials are for the first time entering upon their
new honors and duties, it seems timely for us to give for
their information a statement regarding the purposes and aims
of the MUNICIPAL JOURNAL AND ENGINEER.

We endeavor to keep this the standard periodical for officials
of cities and water works and other corporations conducting
public utilities; also for contractors engaged in constructing
such work. We publish practical information of all kinds
which will be useful to all of these in their official or business
capacities, the news of municipal doings, and nothing else.

The subjects covered include water supply, sewerage, street
and road paving, cleaning and lighting, refuse disposal, public
health and sanitation, police and fire protection, and others.
While occasionally an article is published dealing in a tech-
nical way with new ideas in engineering science as applied to
municipal improvements, in the main the reading matter is
expressed in plain terms which are easily understood by
mayors, councilmen, chairmen of committees and all others
who are interested in municipal improvements.

The contents consist each week of illustrated descriptive
articles giving useful information concerning the subjects
named above; of current news regarding the various municipal
doings of cities throughout the country; recent legal decisions;
news of bids to be received and of contracts awarded; brief
descriptions of appliances used in municipal work and of pat-
ents recently granted for such; news of civic and technical so-
cieties, and discussions between readers upon subjects of gen-
eral interest. Once a month a carefully prepared index is
published, giving information concerning every article dealing
with municipal topics which appeared during the previous
month in all American periodicals of any importance and many
foreign ones, for the purpose that our readers may be kept in-
formed of all current municipal literature.

We realize that if the publication is to serve its readers in
the best manner it is necessary that information be obtained
from those who are actually doing things, and contributions
are urgently solicited from such and gladly paid for. We
desire this paper to be used as a medium of communication
between all earnest men engaged in this field. It is not neces-
sary that a contributor be a literary genius. *Facts* indicating
how any problem connected with public necessities has been
worked out are what are wanted. Just as you have profited
by the experience of others, it is your duty to make public
such information as you possess which will help your fellow
workers to overcome similar difficulties.

Discussions of important subjects are requested, whatever
the views expressed. While the editor has opinions of his
own on most municipal subjects, and occasionally expresses
them editorially, he does not allow them in any way to in-
fluence him in the acceptance for publication of discussions or
opinions sent in by correspondents. In fact, we desire to re-
ceive and publish opinions differing from those expressed by
ourselves in order that our readers may have both sides of all
questions presented to them.

We endeavor to furnish in these columns such information
as our readers want. But it is impossible for us to anticipate
the wants of all, and to meet individual needs this office acts
as a Bureau of Municipal Information. When, for instance,
an important subject is under consideration in any city and
special information is desired regarding it, an inquiry addressed
to the editor will be cheerfully and promptly answered. All
subscribers are invited to make free use of this Bureau.

SANITATION AT LEBANON

The city of Lebanon, Pa., is located over a limestone foundation which, like the surface strata of most limestone, is filled with crevices of greater or less width and depth. This formation underlies a considerable part of northeastern Pennsylvania, and the practice throughout this section, as well as in Lebanon, has been to dispose of the waste water from houses by excavating cesspools down to the rock at points where such crevices existed. The waste water poured into the cesspool then passed down into the crevice and disappeared so far as this property owner was concerned.

Recently Lebanon has found, as have other cities which have followed the same practice, that the capacity of the rock for receiving the suspended matters in this waste water has its limits, and in a great many cases these crevices have refused to receive any more house wastes and it has been necessary to empty the cesspools by hand from above. In speaking of this, City Engineer T. R. Crowell says: "For the last thirty-eight years we have been pouring into the ground an average of something over one million gallons a day. Now crude sewage is coming to the surface." This condition of affairs is to be remedied and the city expects to award a contract next Spring for sewerage about one-fourth of the city.

This method of disposing of sewage is not unique or peculiar to that section of Pennsylvania. There are at least two cities in the country—possibly more—which have constructed a system of sewers for removing the household wastes from practically the entire city which discharges them into a crevice in the limestone rock. In at least one of these the crevice is becoming choked and another sewer outlet must be found.

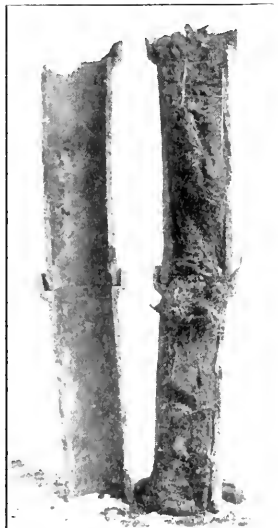
The limestone deposits also are utilized for the disposal of garbage in Lebanon, the garbage being as a rule collected by private arrangement with individual collectors who dispose of it sometimes in hollows formed by these limestone crevices, but perhaps more often in abandoned stone quarries. An effort is made to avoid a nuisance by covering these deposits with layers of earth.

The voters at the last election gave a handsome majority in favor of bonds for constructing the sewerage system above referred to, and this encourages the city authorities to hope that they will be supported in further efforts toward improving and modernizing the sanitation of the city.

POPLAR TREES TO GO

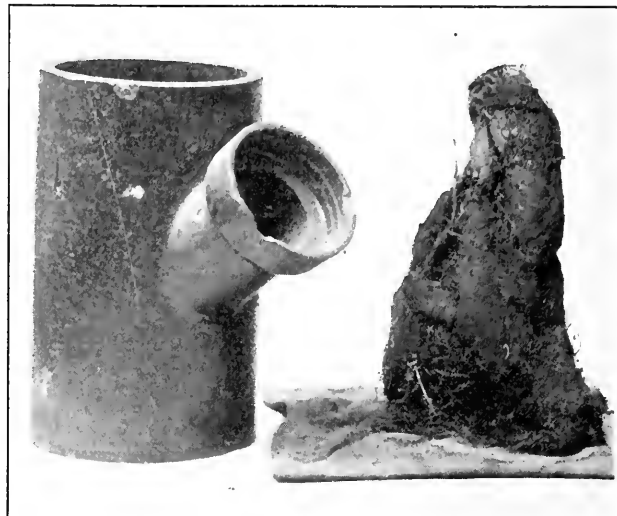
At a recent meeting of the Board of Street and Water Commissioners of the City of Newark, N. J., a motion was passed requesting the Shade Tree Commission to discontinue their own planting of poplar trees on the city streets and to prohibit the planting of them by private individuals.

This action was taken on account of the large and increasing number of obstructions to the city sewers and particularly to the house connections by the roots of these trees penetrating the joints of the pipes. Out of 56 obstructions of all kinds in house connections reported in 1909 15 were caused by poplar roots. Up to the first of December, 1910, 23 out of a total of 64 obstructions since January 1 had been from the same cause, and in November, 1910, the roots were responsible for 5 out of 12 obstructions.



TWO LENGTHS OF 6-INCH HOUSE CONNECTION, SPLIT LENGTHWISE TO SHOW COMPLETE STOPPAGE BY POPLAR ROOTS.

The accompanying photographs show two views of a root which had worked through the joints of a 6-inch house connection and through that into the 12-inch main sewer in the street. A 12-inch pipe with 6-inch branch is shown for comparison. The tree stood at a distance of 19 feet from the point at which the root was removed. We are indebted to Mr. E. S. Rankin, Superintendent of Sewers, for the photographs and information.



ELM ROOT FROM SEWER PIPE.

GAS AND ELECTRIC STREET LIGHTING

In six of the largest German cities—Berlin, Hamburg, Amsterdam, Dresden, Charlottenburg and Cologne—the amounts of gas and electricity used for street lighting in 1908 were 48,270,601 cubic meters of the former and 4,423,529 kw-hours of the latter. As a cubic meter of gas will furnish approximately the same illumination as a kilowatt-hour of electricity, it is seen that gas was used for about ten times as much illumination as electricity in all the cities combined, and the ratio varied from four in Charlottenburg to twenty-four in Hamburg.

NEWS OF THE MUNICIPALITIES

Current Subjects of General Interest, Under Consideration by City Councils and Department Heads—Streets, Water Works, Lighting and Sanitary Matters—Fire and Police Items—Government and Finance

ROADS AND PAVEMENTS

State Takes Over Frederick Turnpike

Annapolis, Md.—The State Roads Commission has paid \$100,000 over to the stockholders of the Baltimore & Frederick Turnpike Company and taken possession of the old highway from Baltimore to Boonsboro, Washington County, a distance of 63 miles. The collection of toll has ceased. Since the highway was begun early in the last century it has been a toll road, and before the day of steam it was one of the most traveled thoroughfares in all the United States.

Route Followed by Pioneers Superior for Modern Highway

Fort Dodge, Ia.—H. Huebinger, a civil engineer in a party of men who are making a map of the Hawkeye Highway from Dubuque to Sioux City, declared the highway presents 100 per cent better opportunities for good road making than does the river-to-river road from Rock Island to Council Bluffs. He commended the skill of the emigrants to the west in pioneer days in picking out a natural highway. Huebinger declared he has found but half the hills he found on the southern trans-State route and that the highway has much better drainage than the southern route. Enthusiasm along the route, he declared, is intense, already equaling that along the other river-to-river road. Residents along two roads from this city to Manson each signed long petitions to the township trustees. Huebinger and his party made a careful examination of both roads.

Nearly \$2,000,000 Expended on Streets

Oakland, Cal.—Street improvements, including permanent pavements, macadam streets, sewers, sidewalks and culverts, have cost the city of Oakland \$1,758,956.08 during the past year, according to Street Commissioner Walter C. Howe's annual report. The following figures show in detail the work accomplished and the cost:

	Miles	Cost
Permanent pavements, completed 1910.....	8.52	\$603,986.17
Permanent pavements, under contract.....	3.20	249,611.00
Macadam, plain	11.80	238,323.01
Macadam, oil	4.37	129,514.40
Macadam streets, outside tracts	10.70	201,867.59
Sewers, sanitary vitrified pipe.....	9.10	89,691.55
Sewers, storm, reinforced concrete and vitrified pipe (Bd of Wks. contracts).....	2.7	52,478.36
Sidewalks (city permits).....	21.2	73,921.00
Sidewalks, private tracts.....	20.4	56,777.00
Concrete culverts, etc. ....	...	5,368.00
	106.39	\$1,758,956.08

The increase in the amount of work over the year 1909 is given as \$229,517. In 1909 the cost of the work accomplished was \$1,529,439, and in 1910, \$1,758,956.08. The report shows the following amounts expended in street cleaning on macadam streets and material carted away: Number of blocks cleaned, 5,860; number of loads of material carried away, 32,880; amount expended, \$46,572; approximate cost per mile, \$140. Fifty-six thousand miles of street watering was done at a cost of \$530 per day, the cost for the year's work (200 days) being \$106,000, or \$190 per mile. The report shows a total mileage in improved and unimproved streets, including the annexed district, of 504.32.

Separation of Grades in Cleveland

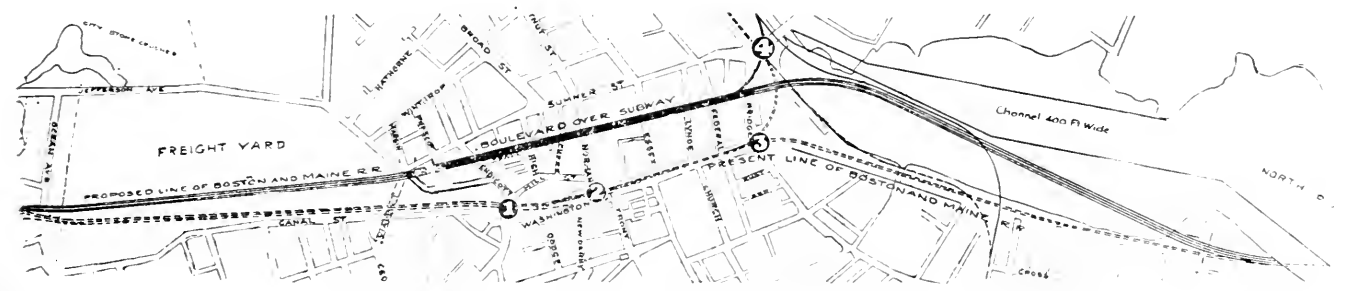
Cleveland, Ohio.—The estimated cost of the Pennsylvania grade crossing improvement is \$2,875,000. As the division of the expense is 65 per cent for the railroad to the city's 35 per cent, the city will have to assume \$912,000 of the expense. July 22 the electors of Cleveland at a special election authorized the expenditure of \$2,000,000 for grade crossing improvements. The resolution declaring it to be the city's intention to proceed with the improvement has already been made by Councilman Spooner. After it is adopted notices must be served on affected property owners and an ordinance authorizing the expenditure of the necessary funds must be passed. This must lie over for 60 days in order to give citizens an opportunity to circulate and file a referendum petition. The referendum must be awaited because of the fact that piers are called for in the streets at a number of the crossings.

Refuse to Pay for Patchwork Pavement

York, Pa.—More trouble is in store for York in connection with its "patchwork" asphalt paving on South George street, where some property owners refused to authorize the work and the contractors were instructed to pave before the residences of the others only. Property owners who had signed for the paving will now refuse to pay it, declaring that they had bargained for an improved highway and not for a checkerboard. Suit will probably be instituted.

Plan for Grade Crossing Elimination in Salem

Salem, Mass.—Engineer George W. Harriman, of the Boston & Maine Railroad, has made the plan reproduced below, which has been approved by Council, for the elimination of grade crossings in Salem. The distance covered by the proposed new route is about 10,000 feet, of which some 7,000 feet will be over land at present under the control of the railroad. The plan provides for four tracks to connect with the proposed four-track system from Boston to Beverly. The new line will diverge from the existing trunk line just south of the Broadway bridge, with no increase in curvature at Castle Hill, thence over the freight yards of the railroad on territory known as the Millpond reservation to the entrance of a subway beginning near the junction of Summer and Margin streets, and extending along a line under Crombie and Sewell streets, with the northern terminal on Bridge street to the trunk line opposite March street. The plan provides that this subway shall be 75 feet wide, 16½ feet in the clear from trackbed to arch of the subway cover, with an 80-foot boulevard above, extending from Federal street to the southern end of the tunnel. The boulevard, it is claimed, will prove of inestimable value in opening up a large area of waste land in the congested section of the city and make probable the erection of a large number of desirable buildings for trade purposes, as it is the avowed policy of the Board of Trade to enlarge the zone of the retail trade section and make this city one of the largest trade centers in the State. That no harm will come from plans to enlarge the trade center by removal of the station to another site is illustrated by cities like New Haven, Portland, Hartford and other places where removal of stations in no way disturbed long-established centers of trade.



PROPOSED RELOCATION OF RAILROAD IN SALEM, MASS., DOING AWAY WITH GRADE CROSSINGS

Boston Wants Teaming Tunnel

Boston, Mass.—Former Alderman Giblin, of East Boston, chairman of the executive committee of the East Boston Improvement Association, says a tunnel for teaming between the city proper and East Boston would solve the transportation problem of his district. He says the ferry system has been run at a loss of \$150,000 annually for 20 years, and that this \$150,000 loss would pay the interest on \$1,600,000, the cost of building the tunnel, and also the cost of operation. This tunnel would have a capacity of 4,000 teams per day, with escalators for pedestrians. He says that if a large fire started in East Boston the district would go before the apparatus could arrive from Boston proper over the ferries.

Query as to Application of State Law to Grade Crossings

New York, N. Y.—The city of New York will be out over \$1,000,000 if a motion heard before Supreme Court Judge Paige is sustained. The Central Trust Company, as trustee for Jason Rogers, asked that the city be compelled to pay interest on an award for change of grade made in 1903, which award has just been affirmed by the courts. The trust company moved under a section of the State highway law passed by the last Legislature providing that interest must be paid in such cases from the time the physical change of grade was made. Charles J. Nehrbas, for the city, said the petitioners had the law passed themselves, but that they had their trouble for nothing because the State highway laws do not apply to the streets and avenues of New York, which are subject to special statutes. The interest in the present case amounts to only \$15,000, but on other awards it would amount to more than \$1,000,000, Mr. Nehrbas said.

SEWERAGE AND SANITATION

Denies that Imhoff Tank Infringes on Cameron Patent

Atlanta, Ga.—City Attorney James L. Mayson has written the Cameron Septic Tank Company, Chicago, that acting on the advice of Dr. Rudolph Hering, the city's consulting engineer, and City Engineer R. M. Clayton, to the effect that the Imhoff system is not an infringement on the Cameron patents, there is nothing for the city to do but proceed with the construction of the sewage disposal plants along the lines recommended by Dr. Hering.

Wants Bureau of Sanitary Engineering in State Department

Austin, Tex.—In the annual report of Dr. Brumby, State Health Officer, attention is directed to the great need of active measures being taken to eliminate the now almost universal pollution of the soil through lack of sewerage and the prevalence of the open closet on the one hand and the contamination of our streams and waterways on the other as a plea to the establishment of a division of sanitary engineering in the Health Department, whose duty shall be the supervision of water and sewage nuisances and public building constructions.

Think New York Sewer Suit Is Near an End

Newark, N. J.—With the refusal of the United States Supreme Court to permit New York City to intervene in the suit brought by the State of New York against the State of New Jersey and the Passaic Valley Sewerage Commission, the latter body is inclined to think that in the near future the entire litigation will be ended.

Annual Inspection of Dairies

Syracuse, N. Y.—Inspector Lees is now engaged in making the annual inspection of the more than 500 herds supplying Syracuse with milk. On this inspection every producer is given a score based on the conditions disclosed. If the score is not up to the requirements the milk from the farm will be barred from the city's supply. "For three years," said Inspector Lees, "we have been giving instructions to the producers how they should keep their stables and cows and how they should cool, strain and otherwise handle the milk. Where the conditions were bad we have helped the farmers to remedy them and given the reasons. By this time they should know what is demanded, and if they do not care to come up to the requirements they have only themselves to blame."

WATER SUPPLY

Value of Plants Increases under Commission

Austin, Tex.—City Commissioner E. C. Bartholemew, in his monthly report on the earnings of the water and light plant, showed the property to be worth \$732,877, with outstanding indebtedness of \$145,730. The amount in cash reported on hand was \$68,683, this amount having accumulated since Austin took the commission form of government, in spite of two reductions in the water and light rates by the commission, as well as the payment of \$29,000 on the old dam debt. Austin has had the commission government less than two years, but its water and light plant makes a splendid showing under it.

Ultimatum Regarding Filtration Plant

Bellaire, O.—An order of the State Board of Health directing the city of Bellaire to place the filtration plant in operation has been received by Director of Public Service William Schramm. There is no other recourse for the city but to get busy and complete the plant at any cost. The matter has been in the hands of the State Board of Health for some time, and after investigating conditions in Bellaire, the Board decided the plant must be operated and laid the matter before Governor Harmon and Attorney General Denham, who approved the action of the board. The order is in the nature of an ultimatum and directs the city of Bellaire to have the plant in operation in six months after the order has been approved by the Governor and Attorney General. For failure to comply with the order, under the laws of Ohio, the city and city officials can be fined \$500, and the statute further provides for the removal of such city officials as fail to carry out the instructions of the State Board of Health. The filtration plant was completed about four years ago at a cost of \$80,000, and it is estimated that it will require a considerable additional amount to place it in operation.

Covered Reservoir Soon Ready to Use

Brookline, Mass.—Brookline's new \$100,000 covered reservoir, which is to become a valuable adjunct of the high pressure service, is completed and within a short time will be ready for a partial filling of water which will be allowed to stand until the reservoir is brought into regular service next spring. The reservoir is located on the summit of Single Tree Hill, in the upper section of the town, which is generally considered an ideal place for it. The reservoir is 23 feet deep and 180 feet in diameter, with a holding capacity of 4,000,000 gallons. It is constructed wholly of concrete and reinforced steel, and practically forms a watertight basin with a roof. The entire work has been completed well within the appropriation. The outside of the reservoir has been given a shapely appearance by the use of loam, which has been graded and seeded. Work was started on the reservoir in May, 1909. The first thing that had to be done was to construct a roadway from Boylston street to the reservoir location.

Competition for Municipal Water System in Colusa

Colusa, Cal.—The Colusa water works has announced that it will continue to furnish water to its old customers, as in the past, and advises consumers that it is not necessary to make a change. The new municipal system is now in operation and connections are being made.

Fitchburg's Water Failing

Fitchburg, Mass.—Meetinghouse pond, Westminster, from which the water for Fitchburg is being drawn, dropped eight inches during one week. Wachusett Lake, the usual source of supply, is not being drawn, but it has not filled up in a week and is not expected to. Fitchburg uses 4,000,000 gallons of water a day. The commissioners intend to serve notice on the consumers to use care. According to an estimate made by Superintendent Arthur W. F. Brown, of the water department, enough water remains in Meetinghouse pond to supply Fitchburg about a month. That does not include the water below the pipe line. At the end of a month, if conditions do not change, pumping apparatus will have to be put in, at a heavy expense, to force the water from below the pipe line in Meetinghouse pond and at the lake into the service pipes.

Broken Main 56 Years Old

Cincinnati, O.—The twenty-inch main which burst last week, tearing up Central avenue, between Fifth and Longworth streets, for a hundred feet or more, was laid in 1854, according to the records found recently by Waterworks Superintendent Laidlaw, who had specimens of the broken pipe brought to his office for examination. Very little damage resulted from the break because the overflow ran down a steep street into the river, not far away.

Water Famine Relieved by Private Works

Port Chester, N. Y.—Residents of Port Chester, Rye and Greenwich awoke Dec. 22 to find that their water supply had entirely failed. The towns have been supplied from the Rockwood Lake reservoir by the Greenwich Water Company. Edmund C. Converse, a New York banker, came to the rescue of the towns by turning over his private lake on the Converse Manor estate for the use of the villagers. The lake was connected by piping with the Greenwich Water Company's mains, and the water which is being pumped in the reservoir is being supplied to the public. The Converse lake contains 350,000,000 gallons and will give the towns a supply of water for three months. Mr. Converse declined to take pay for the water.

City Water Fever Cause

Rutland, Vt.—In a report made to the Board of Alderman the State Board of Health declares that, as result of a hearing in this city a few weeks ago, when testimony was taken from doctors and a number of officials, and from previous investigations, they are of the unanimous opinion that Rutland's recent typhoid fever epidemic, with its 80 cases and three deaths, was due primarily to the city water. It is pointed out that other factors such as milk and personal contact may have helped in the spread of the disease but that all the trouble for 10 years is primarily due to the water. The fact is cited that just prior to the last epidemic the examinations of Rutland water at the State Laboratory showed increased contamination. There is a good deal of feeling between certain doctors who lay the trouble to water and the city officials, who have made a big effort to prove their milk theory. The aldermen took no action on the report.

Special Tax on Lots Having Unused House Connections

Spokane, Wash.—As a result of a conference between Water Commissioner George W. Armstrong, Councilmen John Gray and A. J. Cartwright, an ordinance will be introduced in the City Council and urged for passage assessing a special water tax against every vacant lot in Spokane having city water available but not using it. The tax is expected to net the city \$100,000 per year. That the city Water Department is facing bankruptcy within 10 years owing to immense expenditures for extending the system, from which no return is had from vacant property which is benefited by enhanced value, but which is not using the water, was the statement made by Mr. Armstrong to the Councilmen.

Restricting Use of Water

Waterbury, Conn.—The serious view taken by the City Engineer and the Board of Public Works regarding the city water supply was shown last week when a vote was passed instructing the Superintendent of Water to prohibit the running of hydraulic elevators in all buildings about the city. Clerk Lawlor was instructed to notify the two local hospitals that their employees should use every reasonable effort to conserve the city water now used by the hospitals and prevent its waste. The clerk was also instructed to notify the Board of Education to co-operate with the Water Department in preventing any waste of the water supply in the school buildings.

An Unusual Water Supply

Woodward, Okla.—The city has a peculiar source of water supply, believed to be of great value. State Geologist C. N. Gould pronounces the supply good from every standpoint, and unrivaled in America. Woodward itself has an elevation of 2,000 feet, and the water range is more than 100 above the city. It is a barren, sandy country, having a number of springs, only a few of which are utilized. The level of the underground water rises to within a few feet of the ground over a wide area. It has been proposed to pipe water from this point even as far as Oklahoma City.

STREET LIGHTING AND POWER

Wants Sliding Scale of Charges for Gas and Electricity

Baltimore, Md.—Mayor J. Barry Mahool has announced his intention of petitioning the Public Utilities Commission for the adoption of the sliding scale method of determining the general commercial rates in Baltimore for gas and electric service. Briefly stated, the plan provides for a certain percentage of earnings which the company is allowed to earn on its capital stock after deducting as much as possible of the watered portion of the company's capitalization. With such a percentage of earnings the plan provides that the company shall be allowed to charge a certain rate for gas or electricity which will, under economic administration, produce these earnings. With such an arrangement as a starting point the plan provides that for every reduction of a certain amount in the gas or electric rate the company shall be allowed to increase its distribution to stockholders 1 per cent. In other words, once established, the plan works automatically.

Electric Lights in Prospect Park

Brooklyn, N. Y.—Last week for the first time in its history Prospect Park had a modern, artistic system of illumination. Up till now the illumination of the park at night has been supplied by 150 gasoline lamps, mounted on posts of no particular artistic value. C. F. Lacombe, chief engineer of lighting and power, was possibly the chief instrumentality in bringing about the change, replacing the gasoline lamps with 750 ornamental iron posts, surmounted by symmetrical lanterns, in each one of which is inclosed an 85-watt tungsten electric incandescent lamp. The design of the posts is the work of the Municipal Art Commission, and is practically the same in appearance as the one used in Central Park, although there are some improvements in the mechanical construction which make it easier and simpler to clean the lanterns and substitute new lamps for old. Along all the drives these posts are placed 100 feet apart on alternate sides of the road. On the walks they are installed according to the best judgment of the engineers. One advantage these electric lamps possess over the old gas lamps is that it is so much easier and more economical to light them. Whereas it was necessary to light each gas jet separately by hand, the electric lamps are controlled in groups of from 20 to 50, according to location and distance apart. Thus as many as 50 lamps are lighted instantaneously from one point.

Street Gas Lamps Operated at Loss

Cincinnati, O.—President N. G. Kenan, of the Union Gas and Electric Company, has sent a letter to Service Director Sundmaker, in which he states that his company has hitherto operated the street gas lamps at a loss and that any contract made for the future must be at a much higher price. The maintenance charge hitherto has been \$5, and this includes lighting and extinguishing gas lamps, cleaning globes and repairs to service pipes.

Fails to Sell Bonds for Lighting Plant

Marion, Ind.—Not a single bid was offered for the \$50,000 issue of 4 per cent bonds offered by the city of Marion for the construction of a municipal light plant, at the meeting of the City Council, at the time set for opening bids for the bonds. It is said the reason no bids were offered was because the City Council had failed to rescind a former order of bond issue, on which the Fletcher National Bank, of Indianapolis, had bid \$325 premium on a \$75,000 issue of 4 per cent bonds to be issued for the same purpose as those offered recently. The Fletcher National Bank later recalled its bid, for the reason that information had reached the buyers that the taxpayers of Marion proposed to contest the bond issue. Edward Herbel, Councilman at Large, charged that "somebody had been putting a rail in the wheel to stop the progress of the municipal light bond issue." Though Marion owns a municipal plant for street lighting, the question of the city's maintaining a plant for commercial lighting carried at the ratio of five to one in a city election four years ago. The Marion Light and Heating Company, a plant of the American Gas and Electric Company of New Jersey, supplies Marion with commercial lighting at 10 cents a kilowatt hour.

Gas Supply Flows Into Open Air

Bridgeton, N. J.—A stoppage in some of the outlets of the Bridgeton Gaslight Company's plant was discovered December 27, and there was imminent danger of a terrific explosion that would wreck the plant and damage a good part of the city. The employees were kept constantly busy all day watching the gas, allowing thousands and thousands of feet to escape into the open air. The tanks were thus nearly emptied, and people dependent upon gas for illumination were obliged to dig up oil lamps and candles. Many people had no lamps, and there was a rush to the stores for them, practically everything in the line being sold.

City Light Plant in Bad Repair

Marion, Ind.—Superintendent Weesner has reported to the Board of Works that the lighting plant is in a bad state of repair and the boilers are so weak that he has had to order the steam pressure reduced from 100 to 90 pounds. Moreover, he says that one boiler is in such bad shape that he is afraid the State Boiler Inspector will soon order its use discontinued.

New Street Lights

Philadelphia, Pa.—Market street between Fifty-first and Fifty-third streets was made bright as day on December 26, when the new high-power gas lamps, which have been installed at short intervals along the sidewalk, were lighted for the first time. From now on this section, which is West Philadelphia's busiest center, will be illuminated nightly. Since the elevated railroad was placed along the street several places have been in its shadow, but the new lamps will dispel all darkness. The lamps have been placed on the street through the efforts of the merchants whose stores line the thoroughfare, led by Frank L. Davis, chairman of the Executive Committee of the Fifty-second and Market Streets Business Men's Association. The property owners have paid one-half of the cost of installation and the merchants the other half. An agreement was then made with the United Gas Improvement Company, whereby the gas company erected new poles of a pattern not heretofore seen in this city. They are in the shape of a shepherd's crook and are most attractive in appearance. Each pole carries an incandescent lamp of great power.

Strawberry Point Has Electric Lights

Strawberry Point, Ia.—The switch which sent the electric current through the wires in the streets and into the homes of the town has just been turned on, and Strawberry Point is at last electric lighted. The system is giving excellent satisfaction, with Electrician Andrew Stiles in charge of the plant.

Lighting Department Better Managed under Commission

Tacoma, Wash.—All the dead wood in the city's Light Department has been cut out by Commissioner Lawson of the Water and Light Department. By requiring the men to work full eight hours each day Mr. Lawson has been able to make a saving of the people's money. The following is a comparative statement of the wages paid in the Light Department during September, October and November of 1909 and 1910:

	1909	1910
September	\$10,375.75	\$9,076.95
October	11,177.90	9,330.64
November	10,763.55	9,431.70
Totals	\$32,317.20	\$27,839.29

The figures may be better appreciated when it is made known that many of the employees are being paid better wages than in October and November, 1909. The common clerks in the office, who make out the bills and help keep other records, were advanced \$10 a month Jan. 1, 1910; the linemen were advanced from \$3.85 to \$4 a day; linemen's helpers were given an increase of 50 cents a day; the men who trim the arc lamps were advanced 30 cents a day; the drivers of the wagons in its department were raised from \$2 to \$2.75. By paying the men a little more money the commission found that it was able to get much more work done. An increase of 10 per cent in wages increased the amount of work accomplished 50 per cent. Fewer men were found to be needed.

FIRE AND POLICE

Civil Service for Birmingham Police

Birmingham, Ala.—Chief George Bodeker, of the Police Department, has had prepared a Civil Service bill to be presented to the Legislature, which, if adopted, will entirely remove the Police Department from politics, and protect the members of the department from removal without cause. The terms of the bill include the Chief of Police as well, making his term and that of all other officers indefinite so long as he is not convicted on due trial of bad behavior or inefficiency.

May Use Freight Tunnels for High-Pressure Pipes

Chicago, Ill.—Plans for a high-pressure water system for fire protection are being made under the direction of Commissioner of Public Works Mullaney. Henry A. Allen, consulting engineer for the city, has been making a study of the subject for weeks. George M. Wisner, engineer for the sanitary district, has suggested that a great saving in cost of laying the pipes could be effected by placing them in the freight tunnels of the Illinois Tunnel Company. Electricity to be supplied by the Sanitary District is the only motive power being considered for operating the high-pressure pumps.

Corpulent Policemen Must Go

Columbus, O.—No more corpulent policemen are to be retained on the Columbus police force. Mayor George S. Marshall has given his ultimatum to that effect. "We simply cannot keep these physically deformed and inefficient men on the force," said the Mayor. "But we will give them a chance to qualify. They have free use of the gymnasium at the police headquarters, where by proper exercise they may reduce their weight and make themselves available; if they don't do it they must retire."

Truck Breaks Guy Wire; Fire Alarm System Out

Elizabeth, N. J.—A truck said to belong to McCloud & Brennan struck a guy wire attached to a pole near the Cherry street bridge, and caused the fire alarm system throughout the city to become demoralized for more than an hour. The accident occurred at 3:10 p. m. The truck, which bore a large housing to be used in covering an engine used to hoist sewer pipes, had just crossed the bridge and was going up the Cherry street hill when the horses, losing their foothold, slipped, and the wagon was thrown against the guy wire. The pole, having no support and containing a large number of wires and a fire alarm station, fell over and caused an open circuit. The authorities were at once notified of the accident and soon had a force of men on the scene. At 4:31 p. m. the damage had been repaired, and a test was made, which showed that the fire alarm system was again in working order.

Trolley Cuts Fire Hose in Two

Long Branch, N. J.—At a recent fire one length of chemical hose was cut to pieces and the couplings on another length destroyed by a trolley car. The motorman paid no attention to Fire Marshal Durham's warning to stop the car. The matter is being investigated by Chief of Police Layton.

Leggins to Be Tried Next Week

New York, N. Y.—Trial of leggins on patrolmen on the traffic and bridge squads is to be made next week. A few will be purchased and the general effect noted. The comfort of the men and their appearance will be taken into consideration in arriving at a decision.

Motor Truck for Brooklyn

New York, N. Y.—That the New York Board of Fire Underwriters is convinced that the day of horse-drawn fire apparatus is past is evidenced by the fact that within a few days there will be in operation at Station No. 1 of the fire patrol, until recently known as the salvage corps, No. 12, Dean street, Brooklyn, a new 40-horsepower automobile fire truck, the first motor-driven fire apparatus provided for that city. A duplicate of this truck was installed by the New York Board of Fire Underwriters in Manhattan about six months ago, and proved so valuable in a short time that no time was lost in providing one for Brooklyn.

Accidents Due to Confusion of Auto Horn Sounds

Fort Worth, Tex.—Fire Chief Bideker is much perturbed over causes for which he sees no remedy. Several recent collisions between street cars and fire apparatus is due, the Chief thinks, to the closed vestibules of the street cars which prevent the motormen from hearing the gongs or auto horns of the approaching fire wagons. As the State laws required the closed vestibules for the protection of the motormen and conductors in inclement weather the fire department will have to run the risk. When there was an audible alarm it was the common practice for drivers of vehicles and motormen on the cars to stop until the fire apparatus had passed. Now unless the coming of the fire machines is heralded in some way they are not advised of the coming of the fire wagons, to which all are disposed to accord the right of way. Therefore, the chief is helpless in this matter. What makes the whole matter worse in his opinion is the fact, as he asserts, that several automobiles in the city have horns in tone exactly like that of the fire chief's auto, and the big combination fire auto. The motormen, when their cars are not closed, may hear those auto horns, but having heard them so often merely as automobile horns, have ceased to associate that peculiar style and tone of horn with the fire department, and hence pay no attention to the fire apparatus until it is too late. Chief Bideker is now asking if he can not have an ordinance passed that will prevent the use of a horn on an auto other than the fire apparatus of the same tone and style of blowing. He has invented for his auto a peculiar staccato style of tooting that is distinguished from any other in the city, unless imitated. If it is he will try, if it is possible, a prosecution for malicious mischief.

Stops Hydrants' Use in Street Cleaning

Newark, N. J.—Fire Chief Astley was incensed by the discovery that street cleaners in the vicinity of the "Four Corners" and elsewhere in the city are drawing upon fire hydrants for water used in sprinkling before cleaning. Supplemented by General Superintendent of Works Shipman he ordered the cessation of this practice. The policemen were instructed to arrest any street cleaner who violates the order. The discovery was made while the chief was on a tour of inspection. Subsequently, with Mr. Shipman, in an automobile, further evidence was obtained. The chief complains that this opening of hydrants by men unskilled in the knack of closing them properly invites the peril of freezing, that would be disastrous in case of fire.

High Pressure on East Side

New York, N. Y.—The great East Side is soon to be included within the high-pressure zone. Inside of two weeks, Fire Commissioner Waldo says, three new areas of high-pressure service will be ready. One of the new areas is on the West Side and is bounded by Twenty-second and Sixteenth streets and Tenth and Seventh avenues. Another new area is bounded by Twentieth and Fourteenth streets, Broadway and Lexington avenue. The largest of the three new lots is bounded by East Houston street, the Bowers, James street and the East River. This includes territory that is the most congested as regards population of any part of the city, and the chance of any fire therein getting away from the firemen is very slim. The pumping stations already constructed and operated in connection with the high-pressure pipes now in use will supply ample pressure for the new system.

Fine Black Team for New Engine

Grand Rapids, Mich.—The Board of Police and Fire Commissioners has purchased three handsome black horses for the new engine at No. 1 fire headquarters on La Grave street. The horses weigh 1600 pounds each, and cost \$300 apiece. Captain Isaac Louke and ten men will have their quarters in the building, which is also new.

Fire Protection for Unincorporated Village

Old Fort, O.—This town will soon be on equal footing with its neighbors in the way of fire protection. Although not incorporated, the citizens subscribed to a fund and purchased a chemical engine, hose and ladders. A building to house the same is now under construction and will soon be ready for occupancy.

GOVERNMENT AND FINANCE

Commission Government Loses in Chickasha

Chickasha, Okla.—Out of a total vote of 1,183 the proposed charter carrying the commission plan of government lost at the special election by a majority of 87. The defeat is ascribed directly to the labor organizations, which, though favoring a commission government for the city, refused to accept various terms of the proposed charter.

Concord Holds Novel Election

Concord, N. H.—The first municipal election in Concord under the new city charter was held Dec. 20. Under the new arrangement two candidates for mayor are selected at a preliminary election open to all persons declaring their candidacy, and the field of candidates for minor offices is similarly narrowed by the preliminary election. The new city government will consist of a mayor, three assessors and a single board of aldermen consisting of six aldermen-at-large and one alderman from each of the nine wards.

Louisville Has a New Seal

Louisville, Ky.—Mayor W. O. Head has signed the ordinance which made the design, secured by the Convention and Publicity League in competitive contest for a \$50 prize, the official seal. Among those who voted for the repeal of the old seal ordinance, enacted May 6, 1861, was Councilman Charles G. Russman, a nephew of Henry Miller, designer of the old seal, who died March 30, 1905. It was decided to supplant the old seal device because it was no longer representative of Louisville's motto, "Progress," inasmuch as the central figure was an old, antiquated,



wood-burning locomotive of the type used in '61. The seal which has become the official signature of Louisville was designed by J. R. Bausched, and was selected from more than 100 drawings.

Belton Combines City Offices

Belton, Tex.—The City Council is practising economy in municipal affairs by adopting an ordinance consolidating the offices of Mayor and City Recorder, effective April, 1911, upon the expiration of the term of office of the present City Recorder. An ordinance has also been adopted placing the salary of the Mayor at \$5 a month, with fees of office and allowing the Aldermen a stipend of the same amount minus the fees.

Want Salaries Reduced

Denison, Tex.—Notice has been published that application will be made to the next Legislature to amend the charter of the city to reduce the salaries of aldermen from \$1,500 a year to \$600 a year and to reduce the salary of the mayor from \$1,800 a year to \$900 a year, also to increase the number of aldermen from two to four. Mayor Acheson recently published a statement advocating a change of this kind, but the application to the Legislature will be made by private citizens, according to the notice published. The present city government consists of a mayor and two aldermen.

Bond Issues Invalid

Jamestown, N. Y.—At the last meeting of the Jamestown Common Council the aldermen were startled by an opinion by Corporation Counsel Benjamin S. Dean to the effect that bond issues of the city of Jamestown aggregating nearly a million dollars were invalid because in none had provision been made for raising a sinking fund and interest by annual tax as required by the general municipal law. A \$600,000 issue of water bonds is not included in this opinion. Attention has been called to the defect by the law firm of Caldwell & Reed, attorneys for W. C. Langley & Co., of New York, who examined the records for a \$40,000 issue of hospital bonds which the firm had agreed to purchase. Mr. Dean recommends a legislative enactment to validate the other bond issues on which the city has secured and used the money.

Recall Feature Applied to Appointive Officers

Los Angeles, Cal.—A new feature in the revision of the city charter now going on applies the recall feature to all offices, whether elective or appointive.

STREET CLEANING AND REFUSE DISPOSAL

Garbage Disposal and Hog Feeding

Los Angeles, Cal.—An ordinance has been prepared regulating the disposal of garbage and the feeding of hogs throughout Los Angeles county. It provides that no garbage can be burned except in a furnace or crematory, unless dry, so that there will be no offensive odors from it; that it cannot be transported except in water-tight, metal-lined receptacles, wagons or cars, which must be cleaned daily and disinfected at least once a week; that if fed to hogs, it must be in trays and not on the ground, and that all refuse must be removed and not allowed to generate offensive odors. Hog yards are regulated by the proposed ordinance only when more than 100 hogs are kept, and then a permit must be obtained from the board of supervisors. The yards must be large enough to permit 60 square feet for each hog, not counting young pigs. Penalties for violation of the ordinance are provided in fines not exceeding \$500 or imprisonment not exceeding six months, or both.

Drain Your Garbage

Milwaukee, Wis.—Health Commissioner Kraft has appealed to housekeepers to drain garbage to prevent it from freezing in the cans. Considerable difficulty was experienced by collectors last week. He also advises the substitution of wooden receptacles for the metal cans during the winter months.

Much Sickness Due to Dust in St. Paul

St. Paul, Minn.—Continued high winds and the absence of snow or rain have created an almost intolerable dust nuisance, and an unusual amount of sickness. Such ailments as sore throat, bronchial coughs, la grippe, and some forms of skin disease are said to be more prevalent than ever before. City Engineer Rundlett says he is keeping the downtown district pretty well covered with calcium chloride, but the material has been used so much faster than usual that the supply on hand is short. The use of the chloride is expensive, too. When the temperature is moderate one tank will cover five or six blocks. In cold weather a tank will only cover three or four blocks. Each tank costs \$7 applied to the street. One sprinkling lasts five or six days under the prevailing conditions.

RAPID TRANSIT

Cannot Prohibit Smoking Without Aid of Ordinance

Fort Worth, Tex.—So many complaints have come into the offices of the Northern Texas Traction Company that the officials are seriously considering the prohibition of smoking on the cars, according to Assistant Manager W. C. Forbess, who says:

The complaints come from women, non-smokers and the smokers who have a discriminating taste which revolts at the combination of odors from "men smoking rank pipes, cabbage leaf cigars, cigarettes of all brands, good domestic, or genuine Havanas in the front vestibule of the P-A-Y-E type of cars, where the smokers can use the front vestibule. It is the opinion of the officials of the company that they can not enforce a rule of that kind; that is, to prohibit smoking on the cars without the aid of a city ordinance. If the Commission will enact the ordinance, the company will do its best to enforce it.

Recommends Interborough Plan

New York, N. Y.—The joint committee of the Chamber of Commerce and the Merchants' Association, of which Seth Low is chairman, has recommended the acceptance by the city of the offer of the Interborough company for subway extension and operation. The report is unanimous and is to the effect briefly that this offer ought to be accepted because the Interborough system would make a great addition to the present subway system, which the city owns, and the city could make better terms with the Interborough company on new operating leases than it otherwise could; and for the further reason that the city would get control of an improved subway system many years earlier than under other conditions.

Discovers Provision for Mileage Tax

North Yakima, Wash.—Rummaging among the city documents, City Clerk Brooker has discovered that the street car company has a clause in its franchise providing for the payment of a certain percentage for each mile traversed by its cars within the city limits, the payments to begin at the expiration of 10 years from date of franchise.

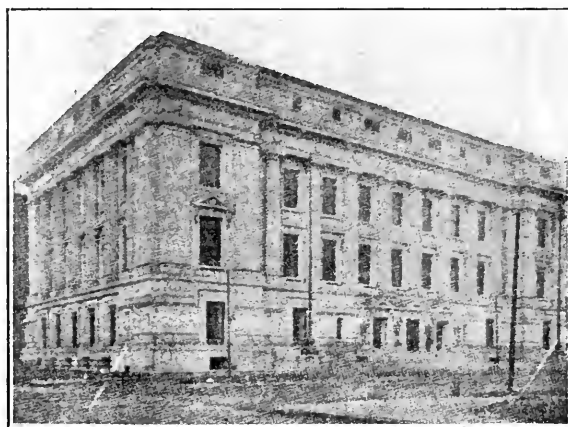
MISCELLANEOUS

Boston Wants Curfew Back

Boston, Mass.—Mayor John F. Fitzgerald has sent to Police Commissioner Stephen O'Meara a draft of the proposed curfew law. The ordinance was drawn up by the Boston Home and Social Association, and provides that all children under 14 found loitering on the streets or parks of the business district after 9 o'clock at night shall be subject to arrest and to a fine not exceeding \$5 for each offense. The ordinance provides that at 8:50 each evening a whistle shall be blown from the City Hall. This gives the children ten minutes to reach home before they are liable to arrest. Members of the association seriously believe the curfew law is necessary for the welfare of the city. Neither the Mayor nor the Commissioner has made public his opinion of the proposed ordinance.

Indianapolis' New City Hall Dedicated

Indianapolis, Ind.—The new City Hall at Alabama and Ohio streets was dedicated last week. Governor Marshall, Mayor Shank and six former mayors made addresses at the ceremonies in the quarters that are to be occupied by the



NEW CITY HALL, INDIANAPOLIS, IND.

public office of the city controller. The building is a four-story and basement structure, the exterior being of Indiana Bedford stone on a granite base. The public lobby or corridor of the first floor is of marble with large imitation marble pillars. The cost of the building was about \$670,000, exclusive of furniture and grounds. The very satisfactory architectural treatment will be noted in the illustration.

Four Towns May Make City

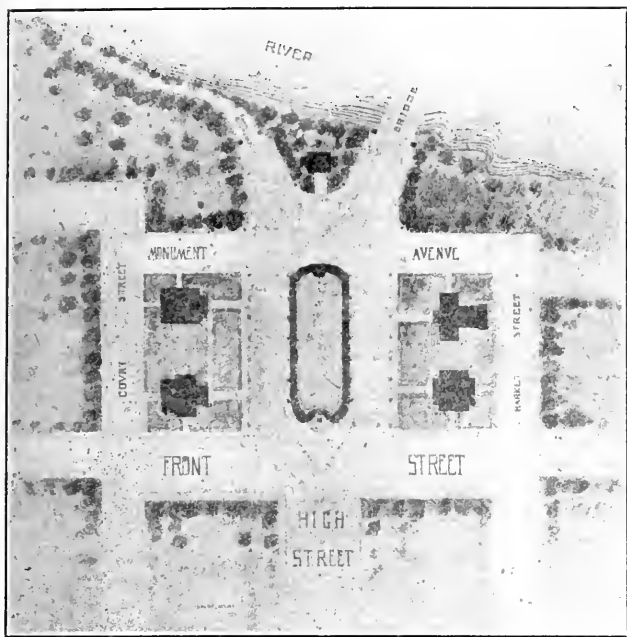
Scranton, Pa.—There is a well-defined movement on foot to give Lackawanna County another city of the third class. The inhabitants of the boroughs of Olyphant, Blakely, Dickson City and Jessup seek to carve a city out of their respective municipalities. These four boroughs are among the largest in the county and are built together. Fathers of the city movement point out that the area of the proposed municipality would be a trifle over four square miles, and that the town would start existence with a population of over 25,000. Better police, fire and school service are the arguments being used by the promoters of the plan.

Municipal Cemetery for Milwaukee

Milwaukee, Wis.—A municipal cemetery is the latest proposed innovation of the administration, according to plans being discussed in the City Hall. It is said that the plan has attained sufficient encouragement to warrant the Council in asking the Legislature to pass a bill which will give the city the right to engage in such an undertaking. Surveys of land beyond the limits have been made by one of the assistants in the engineer's office with a view of securing a site of about 100 acres. The proposition is to sell burial lots at cost, the same as land for dwellings will be sold if a bill which will be presented to the Legislature is passed. Administration members say the high cost of burial lots sold by churches warrants the city in entering such a field.

Proposed Civic Center for Hamilton

Hamilton, O.—Architect F. G. Mueller, Hamilton, has planned the civic center in the accompanying illustration for the city of Hamilton. It includes the land west of the east side of Front street to the river, the south side of Court street, to the north side of Market street, together



PROPOSED CIVIC CENTER, HAMILTON, O.

with the west river bank. It affords sites for six public buildings, three of which will probably soon be built, City Hall, Library and High School. Questions of cost and method of procedure will be considered by a committee appointed by George T. Reiss, president of the Chamber of Commerce.

Talking Up Public Parks in Middletown

Middletown, Conn.—A special meeting of the Common Council was held last week, at which the report of the special Committee on Parks was made. It was a lengthy report, and after relating the occasion of their appointment and the meetings they have held, the majority of them declared in favor of an amendment to the city charter that will permit the establishment here of a Park Commission. They submitted a table showing that the extra tax caused by the establishment of the commission and the carrying out of plans for a Park Commission would need to be but three cents on \$100 and 30 cents on \$1,000. In a general way the proposed amendment is patterned after the Hartford charter, except that the commission is not made self-perpetuating. This report was accepted and later will be submitted to the people.

Municipal City Plan Approved

Minneapolis, Minn.—Plans for a civic centre and the development of Minneapolis, as prepared by E. H. Bennett, Chicago, which, if carried out, may make Minneapolis the most beautiful city in the world, were last week approved by the Civic Commission, an advisory body of representative citizens from various public organizations, which has had the matter in hand for nine months. The draft submitted and approved was a completed one, embodying every feature of a scheme which members of the commission believe would result in a perfect city. Hitherto the plans have been considered in fragments. The scheme provides for the elimination of grade crossings and equalization of the river banks, the widening and beautifying of Lake street and the parking of Franklin avenue from Nicollet avenue across the river to the eastern city limits. Other streets are to be widened and numerous boulevards provided for, while a wall will be laid out around which the park systems and cross boulevards will be linked. Fred B. Snyder is chairman of the commission, and William Pierce Cowles, consulting engineer.

Parks and Playgrounds for Cincinnati

Cincinnati, O.—Children can have playgrounds and grown-ups can have parks because the Supreme Court of Ohio has decided that the Hamilton County \$1,800,000 bond issue, representing breathing places for many, is valid. The decision is sweeping, in that it affirms the Common Pleas Court and the Circuit Court. It is the official stamp on the bond issue. The Board of Commissioners received notice through City Solicitor Ballard that if a purchaser is found in the course of a few weeks park improvements will be started in the spring. Many bonding companies are anxious to float the securities. Back of the playground movement is the Cincinnati Turngemeinde. It is the desire of that organization that the city may be provided for well, but the congested districts must be taken care of first. Policing of the parks will be reorganized. The park commission will employ its own police. The reorganization of the board because of the new term of Commissioner Gilbert was effected with L. A. Ault, president; William Gilbert, vice-president. Secretary Longenecker was re-elected by the board. The lighting of the parks, heretofore carried in the general street lighting contract, hereafter must be provided for by the park commissioners, as the city solicitor has held that the director of public service cannot enter into a contract for the park board. The new lighting contract goes into effect June 1, 1912, when at the same time the park board will have to enter into a contract for the parks.

Want Municipality to Publish Newspaper

Los Angeles, Cal.—With a charter mapped out providing for public ownership of public utilities, even including a steam railway and a steamship line, the latest idea of the Good Government city administration is a municipal newspaper. The question whether the charter shall be amended to give the city authority to maintain such a publication will be submitted to the voters at a special charter election in February. The Good Government people decline to give out any details regarding the proposed unique journal, which would be the first of its kind in the country, but it is understood the plan is to make it a daily, handled along metropolitan journalistic lines, with the City Council as a board of directors, the heads of the principal city departments, such as the Board of Public Utilities, of which Meyer Lissner is chairman, as editors, and the Mayor as editor in chief. A department of printing would, of course, be created. Among the daily items would be the municipality's advertisements, but these are trifles to be adjusted after provision is made in the charter.

Plan Municipal Exhibit

Philadelphia, Pa.—In preparation for the municipal exhibit which is to show the achievements of the present administration and unfurl the comprehensive plans for a greater Philadelphia, two rooms in the third floor of the City Hall have been placed at the disposal of the Survey Bureau, which is to direct the preparation of drawings, blue prints, clay models and photographs that will enter into the collection that will eventually be displayed in a public hall or auditorium. The idea advanced by the Mayor, when he sent his request to Councils a few weeks ago for an appropriation of \$30,000, was to place \$20,000 of this for use by the Survey Bureau and \$10,000 at the disposal of his office for the furtherance of plans for the exhibit. It is said that the original and advance plan is to have an exhibit about the time that the National City Planning Association meets in this city. The date is fixed for some time in March, but the Mayor, for the purposes of displaying his exhibit, desires that this convention be held in May. Later, during the week of October 4, at the Founder's Week celebration, it is proposed to have an elaborate exposition of the municipal government. This is to include a display of model sewer sections, showing the method of construction, specimens of materials used in street repairs, and the supplies, such as uniforms of policemen and firemen, and other materials purchased by the city. One of the principal features is to be an exhibit of a model municipal transportation system, including subways and suburban systems connected with a central system. The entire exhibit is to show that the present administration has accomplished more than the public is inclined to credit it with, and the solution of the transit problems is to be the monument of the Rebyburn administration.

LEGAL NEWS

A Summary and Notes of Recent Decisions—Rulings of Interest to Municipalities

Comfort Station—Injury to Person Using

Pitman vs. City of New York.—Where New York City authorities, under power expressly granted by Greater New York Charter, established a comfort station in accordance with plans calling for rough-axed granite steps leading thereto without a handrail or tooling or protection of the steps by metal or rubber treads, and it appears that two years after the station was opened the steps were "pretty smooth," and that at the time of an accident from slipping thereon one year later they appeared very smooth, slippery and damp, it was for the jury to determine in an action for the injuries, if they found that they were caused by the condition of the steps, whether such condition was due to the negligence of the city authorities in failing to tool the steps or otherwise protect the users thereof against slipping on them.—Supreme Court of New York, 125 N. Y. S., 942.

Public Improvements—Rights of Materialmen

National Iron Works vs. City of Monroe et al.—In the absence of collusion between a city and a contractor for a public work, entitled under the contract to partial payments, to defeat the claims of materialmen by making excessive payments on inflated monthly statements, the court must presume that the estimates on which the payments were made were correct, so that the payments were binding on the materialmen notwithstanding Civic Code, making the owner making excessive payments to the contractor liable to materialmen and laborers.—Supreme Court of Louisiana, 53 S. R., 563.

No Authority to Grant Perpetual Utility Franchise

City of Joseph vs. Joseph Water Works Company.—A municipality has no authority to grant a perpetual utility franchise. Where a municipality granted a water company in one section of its franchise unlimited rights to lay pipes, etc., and in another section limited this right to 15 years, the limitation will be upheld, for a municipality has not a right to grant a perpetual utility franchise and will not be presumed to have intended to so do, and another construction would render the latter section meaningless.—Supreme Court of Oregon, 111 P. R., 864.

Assessment—Right to Injunction

Jenkins vs. Oklahoma City et al.—Unless the whole assessment for the purpose of grading, draining, curbing and paving a street is void, a case for injunction cannot be maintained, for he who seeks equity must do equity. If any part of the assessment against the owner's land is valid, he cannot have an injunction unless he has paid or offered to pay such part as is valid.—Supreme Court of Oklahoma, 111 P. R., 941.

Public Water Rates—Discrimination

People vs. Albion Water Works Company.—In proceedings by the State to enjoin defendant water company from ceasing to deliver water to a public institution unless paid a certain rate, on the ground of unjust discrimination, it appeared that defendant was engaged in the business of furnishing water to the village of A., and it alleged that at its own expense, on request of public authorities, it laid a line from its main to said institution, situated in the town, but not in the village, of A., and that it was reasonably worth the sum sought to be charged to furnish water to the institution. Held that, while the rates charged in the village might be considered, the test was whether the rate sought to be charged was reasonable, and defendant was entitled to show facts tending to support its averments.—Supreme Court of New York, 125 N. Y. S., 589.

Contracts—Statutory Provisions—Surety

O'Rourke Engineering Construction Company vs. City of New York.—The surety of a contractor who was declared in default took over his work and completed it and did certain work on a supplemental contract. Before the executed contract was delivered, the requirements of Greater New York City Charter, Sec. 419, that there should

be an unapplied and unexpended appropriation and a certificate to the Comptroller to that effect, were completed, and the surety, without waiting for the city officials to perform the ministerial acts necessary to give validity to the contract, proceeded with the work. Held, that the surety could recover upon the contract, the requirements of section 419 having been complied with, the city not being harmed by the fact that the surety proceeded with the work, running the hazard of receiving fair treatment.—Supreme Court of New York, 125 N. Y. S., 664.

Damage to Property—Limitation

Harms vs. City of New York.—Section 261, Greater New York Charter, provided that claims against the city for damages for injuries to personal property or the destruction thereof by reason of the negligence of the city or its department shall be barred unless action be brought within one year. The plaintiff rented a scow to the city which was injured through its negligence. He then brought an action on the contract of bailment. Held, that the aforesaid rule did not apply, being limited by its terms to actions arising by reason of negligence, and this action was based on the contract.—Supreme Court of New York, 125 N. Y. S., 477.

Defective Streets—Contributory Negligence

Hunter vs. City of Montesano.—A pedestrian, who, on a dark stormy night, knowing that M street was being paved, contained piles of materials, was torn up and not in a condition to be traveled by teams, and that a barrier was across it on the south side of D street, and another a block further south, crossed it on the north side of D street, and, after going north a piece on M street, returned to D street, and, instead of recrossing where he had crossed, went further south and attempted to recross diagonally in the middle of the block between the two barriers, keeping his eyes on a light in a store, was guilty of negligence, barring recovery for his injury from running into a plank resting on material and rubbish.—Supreme Court of Washington, 111 P. R., 571.

Parks—Ocean Front—Boardwalks

Crossan vs. Ventnor City.—An act to enable cities in this State located on or near the ocean and embracing within their limits or jurisdiction any beach or ocean front to open and lay out a public park or place for public resort or recreation on and along the beach or ocean front of such city, etc., defines in its title and body "ocean front" as meaning as much of such front as is within the territorial limits or jurisdiction of such city. The proviso by which boardwalks theretofore constructed to the landward of the high water line are excepted from the prospective operation of the act does not make it special or in excess of the object expressed in its title.—Supreme Court of New Jersey, 78 A. R., 12.

Right to Drain Land—Consent of Property Owners

Hart vs. Village of Adams et al.—The assent of property owners to have water drained across their land by ditches dug by a village gave the village no right to continue such drains, after the owners objected to their continuance, so that their continuance could be enjoined; the village not having the right to maintain the ditch without the property owners' consent.—Supreme Court of New York, 125 N. Y. S., 652.

Civil Service—Illegal Removal of Veteran

Barton vs. Brennan et al.—Where relator, a veteran, was appointed General Inspector of Construction in Bellevue and Allied Hospitals, and his salary was duly fixed, and he was removed when the building to which he had been last assigned as inspector had been completed, and there was work requiring his functions, he was entitled to be reinstated and reassigned to it, in preference to another, appointed to the same office at a later date, who is not a veteran.—Supreme Court of New York, 125 N. Y. S., 691.

Notice of Injuries—Not Unreasonable Requirement

Tonn vs. City of Helena.—Revised Codes, requiring notice to municipalities of injuries received by reason of defective sidewalks, is not an unreasonable classification, and the act is not invalid as class legislation in not applying to all others who may be defendants in personal injury actions.—Supreme Court of Montana, 111 P. R., 715.

NEWS OF THE SOCIETIES

City Engineers of North Dakota.—City engineers of North Dakota will hold a meeting in Fargo January 17 and 18, City Engineer H. G. Lykken, of Grand Forks, being one of those backing the movement. The program arranged includes a number of topics of peculiar interest to the engineers of North Dakota cities. On the first day T. R. Atkinson, State Engineer, will speak on "Roads," E. S. Keene, of the Agricultural College, will read a paper, while Dean E. J. Babcock, of the School of Mines, will talk on "Lignite Coal and Its Possibilities." Prof. A. J. Booker, of the university, will speak on "Concrete," while Prof. H. R. Slocum and J. A. Jardine and F. L. Anders will carry out a series of concrete tests. On the second day City Engineer H. G. Lykken, of Grand Forks, will read a paper on "Modern Trend in Water Purification." Prof. E. F. Chandler, of the university, will talk on "Water Supply in North Dakota," while G. O. Sanford, project engineer, will deal with the Williston irrigation project.

Minnesota Surveyors and Engineers Association.—The annual meeting was held in the Senate chamber of the old capitol, St. Paul, Minn., when the following program was carried out:

Morning—President's address, Prof. W. R. Hoag; Report of the Secretary and Treasurer, Charles A. Forbes; paper, "Government Corners," Nathan Butler; paper, "Drainage Project with 250 Miles of Highway," Prof. W. R. Hoag; paper, "Minnesota Resources," George A. Ralph, State Drainage Engineer.

Afternoon—Opening at 2 P. M.—Paper, "Necessity of Good Roads and How the State Should Aid in Building Them," Senator James T. Elwell; "Good Road Instructions," George W. Cooley; paper, "Tonecan Metal," F. N. English, of the Stark Milling Co.; paper, "Sheet Steel," American Sheet and Tin Plate Co.; "Peat and Its Usefulness," Max Tolz, St. Paul; Reports of Committees, Election of Officers, Question Box.

League of Third Class Cities of Pennsylvania.—The subcommittee of the Law Committee of the League met at Harrisburg December 30, with Chairman D. S. Seitz, City Solicitor. This committee was named by the Law Committee on Tuesday, following the convention of the league. The committee will direct a measure that will provide for all of the provisions of the 1909 amendments to the constitution relating to the government of third class cities. The general committee has already provided a bill extending the tenure of office of city officials whose terms expire in April to the first Monday in December; also a measure for the election of one assessor next fall and two at the election two years hence.

Municipal Engineers of the City of New York.—At the meeting of December 28 a paper on "The Construction of the Croton Falls Reservoir of the New York City Water Supply" was presented by Mr. Frederick S. Cook, of New York City.

Albany Society of Civil Engineers.—At a meeting at the Ten Eyck December 20 C. V. Merrick gave an address on the rapid rise of the skyline of skyscrapers in the past 25 years and their usefulness from a business standpoint.

American Society of Civil Engineers.—Three meetings for topical discussion will be held January 20 and 21 at the society's house in New York

City. The general subject for the three meetings is to be road construction and maintenance. All engineers, whether members of this society or not, are invited to attend. At the first meeting, on the morning of January 20, three subdivisions will be taken up: (1) Preliminary investigations. (2) Relative value of three methods of carrying on work; (a) that in which both labor and material are furnished by the contractor; (b) that in which the material is supplied by the party of the first part and the labor by the contractor; (c) that in which both labor and material are supplied by the party of the first part. (3) Systems of maintenance. The discussion of the three divisions will be introduced respectively by Logan W. Page, Harold Parker and Hubert K. Bishop. At the second meeting, on the afternoon of January 20, the subdivisions taken up will be the use of water, calcium chloride, light oils, etc., as dust palliatives, and surface treatment with tars, heavy oils, etc. The discussion will be introduced by Samuel Whinery and Charles W. Ross. The use of bituminous materials by penetration and by mixing methods will be the subject for the third meeting, on the morning of January 21, at which the discussion will be led by Walter W. Crosby and Arthur H. Blanchard.

The society has chartered two steamers of the United Fruit Company for the trip to the Panama Canal. One steamer will leave New York on March 2 and will return to New York on March 24. The other will leave New Orleans on March 4 and return to that city on March 21. Both steamers will go directly to Colon, and after a brief stop proceed on the cruise, stopping again at Colon on the return trip. Visitors may take the entire cruise and thus spend but a few days on the isthmus or may remain on the isthmus while the vessel is away, thus affording plenty of time for a careful inspection of the work. The steamship company will reserve the vessel for members of the society until January 15, and each member must make his own reservation.

National Commercial Motor Car Show.—A comprehensive display of motor trucks, delivery wagons and self-propelled road machines for all sorts of industrial purposes is to be held in Chicago during the week of February 6-11 next. It will follow immediately after the annual automobile show, and will occupy the same building and be conducted by the same management, under the auspices of the National Association of Automobile Manufacturers. Power vehicles suitable for almost every kind of industrial and commercial business will be shown, from tricar parcel carriers for the quick delivery service of laundries, haberdashers, boot and shoe stores, confectioners and other retailers of light good to ponderous motor trucks of five tons load capacity or more. There will be light and heavy delivery wagons, express wagons, baggage wagons, mail transfer wagons, light and heavy trucks from one ton capacity up, with open platform, stake, slat and covered bodies. Special forms for unusual purposes will be displayed, such as self-propelled chemical and hose carts for fire fighting, trucks with power winches operated by the motor that propels the vehicle for loading and unloading heavy pieces of machinery and boxes, crates and barrels; trucks with self-dumping bodies for handling building materials,

ashes, etc.; self-discharging coal trucks; patrol wagons, ambulances, sightseeing cars and motor stages.

New England Water Works Association.—The following is the program for the annual meeting, Hotel Brunswick, Copley Square, Boston, January 11:

10:00 A. M.—The headquarters in Tremont Temple will be open for the use of members. 11:30 A. M.—Meeting of the Executive Committee at the headquarters, Tremont Temple. 1:00 P. M.—Lunch will be served at Hotel Brunswick, Copley Square.

2:00 P. M.—Address of Retiring President, Report of Secretary, Report of Treasurer, Report of Editor, Report of Auditing Committee, election of officers, report of tellers appointed to canvass ballots. 3:00 P. M.—Report of the following committees: Committee "To look after and keep track of legislation and other matters pertaining to the conservation, development and utilization of the natural resources of the country," M. N. Baker, Chairman, New York City. Committee "To prepare a standard specification for fire hydrants," H. O. Lacount, Chairman, Boston, Mass. Committee "On information as to the conditions under which extensions of water mains are made by town-owned water supplies," Charles W. Sherman, Chairman, Boston, Mass. Committee "On uniformity of hose and gate-nuts, and direction of opening," Frank L. Fuller, Chairman, Boston, Mass. Committee "To compile information relating to awards that have been made in water works valuation cases," H. W. Dean, Chairman, Boston, Mass. Committee "On library," Charles W. Sherman, Chairman. A paper will be presented on "The Gas Producer Pumping Plans at Manchester, Massachusetts," illustrated, by Raymond C. Allen, C. E., Manchester, Mass. George A. King, President, Taunton, Mass. Willard Kent, Secretary, Narragansett Pier, R. I.

Oregon Good Roads Association.—Oregon good roads workers are committed to creation of a highway board and selection of a highway commissioner to serve at \$4,000 a year; to appropriation of \$680,000 by the State for distribution equally among the counties in the coming two years for State-aid road construction; to the raising of \$1,360,000 among the counties for use with the State appropriation in the coming two years in starting good road construction; to the employment of convict labor and all prison labor available in good road work; to the establishment of at least three convict centers in the State, where great rock crushers shall be operated, and the product sold to the counties for road construction at actual cost and to several minor features in road construction, the substance of which was contained in the five bills submitted to the general Good Roads Convention, Portland, December 12, by Judge L. R. Webster.

For the present at least the Oregon road builders are not ready to enter into the interstate boulevard scheme suggested by the Pacific Highway Commission. They do not care to tax one-quarter or any other amount of the cost of road construction to adjacent land or to a specific road district outlined by the county road. They will not leave the selection of a road route to the people at large, but insist that the County Court is the proper power to make such selection. They have not limited the routes for road construction contemplated in the appropriations recommended to one market center, but insisted that the limitation should read "market centers."

In the five measures dissected and reconstructed there are a multitude of provisions which have deep interest. Some of these did not come to the surface in the controversies. One proviso, that the State Highway Commissioner shall have general and supervisory charge of the disbursement of work done with funds raised by selling county bonds, did not crop up for discussion, but is assured prominence in future developments, as many of the counties are going to insist upon at least theoretical independence in their own work which is being met by strict county funds.

The good roads men do stand for taxing automobiles 25 cents each horsepower a year for machines of 50 or less registered rating, and 50 cents each horsepower for all going above 50 horsepower.

Authority was granted the chairman to name two committeemen from each county of the State further to round out the bills discussed, and then to press these bills upon the Legislature at the coming session. Another committee of five, John H. Albert, of Salem; M. J. Lee, of Clackamas; H. W. Thompson, of Eugene; M. R. Ryan, of Douglas, and F. F. Eddy, of Coos, was named to frame a measure providing for wider tires in the State and to report this measure to the legislative committee.

No permanent Statewide organization was perfected. For the present the Oregon Good Roads Association, as it has been constituted for the last few months, will continue its labors. Dr. A. C. Smith, President; Judge L. R. Webster, Chairman of the Executive Committee, and Walter L. Priest, Secretary, will continue activities.

Colorado Association of Members of the American Society of Civil Engineers.—The association has arranged to have tables reserved at the Traffic Club, Denver, every Wednesday at luncheon for the members of the association and their guests. The privileges of the club will be opened to the association in connection with these luncheons. The first one was held Dec. 14.

Calendar of Meetings

- January 2-6.**
Canadian Society of Civil Engineers.—Annual Meeting, Winnipeg, Manitoba, Can.—C. H. McLeod, Secretary, 413 Dorchester street, West, Montreal, Que.
- January 4.**
American Society of Civil Engineers.—Regular Meeting.—C. W. Hunt, Secretary, 220 West 57th street, New York.
- January 6-7.**
Association of Kansas Police Chiefs.—Annual Meeting, Wichita, Kan.
- January 10-14.**
Organization of City Officials for Standardizing Paving Specifications.—Second Meeting, Engineering Societies Building, 23 W. 39th street, New York, N. Y.—John E. Hittell, Secretary-Treasurer, Chief Engineer of Streets, Chicago, Ill., Hotel Rector, New York, N. Y.
- January 11-13.**
Michigan Engineering Society.—Annual Meeting, Lansing, Mich.
- January 12-13.**
New York Tax Reform Association.—State Conference on Taxation.—A. C. Pleydell, Secretary, New York, N. Y.
- January 12-14.**
Montana Society of Engineers.—Annual Meeting, Helena, Mont.—Clinton H. Moore, Secretary, Leysen Block, Butte, Mont.
- January 12-14.**
National Civic Federation.—Annual Convention, New York, N. Y.—D. L. Case, Secretary, 1 Madison avenue, New York, N. Y.
- January 12-14.**
Indiana Engineering Society.—Annual Meeting, Hotel Denison, Indianapolis.—Charles Brossman, Secretary, Union Trust Building, Indianapolis, Ind.

- January 16-20.**
Canadian Cement and Concrete Association.—Annual Convention and Exhibition, Toronto, Ont.—R. E. W. Hagarty, Secretary, 662 Euclid avenue, Toronto, Ont.
- January 17.**
Engineers' Society of Western Pennsylvania.—Annual Meeting, Pittsburg, Pa.—Elmer K. Hiles, Secretary, 803 Fulton Building, Pittsburg, Pa.
- January 17-19.**
American Institute of Architects.—Annual Convention, San Francisco, Cal.—Glenn Brown, Secretary, Octagon, Washington, D. C.
- January 18-19.**
American Society of Civil Engineers.—Annual Meeting, New York.—C. W. Hunt, Secretary, 220 W. 57th street, New York.
- January 20.**
Illuminating Engineering Society.—Annual Meeting, New York, N. Y.—P. S. Millar, Secretary, 29 W. 39th street, New York, N. Y.
- January 24-26.**
American Society of Heating and Ventilating Engineers.—Annual Meeting, New York, N. Y.—W. M. Mackay, Secretary, P. O. Box 1818, New York, N. Y.
- January 24-26.**
Ohio Engineering Society.—Annual Meeting, Columbus, O.—C. J. Knisely, Secretary, New Philadelphia, O.
- January 25-27.**
Illinois Society of Engineers and Surveyors.—Annual Meeting, East St. Louis, Ill. E. E. R. Tratman, Secretary, 1636 Monadnock Block, Chicago, Ill.
- February 1-3.**
Nebraska Cement Association.—Western Cement Exposition, Omaha, Neb.—Peter Palmer, Secretary, Oakland, Neb.
- February 6-11.**
National Brick Manufacturers Association.—Annual Convention, Louisville, Ky. T. A. Randall, Secretary, Indianapolis, Ind.
- May 29.**
American Water Works Association.—Annual Convention, Rochester, N. Y.—J. M. Diven, 14 George street, Charleston, S. C.
- May.**
City Commission Congress.—Meeting, Galveston, Tex.—Mayor Lewis Fisher, Chairman of Committee, Galveston, Tex.

PERSONALS

BERGER, VICTOR, Alderman-at-large of Milwaukee, Wis., who has been elected to Congress as a Socialist, will qualify for Congress March 4, but will not draw his salary as a municipal officer after that date, even though he continues to serve the city until the convening of the new Congress next December. The National position pays \$7,500 and the city \$100.

BRUSKI, L. J., Winona, Minn., has been appointed Street Commissioner.

CHARLES, SALEM D., Chairman of the Street Commission, on which he has served for ten years has been certified to the Civil Service Commission for reappointment to a three-year term by Mayor John F. Fitzgerald, the other members are James J. Gallivan, recently reappointed, and John H. Dunn, whose term expires in 1912.

COUNTY ENGINEER.—The Road Commission of Union County, Mississippi, will receive applications at once for the position of County Engineer, to take charge of the construction of sand-clay and other roads. Applicants should state age, experience, education and salary desired, and give references. Communications should be addressed to Mr. W. G. Bias, Chairman of the Union County Road Commission, Route 1, New Albany, Miss.

FISHER, IRA M., Superintendent of the plant of the Massillon Electric & Gas Co., Massillon, O., for 25 years, has resigned in order to devote his entire time to the business of the Fisher Electric Company of Massillon, of which he is President.

FOYE, EDWARD H., Lowell, Mass., has been elected Purchasing Agent over Alderman Smith J. Adams.

HERING, RUDOLPH, and GEORGE W. FULLER, consulting engineers, New York, and Dr. L. L. Lumsden, of the Public

Health and Marine Hospital Service, are investigating the cause of typhoid fever in Des Moines, Iowa.

JENNE, FRANK A., Prosser, Wash., has been appointed supervising engineer in charge of the construction of the sewerage system of that city.

JOHNSTON, CLARENCE I., State Engineer of Wyoming, has been appointed professor of surveying in the University of Michigan. Mr. Johnston was graduated from this institution in 1895 and received the degree of civil engineer in 1899.

KELSEY, LOUIS C., Portland, Ore., consulting engineer, has opened an office in Portland and will give special attention to the designing of water-works, sewerage systems and pavements. Mr. Kelsey will be located in the Madison Building, 250 Third street, until March, after which his permanent office will be in the Selling Building. He will also retain his office, 412 Dooly Building, Salt Lake City, Utah.

MACVICAR, JOHN, Des Moines, Iowa, has been appointed commissioner general of the International Municipal Congress and Exposition, to be held in Chicago, September 18-30, 1911.

SEBASTIAN, CHARLES E., Los Angeles, Cal., has been appointed Chief of Police.

SEYGERLICH, CHARLES, Chicago, Ill., has been appointed Fire Marshal, succeeding the late James Horan.

SERM, ALFRED, Milwaukee, Wis., has been appointed free warden and superintendent of the new nursery and experimental garden in Evergreen Park.

STOLL, PAUL, Red Bluff, Cal., has been elected Chief of the Fire Department, succeeding H. C. Wietfeldt, who has been Chief for nineteen years. Mr. Wietfeldt declined another election.

THOMAS, J. BOSBY, Baltimore, Md., has been appointed chemist and bacteriologist for the water department.

WHITFORD, NOBLE E., Albany, N. Y., resident engineer of the New York State Engineer's office, delivered an address at Watkins, N. Y., December 14, on the construction of the Barge Canal.

WILCOX, W. F., Meridian, Miss., has resigned as superintendent of the Meridian water works system to accept the position of assistant chief engineer of the Tennessee Coal, Iron & Railroad Company, at Birmingham, Ala.

Massachusetts

Beverly—Frederick A. Dodge, former Alderman, over William Stafford, Sumner E. Glines and Jeremiah F. Desmond.

Chicopee—Sol. E. Fletcher, over Frank A. Rivers.

Everett—Herbert P. Wasgatt, without opposition.

Lowell—John F. Meehan, over former Policeman and Mayor George H. Brown and Carroll.

Lynn—William P. Connery over Mayor James E. Rich for Mayor and Commissioner of Public Safety; Frank A. Turnbull elected Commissioner of Finance; George H. McPhetres, Commissioner of Streets and Highways; Thomas Gambell, 2d, Commissioner of Water and Water Works; Herbert C. Bayrd, Commissioner of Public Property.

Malden—George H. Fall over Dr. George L. Farrell and Calvin M. Verbeck.

Medford—Charles S. Taylor, without opposition.

Melrose—Eugene H. Moore, for fifth term without opposition.

Newburyport—Robert E. Burke over Hiram L. Langford and Fred E. Green.

Newton—Charles E. Hatfield.

Salem—Alderman Rufus D. Adams over former Mayor J. F. Hurley, who will continue as Alderman; Alderman Wm. H. McSweeney, Herman F. Curtis and Alderman John J. Cahill; Mayor Arthur Howard was elected an Alderman.

Somerville—Charles A. Burns over Thos. F. Nolan.

Woburn—Hugh D. Murray over Alderman Harold P. Johnson by 28 votes.

Worcester—James Logan for fourth term, over David F. O'Connell by 124 votes; contest probable.

TRADE NOTES

Cast Iron Pipe.—Chicago: Western cities are slow in advertising their specifications. The more favorable market for municipal bonds is encouraging. Quotations: 4-inch, \$27; 6 to 12-inch, \$26; 16-inch and up, \$25, Birmingham. It is expected that competition for some large lettings in February at Pacific Coast points will be keen on account of the large accumulations of stocks. Quotations: 4 to 6-inch, \$19 to \$19.50; 8 to 12-inch, \$18 to \$18.50; over 12-inch, average, \$17, New York. Quotations: 6-inch, carload lots, \$22.

Lead.—It is now generally believed that lead is scarce. Quotations: New York, 4.50c.; St. Louis, 4.35c.

Oregon Fir for Pavements.—The Oregon and Washington Lumber Manufacturers' Association, Portland, Ore., has appointed a committee to take up a study of wood block pavement. It is hoped to greatly increase the use of fir for this purpose, though as yet but a comparatively small amount has been tried. In cutting fir there is a loss of about 25 per cent of every tree, as the tree tops are not now used, except to a small extent by box factories. It is this waste material which the lumbermen's organization hope to see used for paving blocks.

Road Machinery.—The addition to the boiler shops of the J. I. Case Threshing Machine Co., Incorporated, Racine, Wis., is just being completed. This is a building 60 ft. by 215 ft., which will be used exclusively for a stock room for the Case boiler shops. A boiler storage has been completed 230 ft. by 60 ft. This is equipped with a traveler for movement of boilers from one part of the building to another. Under the supervision of the Case architect the above work has been undertaken and completed, also the remodeling of the Garfield warehouse, which is 100 ft. by 250 ft. and two stories high. This building, when the remodeling is completed, will be used as a machine shop. Machine shop facilities have not been adequate. As soon as the weather will permit, other buildings will be put under construction by the Case architect and completed. The heavy business for the present year has necessitated all these changes.

Stone Crusher Patents.—Thomas A. Edison, the inventor, is suing the Allis-Chalmers Company, the Empire Limestone Company and the Caspan Stone Company in the United States Court, Buffalo, N. Y., for damages for alleged infringement on one of his patents for a stone crusher.

Concrete Surface Finisher.—The Vulcanite Portland Cement Company, Land Title Building, Philadelphia, Pa., has published with handsome colored illustrations a paper by Albert Moyer on concrete surface finisher. One of the most handsome finishes illustrated is made with ¼-inch white marble screenings, ½-inch red marble and ½-inch black marble and Cow Bay sand. The proportions used were: 1 part Vulcanite Portland cement; 2½ parts Cow Bay sand; 2 parts red marble and 1½ parts of black marble.

Pipe Joints.—The Best Manufacturing Company, Pittsburgh, Pa., in circular No. 3 illustrate the various types of pipe joints which this firm is prepared to furnish. The different styles include screwed joints, welded joints, the Van Stone joint, bronze unions and special types of joints for hydraulic work.

Water Company Reorganization.—A syndicate of local capitalists is seeking to purchase a controlling interest in the Bristol (Conn.) Water Company. The negotiations have been under way for some time, and it is stated that options have been secured on more than 51 per cent of the stock, the amount required. The necessary amount of money to take this stock over is practically subscribed for. The company was organized 26 years ago and is capitalized at the present time for \$200,000, one-half of which came through the issue of stock as dividends. There are outstanding bonds to the amount of \$100,000. The present dividend rate is 5 per cent. The company owns four reservoirs, situated in this town and Harwinton, and has storage capacity enough to meet the needs of the town for a number of years to come. There will be a petition presented to the next Legislature asking that an act be passed which will permit the town to purchase the rights and privileges of the company. If the syndicate gains control, as it now seems likely that it will, it is said that this measure will not be opposed. However, the town will be asked to desist from voting to take the company over until an opportunity is given the new interests to demonstrate that the company can furnish water to users as low as any municipal or private owned company in the State, in which event there would be no reason for the town to go into the water business.

Water Company Reorganization.—The Rochester & Lake Ontario Water Company was reorganized at a meeting of the Board of Directors December 21. Henry C. Brewster was elected treasurer and Alexander Russell was named secretary. The two positions were formerly held by George K. M. Clarke, who absconded after embezzling \$40,000 of the company's funds. Alvin H. Dewey was elected vice-president in place of William F. Balkam, resigned. The following is the new Board of Directors: Henry C. Brewster, president; Alvin H. Dewey, vice-president and general manager; Alexander Russell, secretary; Henry C. Brewster, treasurer; V. Moreau Smith, A. B. Lamber-ton, Frederick W. Zoller, William F. Balkam, Andrew H. Bowen and Merton E. Lewis. The new director is Frederick W. Zoller, of the Union Trust Company. Alvin H. Dewey will have general charge of the management of the company.

Water Company Increases Capital.—The Richmond City Water Works Company, Richmond, Ind., has increased its capital from \$375,000 to \$550,000. The increase is made to provide for future improvements of the plant and will be issued from time to time.

Gasoline Fire Engine Test.—William M. Johnson, engineer for the National Board of Fire Underwriters, has made the following report on tests of the Westinghouse gasoline fire engine, recently delivered to the city of Cohoes:

Drafting water through 20 feet of suction and pumping through two lines of 200 feet each, siamesed into a 3½-inch line with a 1½-inch nozzle, the engine developed a pressure at the pump of 82 pounds and threw an average of 491 gallons a minute, for twenty minutes.

Pumping from a hydrant with a pressure of 42 pounds, the engine threw an average of 705 gallons a minute for a test of sixteen minutes.

When attached to hydrants which give the engine about 30 pounds pressure to start with, it should be able to supply two good 1½-inch fire streams through 400 or 500 feet of hose.

Gurley's Manual.—The forty-fifth edition of Gurley's Manual of American Engineers and Surveyors Instruments, manufactured by W. & L. E. Gurley, Troy, N. Y., has been published. It is primarily a book of instructions in the adjustment and use of field instruments, and while it does not attempt to take the place of treatises on the subject, it is generally sufficient for students and young engineers and is frequently used by them. The illustrations in colors of the instruments are attractive and make it easy to understand the instructions. Some of the instruments described might be of practical use in their daily work to others than surveyors, for instance, contractors, superintendents and foremen. The telescopic hand level, the angle mirror and the tally register are among these. The book is ordinarily sold for 50 cents.

New Floor Preparation.—The Wilson & Baillie Manufacturing Company, 26 Court street, Brooklyn, has taken the agency for the United States of "Terrano," a magnesite floor preparation made according to a German formula and used to a considerable extent in Canada, where the rights are controlled by the Eadie-Douglass Company, of Montreal. The Wilson & Baillie Company will lay the floor by its own forces in Greater New York, but outside that territory it will sell the material ready mixed for laying and will supply an experienced foreman to direct the work. Practically all the material for the composition is imported and will be mixed in the company's plant in Brooklyn.

Trade Catalogue Library.—A library has been established in the Hudson Terminals at 50 Church street, New York City, which is accepting catalogues of American manufacturers, classifying and filing these catalogues and digesting them in card index form for reference and consultation of buyers, manufacturers, engineers, contractors, purchasing agents and other consumers, both resident in and visitors to the metropolitan district. The plan has filled a needed want in the way of providing a permanent and comprehensive collection of trade literature, which is resulting to the mutual benefit of the manufacturer and the buyer.

The custodian of the library is the Commercial Bureau Company, to which applications for space should be addressed. The total cost to the manufacturer will be \$10 per year, for which sum he is entitled to have placed on file any or all of his catalogues, photographs, drawings, etc. This fee also includes the insertion in card index files for buyers, of a card giving a printed index of the original catalogues placed on file by the manufacturer. These card index files are distributed to buyers and others interested for use in their own offices.

Change of Office.—The general offices of the Universal Road Machinery Company have been removed from New York to Kingston, N. Y., where its shops are located. The office of the President, Mr. George H. Ford, will be kept at 120 Liberty street, New York.

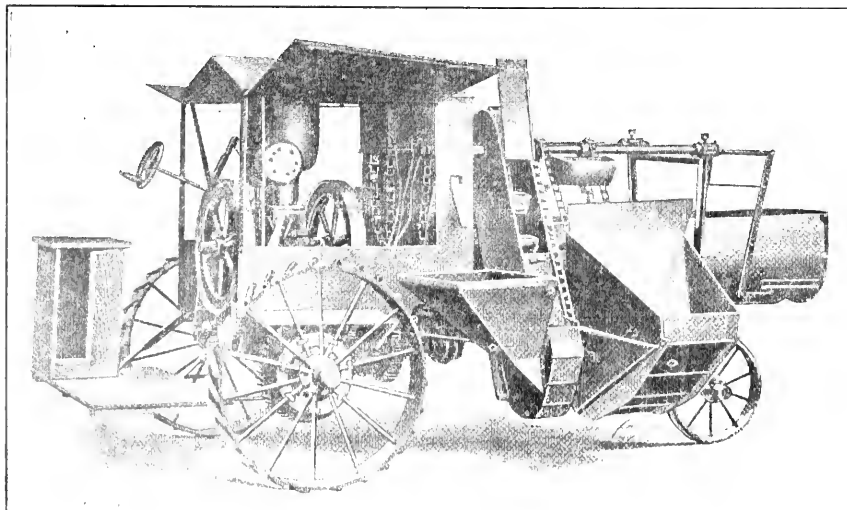
Menzies Street Cleaner.—The Menzies Street Cleaner Company, Glens Falls, N. Y., have issued a new catalogue, describing the Menzies Patented Sanitary Hand Cleaning Machine. The largest cities in the country have used them for years with entire satisfaction and the demand is rapidly increasing.

MUNICIPAL APPLIANCES

Continuous Concrete Mixer with Measuring and Elevating Devices

The Butler Concrete Machinery Co., Butler, Ind., manufacture concrete mixers of several sizes and types. Their model AA mixer is shown in the illustration. The mixing apparatus is of the pug-mill type; three hoppers receive the cement, sand and stone and deliver it by bucket elevators which do the measuring into the trough. The whole is mounted on a four-wheeled truck, propelled by a gasoline engine which also does the mixing.

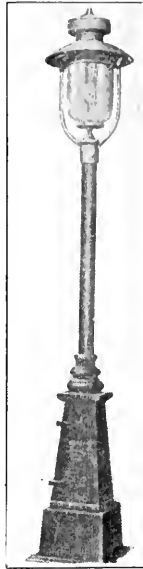
Capacity is from 150 to 200 cu. yd. per day with a 5-hp water-cooled Novo gasoline engine which is simple and compact and claimed to be reliable and easily operated. The main frame is constructed of 3 by 3½ by ½ steel angle to which the various parts are securely bolted and braced. The front bolster and axle are of the swivel type, allowing perfect freedom of the front trucks. These are guided and held in place by chains running back to the shaft which in turn is connected by a worm gear to the steering wheel. The rear axle is of the best steel shafting, size 2 inches, with differential gears and wide bearings. All the gears are of the Web pattern and four sets of steel back gears are used, including the special design clutch for operating the traction. The wheels are 38 by 8 inches wide and the rear 20 by 6 inches. The gears are of the best gray iron and steel of such dimensions as to require a minimum amount of power to operate the machine. The pug shaft is of square steel, making it easy to remove or replace the mixing paddles. The drum is made of 10 gauge steel boiler plate, 7 ft. 2 in. long, with 36 steel mixing paddles. The sand, stone and cement hoppers are made of 14 and 16 gauge steel and are located at the side of the mixing drum, 27 inches high to the top of the hoppers, where the elevating buckets pass through a special made boot, picking up the materials in just such quantities as the size and number of buckets will admit and deposits it into the mixing drum in plain sight in the propositions desired by the arrangement of the buckets on the links or chain belt. The elevating chain and steel buckets are of standard pattern.



TWENTIETH CENTURY CONTINUOUS CONCRETE MIXER

Gasoline Street Lamp

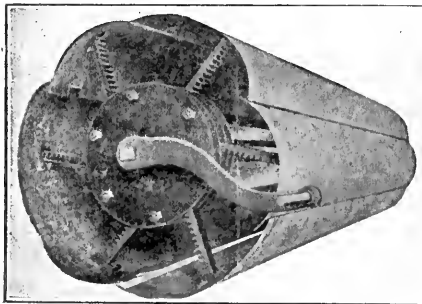
A GASOLINE street lamp of 1,000 candlepower, which is suited for lighting small town and suburban streets, is made by the Herz Manufacturing Company, of 388 Jackson street, St. Paul, Minn. The height of the lamp post, which is of cast iron, is 11 feet, the base is 2 feet square and the weight of the whole is 225 pounds. Each lamp is filled, as shown in the illustration, with a Herz Simplex generating tank, making each unit a gas machine in itself.



The base of the post is made larger than in the case of a gas or electric pole so that the door will provide free access to the apparatus. Although gasoline lighting is of special interest to towns desiring to light their streets for the first time, even the largest cities have not been able to dispense with the system in its suburban sections.

Adjustable Concrete Culvert Mold

A CONCRETE culvert mold having a simple mechanism for adjustment is made by the Township Supply Co., Garrison and Lawton avenues, St. Louis, Mo. The illustration shows the mold set for making a culvert 24 inches



ADJUSTABLE CONCRETE CULVERT MOLD

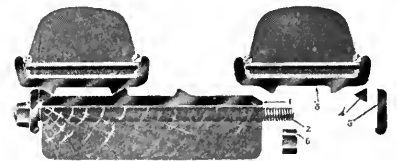
in diameter. The same mold makes all sizes, 14 to 24 inches, and any length required. A larger size molds culvert in all sizes from 30 inches to 5 feet in diameter. It is claimed that with these molds in many places concrete culverts can be built for less money than wooden ones.

The New Firestone Quick Removable Side-Wire Tires

A NEW tire and rim equipment that promises to revolutionize the present methods of changing truck tires has been placed on the market by the Firestone Tire & Rubber Company. This equipment does away with lay-ups for tire repairs or replacements by enabling the driver to change tires anywhere in a few minutes with no other tool than a wrench. It keeps deliveries going on with but slight interruption and cuts off the dead expense of having the vehicle out of commission on account of tires.



This illustrates a single tire mounted on the wheel.



The second cut shows sectional view of rear wheel equipped with dual tires, one of which has been removed. In order to change tires, the driver removes the nuts (No. 6), of which there are fourteen around the wheel. This releases the clamping flange (No. 5). He then slides off the tire, rim and all in one lateral movement. The clamping ring (No. 4) is split and comes off along with the tire. A spare tire already applied to rim is substituted by merely reversing the operation. One or two spare rims with tires already applied are kept at headquarters ready for use. Rims of equivalent size are interchangeable on all wheels, front and rear, single or dual. There is no risk of the tire not being firmly and properly applied in its rim, for the tire itself is applied by experts at any of the hundred-odd Firestone applying stations. The driver only changes the rim and does not tamper with the tire itself.

This equipment enables the removal of any tires at will to be rebuilt or repaired before they are too far gone. Such repairs to Firestone side-wire tires frequently double their length of service.

Like all other Firestone products, this equipment has been thoroughly tested, and its efficiency proved in actual service before offering to the public. One of the largest truck manufacturers has already adopted it as regular equipment. Demonstrations are given at the Madison Square Garden and Chicago and Boston auto shows and literature sent on request to any one interested.

Contractor's Motor Truck

AN automobile truck with an end dumping body suitable for contractors' use has been placed on the market by the White Company, Cleveland, O. One of these trucks has been used in New York City for several months by McDonald and Barry for hauling coal, ashes and gravel. When working on ashes the truck carried them from a power house situated on the Harlem River at 224th street to a new street that was being filled at Broadway and 24th street.

The truck carries a load of seven cubic yards of ashes a distance of over a mile. In comparison with horses, the regular teams which have been used on this work have been hauling three and a half cubic yards to a load. The daily trips average from five to six. The truck has been carrying twice as great a load and has averaged from 10 to 12 trips, or double the number. In other words, it has easily done four times the work, or taken the place of four horse-drawn wagons.

The main points in the specifications of the G T A, as it is called, truck is as follows:

Cylinders—Four cylinders cast en bloc, dimensions, 3¼-inch bore, 5½-inch stroke.

Motor Control—Throttle and spark advance controlled by levers mounted on steering wheel.

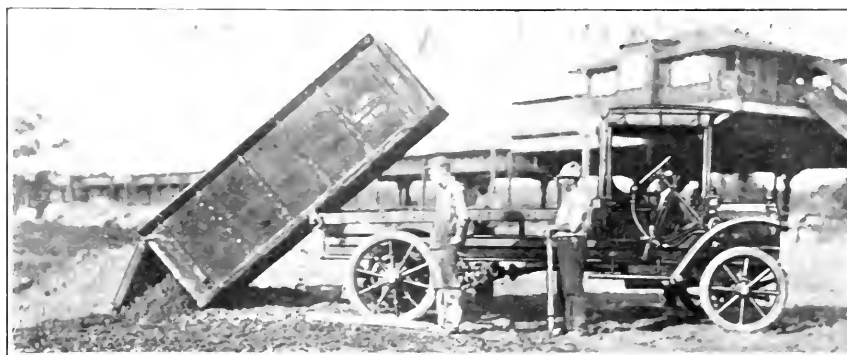
Transmission—Four forward speeds with direct drive in the third gear, and a reverse. The transmission is of the selected type. The gear shifting mechanism is enclosed within the gear case which forms an oil well and is free from dirt and grit. The gears are made of chrome nickel steel. All gear shafts are ball bearing.

Clutch—Leather faced, cone clutch.

Valves—Mechanically operated and interchangeable. Each valve with its valve-stem is a one-piece forging made of special nickel alloy of such a nature as to prevent distortion by heat. The valve lifters have fibre seats, thus reducing noise to a minimum and preventing the ingress of grit and sand.

Motor Cooling—Positive water circulation by gear-driven centrifugal pump. The radiator is so supported that it does not receive the strain to which the frame may be subjected on rough roads.

Lubrication—A combination of the splash system with positive speed.



3-TON END DUMPING CONTRACTOR'S TRUCK.

Ignition—Bosch magneto.

Carbureter—White, water-jacketed.

Crankcase—Made in two sections of special aluminum alloy. The upper section carries all the working parts of the motor. The lower section is simply an oil well and is easily removable for inspection or adjustment of connecting rods, cam-shaft, etc., without disturbing the crankshaft bearings.

Crankshaft—Forged of nickel steel. Is of unusually heavy construction.

Mechanism Protected—Mechanism incased in a heavy sheet metal dust pan. Universal joints protected in heavy leather shoe, which permits being packed in grease.

Steering—Worm and sector type with ball-thrust bearings.

Brakes—Internal, expanding, in rear; external, contracting brakes on the jackshaft. Very large.

Drive—Shaft drive from gearcase to jack shaft. This shaft is fitted with two universal joints. From jackshaft transmitted by a chain to rear wheels. Differential in jackshaft.

Frame—Standard "I" beam, six inches high.

Springs—Front springs semi-elliptic; rear springs platform type.

Front Axle—Solid drop forging, 40 carbon steel.

Rear Axle—Solid drop forging, 40 carbon steel, straight, springs hung from lower side.

Wheels—Steel casting reinforced by webs.

Wheel Base—144 inches.

Tread—Front wheels (center to center of tires) 63½ inches; rear wheels (center to center of tires) 65½ inches.

Tires—36 x 5 inches, solid in front; 40 x 4 inches, solid double tires in rear.

Measurements—Length over all 19 feet 7½ inches; dash to rear, 16 feet 10½ inches; length of platform, 12 feet 3 inches; width of platform, 6 feet 5 inches.

Digging Ditches with Dynamite

THE excavation of trenches with dynamite is a process which is being exploited by the E. I. du Pont de Nemours Powder Company, of Wilmington, Del. While the process is specially adapted for use in wet clay and hence has been used mostly in the digging of drainage ditches, there are many instances in which the process would be available for municipal work. Outfall sewers, for example, in sea coast cities often run through areas of marshy land before discharging into the ocean.

Every one who has had anything to do with excavating in rock, shale or frozen earth, knows that this work cannot be done rapidly or economically without explosives. Very few people know, and they have only found it out quite recently, that ditches and channels through clay, gumbo, sand, loam or other earth can be dug at a wonderful speed and at a low cost with dynamite. Ditches and channels can be cut through swamps, although several inches or even a foot of water covers the ground, just as well as or even better than through dry ground. A channel or ditch dug with dynamite, and particularly one cut through dry or sandy ground is not so even and regular just at first as one dug by hand or machine, but will even up very soon after water fills it, and as the banks have a good slope there is little caving afterward.

When a ditch is blasted there is no outlay for expensive equipment because the only machinery necessary is an iron bar pointed at one end. In hard dry ground a sledge or maul is needed to drive the bar down to the necessary depth. There is no delay and expense getting machinery in place through swamps and thickets. Not even a team is needed when ditches are dug with dynamite, for one or two men can carry sufficient dynamite to dig a ditch four or five hundred feet long, four or five feet wide and three or four feet deep. When ditches are dug with dynamite, the material taken from the ditch is practically all thrown out by the blast and little shoveling is necessary.

Ohio Road Machine Abroad

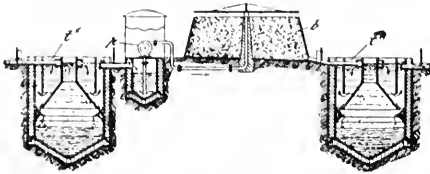
The accompanying photograph illustrates an Ohio reversible road machine in use in road making on the plantation of J. W. Bischodt, St. Thomas, Danish West Indies. The value of the machine is not limited to its use on roads. In fact, the machine illustrated has been used with great success in digging small canals from one part of the harbor to another. A number of types of grades are made by the Ohio Road Machinery Company, Oberlin, O.



BUILDING ROAD IN WEST INDIES WITH OHIO REVERSIBLE ROAD GRADER.

PATENT CLAIMS

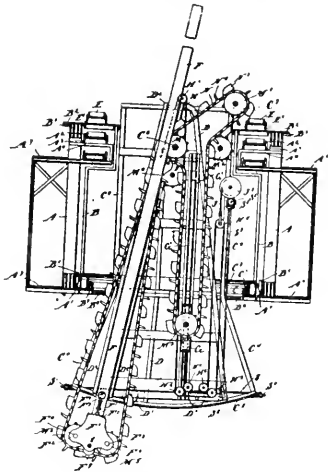
978,889. **TREATING SEWAGE.** Karl Imhoff, Bredenezy, near Essen, Germany. Serial No. 544,852.
The method of treating sewage consisting in passing it through a sedimentation



tank, thence to a biological filter, thence to a further sedimentation tank and periodically changing the direction of movement so that each sedimentation tank is alternately employed as the first and final tank respectively.

978,908. **EXCAVATING APPARATUS.** William J. Leary, New York, N. Y., assignor to W. J. Leary Manufacturing Co., Jersey City, N. J., a Corporation of New Jersey. Serial No. 497,589.

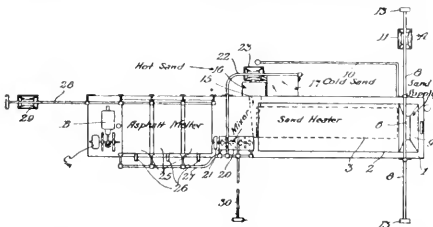
In an apparatus of the character set forth, a pair of girders disposed horizontally and parallel and provided with bottom stringers, a carriage supported by the bottom stringers only of said girders and mov-



able longitudinally thereof in the space between them, a turn table in said carriage, a boom having side bars, a conveyor of the chain and bucket type mounted on said boom, the buckets of which are movable between the side bars of said boom, cars movably supported on the turn table on said carriage, and a swinging frame in which said boom is mounted to slide, said frame being carried by and rotatable with said turn table.

978,973. **ASPHALT-PAVING PLANT.** Charles I. Williams, Utica, N. Y. Serial No. 383,128.

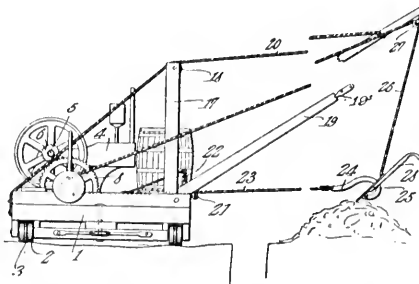
In a plant of the character described, the combination with an asphalt melter and a mixer, of a sand heating member, the



same comprising an automatic feeding supply, a receptacle for the heated output therefrom and a receptacle adjacent to the latter for cold sand, the two latter receptacles having outlets for discharge into a common receptacle whereby the sand may be mixed to supply the mixer with sand of desired temperature, substantially as described.

978,886. **TRENCH-FILLING APPARATUS.** William G. Howe, Butler, Ind. Serial No. 511,114.

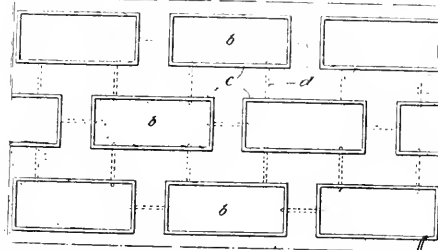
An apparatus as described comprising a wheel mounted platform, an engine located upon the platform, a shaft operatively connected with the engine, winding drums mounted upon the shaft, lever actuated clutch mechanisms mounted upon the shaft for engagement with the winding drums and being located between the adjacent



ends of the drums, a boom pivotally attached to the platform and restrained to swing in a vertical plane only between the adjacent ends of the drums, a cable arranged to wind upon each drum, one of said cables being guided along the boom and a guide for the other cable located upon the platform, a manually directible scraper with which both of said cables connect, a brace attached to the boom and pivotally connected with the platform, said cable guide being located upon the platform at a point between the end of the said boom and the end of the said boom.

978,994. **PAVEMENT.** Matthew E. Dunn, New York, N. Y. Serial No. 459,522.

A continuous street pavement having a foundation, a number of metallic reinforce sections placed on edge on the foundation and spaced from each other, said reinforce sections having openings in the walls thereof, metallic ties extending between the adjacent walls of adjacent reinforce

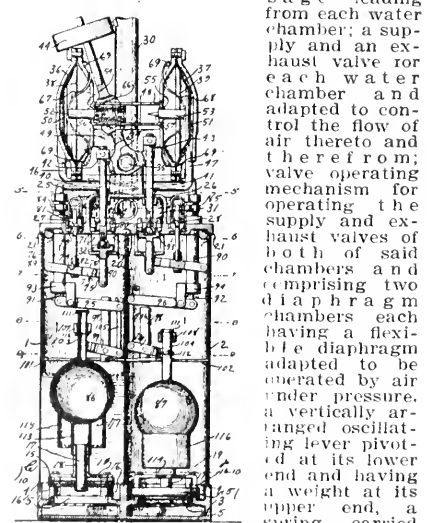


sections and provided at their ends with heads, said ends projecting through said openings and said heads being adapted to contact with the inner surfaces of said sections to prevent separation thereof and being removable through said openings, thereby joining the reinforce sections together and permitting any one of them to be removed without disturbing the others, and a sheet of paving material laid on the foundation and between the reinforce sections.

979,107. **DEVICE FOR RAISING WATER.** John M. Swanstrom, Chicago, Ill. Serial No. 519,397.

In a device of the class described, two water chambers; a valve controlled inlet passage for each chamber and through which water may enter thereinto; a valve controlled outlet passage for each chamber and through which water is discharged therefrom; a supply passage for air under pressure leading into each water chamber;

an exhaust passage leading from each water chamber; a supply and an exhaust valve for each water chamber and adapted to control the flow of air thereto and therefrom; valve operating mechanism for operating the supply and exhaust valves of both of said chambers and comprising two diaphragm chambers each having a flexible diaphragm adapted to be operated by air under pressure, a vertically arranged oscillating lever pivoted at its lower end and having a weight at its upper end, a spring carried by said lever and through

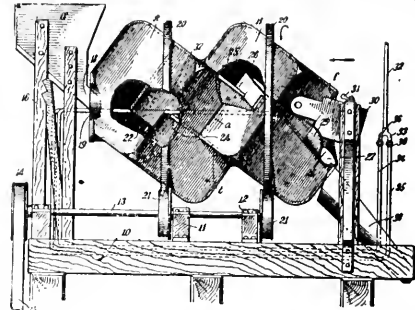


which movements of said diaphragm are

communicated to said lever, and means whereby movement of said lever is transmitted to said supply and exhaust valves; a conduit leading from within each water chamber and adapted to conduct air under pressure from the interior of the chamber from which it leads to one of said diaphragm chambers and which conduits constitute the sole connecting means through which fluid may flow with which said chambers are provided; a valve for each of said conduits and adapted to control the flow of air therethrough; a float within each water chamber; and lever mechanism interposed between each of said floats and one of said controlling valves and through which said valve is operated.

977,897. **MIXING MACHINE.** Alvin Flavel Nims, Philadelphia, N. Y. Serial No. 545,813.

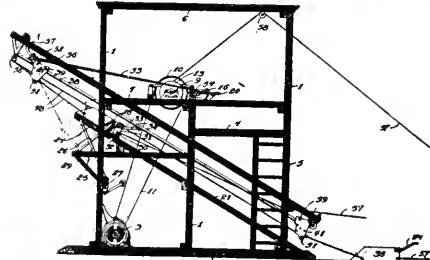
A mixing machine, comprising hollow sections communicating interiorly, and rotatably mounted, one of said sections having an inlet, the other of said sections having



an outlet, a partition in the first of said sections, having a part cut away and extending across said section, the first of said sections having a wall thereof extending into the second of said sections to form a partition within said second section.

977,920. **EXCAVATING MACHINE.** Vernon A. Younger, San Jose, Cal., assignor to Joshua M. Younger, San Jose, Cal. Serial No. 516,169.

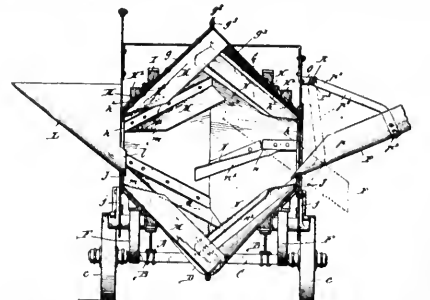
A device of the character described comprising a slideway, tracks raising and lowering drums carried by said slideway, separate cables for each drum, shovels connected to said cables, shovel dumping means at one



end of said slideway, tracks carried by said slideway, a carrier mounted on each track, and means carried by the cables of the hoisting drums for causing said carriers to render the hoisting drums idle and the lowering drums active after the shovels have been dumped.

978,011. **MIXING MACHINE.** Charles E. Foote and Chester T. Foote, Nunda, N. Y., assignors to The Foote Manufacturing Company, a firm consisting of Charles S. Warner, Wilson H. Willard, Oscar J. Willard, Charles E. Foote, Fred G. Olp and Chester T. Foote, Nunda, N. Y. Serial No. 389,551.

In a mixing machine, a tapering mixing drum having mixing-wings and discharge-wings secured to the inner sides of its walls and an opening through which the material



is discharged, said discharge-wings having their free longitudinal edges bent at an angle to form scoops, and at least one of said discharge-wings bent rearward at a point between its ends.

THE WEEK'S CONTRACT NEWS

Relating to Municipal and Public Work—Street Improvements—Paving, Road Making, Cleaning and Sprinkling—Sewerage, Water Supply and Public Lighting—Fire Equipment and Supplies—Bridges and Concrete Work—Sanitation, Garbage and Waste Disposal—Police, Parks and Miscellaneous—Proposals and Awards

To be of value this matter must be printed in the number immediately following its receipt, which makes it impossible for us to verify it all. Our sources of information are believed to be reliable, but we cannot guarantee the correctness of all items. Parties in charge of proposed work are requested to send us information concerning it as early as possible; also corrections of any errors discovered.

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREET IMPROVEMENTS				
Kansas.....	Hutchinson.....	Jan. 6.....	Improv. 6 mi. of road including laying of 8,000 cu. yds. of clay or gumbo, excav. 5,000 cu. yds. of earth & build. 6 culverts.	H. R. Hamma, County Clerk.
Ohio.....	Cincinnati.....	Jan. 6, noon.....	Imp. Dick road from Howar's Crk. to Oxford road, Crosby twp.	Frederic Dreih, Clk., County Comrs.
Connecticut.....	New Haven.....	Jan. 6.....	Furn. crushed stone dur. 1911, inc. 8,000 tons screenings.....	C. W. Kelly, City Engineer.
Georgia.....	Savannah.....	Jan. 6.....	Furn. 4,000 cu. yds. cement gravel for improving and repairing roads.....	A. B. Moore, Chm. County Comrs
Indiana.....	Frankfort.....	Jan. 7, 2 p.m.....	Constructing 4 gravel roads.....	Charles F. Cromwell, County Aud.
New Jersey.....	Jersey City.....	Jan. 9, 2 p.m.....	Belgian block paving 1,400 sq. yds., 1,150 cu. yds. earth excav. and 250 cu. yds. earth and 340 cu. yds. sand fill; 3,500 sq. feet flag.....	Geo. T. Bouton, Clk. St. & W. Bd.
Kansas.....	Oskaloosa.....	Jan. 9, 10 a.m.....	Grad. and macadamizing portions of James Neal et al. roads.....	Geo. A. Patterson, Chm. Co. Comrs
Pennsylvania.....	Erie.....	Jan. 9, 8 p.m.....	Paving 26th st., from Peach to Chestnut st.....	B. E. Briggs, City Engineer.
New York.....	Albany.....	Jan. 9, 1 p.m.....	Improving 23 State highways in 12 different Counties, ranging from 1.21 to 8.58 mi. long, total length, 99.65 miles.....	S. P. Hooker, Chm. State Hwy Comn.
Missouri.....	St. Louis.....	Jan. 10.....	Constructing a municipal asphalt plant.....	W. B. Dryden, Secy. B.I. Pub. Imp.
Nebraska.....	Geneva.....	Jan. 10, noon.....	Grad. and build. bridges in Fillmore County during 1911.....	Uriah F. Stanard, County Clerk.
Nebraska.....	Plattsmouth.....	Jan. 10, noon.....	Grad. County roads; plans with D. C. Morgan, County Clerk.....	County Judge of Cass County.
Florida.....	Palatka.....	Jan. 10, noon.....	Grad. and paving 5,071 sq. yds., curbing 3,837 lin. ft.....	E. S. Crill, Chm. Bd. Bond Trustees.
Texas.....	Wichita Falls.....	Jan. 11.....	Pav. business dist. of city with various kinds of material.....	Mayor and City Council.
New York.....	Albany.....	Jan. 11, 1 p.m.....	Improving 24 State highways in 9 different Counties, ranging from 0.50 to 6.22 miles long, total length, 84.19 miles.....	S. P. Hooker Chm. State Hwy. Com.
New Jersey.....	Salem.....	Jan. 11.....	Grad. and plac. grav. and oyster shell surface, 5.05 mi. Wdstwn.	H. P. Gray Dir. Bd. Freeholders.
Indiana.....	Rushville.....	Jan. 11, 2 p.m.....	Bldg. mac. rd. in Anderson twp., pet. for by J. A. Brown et al.....	Jesse M. Stone, County Auditor.
Alabama.....	Chico.....	Jan. 12, 7:30 p.m.....	Grading and graveling 39 sections of streets; price per cu. yd.....	B. F. Hudspeth, City Clerk.
New York.....	Albany.....	Jan. 13, 1 p.m.....	Improving 20 State highways in 13 different Counties, ranging from 0.53 to 7.04 miles long, total length aggregating 84.29 mi.	S. P. Hooker, Chm. State Hwy. Com.
Minnesota.....	Minneapolis.....	Jan. 13, 7:30 p.m.....	Furn. paving material during 1911, inc. sandstone, creco, wood and vit. paving block; granite and sandstone curb, crushed granite, cement.....	Henry N. Knott, City Clerk.
California.....	Los Angeles.....	Jan. 16, 2 p.m.....	Improving portions of Huntington Drive in Los Angeles County	C. G. Keyes, County Clerk.
Kentucky.....	Paducah.....	Jan. 16, 3 p.m.....	Bldg. sidewalks, etc., 3 jobs: concrete walks: 14,325, 23,000 and 13,300 sq. ft.; concrete driveways: 820, 800 and 380 sq. ft.; concrete gutters: 2,900, 3,046 and 1,520 lin. ft.; granite curb: 2,900, 3,940 and 2,500 lin. ft.; L. A. Washington, City Engineer.	Board of Public Works.
Ohio.....	Lakewood.....	Jan. 16, noon.....	Paving 3 aves. and one road; Wm. H. Evers Eng. Co., Arc. Clyde	B. M. Cook, Village Clerk.
Oregon.....	Salem.....	Jan. 16.....	Paving 175,000 sq. yds. street surface with harl surface pave.....	W. A. Morse, City Recorder.
Washington.....	Olympia.....	Jan. 18.....	Grad., drain., mac. et. al., State Aid rd. 99, Walla Walla Co.....	H. L. Bowlby, Sec'y. St. Hwy. Bd.
New Jersey.....	Mt. Holly.....	Jan. 19, 11 a.m.....	Grav. rd. through Akron from Gardner's Cor. to Atlantic Co. line	Earl Thomson, Co. Engr., Camden.
Ohio.....	Hamilton.....	Jan. 20 noon.....	Imp. Dayton Pike Sycamore twp., Spec. No. 127; Bond \$1,000.	Fred Dreih, Clk. County Comrs.
New Jersey.....	Alpine.....	Jan. 21.....	Bldg. stone rd. 2,570 ft. long, from Tenafly to Alpine, Sylvan av.	Franklin W. Hopkins, Mayor.
Alabama.....	Wetumpka.....	Jan. 23.....	Road improvements to cost \$170,000.	Solomon Norcross, C.E., Atlanta, Ga
SEWERAGE				
Wyoming.....	Buffalo.....	Jan. 6, 8 p.m.....	Bldg. sewer system: 6,390 ft., 6-in.; 11,540 ft., 8-in.; 1910 ft., 10-in.; 4,340 ft., 12-in. and 700 ft., 15-in. pipe sewer, 51 manholes, 15 flush tanks; 22 lamp holes, house con., outlets, etc.	E. L. Clarke, Engineer-in-Charge.
California.....	Oroville.....	Jan. 7.....	Bldg. sewer system, as whole or labor and material separately; Olmsted & Gillesen, 604 Wright & Callender Building, Los Angeles, Engineers.....	C. H. Reed, Jr., City Clerk.
South Dakota.....	Aberdeen.....	Jan. 9.....	Bldg. 5,600 ft. 12, 15 and 20-in. pipe sewer ext., 14 manholes.....	F. W. Raymond, City Auditor.
Minnesota.....	Springfield.....	Jan. 9, 8 p.m.....	Bldg. 8-in. sewer on Brunst.....	J. A. Eichmann, Village Recorder.
Alabama.....	Brawley.....	Jan. 12.....	Bldg. sewer mains, outfall sewer and septic tank.....	W. H. Wheelan, City Clerk
Minnesota.....	Minneapolis.....	Jan. 13, 7:30 p.m.....	Furn. Portland cement for sewer and street work, etc., in 1911.....	N. K. Thompson, Street Comr.
New Jersey.....	Elizabeth.....	Jan. 16, 8:30 p.m.....	Furn. and lay 570 ft. 10-in. 505 ft. 8-in., sewer, m.h., etc.....	W. W. Southard, City Engineer.
Klahoma.....	Checotah.....	Jan. 16.....	Bldg. 11 miles 8, 10 and 12-in. san. sewer, disposal works, etc.....	L. A. Washington, City Engineer
Kentucky.....	Paducah.....	Jan. 16, 3:30 p.m.....	Constructing c.i. drain pipes, paving, etc., 2 sts.....	C. V. Cloud, Chm. Council Com.-in-C.
Pennsylvania.....	Masonstown.....	Jan. 16.....	Constructing a sewer and water system for borough.....	G. D. Holmes, Ch. Engr. Inter. S. Bd.
New York.....	Syracuse.....	Jan. 26, 10 a.m.....	Bldg. Harbor brook intercepting sewer and imp. stream.....	C. R. Heath, Health Engineer.
Manitoba, Can.	Souris.....	Feb. 1.....	Furn. 31,000 ft. vit. sewer pipe etc. spring and summer, 1911.	
WATER SUPPLY				
New Jersey.....	Newark.....	Jan. 6, 3 p.m.....	Furn. and lay. water pipes and con. at Tuberc. Hosp. at Soho.....	L. E. Voorhees, Chm. Com. Bd. Fr'h
Nebraska.....	Superior.....	Jan. 6, 8 p.m.....	Bldg. extensions and additions to water works system.....	J. T. Robbins, City Clerk.
Washington.....	Spokane.....	Jan. 6, 2 p.m.....	Furn. 3,600 ft. 18-in. water pipe to withstand working pressure of 125 lbs. per sq. in.; bidders' spec and 3 copies of bids.....	John Gifford, City Purchasing Agt.
Washington.....	Newton.....	Jan. 9, 7:30 p.m.....	Bldg. 100,000 gal. steel water tank on 100-ft. steel trestle.....	E. G. Finch, City Clerk.
Ohio.....	Euclid.....	Jan. 9, noon.....	Construct. 6-in. water mains in 3 sts.; F. A. Pease Eng., Clevel.	Nelson J. Brewer, Village Clerk.
Illinois.....	Anna.....	Jan. 9.....	Constructing a \$50,000 water works system.....	Mayor and City Council.
Kansas.....	Onaga.....	Jan. 10, 7 p.m.....	Bldg. w. w. system; Burns & McDonnell, Scarritt bldg., K. C. Mo.	Elmer E. Hines, City Clerk.
Maryland.....	Ft. Smallwood.....	Jan. 10.....	Bldg. pump house and install pump. machinery at Fort.....	Constr Q M., U.S. Army, Ft. Howard
Oregon.....	Portland.....	Jan. 10, 4 p.m.....	Furn. c.i. pipe, etc.; 700 lengths, 30-in., 1,303 tons; 1,000 lengths, 12-in., 485 tons; 300 lengths 10-in., 114 tons; 10,000 lengths 8-in., 2,575 tons, 1,000 lengths 6-in., 190 tons; total 5,792 tons, also 100,000 lbs. specials, all del. f.o.b. cars Albina Yard, Portland	D. D. Clarke, Engr., Water Bd.
South Dakota.....	Onida.....	Jan. 11.....	Bldg. w. w. system, plans by Des Moines Bldg & Iron Co., D. M.	E. E. Brookings, Town Clerk
New York.....	Angola.....	Jan. 11, 8 p.m.....	Bldg. w. w. system; 850 tons (7.25 mi.) c.i. pipe, 50 fire hydrants 38 valves and boxes, pumping station, inc. well, etc., 2 power pumps, 2 gas engines, steel stand pipe, etc., furn. any or all, or for entire job. Witmer & Brown, Chapin Bldg., Buffalo, Engs.....	George L. Peck, Clk. Village Trus.
Washington.....	Spokane.....	Jan. 13, 2 p.m.....	Bids in triplicate for 100 4 in. and 30 6-in. hydrants; 50 6-in. 25 8-in. 25 10-in. and 25 12-in. valves, c.i. bell and 50 6-in. valves, Kal. bell.....	John Gifford, City Purchasing Agt.
Kentucky.....	Dayton.....	Jan. 16.....	Franchise to construct and operate w. w. system for 18 years.....	C. V. Cloud, Chm. Council Com
Pennsylvania.....	Masonstown.....	Jan. 16.....	Constructing a water and sewer system for Borough.....	

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
WATER SUPPLY (Continued)				
Michigan	Grand Rapids	Jan. 19, 8 p.m.	Bldg. fireproof w.w. and filtration plant, one story, 178x178 ft., and repair shop, two stories, 40x66 ft.; cost \$400,000; Hering & Fuller, Engrs, 170 Broadway, New York City	S. A. Freshney, Gen. Mgr., Bd. P. W.
Missouri	Kansas City	Jan. 26	Bldg. horizontal shaft centrifugal pump, direct connected to vertical cross-com engine, capacity 30,000,000 gals.	W. Kiersted, Ch. Engr. Water Dept.
Manitoba, Can.	Souris	Feb. 1	Furn. 425 tons c.i. water pipe, specials, fire hydrants, gate valves and boxes, pig lead, etc., in spring and summer of 1911	J. W. Breakey, Secy.-Treasurer.
BRIDGES				
South Dakota	Wessington Spgs.	Jan. 7	Furn. material and bldg. 8 comb. steel and concrete bridges	Board of County Commissioners.
Illinois	East St. Louis	Jan. 9	Bldg. 4 steel hwy. bridges, each 270 ft. long, cost \$45,000	H. D. Sexton, Pres. Sanitary Dist.
Ohio	Girard	Jan. 9	Conc. work and bridge construction new road to Mosier Lane	Trumbull County Commissioners.
New York	New York	Jan. 10, 2 p.m.	Bldg. elevator, stairs, drainage, ornamental work and elec. work for anchor piers of Queensboro Bridge over East river	Kingsley L. Martin, Bridge Comr.
Nebraska	Geneva	Jan. 10, noon	Constructing bridge fills and grading in County during 1911	Uriah F. Stanar, County Auditor.
Nebraska	York	Jan. 10	Erec. all steel and wood, bridges ordered dur. 1911 by York Co.	H. F. Chapin, County Clerk.
Kansas	Newton	Jan. 10, noon	Erecting three iron and concrete bridges	J. A. Hunter, County Clerk.
Quebec, Can.	Quebec	Jan. 11	Construct. a bridge and appro. over the St. Charles river	W. D. Baillarge.
Ohio	Cincinnati	Jan. 13, noon	Bldg. concrete bridge on Cooper ave.	Fred Dreihls, Clk. Co. Comrs.
Kansas	Wichita	Jan. 16	Bldg. pile bridge in Lincoln twp.	Jesse Leland, County Clerk.
Virginia	Richmond	Feb. 1, 4 p.m.	Plans, designs, detailed drawings, strainsheets, specifications and proposals for \$225,000 rein. concrete bridge over James ri.	Charles E. Bolling, City Engineer.
LIGHTING AND POWER				
Minnesota	Shakopee	Jan. 10	Furn. and install engine driven pump in power house	Supt. Electric Lighting Plant.
Minnesota	Duluth	Jan. 12, 4 p.m.	Furn. a gas exhauster for b. Duluth	L. N. Case, Mgr. Water & Lt. Comrs
Ohio	Columbus	Jan. 13, 9 a.m.	Elec. wiring and heating plant for Ohio Penitentiary	Marriott & Allen, Architects.
New Jersey	Perth Amboy	Jan. 15	Structural iron work on 200x200 ft., power house, 50 ft. high	Public Service Electric Company.
FIRE EQUIPMENT				
Missouri	St. Louis	Jan. 6	Build engine house	Board Public Improvement.
Washington	Tacoma	Jan. 16, 3 p.m.	Furn. motor-driven comb. chemical engine and hose wagon; one motor-driven Aerial ladder truck; also auto roadster to carry four persons.	L. W. Roys, Comr. Pub. Safety.
MISCELLANEOUS				
Maryland	Cumberland	Jan. 7, noon	Bldg. City Hall	Ward M. Eichelberger, Comr. P. P.
Ohio	E. Youngstown	Jan. 8	Erect. a stone, brick and frame City Bldg; A. F. Thompson, Arch.	P. J. Carney, Jr., Village Clerk.
Wisconsin	Whitehall	Jan. 10, 2 p.m.	Bldg. brick and stone addi. to Court house & jail, cell work, etc.	Jas. N. Hunter, Chm., C. H. Com.
New York	N. Brighton, S.I.	Jan. 10	Bldg. furnaces, steam boilers, etc., of Clinton destructor	Geo. Cromwell, Boro. President.
Virginia	Norfolk	Jan. 10, 12:30 p.m.	Erecting Police Headquarters, 1st. Precinct Station and Police Court; \$2,000 certified check with bid; \$25 for plans: John Kevan Peables, Archt.	Board of Control of Norfolk City.
California	Oakland	Jan. 11, 11 a.m.	Dredging and filling in the Key Route Basin; \$50,000 security	Jas. W. Nelson, Sec'y. Bd. Pub. Wks.
Canada	Ottawa, Ont.	Jan. 11, 4 p.m.	Bldg. 15-in. suction dredge; also bldg. wharf	R. C. Des Rochers, Sec'y. Bd. P. Wk.
Minnesota	Minneapolis	Jan. 13, 7:30 p.m.	Furn. Portland cement for filter plant, st. and scw. work in 1911	Henry N. Knott, City Clerk
Louisiana	Lake Charles	Jan. 16	Erect. \$165,000 Court House, Payrot & Livaudais, Archts., New Orleans	Police Jury.
Pennsylvania	Pottsville	Jan. 17, noon	Gen. contract for erect. bldg. for insane at Schuylkill Haven	Charles T. Straughn, County Cont.
Pennsylvania	Philadelphia	Jan. 20	Bldg. superstruc. of Vine st. pier; cost about \$35,000	J. F. Hasskarl, Act. D. Dt. W. & D.
North Dakota	La Moure	Jan. 20, 2 p.m.	Furnishing cor. galvanized culverts needed during 1911	C. J. Alister, County Auditor.
Minnesota	Minneapolis	Jan. 21, noon	Dredging in Lake Calhoun and filling low lands and boulevard adjacent; 500,000 cu. yds. material to be moved; \$1,000 check with bid.	J. A. Ridgway, Secy. Bd. Pk. Comrs
Oklahoma	Ardmore	Jan. 23, noon	All furniture to furnish and equip new County Court House	R. F. Seivally, Chm. Bd. County Co

STREET IMPROVEMENTS

Phoenix, Ariz.—Work will soon begin on proposed paving.

Santa Monica, Cal.—City will make following street improvements: Paving of 7th st. from California ave. N. to San Vicente blvd. in Palisades, estimated by City Engineer James at \$24,000; Fremont ave. will be opened for distance of 14,100 ft. at an estimated expense of \$14,879. Central ave. for 570 ft. and South 8th st. for 386 ft.

Sonoma, Cal.—City Trustees are considering purchase of municipal rock crusher.

Colorado Springs, Col.—Plans have been completed for parking six avenues at cost of \$250,000.—T. W. Waggener, City Engineer.

Brooksville, Fla.—Citizens will vote Jan. 17 on \$7,000 bonds for street improvements.

Manatee, Fla.—Council has ordered construction of sidewalks on cross streets.

St. Augustine, Fla.—Bids have been rejected for paving Orange st.; committee has been appointed to take up matter of paving Bay st.

Atlanta, Ga.—City Engineer R. M. Clayton estimated cost of repaving Spring st. at \$200,000.

Belleville, Ill.—City will pave number of streets at cost of \$70,730.

Peoria, Ill.—Council has decided to pave South st.

Rockford, Ill.—City is planning to macadamize 13 miles of streets.

Silvis, Ill.—Board of Trustees has decided to pave 1st ave. from 1st to 16th st.; cost \$60,000.

Indianapolis, Ind.—Board of Park Commissioners has passed resolutions for construction of a boulevard along Pleasant Run, from Beecher st. to Shelby st.; cost is \$80,000.—H. W. Klausmann, City Engineer.

Maquoketa, Ia.—City is planning paving of 20 more blocks next spring.

Sioux City, Ia.—Department of Streets is considering paving of 8th st., Jennings to Jackson, with concrete.

Hutchinson, Kan.—County Commissioners are considering construction of road in western part of Valley Township.

Kincaid, Kan.—Rock road will be built from this city east 4 miles to county line.

Topeka, Kan.—City Commissioners have decided to pave portions of 14th, Huntoon, Polk, 12th, and Chandler sts. with brick; 13th, Muivane and King sts with asphaltic concrete.

Colfax, La.—Grant Parish is considering 15 to 20 miles of road.

New Orleans, La.—City is considering paving portion of Orleans st. with mineral rubber.

Baltimore, Md.—Harbor Board will consider three sets of tentative plans for construction of proposed water front street on south side of harbor as submitted by Harbor Engineer Lackey.

Boston, Mass.—Massachusetts Highway Commission, Harold Parker, Chairman, is planning to expend \$500,000 for new roads.

Springfield, Mass.—Board of Public Works is planning to construct street from corner of Mill st. and Belmont ave. south of Mill River to Dickinson st.; cost \$21,000.

Detroit, Mich.—Department of Public Works will secure bids for paving alley with vit. brick at cost of \$6,500.—J. J. Haarer, Commissioner.

Grand Rapids, Mich.—Council has voted to issue \$55,000 street improvement bonds.

L'Anse, Mich.—Citizens will vote on \$25,000 bonds to build road from Herman to Nestoria.

Glenwood, Minn.—Council is considering plans for large amount of paving; heavy concrete favored.

St. Cloud, Minn.—City Engineer S. S. Chute has completed plans for paving of the St. Germain st. bridge; \$7,500 available; plans call for four lines of 40-lb. 1-beams, and old wooden stringers at present under bridge will be used for strengthening the beams.

Aberdeen, Miss.—City will not let contracts for paving until spring; cost, \$50,000; \$50,000 will also be expended to construct

road leading into Aberdeen.—J. M. Acker, Mayor.

Jefferson City, Mo.—City is considering building of eight blocks of macadam paving in spring.—E. F. C. Harding, City Engineer.

St. Joseph, Mo.—Board of Public Works is considering improvement of 5th st. and Shady ave.—Alfred Meler, President.

St. Louis, Mo.—City has passed ordinance for paving 18th and 19th sts.

Fremont, Neb.—City is considering paving of H st.

Brown's Mills, N. J.—Maps, plans and specifications for portion of the Brown's Mills and Lakehurst gravel road to be constructed by Pemberton Township are being considered by State Road Commissioner Fred. Gilkyson, of Trenton.

New Brunswick, N. J.—Residents of Piscataway Township have asked for macadamizing of portion of road from Main st., near Bound Brook to Cedar Lane, Piscataway.

Albuquerque, N. M.—City is considering paving of number of business streets with bitulithic.—F. H. Lester, Mayor.

Frankfort, N. Y.—Taxpayers are considering paving of Main st.—Richard Rose, President of Village.

Scotia, N. Y.—Board of Trustees has decided to pave Scotia dyke and portion of Mohawk ave.

Yonkers, N. Y.—City Engineer Cooper will draft plans for widening Warburton ave.

Raleigh, N. C.—Wake County is considering \$300,000 bond issue for road building.

Bucyrus, O.—City has sold \$25,000 street improvement bonds to City Bank.

Canton, O.—Council has adopted resolutions for improvement of McKinley and Arlington sts.; cost of improving Sharp st. has been estimated at \$23,693; Bellevue ave., at \$6,211; Dewart st., at \$575; 4th st., at \$5,362; and 10th st., at \$10,360.—B. H. Weber, City Engineer.

Cincinnati, O.—Approximate estimates submitted to Director Sundmaker by Engineer Shipley are: Depot st., 8th to Engst,

ith granite, \$17,903.50; Seegar alley, with
antoid, \$1,259; Harlem pl., with brick,
4,691.50.

Cincinnati, O.—Council has approved
resolution to improve Linn st. with wood
block between car tracks.

Cincinnati, O.—Council Committee on
streets has recommended paving of Sum-
mers st.

East Liverpool, O.—Council has passed
resolution providing for improvement of
Adshaw ave. by grading and paving; also
paving of St. George st.

Hamilton, O.—Butler County Commis-
sioners will soon receive bids for construc-
tion of lower river road.—L. A. Dillon,
county Engineer.

Massillon, O.—Council is considering ad-
visability of repaving East Main st., Mill
to Erie st., and paving of Duncan, Erie,
Ill and Cherry sts.

Tiffin, O.—Macadamizing Miami and Will
is being urged.—Charles J. Peters, City
Engineer; Edward Kuhn, Superintendent
Paving.

Portland, Ore.—Milwaukee, a suburb, has
voted to improve principal streets at cost
\$60,000.

Butler, Pa.—Residents of Clinton Town-
ship, this county, and of Allegheny County
are urging improved highway from Alle-
gheny County line to Millerstown road, the
road passing Lardin's Mills.

Norristown, Pa.—Springfield Township,
Montgomery County, will have \$20,000
available for construction of roads.

Philadelphia, Pa.—Department of Public
Works has postponed opening of bids for
repairs to asphalt streets.

Kingston, Tenn.—Roane County is con-
sidering \$300,000 bond issue for good roads.

Nashville, Tenn.—City will soon begin
construction of proposed Capitol Blvd., to
extend from Church st. to Capitol grounds;
est. \$12,000.—W. W. Southgate, City En-
gineer.

Fort Worth, Tex.—Citizens will vote Jan.
on \$300,000 bonds for streets.

Greenville, Tex.—City will soon begin
paving about 10 miles of streets; \$100,000
and issue has been authorized.

Lufkin, Tex.—City has decided to pave
sidewalks.

Seguin, Tex.—City will rebuild principal
streets.

Suffolk, Va.—Nansemond County Board
of Supervisors is considering \$8,000 ex-
penditure on permanent road improvements.

Seattle, Wash.—Board of Public Works
has approved plans for paving Western
avenue.

Spokane, Wash.—Board of Public Works
has rejected bid of the Spokane Asphalt
Macadam Paving Co., only one received on
paving of Wall st., Garland ave. to north-
city limits; new bids will be sought.—Mor-
ton Macartney, City Engineer.

Waitsburg, Wash.—Paving of Main st. is
being urged.

CONTRACTS AWARDED

Los Angeles, Cal.—By Board of Public
Works, to Barber Asphalt Paving Co., Cen-
tral Bldg., for improving Pasadena ave. and
other streets, 16.08c per sq. ft. for asphalt
paving, 25.09c per sq. ft. for brick paving,
1.09c per sq. ft. for vit. brick gutters, 30c
per lin. ft. for cement or asphalt curb pav-
ing, \$1.10 per lin. ft. for curb with angle
on facing, \$510.19 for steel concrete cul-
vert at Ave. 19, \$260.63 for vit. pipe culvert
at Ave. 23, \$209.55 for same at Ave. 31, \$5-
07 for storm sewer in Pasadena ave. and
Ave. 37, \$3,168 for same in Pasadena ave.
and Woodside Drive, \$2,414 for culvert and
sewer in Arroyo del Cal, and \$669.87 for
storm sewer in Pasadena ave. and Ave. 26;
to B. C. Nichols for improving Hartford
ave., (a) 25c per sq. ft. for asphalt paving,
(b) \$2.85 per lin. ft. for grading and grav-
ing, (c) 35c per lin. ft. for cement curb,
5c per sq. ft. for cement gutter, 35c per
sq. ft. for vit. block gutter; other bidders:
John Falch, (a) 32c, (b) 1 1/2c, (c) no bid;
David Joy, (a) 35c, (b) 12c, (c) 35c; P.
Heim, (a) 35c, (b) 12 1/2c, (c) \$1.50.

St. Augustine, Fla.—Furnishing street
grader to Good Roads Machine Co., Ken-
nett Square, Philadelphia, Pa.

Chicago, Ill.—Building cinder sidewalks,
following bidders: Quinn Construction
Co., 3519 W. Chicago ave.; John Hickey,
102 W. 59th st.; Demling & Wendt, 81
a Salle st.; Sievert Colssen Co., 3865 Mil-
waukee ave.; Chas. Chambers & Son, 5248
W. Wood st., and Benjamin Sullivan, 7020
Hodes ave.

Normal, Ill.—Paving Virginia ave. with
brick, to Roy Williams, \$6,880.76.

Sioux City, Ia.—Paving 6th, 7th, 8th, 9th,
10th, 11th, 12th, 13th and 14th sts., between
Pearl and Jackson sts., to Flinn & Han-
nan, \$1.18 per sq. yd. for concrete and \$1.23
per sq. yd. for corrugated concrete; total,
\$6,000.

Carrollton, Mo.—Vit. brick paving, 7,500
sq. yds., to J. C. Likes, Des Moines, Ia., about
10,000.—Brooks & Jacoby, Plunkert Bldg.,
Kansas City, Mo., Engineers.

Mt. Pleasant, N. Y.—Improving Columbus
and Commerce aves., to Molls and Murray,
Yonkers, \$45,000.

St. George, S. I., N. Y.—By George Crom-
well, President, for furnishing all the labor
and materials required for one 15-gross-ton
steam roller, with equipment, to the Buf-
falo Steam Roller Co., 150 Nassau st., New
York.

Wilmington, N. C.—To Bowe & Page,
Charleston, S. C., to pave 3570 sq. yds.
of street with cement gravel, 69 1/2c per
sq. yd.; contract for 693 sq. yds. will be
awarded later.—C. R. Humphreys, En-
gineer.

Akron, O.—Paving three sections of road
between Cuyahoga Falls and the Cuyahoga
County line: Section 3, to Wildes & David-
son, \$38,682.64; Section 1, to E. McShaffrey
& Son, \$63,267.04; Section 5, to Paul &
Henry, \$106,652.18.

Washington, Pa.—County road improve-
ments: Macadamizing Monongahela pipe,
section No. 3, to Neelan & Daily, S. 21st
and Sidney sts., Pittsburg, \$21,422.75, and
Monongahela pike, section No. 4, to Donora
Construction Co., \$11,859.40; bricking Ros-
coe-Stockdale road, to Hastings Piper, \$2-
553.44; brick will be furnished by Pittsburg-
Buffalo Co., \$17.59 per M.; Meadowlands-
Houston road, to Hallam Construction Co.,
city, \$31,580.48; brick will be furnished by
four different firms, Pittsburg-Buffalo Co.,
Donley Brick Co., James M. Porter, Tor-
onto block, and James M. Porter, Ameri-
can sewer pipe Porter block; each fur-
nishes fourth of the bricks at \$15 per M,
except Donley Brick Co., which furnishes
red clay brick at \$1.50 per M.

Denison, Tex.—To Roberts & McSpadden,
Vinita, Okla., for completion of the \$250,000
road contract in Denison precinct; contract
was abandoned by original contractor,
Denis McNeerney, of Muskogee, Okla., after
work to the extent of \$10,000 had been done.

Martindale, Tex.—By Precinct No. 2 of
Caldwell county, to Van B. Flowers, Lock-
hart, at \$1,500 per mile to construct 3 1/2
miles of gravel road; \$25,000.

BIDS RECEIVED

Long Beach, Cal.—Improvement of Ala-
mitos ave. roadway and ornamental stairs
leading from East Ocean ave. to high tide
line. S. N. Patterson, \$4,970; A. S. Bent,
\$4,544; both of Los Angeles.

Los Angeles, Cal.—By County Board of
Supervisors, for improving portion of Val-
ley road: George A. Rogers, Stimson Bldg.,
for grading and culverts on Section 1, \$5-
500; Section 2, \$2,500; oil macadam paving,
\$1.45 per ton; class A concrete, \$14 per cu.
yd.; class C, \$11; reinforcing steel, 5c per
lb.; Oil Macadam Paving Co., grading and
culverts, Section 1, \$9,411; Section 2, \$4-
162; oil macadam paving, Section 1, \$1.75
per ton; Section 2, \$1.49 per ton; class A
concrete, \$18 per cu. yd.; class C, \$16; steel,
6c; approximately 16,466 tons of oil mac-
adam paving will be required on Section 1,
and 7,549 tons on Section 2.

Los Angeles, Cal.—Street improvements:
Improving Elmyra st., H. H. Curtis, 30c
per lin. ft. for cement curb, 9.07c per sq.
ft. for sidewalk; Paul H. Ehlers, 29.07c and
9.07c; David Joy, 33c and 10.95c; Bonita
pl., F. E. Low (a) \$2.40 per lin. ft. for grad-
ing and graveling complete, (b) 37c per lin.
ft. for cement curb, (c) 18.05c per sq. ft.
for cement gutter, (d) 34c per sq. ft. for
vit. block gutter; H. O. Richwine, (a) \$3,
(b) 37c, (c) 17c, (d) 35c; M. S. Cum-
mings, (a) \$2.49, (b) 39c, (c) 19c, (d) 47c;
L. N. Davies, (a) \$2.35, (b) 38c, (c) 18c,
(d) 46c; T. F. White, (a) \$2.35, (b) 39c,
(c) 18c, (d) 45c; A. W. Beesmyer, (a)
\$2.21, (b) 38c, (c) 18c, (d) 50c; improving
Alta st., H. H. Curtis, 34c per lin. ft. for
cement curb, 13c per sq. ft. for sidewalk,
50c per sq. ft. for asphalt curb; improving
Ave. 18, Paul H. Ehlers, \$29.7c per lin. ft.
for cement curb, 9.7c per sq. ft. for side-
walk; David Joy, 35c and 11c; P. Heim,
34c and 12 1/2c and \$1.50 per lin. ft. for as-
phalt wearing surface for curbs.

Brooklyn, N. Y.—Paving with asphalt on
concrete foundation Blake ave., from Van
Sicken ave to Logan st., as follows: (a)
Barber Asphalt Paving Co., 30 Church st.,
New York City, \$28,391; (b) Cranford Co.,
52 9th st., Brooklyn, \$27,217; (c) Uvalde
Asphalt Co., 1 Broadway, New York City, \$25-
147, and (d) Borough Asphalt Co., Metro-
politan ave. and Newtown Creek, Brook-
lyn, \$24,935 (awarded contract); 14,084
sq. yds. asphalt pavt. (5 years' mainte-
nance), a \$1.02, b 88c, c 82c, d 82c;
1,969 cu. yds. concrete for pavt. founda-
tion, a \$5, b \$5.40, c \$4.75, d \$4.85; 1,030
lin. ft. new curb, set in concrete, a 94c,
b 95c, c 90c, d 89c; 5,810 lin. ft. old curb,
reset in concrete, a 55c, b 55c, c 52c,
d 50c.

Brooklyn, N. Y.—By Department of
Parks, for repairing asphalt pavement on a
concrete foundation the roadway of Eastern
Parkway extension and Glenwood ave: Bar-
ber Asphalt Paving Co., 30 Church st., \$8-

305; Uvalde Asphalt Paving Co., 1 Broad-
way, \$7,305; the Cranford Co., 52 9th st.,
Brooklyn, \$8,662.

New York, N. Y.—Regulating, grading,
setting curbstones, flagging the sidewalks,
building approaches and placing fences in
the following streets: (a) Cromwell ave.,
Jerome ave. to Macomber road, (b) Boston
road, White Plains road to north line of
city, (c) West 176th st., Aqueduct ave. to
Popham ave. (d) regulating, grading, set-
ting curbstones, flagging the sidewalks,
laying cross walks, building approaches and
drains, etc., and placing fences in Mt.
Veiron ave., East 233d st. to northerly
boundary line of the city, (e) constructing
sewers and appurtenances in Walker ave.,
Westchester sq. and covering streets, in
Benson ave., Westchester sq. and Walker
ave.; Overing st., Westchester ave. and
Walker ave.; St. Peter's ave., Westchester
ave. and Walker ave.; Rowland st., West-
chester ave. and St. Raymond ave.; Zerega
ave., Westchester ave. and Glebe ave.;
Tratman ave., Zerega ave. and Benson
ave.; Frisby ave., Zerega ave. and Walker
ave.; Glebe ave., Rowland st. and Overing
st.; McClay ave., St. Peters ave. and Ben-
son ave.; J. B. Malestesta, (a) \$16,676, (b)
\$220,502, (d) \$40,449; Thos. F. Murray, (a)
\$15,534; P. J. Hane Contracting Co., (a)
\$16,393, (c) \$9,954; Antonio Cegrelli, (a)
\$15,722, (c) \$10,097; J. C. Voorhees, (a)
\$17,860, (c) \$9,187; S. Amanna, (a) \$22,065,
(c) \$8,914; P. J. Duffy, (a) \$18,583, (c) \$9-
231; Standard Construction Co., (a) \$18-
224, (c) \$8,234; J. J. Moran, (a) \$19,199, (b)
\$252,747, (c) \$9,517, (e) \$71,898; M. Di Menna
Contracting Co., (a) \$15,719; Jas. V. Tro-
lissi, (d) \$30,518; J. C. Rogers, Jr., (b) \$210-
082, (d) \$43,310; Lamurea Contracting Co.,
(b) \$222,201, (c) \$8,676; Venton Contracting
Co., (b) \$243,447, (e) \$75,689; Godwin Con-
struction Co., (b) \$247,882; C. W. McDonald,
(b) \$239,476; W. F. Murray, (b) \$276,672,
(e) \$79,229; Alegro & Spalini, (b) \$250,228;
J. Damina (c) \$8,574; S. Purificago, (c)
\$8,270; Geo. M. Dunn, (e) \$64,592; Leahy
Contracting and Construction Co., (e) \$66-
934; Standard Construction Co., (e) \$73,380;
Melrose Construction Co., (e) \$73,380;
Aneta Construction Co., (e) \$66,927; Alamo
Construction Co., (e) \$67,480; S. Amanna &
Lyons, (e) \$68,447.

Seattle, Wash.—Fifteenth ave. N. W. and
W. 65th st., grading and curbing; Hanson
& Co., 4100 25th st. S. W., \$7,987; East 45th
st., paving, Barber Asphalt Paving Co.,
\$17,661; P. J. McHugh, 3d ave. N. and
Mercer st., \$16,824.56; Ind. Asphalt Paving
Co., Northern Bank Bldg., \$16,969.85; wood
side stop, Barber Asphalt Paving Co., \$17-
661; P. J. McHugh, \$17,047.76; Ind. Asphalt
Paving Co., \$16,657.37.

SEWERAGE

Phoenix, Ariz.—Bids will be asked on
\$400,000 bonds for building sewer system.

Bakersfield, Cal.—City proposes to ex-
pend about \$15,000 for sewers, to include
about 1,500 ft. each of 6, 8, 10, 12, 14, 16
and 18-in. pipe.—C. B. Greely, P. O. Box
78, Engineer; H. F. Murdock, City Clerk.

Calexico, Cal.—I. B. Funk, Imperial, is
preparing plans and specifications for mun-
icipal sewer system; cost, \$35,000.

De Land, Fla.—Council is considering
construction of sewer system.

Galesburg, Ill.—City is considering con-
struction of system of sanitary sewers; cost
\$60,000.—Geo. Sanderson, President Board
of Local Improvements.

Hoopeston, Ill.—Civil Engineer Frank
Payne, Danville, has prepared plans of
construction of drainage sewer system.—
Robert Rodman, City Attorney.

Danville, Ind.—Citizens will soon vote on
\$60,000 to \$75,000 bonds for construction of
sanitary sewer system.

Mount Vernon, Ia.—Council is consider-
ing installation of sanitary sewer system.

Nevaea, Ia.—Council has asked plans of
installation of sewer system and disposal
plant.

Auburn, Me.—City has awarded \$24,000
sewer bonds to Hayden, Stone & Co.

Albert Lea, Minn.—Plans are being pre-
pared by City Engineer Barneck for sewer
on William and other streets; cost \$17,696.

Joplin, Mo.—Council will consider ordi-
nance authorizing election on \$50,000 bonds
for construction of septic tank sewerage
system in South Joplin.—J. B. Hodgdon,
City Engineer.

Lincoln, Neb.—City Engineer Adna Dob-
son will prepare estimate of cost and plans
for sewer in District No. 107.

Sparks, Nev.—Louis C. Kelsey, 250 3d st.,
Portland, Ore., has been selected to design
and supervise construction of sanitary
sewer system.

Matawan, N. J.—Installation of sewer
system is being considered.—J. P. Lloyd,
Chairman Committee.

Corona, N. Y.—City is considering con-
struction of sewer system. D. W. Foley
is interested.

Frankfort, N. Y.—Cost of piping for proposed sewers has been estimated at \$55,608, and for disposal plant at \$28,769.

Hastings-on-Hudson, N. Y.—State Board of Health has approved plans of Ward, Carpenter & Co., of Tarrytown, for construction of sewer system; work will consist of approximately 19,000 lin. ft. of sewers, with small pump house and pumping plant.

Richmond Hill, L. I., N. Y.—Plans are now being prepared by John H. Weinberger, Ch. Engr. of Queens Borough, Sewer Dept., for proposed sewage disposal plant; contract will be let in spring.

Seacliff, L. I., N. Y.—Plans will be prepared by Clyde Potts, 30 Church st., New York City, for proposed sewer system and disposal plant.

Charlotte, N. C.—Water Commissioners have recommended to Board of Aldermen extension of sewer system.—Joseph Firth, City Engineer.

Durham, N. C.—Board of Aldermen will petition General Assembly of North Carolina for authority to vote on \$300,000 bonds for extension to sewer system.

East Liverpool, O.—Council is considering construction of sewers on the east end district; cost, about \$30,000. C. V. Beatty, Director Public Service.

Grand View, O.—Citizens have voted \$50,000 bonds to install sewerage and water system; village plans to lay pipes to Columbus sewage disposal plant and secure contracts with city for use of its improvements.

New Philadelphia, O.—Council has adopted resolutions for construction of sewers and sewage disposal plant.

Niles, O.—Council has decided to construct four miles of sanitary sewers in District No. 4.

Duncan, Okla.—Citizens will vote on \$45,000 bonds in January for construction of system of sanitary sewers, including disposal plant, and for extension of the present water works system.—W. L. Benham, 714-716 Campbell Bldg., Oklahoma City, Consulting Engineer.

Shawnee, Okla.—City will construct lateral sewers; bids asked; cost, about \$5,000.

Baker City, Ore.—Board of Commissioners has ordered construction of sanitary sewer in 5th st.

Gresham, Ore.—Sewerage system will be installed under direction of Consulting Engineer Louis C. Kelsey, 250 3d st., Portland.

Carrick, Pa.—Wm. McClurg Donley has completed and filed with the State Dept. of Health plans for 1½ miles of trunk sewer connecting Boroughs of Carrick, St. Clair and Mt. Oliver, and leading to disposal plant.

Collingdale, Pa.—Sewer Committee has recommended erection of sewage disposal plant at cost of \$50,000.

South Bethlehem, Pa.—Council has engaged under special contract R. E. Neumeyer, Borough Engineer, to prepare surveys, plans, designs and specifications for a sewage disposal plant, to be ready July 1, 1911.—Thomas Haney, Borough Secretary.

CONTRACTS AWARDED

Birmingham, Ala.—Installing \$300,000 sewer to J. W. Gurley & Co., Mobile.

Los Angeles, Cal.—Constructing sewer in Western ave., to John Genilla, at \$9,250; sewer work in Hope st., to John Balch & Co.; improving Ross Court, to Jones Bros., at \$3,250 per lin. ft. for grading and graveling, 33c. per lin. ft., cement curb, 15c. per sq. ft., cement gutter; sewer construction in Alvarado st., to Radisch & Zernlich, \$10,755.

Oakland, Cal.—Building main lake sewer, to Mery-Elwell Co., city; 36th st. sewer to same bidder, \$7,947.

Orange, Cal.—To E. R. Werdin, Los Angeles, for outfall sewer system; about \$16,000.

Atlanta, Ga.—To Chester A. Dady, Brooklyn, N. Y., to construct Peachtree disposal plant, \$195,363. Hering & Fuller, 170 Broadway, New York, Consulting Engineers; R. M. Clayton, City Engineer.

Dalton, Ga.—To Haig & Puryear, city, to construct 9 miles of additional sanitary sewer, \$28,700. H. S. Jaudon Engineering Co., Savannah and Atlanta, Ga., in charge.

Chicago, Ill.—Building sewers, to following contractors: East 104th st., Christino Tosco, 814 Des Plaines st., \$2,036; Balmoral ave., Jos. Davaino, \$3,818; Manistee ave., Thos. Burke, 4648 McLean ave., \$4,992; Phillips ave., Christino Tosco, \$3,438; N. 10th ave., Christino Tosco, \$5,519; W. 40th st., American Engineering and Construction Co., 112 S. Clark st., \$72,988.

Louisville, Ky.—Construction of sewers; Park ave. and Brook st., to R. D. Smith & Co., \$3,600; Jefferson st. and Baxter ave., to L. W. Hancock & Co., \$3,200; Green st. and Herp ave., to L. R. Figg & Co., \$3,800.

Baltimore, Md.—Wiring sewerage pumping station, East Falls ave., to Central Electric Co., \$3,526.

Philadelphia, Pa.—Erecting two operating houses for sewage disposal plant at Torresdale filtration plant to Costello & Co., \$18,725.

Waynesboro, Pa.—Installing 903 ft. of sewer in Gilberton tract, to A. R. Warner.

El Campo, Tex.—To Hicks & Lehland, 121 Campo, to construct sewer system, comprising 2,500 ft. of 12-in., 2,160 ft. of 8-in., 3,000 ft. of 6-in. pipe and septic tank, cost, \$2,650.—W. A. Hiddleston, City Clerk.

BIDS RECEIVED

Plainfield, N. J.—Constructing two sewage pumping plants, one at Monroe ave, the other at Plainfield ave., each consisting of motors, air compressors, ejectors and operating devices in duplicate, an air receiver with pipe connections, gates and valves complete, each unit to have capacity of 175 gals. per minute; Blaisdell Machinery Co., 90 West st., New York, N. Y., \$3,745 each; Merritt & Co., Camden, \$4,224 each, and Blackall & Baldwin Co., 39 Cortlandt st., New York, N. Y., \$3,980 each.—Andrew J. Gavett, City Surveyor.

Seattle, Wash.—Sewering 12th ave. N. et al., Walker & Plackay, \$30,190.75; V. Romaglia & Christopher, 6506 3d ave., \$25,420; Krogh & Jessen, \$27,265; Ferguson Construction Co., \$31,028.30; Wood slave, Walker & Plackay, \$29,718.25; W. Romaglia & Christopher, \$24,889; Krogh & Jessen, \$27,265; Ferguson Construction Co., \$30,211.80.

WATER SUPPLY

Hemet, Cal.—Lake Hemet Land & Water Co. will build steel pipe line in San Jacinto Canyon and large amount of new concrete work.—W. F. Whittier, President.

Lordsburg, Cal.—Bids will be received about Jan. 15 for \$36,000 bonds for water works; bids for construction will be received about Feb. 1. Frank Latrop, Los Angeles, Engineer.—J. A. McClellan, City Clerk.

Santa Ana, Cal.—Citizens will at once vote on \$35,000 bonds to improve water supply as follows: Well, \$3,000; pump, \$16,000; work on reservoir, about \$16,000.

San Francisco, Cal.—Pine Mountain Water Co. has been incorporated, capital \$3,000,000, to own and operate water and power plants. Duncan McDuffie, W. G. Vincent, Jr., C. L. Cory and others, all of Berkeley, and C. G. Dall, San Francisco, Directors.

Stockton, Cal.—National Board of Fire Underwriters has recommended following improvements at pumping plants: Station No. 1, two additional pumps, 5,000,000 gals. capacity each; two additional boilers, 80-h.p. each and minor work; Station No. 2, connections at earliest date to at least one additional power circuit, also installation of number of 12, 16 and 20-in. mains.

Stanford, Ill.—Engineers Melluish & Broxhill, Bloomington, has estimated cost of constructing proposed system of water works at \$6,458.—W. C. Murphy, Village Clerk.

Steamboat Rock, Ia.—Town is planning to install water works system.

Hoisington, Kan.—City has sold \$200,000 water works bonds.

Scammon, Kan.—Council has decided to extend water mains.

Stafford, Kan.—City has sold \$55,000 water and light bonds to Farmers' National Bank.

Lawrence, Mass.—Water Board has voted to adopt recommendation of Morris Knowles, Consulting Engineer, Pittsburg, Pa., to install new engine at pumping station; action will be taken later on appropriating \$9,000, estimated cost of engine.

Westfield, Mass.—City is considering construction of storage system in connection with Grantville system.

Homer, Mich.—P. A. Contrite, Lansing, has prepared plans for water works system.

Easton, Minn.—Citizens have voted to erect steel tower and tank.—S. R. Johnson, City Recorder.

St. Paul, Minn.—Dabney H. Maury, Consulting Engineer Municipal Research Commission, has recommended three new wells in the low ground near Mississippi River, to be equipped with electrically-driven pumps, cost \$30,000; electric pumps for six wells just completed at McCarron's Lake; laying a 36-in. main from the high service reservoir to Dale and Front sts., and a 20-in. main from that point to Lexington and University aves.; cost \$150,000.—H. P. Keller, Mayor.

Chaffee, Mo.—Bids will be received Jan. 15 for \$26,000 bonds for water works and city hall.—J. M. Massengill, Mayor.

Edina, Mo.—Construction of water works is being considered.

Cortland, Neb.—Village is considering installation of system of water works and electric lights.

Elizabeth, N. J.—James H. Fuentes, Consulting Engineer, is locating water supply in connection with proposed municipal water plant.

Gibbsboro, N. J.—Gibbsboro Improvement Association is interested in proposed installation of water works plant.

Raton, N. M.—G. H. Webster, Jr., Denver, Colo., is completing arrangements for the construction of a 500,000-gal. reservoir to be lined with cement, and 76,000 ft. of pipe, to bring water from Cimmanoncito River to Raton; distance, 7 miles.

Lockport, N. Y.—Bids will be asked for building drains and water pipes in three streets.

Asheville, N. C.—Buckeye Water Co. will lay additional pipe lines and construct storage reservoir.

Charlotte, N. C.—Water Commissioners have recommended to Board of Aldermen construction of pipe to Catawaba River to furnish additional water supply; about 10,000,000 gallons daily; cost, \$275,000 to \$300,000.—Joseph Firth, City Engineer.

Durham, N. C.—Board of Aldermen will petition General Assembly for authority to vote on \$500,000 bonds for purchase and improvement of water works.

Jonesboro, N. C.—White & Piatt, Consulting Engineers, Durham, are preparing plans for \$25,000 water works plant.

Statesville, N. C.—J. C. Steele desires prices, delivered, on 2,500 ft. of 4-in. water main, 2,500 ft. of 6-in. and 1,000 ft. of 4-in. sewer mains.

Sugar Creek, O.—Bids will be received about Feb. 1 for construction of water works.—L. E. Chapin, Canton, Engineer; W. A. Hahn, Village Clerk.

Ada, Okla.—Citizens have voted bonds for water works extensions.

Lamont, Okla.—Citizens will again vote on \$17,000 bonds for construction of water works.—W. F. Porter, City Clerk.

Oklahoma City, Okla.—Citizens will vote Jan. 10 on \$1,225,000 bonds to carry out recommendations of Dr. Alexander Potter, New York, for adequate water system.

Silverton, Ore.—City will expend about \$50,000 for gravity system of water works and \$20,000 for sewers, if citizens vote in favor of same.—C. H. Green, Spokane, Wash., Engineer; S. E. Richardson, City Recorder.

Huron, S. D.—Bids will be received about Feb. 1 for the construction of water works, including 750,000-gal. concrete reservoir, 200,000-gal. elevated tank, a 1,400-gal. per minute pumping plant; alternate bids will be received on steam, oil engine or gas producer plant; cost \$40,000.—L. P. Wolff, St. Paul, Minn., Consulting Engineer.

Austin, Tex.—Citizens rejected all bids for construction of reinforced concrete filtering trenches; cost, about \$10,000.—M. C. Welborn, Engineer-in-Charge; G. S. Iredell, City Engineer.

Elkhart, Tex.—Citizens will vote on bonds for construction of water works for fire and domestic purposes; nearby spring will be utilized for water supply; will build water tower.

Fort Worth, Tex.—Engineering Board has recommended immediate repair and improvement of Holly pumping station, cost \$67,500; erection of filter beds and settling basin, capacity 3,000,000 gals., \$60,000; early establishment of southside artesian field and minor improvements, \$6,300.—T. J. Powell, Commissioner Water, Streets and Light.

Rusk, Tex.—Citizens have voted bonds for construction of water works.

Midvale, Utah.—Salt Lake County Water Co. has asked for 50-year franchise from Council.

Norfolk, Va.—Preliminary plans have been prepared by Engineers W. K. Palmer Co., Dwight Bldg., Kansas City, Mo., for improvement and enlargement of water works.

Leavenworth, Wash.—Citizens have voted bonds for water system.

Port Townsend, Wash.—City will construct extension to water main.—Geo. Anderson, City Clerk.

Basin, Wyo.—Preliminary plans are being prepared by Burns & McDonnell, Scarritt Bldg., Kansas City, Mo., for proposed water works.

Upton, Wyo.—Burns & McDonnell, Scarritt Bldg., Kansas City, Mo., are preparing preliminary plans for water works plant.

CONTRACTS AWARDED

Chipley, Fla.—To Moore & Gammon, city, to rebuild water works; cost, \$20,000.

Huntington, Ind.—Laying 1,700 ft. of trunk sewer in 7th st. to Amos Tramor, \$8,500.

Youngstown, O.—To L. Adavasio, city, for building concrete work and removal of earth in connection with building of new dam and reservoir for Commercial Water Co.; total cost will be \$300,000.

Stilwell, Okla.—To Southwestern Engineering Co., Oklahoma City, for construction of water works.

Richmond, Va.—Cleaning out the new reservoir to A. W. Maynard & Co., \$6,294.
Walla Walla, Wash.—To Gilbert Hunt Co., city, for furnishing 6,000 ft. of 20-in. steel water main, \$5,996.

BIDS RECEIVED

Cimarron, N. M.—Construction of gravity system of water works, Cooke-Gregory Eng. Co., Joplin, Mo., lowest bidder, as follows: 13,350 lin. ft. 8-in. wood stave pipe, complete, 44.5c.; 23,560 lin. ft. 6-in. wood stave pipe, in place, 36c.; 1,350 cu. yds. excav. in reservoir; 40.5c. 200 cu. yds. concrete, \$6.50; 130 cu. yds. ground clay puddle, \$1.10; 4,565 lbs. cast-iron pipe, 3.5c.; 855 lbs. special castings, 5.75c.; 12,973 lin. ft. 8-in. wood stave pipe, complete, 55c.; 12,380 lin. ft. 6-in. wood stave pipe, in place, 44c.; 7,455 lbs. special air trap, 5.75c.; total, including valves, hydrants, etc., \$32,329. Total of other bidders: Midland Co., Ft. Scott, Kan., \$36,730; Hibbs Hardware Co., Raton, N. M., \$37,458; Marshall Bros., Las Animas, Colo., \$47,605; S. B. Morrison, Denver, Colo., \$41,880; McKay & Reed, Salt Lake City, Utah, \$45,198; Westcott-Doan Invmt. Co., Denver, Colo., \$45,067; MacArthur Bros. Co., Ancepio, Mo., \$45,805; P. O'Brian P. Co., Denver, Colo., \$46,938; W. D. Lovell, Minneapolis, Minn., \$46,958; T. A. Hayden, Santa Fe, N. M., \$49,576; H. B. Iklar, Greenwood Springs, Colo., \$43,000.—T. W. Jaycox, Denver, Engineer.

Fort Crook, Neb.—Construction of reservoir and well. J. W. Turner Improvement Co., 309 Youngerman Bldg., Des Moines, Ia., lowest bidder, \$14,000 for reservoir and \$5,000 for well.

Lincoln, Neb.—Furnishing water pipe: 170 tons of 16-in., 35 tons of 12-in., 150 tons of 6-in., 75 tons of 4-in. and five tons of specials, class C standard specifications; J. S. Cast Iron Pipe and Foundry Co., Chicago, Ill., \$10,645; Dominick Pipe Co., Kansas City, \$10,814; American Cast Iron Pipe Co., Scarritt Bldg., Kansas City, Mo., \$10,64.—James Tyler, Water Commissioner.

Portland, Ore.—By Water Board for 200 fire hydrants: Glamorgan Pipe and Foundry Co., \$7,000; J. Wood Iron Works Co., \$7,950; Ludlow Valve Mfg. Co., \$8,040; R. D. Wood & Co., \$8,200; Caldwell Bros. Co., \$8,296; Eddy Valve Co., \$8,700; Phoenix Iron Works, 6,900.—D. D. Clarke, Chief Engineer Water Department.

LIGHTING AND POWER

Elsinore, Cal.—M. L. Gamburn and Mrs. I. A. Gardner have applied for a 50-year franchise from Council; will drill for natural gas.

Jacksonville, Fla.—Jacksonville has purchased site for erection of proposed power house.

Indianapolis, Ind.—Southern Indiana Power Co. has been incorporated, capital \$00,000, to build and equip power plants or generating and distribution of electricity for lighting and power purposes. red E. Matson, Thos. N. Stillwell and Wm. J. Henley are Directors.

Adair, Ia.—Town has voted to establish electric light plant at cost of \$10,000.

Atlantic, Ia.—Bids will be received about March 1 for improving the electric light and power plant and combining it with the water works; cost \$40,000.—T. E. Nichols, City Clerk.

Hamburg, Ia.—Citizens have voted to grant E. E. Hillman, of Peoria, Ill., franchise for electric light plant.

Redfield, Ia.—Installation of electric light plant is being considered.

Kansas City, Kan.—Citizens will vote Feb. 7 on \$350,000 bonds to build and equip electric light plant.

Lexington, Ky.—Fayette Lighting Co. is having plans prepared under supervision of J. H. Peck, General Manager, for electric power plant.

Crowley, La.—Council has passed resolution for improvement of the electric light plant, authorizing purchase of a 110-h.p. engine and a 150-kw. dynamo and a 75-kw. dynamo.

Brown's Valley, Minn.—Citizens will vote on \$10,000 bonds for installation of electric light plant.

Fergus Falls, Minn.—City is considering installation of steam turbine or gas engine plant for electric lighting system.

Warsaw, Mo.—S. O. Morris, Continental Power & Development Co., Clinton, has purchased Arnolds mills property and will furnish electric light and power to city; power will be obtained from Niangua river.

Fallon, Nev.—Council is reported to be considering construction of electric light plant.

Gibbsboro, N. J.—Gibbsboro Improvement Association is interested in proposed installation of electric light plant.

Matawan, N. J.—Standard Gas Co. will make proposition for lighting streets.

Bolton, N. Y.—Public Service Commission has authorized Bolton Light & Power Co. to exercise franchise granted it for furnishing of electricity and also authorized company to issue \$125,000 capital stock and \$10,000 bonds for construction and equipment of plant.

Oswego, N. Y.—Mayor Fitzgibbons has been authorized to employ hydraulic engineer to examine plans for the new power house for city; plans were prepared by Timothy Buckley, of Water Department.

Carrington, N. D.—Stern Electric Co. has applied to Council for franchise to install electric light plant.

Stanley, N. D.—John I. Moore, Minot, has petitioned Council for franchise for electric light plant.

Kenton, O.—Kenton Gas and Electric Co. has requested extension of its franchise; company has given Council to understand that if extension is made a new \$65,000 plant will be built at once.

St. Mary's, O.—St. Mary's Machine Co., St. Mary's, has secured contract to construct gas producing plant at electric light plant; about \$18,500.

Stillwell, Okla.—To Southwestern Engineering Co., Oklanoma City, for construction of electric light plant; cost, \$5,000.

Canyon City, Ore.—Oregon Light and Power Co. is planning to install electric plant at Magoon Lake to furnish light and power for Day Valley. W. C. Parrish, Baker City, is interested.

McKeesport, Pa.—Home Light Co. will apply for charter to furnish light and power.—Simon F. Loeb, Henry Firestone and Jacob Roth, Incorporators.

Pittsburg, Pa.—Select Council has adopted resolution introduced by Dr. Dillinger, which instructs Director of Public Works to report estimated cost of constructing electric light plant.

Steeltown, Pa.—Steeltown Light, Heat and Power Co. is planning erection of electric plant and within next six months expect to be furnishing electric power from plant in borough.

Erwin, Tenn.—Nolichucky Power Corporation has plans and estimates for proposed power water electrical plant, to cost \$434,000.

Corpus Christie, Tex.—F. H. Lancashire, Dallas, will draw up form of gas franchise.

Fort Stockton, Tex.—Pecos County Commissioners have granted franchise to Clay Bros., San Angelo, to construct and operate electric light plant.

Georgetown, Tex.—Council has retained F. H. Lancashire, Dallas, to make plans and specifications and advise as to reconstruction of the old lighting and water plant.—R. E. Ward, Mayor.

Lexington, Va.—Rockbridge Power Corporation, John L. Rivers, Buena Vista, Engineer, has purchased water power, poles, wires, cables, etc., of Lexington Light & Power Co., and will extend lines to Lexington and operate plant.

New Market, Va.—J. D. Manor & Co. desire prices on 600-hp. producer gas plant, complete.

Roanoke, Va.—Roanoke Gas & Water Co. will purchase water gas set and 75,000-ft. gas holder during year.

Aberdeen, Wash.—Citizens Lighting and Power Co. will ask for franchise to furnish light and power.

Martinsburg, W. Va.—Martinsburg Power Co. will erect brick addition.

Bloomer, Wis.—Bloomer Electric Light and Power Co. has been incorporated to supply village with electric light and power; capital \$25,000.

Lena, Wis.—United States Manufacturing Co. will purchase producer gas plant and engine in near future.

Prairie du Sac, Wis.—Wisconsin River Power Co. is considering the construction of power dam.

Basin, Wyo.—Preliminary plans are being prepared by Burns & McDonnell, Scarritt Bldg., Kansas City, Mo., for proposed electric light plant.

Upton, Wyo.—Burns & McDonnell, Scarritt Bldg., Kansas City, Mo., are preparing preliminary plans for electric light plant.

CONTRACTS AWARDED

Elmo, Col.—Lighting streets during year, to Pacific Gas and Electric Co., only bidder, \$6.60 each for 16-c.p. lights per year and \$81 for each 2,000-c.p. light.

Jackson, O.—Improving electric light plant: To Ball Engine Co., for engine; to Scioto Valley Supply Co., heater and pumps; to Ft. Wayne Electric Works, for generator, switchboard and street lighting outfit.—Capitol Eng. Co., 48-50 N. Third St., Columbus, O., Engineers.

Brattleboro, Vt.—Village has voted to make 10-year contract with Twin State Gas and Electric Co. for 100 lamps to burn all night at \$20 per lamp per year.

Hoquiam, Wash.—Five-year lighting contract, to Grays Harbor Gas Co., by City Council; contract calls for installation of

boulevard gas posts erected on the main streets; outskirts will be lighted by Tungsten lamps.

Winnipeg, Man., Can.—Furnishing overhead line supplies for the Power Distribution System: To Northern Electric & Mfg. Co., Ltd., for western cedar poles, \$16,576; cross-arms, \$109; hardware supplies, \$2,129, and pins and brackets, \$195. To the Steel Co. of Canada, Winnipeg, Man., for 8,000 machine bolts, \$700, and for guy wire, \$471.

FIRE EQUIPMENT

Stockton, Cal.—National Board of Fire Underwriters has recommended purchase of following equipment: Two first-class engines and one second-class, auto chemical engine for auxiliary squad, auto combination chemical and hose wagons for three companies, either 3-horse hitch and quick-raising mechanism for present ladder truck or auto 75-ft. quick-raising aerial truck, chief's auto, turret pipe for hose wagon No. 2 and minor equipment.

San Francisco, Cal.—Fire Commissioners are considering erection of fire station on Brazil ave.

Augusta, Ga.—Fire Committee has recommended purchase of Webb combination auto engine and hose wagon for new engine house.

Gridley, Ill.—Bids will be received for purchase of 300 ft. of 2-in. fire hose.—C. R. Rowley, Village Clerk.

Belmond, Ia.—City will purchase quantity of hose in near future.—M. A. Holtzbauer, Chief.

Kansas City, Kan.—Citizens will vote Feb. 7 on \$50,000 bonds to build central fire headquarters.

Chicopee, Mass.—Special Aldermanic Committee is favorable to purchase of one or more motor-driven trucks for fire department.

Eveleth, Minn.—Council is considering erection of fire hall.

Meridian, Miss.—City is planning to erect three fire stations and repair central fire station.—I. F. Eldridge, Inspector.

Jefferson City, Mo.—City is considering purchase of 1,000 ft. of fire hose.—Geo. N. Winston, City Clerk.

Plainfield, N. J.—Fire Chief Doane has recommended purchase of either steam or motor fire engine and placing underground of at least one section of overhead wires during year.

Manchester, N. H.—Erection of fire telegraph station is being considered.

Akron, O.—Council has passed ordinance to issue \$3,300 bonds to purchase fire chief's auto wagon and chemical engine.—Dow W. Horter, Clerk.

Cleveland, O.—Public Safety Director Hogen is planning to erect two fire stations on east side and two on west side.

Norwalk, O.—Board of Control will ask for new bids for furnishing combination hook and ladder truck.—Mayor Venus, President.

Hood River, Ore.—Fire department is raising funds for purchase of new equipment.

East Providence, R. I.—Town is considering purchase of auto fire truck for Wall-market district; \$5,000 available.

Pawtucket, R. I.—Committee on City Property will investigate matter of site for fire station in South Woodlawn.

Fort Worth, Tex.—Citizens will vote Jan. 11 on \$120,000 bonds for fire and police departments.

Spokane, Wash.—Council has decided to erect proposed Altamont fire station at 17th ave. and Pittsburg st.

Random Lake, Wis.—Citizens have voted \$1,000 bonds for purchase of engine, hose cart and 1,500 ft. of hose; also for erection of fire station.

CONTRACTS AWARDED

Chico, Cal.—Furnishing second size steam fire engine, Metropolitan type, to American-La France Co., Elmira, N. Y., \$5,750.

Oakland, Cal.—Furnishing temporary cable for underground system for fire and police telegraph, to Standard Underground Cable Co., 37.7c. per ft.

Boston, Mass.—Furnishing 1,250 ft. 2½-in. 4-ply "Maltese Cross" rubber fire hose, coupled in 50-ft. lengths, capped ends, to Gutta Percha and Rubber Manufacturing Co., \$1.25 per ft.; to Combination Ladder Co., for 1,250 ft. "White Anchor" rubber fire hose, \$1.19.

Dallas, Tex.—Furnishing fire hose: 2,000 ft. Paragon brand, \$1.15 per ft., to Eureka Fire Hose and Manufacturing Co.; 500 ft. Ray State Jacket brand, \$1 per ft., to Boston Woven Hose and Rubber Co.; 500 ft. Goodrich brand, \$1 per ft., to the Chicago Fire Hose Co.

Weatherford, Tex.—Building fire station and city hall, to Johnson Sons & Co.

BIDS RECEIVED

New York, N. Y.—Furnishing and delivering two gasoline propelled and pumping engines: Webb Fire Apparatus, 50 West Broadway, city, \$16,500; Watrous Fire Engine Co., \$17,000.

Rochester, N. Y.—Furnishing 2,800 ft. of cable for Fire Department, Standard Underground Cable Co., only bidder, 27.5c. per foot.

BRIDGES

Corcoran, Cal.—Board of Supervisors of Tulare County, Visalia, have decided to build 600-ft. trestle bridge over Tule River.

Fullerton, Cal.—Bond election will be called on \$10,000 for construction of a concrete bridge.

Hanford, Cal.—Board of Supervisors of Tulare County have decided to construct 600-ft. trestle over Tule River.

Pasadena, Cal.—Bids are being taken by Long & Cary, 16 South Raymond ave., for construction of a 350-ft. concrete bridge across Arroyo Seco from Prospect Square to Arroyo st.; plans have been drawn by Engineers Williams & Niskhan, 423 Chamber of Commerce Bldg., Los Angeles.

Santa Ana, Cal.—Plans for the construction of highway bridge at Newport Bay have been prepared by Engineer S. H. Finley.

Macomb, Ill.—Special Committee McDonough County Board of Supervisors has recommended construction of proposed bridge.

Normal, Ill.—Board of Local Improvements is considering construction of proposed Sugar Creek bridge.—Melluish & Broyhill, Bloomington, Engineers.—J. H. Keyes, City Clerk.

Great Bend, Kan.—Liberty Township has voted bonds to build bridge across Arkansas River at Dundee.

Lawrence, Kan.—City has decided to construct 46-ft. bridge over Toy Creek.

Leavenworth, Kan.—County Commissioners have adopted plans for building nothing but concrete bridges.

Fitchburg, Mass.—City Engineer T. J. Sheehan has recommended erection of new bridge at Nassau St.

Holyoke, Mass.—City Engineer J. L. Tighe has recommended gradual replacing of old bridges with new, beginning with Cabot st. second level canal bridge.

Joplin, Mo.—Council will consider ordinance authorizing election on \$40,000 bonds toward construction of viaduct along Broadway across Kansas City bottoms; total cost, \$120,000.—J. E. Hodgdon, City Engineer.

Jersey City, N. J.—Boulevard Commissioners will expend \$15,000 in improving Boulevard bridge near Pennsylvania Railroad.

Syracuse, N. Y.—William S. Manning, Engineer, is planning the construction of a 250-ft. bridge in connection with Bridge st. extension work.

Webb, N. Y.—Town is considering erection of \$2,500 bridge across Mosse River.

Akron, O.—Plans are now being prepared for erection of a concrete bridge over Erie tracks at Brewster's crossing on South Main st.—John Payne, City Engineer.

Columbus, O.—Plans are being prepared by the County Surveyor of Franklin County for construction of a bridge over Blacklock Creek to provide the extension of East Broad st.; cost \$18,000.

Germantown, O.—Montgomery County is considering erection of reinforced concrete bridge over Twin Creek; preliminary plans being made.—Ed. Moritz, Dayton, Engineer.

Portland, Ore.—Tentative plans will be prepared by Waddell & Harrington, Consulting Engineers, Kansas City, Mo., for the construction of the bridge at Ellsworth and Mead sts.; cost \$600,000.

Pittsburg, Pa.—Council is considering resolution to place \$50,000 in appropriation fund for construction of bridge from Ruth st. to Washington ave.

Reading, Pa.—County Commissioners have decided to erect rein. concrete bridge 1,400 ft. long and 56 ft. wide over Schuylkill River.

Trechlers, Pa.—Lehigh and Northampton County Commissioners are considering making of repairs and alterations to bridge across Lehigh River; cost \$2,500.—R. S. Rathbun, Allentown, Engineer.

Plain City, Utah.—County Commissioners, Ogden, have granted authority to Road Supervisor, Plain City, to erect bridge across Dick's Creek.

Fond Du Lac, Wis.—Plans for steel and concrete bridge to be erected across De Neveu Creek on East Scott st. are being prepared by Assistant City Engineer A. H. Pitz.

Vancouver, B. C., Can.—Cost of the construction of concrete bridge at the foot of Burford ave., to Kitsilano has been estimated at \$922,400.—N. A. Clement, City Engineer.

CONTRACTS AWARDED

San Diego, Cal.—To Knight & Hyde, for constructing bridges as follows on coast road between Oceanside and Capistrano: Santa Margarita, \$7,765; San Onfre, \$6,016, and San Mateo, \$6,939.

Salmon, Ida.—Construction of new bridge across Lemhi River, at Barracks Lake, to E. L. Emigh.

Denison, Ia.—To Lana & Co., Harlan, for building bridges in county.

Chaumont, N. Y.—Constructing substructure and fender cribs for lift bridge over Chaumont River at Chaumont, to John M. Fitzgerald, Sackets Harbor, \$5,260.

Rome, N. Y.—Constructing a highway bridge over the Erie Canal at South Washington st., to Henry Tosh & Son, Port Byron, N. Y., \$14,777.

Allentown, Pa.—To George H. Hardner, re-award for widening Hamilton st. bridge, \$25,950; Nov. 28 contract was awarded to R. T. & C. D. Stewart Construction Co., Easton, Pa.—Robert S. Rathbun, County Engineer.

Providence, R. I.—Lumber for bridge work, to William M. Harris & Co., \$27.20 per M; bridge piles, to H. E. West, Seekonk, 15½c. per ft.; other bidders: C. A. Card, Groton, Conn., 20c. per ft.; John McLaughlin, Cumberland, \$6.50 each, and Alfred F. Morse, Boston, \$5.75 each.

MISCELLANEOUS

Napa, Cal.—Council is considering erection of garbage crematory.—O. H. Buckman, City Engineer.

Redlands, Cal.—City Trustees will call election on \$80,000 bonds for park purposes.

Denver, Col.—Appropriation of \$90,000 for sprinkling streets during year has been asked for by Thomas Phillips, Superintendent Highway Department; purchase of 10 new sprinklers is proposed.

Pensacola, Fla.—Bids will be received Jan. 16, noon, for \$250,000 improvement bonds.—John A. Merritt, Chairman, Board of Bond Trustees.

Denison, Ia.—Crawford County Supervisors will soon let contract for erection of \$25,000 building for county poor.

Kansas City, Kan.—Citizens will vote Feb. 7 on \$100,000 bonds to build auditorium annex to city hall; \$50,000 bonds to build two incinerating plants and \$50,000 to build dikes and boat landing on levee.

Leominster, Mass.—Frank Lent, of Leominster, is preparing plans for \$150,000 town hall.—P. H. Killalea and Geo. M. Kendall, Building Committee.

Chaffee, Mo.—Bids will be received Jan. 18 for \$26,000 bonds of city hall and water works.—J. M. Massengill, Mayor.

Jefferson City, Mo.—Cole County is considering erection of brick jail.—C. H. Dirclix, County Clerk.

Schenectady, N. Y.—Dr. Charles F. Clowe, Health Officer, has recommended construction of garbage disposal plant.

Troy, N. Y.—Architect Wm. J. Beardsley, 49 Market st., Poughkeepsie, will prepare plans for erection of proposed jail, workhouse and sheriff's quarters; cost \$111,680.—J. N. Palmer, Clerk Board of Supervisors Irenselaer County.

Muskogee, Okla.—Mayor McGarr will enter into negotiations with Expert Engineer Alexander Potter, of New York City, for preparation of plans and specifications for modern garbage disposal system.

Dumont, Pa.—Borough is considering bond issue for improvements.

Pittsburg, Pa.—City has awarded \$4,878,000 improvement bonds to National City Bank of New York, and N. W. Harris & Co., of New York.

Pittsburg, Pa.—Bureau of Parks has asked for following appropriations: Additional land for Highland Park, between the present boundaries of the park and Allegheny River, and adjoining the Hights Run Bridge, \$150,000; additional land adjoining the Murdock ave. entrance to Schenley Park, \$45,000; improvements to Riverview Park, \$16,000; golf grounds and shelter house in Schenley Park, \$73,795; brick building for stable and supply house for parks, \$50,000; grading, sewerage, curbing and macadamizing road from Beacon st. to connect with park road, \$81,000; artesian wells, \$1,000; music for summer concerts, \$10,000.

Sioux City, S. D.—Architect Jos. Schwartz has completed plans for erection of jail and sheriff's residence for Minnehaha County; cost \$50,000.

Fort Worth, Tex.—Citizens will vote Jan. 11 on \$120,000 bonds for police and fire departments.

Merrill, Wis.—Committee of the Lincoln County Board is repairing plans for county jail.

CONTRACTS AWARDED

Oakland, Cal.—Building levee in Key Route basin, to Pacific Coast Dredging and Reclamation Co., 5.4c. per cu. yd.; total cost about \$13,000.

Anderson, Ind.—Daniels & Lyst, city, have received contract for dredging small stream near Scottsburg, \$20,000.

Evansville, Ind.—To Henry Korff, Jr., for street sweeping for 1911 by Board of Public Works, 19½c. per 10,000 sq. ft.

Ventnor City, N. J.—To John W. Cooney, Atlantic City, for jetty; to Ingersoll & Weeks, Atlantic City, for pier, \$24,393, and to Wilbert Beaumont, Atlantic City, for building, \$26,000.

Providence, R. I.—Improving Providence river and harbor by dredging channel approach to the Coastwise Dredging Co., Norfolk, Va., about \$200,000.

Weatherford, Tex.—Building city hall and fire station, to Johnson, Sons & Co.

TOO LATE FOR CLASSIFICATION

STREET IMPROVEMENTS

Los Angeles, Cal.—Committee of Supervisors, with I. B. Noble, County Surveyor, will investigate question of building one mile and a half of macadam highway.

Elkhart, Ind.—Board of Public Works has decided to pave portions of Jackson, Vista and three other streets.

South Bend, Ind.—Paving of Michigan st. with asphalt at cost of \$250,000 is being considered.

Corning, Ia.—Council has decided to pave Davis ave., Adams and 8th sts.; work includes 2,550 ft. comb. curb and gutter; 247 ft. gutter to be laid to old curb; 14,133 yds. brick paving and 292 yds. concrete alley approach paving.—Theo. S. De Lay, Creston, Engineer in Charge; A. T. Wheeler, Mayor.

Wilkes-Barre, Pa.—Council has passed ordinance for paving Park ave., between Northampton and Hazle Sts.—F. H. Gates, City Clerk.

Tacoma, Wash.—Widening Pacific ave., to Keasel Construction Co., \$35,948.

CONTRACTS AWARDED

Bluffton, Ind.—By Board of County Commissioners for four gravel and stone roads in this county to Wilson A. Woodward, Ossian, for Calvin Kunkel, Orlando Kizer and the M. N. Newman roads, \$10,040; to Charles W. North, city, William Spade road, \$4,960.

Muncie, Ind.—To Wm. Birch, city, for building 2 mi. of brick roadway on Middletown pike; \$42,000.

SEWERAGE

South Bend, Ind.—Board of Public Works is considering installation of sewer in downtown district.

Vincennes, Ind.—Plans for construction of sewer system are being discussed.

Grand Rapids, Mich.—Health Officer Slemmons has recommended immediate construction of sewer in College ave.

Grand Rapids, Mich.—Council has decided to issue \$25,000 sewer bonds.

Pelham, N. Y.—Following propositions will be voted on Jan. 11: Village of North Pelham will vote as to whether village will enter into contract with Pelham and Pelham Manor to extend its sewer through Pelham and Pelham Manor to disposal plant, and also whether \$15,000 shall be expended in building extension; Pelham will vote as to whether it will also enter into contract with Pelham Manor to build sewer to extend to the disposal plant and if it shall allow North Pelham to go through village with its sewer system; Pelham Manor will vote to allow the village of North Pelham and Pelham to extend their sewer system into Pelham Manor to connect with disposal plant.

Quakertown, Pa.—Albright & Mebus, 1 and Title Bldg., Philadelphia, are preparing plans for sewerage system and disposal plant; cost, \$125,000.

Fort Worth, Tex.—Citizens will vote Jan. 11 on \$40,000 bonds for storm sewers.

Pecos, Tex.—Citizens will vote Jan. 30 on \$25,000 sewerage bonds.

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ENCLOSED ARC LAMPS IN ROCHESTER, N. Y.

Lights low, street wet. Note distinctness of objects beyond light. Compare with view, page 49.

INTENSE STREET LIGHTING

Tungsten Incandescent and Flaming Arc Lamps Compared with Carbon Arcs—Arch Lighting Objectionable—Watts and Costs Per Foot of Street in Several Cities—Examples of Intense Lighting

By ALTON D. ADAMS

WHILE the efficiency of electric street lamps has been doubled and tripled during the past few years, the power devoted to this purpose has been multiplied by four or more in many instances, resulting in an intense street illumination of much higher cost. In many cases an increase of the power for illumination was necessary, in some it has become excessive, and often it is still applied.

Intense street lighting has been accomplished in the main with tungsten incandescent and flame arc lamps. The tungsten lamps give nearly three times the candle power of the carbon incandescent for an equal consumption of energy, and more

than twice as much illumination is obtained with the metallic as with the enclosed carbon arc and equal power. Until the advent of intense street lighting within the past two years it was the general custom to space carbon arcs 200 to 300 or more feet apart, the shorter distance between lamps being found as a rule only on important streets in fairly large cities. As the carbon arcs consume 300 to 500 watts each the old spacing commonly gave about 2.5 to less than one watt per foot of length in the lighted streets, and at points midway between lamps on the longer spacings the illumination was practically negligible.

Carbon incandescent lamps gave street illumination as bad or worse than that with the old arcs, for they were generally



ARCHES IN SOUTH BEND, IND.
Appearance in daylight not pleasing

spaced several hundred feet apart and mounted singly in units of not over 30 candle power, so as to consume less than one-half watt per foot of street.

Now the tungsten has displaced the carbon incandescent lamp in the great majority of instances, sometimes with more power or shorter spacings, and almost always with increased illumination. So, too, the metallic arcs have often displaced the carbon, not infrequently with a much larger number of lamps per mile of street. While lighting in the outlying streets of cities and towns has thus been materially improved, it is mainly in the central or business portions that intense lighting has developed. A striking feature of this intense street lighting is the mounting of two or more arc or tungsten lamps on a single post or cross-cable instead of the single lamp more common before, and it is this grouping of lamps that leads to the higher powers and costs per mile of streets.

Cables or arches carrying lines of tungsten lamps across the streets have been adopted for intense lighting in a number of cities of which Grand Rapids, Mich., and Norfolk, Va., are good examples. At Grand Rapids the arches cross the street at intervals of 100 feet and each carries 14 tungsten lamps of the 75-watt size, requiring 1,050 watts per arch, and 10.5 watts per foot in length of the street. Norfolk streets also have cross arches 100 feet apart and each arch in this instance carries 10 75-watt lamps giving a total of 750 watts per arch and 7.5 watts per linear foot of street lighted. In Grand Rapids the arch lighting is paid for by the merchants at the rate of \$7 per lamp, 98 cents per foot of street and \$98 per arch yearly. The Norfolk rate is \$15 per lamp and \$1.50 per foot of street per year.

An objection to the method of street lighting with cross arches of lamps is the striped or zebra effect produced unless the arches are very close together, which would require a large amount of power. Thus, in the case of Norfolk, if the street is as much as 90 feet wide the lamps of each arch are only 10 feet apart, while the distance between the arches is 100 feet, and there must therefore be alternate bands of light and darkness.

A method of arch lighting not open to the objection just named is that where the arches run along the center or each side of the street with lamps at short intervals, and this produces a very uniform illumination. This method of street lighting is in use at Belvidere, Ill., where 800 lamps are supported 4 feet apart on arches or cables that run along each side of the main street. Each of these lamps operates with 10 watts, so that the required power is 5 watts total per foot length of streets, or 2.5 watts per foot along each side, and there are 2 feet of street per lamp.

The more common and desirable method of locating the tungsten or flame arc lamps for intense lighting is on posts along both sides of the street alternately. Intense street lighting on this plan has been adopted in scores of places of which a few

of the more important are here mentioned. Among the notable installations of intense street lighting with more than one tungsten lamp per post those at Aurora, Buffalo, Chicago, Des Moines, Gary, Indianapolis, Los Angeles, Minneapolis and Vancouver are representative.

In Aurora there are 320 posts, each carrying three tungsten lamps, each lamp consuming 225 watts. The posts are 50 feet apart on each side of the street, so that the watts per foot of street are nine, and there is one lamp to each 16.6 feet on each side of the street.

On Genesee street, Buffalo, posts, carrying five 60-watt tungsten lamps each, are erected 120 feet apart on each side, giving 300 watts per post, 5 watts per foot length of street, and one lamp for each 12 feet of street. For the maintenance and operation of these lamps during 4,000 hours per year the rate is \$37.50 per post, or \$7.50 per lamp and 62.5 cents per foot in length of street lighted.

A number of streets in Chicago have groups of tungsten lamps on posts, and in one instance the posts are 50 feet apart and carry five 60-watt lamps each on both sides of the street, so that there are 300 watts per post, 12 watts per foot length of street, and 5 feet of length per lamp. For the maintenance and operation of these lamps the charge is \$109.10 per post per year, amounting to \$21.82 per lamp and 87 cents per foot length of street.

In Des Moines each post carries five 100-watt lamps and the distance between posts is 44 feet, so that the required watts are 500 per post and 22.7 per foot length of street, the posts being located on both sides. For this lighting the rate is \$69.50 per post, \$13.90 per lamp and 63 cents per foot of street. In this instance there is a 100-watt lamp for each 8.8 feet of street.

Gary, Ind., has posts along Broadway that carry two 60-watt and one 100-watt tungsten lamps, with four of the 60-watt and one 100-watt at corners. Even on the basis of the posts between corners, each requires 220 watts, and as the standards are on each side of the street there are 8.8 watts per foot of street and 8.3 feet per lamp. Corner posts increase the watts per foot. For this lighting service the rate is \$75 per post or \$3 per foot of street per year.

On Washington street, the long and wide highway of business in Indianapolis, groups of five 100-watt tungsten lamps are carried on posts 84 feet apart along each side, so that 500 watts are required per post and 9.5 watts per foot of street. With the distance of 84 feet between posts there are 8.4 feet in length of street per lamp, and the total number of posts on Washington and other streets is about 400, corresponding to 2,000 lamps.

Los Angeles has tungsten clusters of five 100-watt lamps on posts spaced 60 feet apart on both sides of the street, so that 16.6 watts are required per foot of length and there is a lamp for each 6 feet. The yearly rate for this service is \$58.50 per cluster of five lamps, which amounts to \$11.70 per lamp and to \$1.95 per foot of street lighted.

In Minneapolis clusters of five 100-watt lamps are located 30 feet apart on both sides of the streets to the number of 510, or 2,550 lamps. This spacing gives 12.5 watts per foot and 8 feet of street per lamp. Per cluster the annual rate is \$78, amounting to \$15.60 per lamp and to \$1.95 per foot of streets.

Vancouver has its lamp clusters 110 feet apart along each side of the street, and five 100-watt lamps per cluster, so that 9.1 watts are used per foot of street and there is one lamp to each 11 feet.

In each of the above instances of street lighting with clusters of tungsten lamps the supporting posts are located on both sides of the streets, and the figures for watts required and for cost per foot of the length of street lighted include the lamps on both sides. As a result, if the rate or the required watts per front foot of property on the street is wanted, the figures given for these items must be divided by two.

For more convenient use the above data as to required watts

and as to rates for intense street lighting with clusters of tungsten lamps are here tabulated.

From this table it appears that three to five lamps are often used per cluster and as many as 14 lamps per arch, giving clusters that operate with as much as 500 watts each and arches with 1,050 watts. The clusters or arches are located 44 to 110 feet apart, the former usually on both sides of the street, giving 5 to 22.7 watts per foot in the length of street lighted, and 1.0 to 16.6 feet per lamp.

With the old style incandescent street lamps the power seldom reached one watt per foot, and the annual rate was usually below 20 cents per foot, with generally more than 100 feet of street per lamp. On the other hand, incandescent lighting was not formerly much used on main business streets.

The method of cluster lighting necessarily tends to large power and high cost per foot of street where a good degree of illumination is wanted at points midway between clusters, and equally satisfactory results can be got at much less power and cost by the use of only one tungsten lamp per post. Important reasons for this are that the intensity of illumination varies inversely as the square of the distance from its source and that the cost of new tungsten series lamps for street lighting is independent of their candle power up to and including the 75-watt size and increases at only a moderate rate with the higher candle powers.

To illustrate the point as to least intensity of illumination, take the case of 500-watt clusters located 50 feet apart along each curb of the street, each cluster containing five 100-watt lamps. For the cluster the total candle power should be 400,



TEMPORARY DISPLAY LIGHTING IN ROCHESTER, N. Y.

at 114 watts per candle power, and at points on the curb midway between clusters the illumination on surfaces at right angles to the rays of light is about 0.64 candle foot.

Next let the 100-watt lamps be located singly at points 20 feet apart along the curb of the street, so as to give 80 candle power per post. At points along the curb midway between these single lamps the illumination on surfaces normal to the rays of one lamp is about 0.8 candle foot, or one-fourth greater than that above found with the clusters of five lamps each. On the other hand, the five-lamp clusters 50 feet apart along each

Place.	POWER AND RATES FOR STREET LIGHTING					Annual Cost per Cluster.	Cost per Lamp.	Cost per Foot Street.	Sid. s of Street. Both	Posts or Arches. Posts
	Lamps per Cluster.	Watts per Cluster.	Clusters Feet Apart.	Watts per Foot of Street.	Feet of Street per Lamp.					
Albany	3	225	50	9.0	16.6	...	...	...	...	...
Albany	5	300	120	5.0	12.0	\$37.50	\$7.50	\$0.625	"	"
Chicago	5	300	50	12.0	5.0	100.10	21.82	4.36	"	"
Des Moines	5	500	44	22.7	4.4	69.50	13.90	3.16	"	"
Dayton	3	260	50	10.4	8.3	75.00	25.00	3.00	"	"
Indianapolis	5	500	84	11.9	8.4	...	...	...	"	"
Los Angeles	5	500	60	16.6	6.0	58.50	11.70	1.95	"	"
Minneapolis	5	500	80	12.5	8.0	78.00	15.60	1.95	"	"
Montreal	5	500	110	9.1	11.0	...	...	...	"	"
St. Paul	(Per Lamp)	10	(Lamps)	4	5.0	...	...	...	"	"
St. Paul and Rapids	14	1,050	100	10.5	7.3	98.00	7.00	0.98	Across.	Arches.
Worcester	10	750	100	7.5	10.0	...	15.00	1.50	"	"



MAGNETITE LAMPS ON A ROCHESTER STREET

Street wet. Illumination greater than on page 17. Glare also greater, chiefly because lamps are too low

curb require a lamp for each 10 feet of curb and 10 watts per foot of curb, or double these figures per foot of the length of street, while the same size of lamp located singly 20 feet apart represent a lamp for each 20 feet of curb and 5 watts per foot of curb.

By using a single lamp per post under above conditions the total power and total number of lamps required by the five-lamp clusters to give less light midway between posts are reduced by one-half.

As to the cost of lamp renewals to maintain any given candle power at a post, either six 50-watt lamps or four 75-watt lamps give a total of 240 candle power, and each of these sizes costs the same amount each.

Intense street lighting with metallic flame arc lamps is well illustrated in Toledo and St. Louis, where the numbers of arcs per mile of street have been carried to a point probably never equalled before.

The new street lighting in Toledo is to include about 2,500 metallic flame arc lamps of the 4-ampere size, and on the more important streets pairs of these lamps are located 80 feet apart along each side so that there is an arc for each 20 feet of the length of street and 16 watts per foot. The rate for this lighting is \$45 per lamp per year, amounting to \$2.25 per foot of the length of street.

In St. Louis the streets formerly lighted with 138 enclosed carbon arc lamps now have the intense illumination of 240 4-ampere and 427 6.8-ampere metallic arcs. The 6.8-ampere lamps operate with 500 watts each and are spaced 80 feet apart along some of the streets, alternate lamps on opposite sides requiring 6.25 watts per foot of length. Along Broadway, St. Louis, 80 posts carry three each of the 4-ampere arcs, and these posts are about 60 feet apart on each side of the street, so that there is an arc for each 10 feet and 32 watts per foot.

CO-OPERATIVE SANITATION

WHAT appears to be needed in this country at the present time is some method of co-operation by which needed sanitary reforms can be brought about at least expense. It is unbusiness-like to compel the purification of the sewage of a large upstream city in order to protect the water supply of a small city lower down, provided pure water can be furnished the latter in some better and cheaper way. Legislation that clothes the State authorities with power to prevent the pollution of sewage, but does not give them power to compel the purification of water or to control pollution by trade wastes is unfortunate. It naturally leads to litigation rather than co-operation, and may retard rather than hasten necessary sanitary reforms. If our State authorities cannot be trusted in this matter it may be that a proper solution of the difficulty will be found in the establishment of district boards similar to those in England and Germany, such boards having jurisdiction over the limits of particular watersheds. In some respects these natural hydrographic boundaries have advantages over artificial State boundaries. In the near future also our national government will doubtless take a hand in the matter. In whatever form the authority may be constituted the idea of co-operation should prevail and ironclad rules against stream pollution should give way to a rational distribution of the burden of purification of both water and sewage, and an equitable adjustment of cost made between the parties interested, thus decreasing the total expense of sanitary measures required and utilizing natural resources for the purification of sewage in water as far as this is safe.

If the system of water carriage of sewage continues in use, the time will some day come when the sewage of all of our cities will be purified, partially or completely, and all surface water supplies filtered. It is proper to anticipate this consummation as far as our means permit, but meantime it is good business and sound common sense to spend our money first where it will go furthest and do the most good, building water filters and sewage purification works, sometimes one, sometimes both, as they may be needed.—George C. Whipple, in a paper before Institute of Chemical Engineers.

RAPID ROAD BUILDING IN KANSAS

Grading and Rolling Eighteen Miles of Dirt Road in One Day by Volunteer Labor—Organization and Construction Methods

Coffeyville, Kan., is one of the leading manufacturing centers in that state of such materials as brick, glass, roofing tile and pottery products. About eighteen miles distant is another manufacturing town, Independence. These two are connected by an old county road which was laid out thirty years ago, but has never been improved, although carrying considerable traffic.

Several years ago the desirability of furnishing a better roadway was realized, but it was not until last July that anything definite was done, when the leading business men of both cities got together and decided to endeavor to make of this an oiled highway with a minimum width of roadway of thirty feet. This union of prominent men of the two cities resulted in the organizing of the "Montgomery Good Roads Association."



PART OF ROAD AS IT APPEARED IN THE MORNING

The plans as finally decided upon involved what looked like the impossible proposition of building this road in one day by volunteer labor obtained from the two cities. Those whom it was most difficult to get interested in the project were the farmers themselves who owned the land along the roadway, and who believed that the idea was to provide a speedway for automobile owners. Even the mail carriers used their influence with the farmers, however, and through their efforts, but especially through those of the Commercial Club and a few prominent men and the Coffeyville *Daily Journal*, most of the objections were finally overcome and the plans were completed. In order to provide the funds a finance committee was



STRETCH OF FINISHED ROAD



VITRIFIED PIPES READY TO BE LAID FOR CULVERTS

appointed in each of the cities, and every one was asked for contributions, which ranged from sums of \$5 to \$200, and reached the total amount of about \$4,000.

In order to obtain materials and machinery for building the road, this was divided into two divisions, the southern or Coffeyville half being placed in charge of Mr. Oscar Jansen, of that city, and the Independence half, in charge of Mr. Fred Maine. Each of these divided his division into sections of one mile in length and appointed a foreman to take charge of each, with directions to have the roadway cleared of grass, hedges, rubbish and small trees. The County Commissioner, Mr. H. W. Dale, obtained the necessary graders, scrapers and rollers, and placed them at intervals along the route before the day in which the road was to be built, November 15. Grading machinery was collected from every township in the county, and that used by the street departments of the cities was obtained also. All culvert and bridge work was placed in charge of one man, who saw that the necessary sand and stone and vitrified clay culvert pipe were distributed where needed.

The Mayors of both Coffeyville and Independence issued proclamations making Tuesday, Nov. 15, a holiday, and asked that all places of business and schools be closed for the day. Judge Flannelly dismissed court and requested his office force to be out and assist in the work. The women of the two cities made arrangements to provide food for the thousand or more laborers at the noon hour, and again at 6 o'clock, if necessary. For laborers reliance was placed upon volunteers of the citizens, and early in the morning of the 15th, which was fortunately fair and clear, these citizens, including doctors, lawyers, bankers, farmers and laborers, gathered at the centers of the two cities, from which points automobiles and wagons provided by citizens took them to the several sections to which they had been assigned.



BUILDING CONCRETE BRIDGE CULVERT

The first work to be done was the plowing, grading and leveling of the road, cutting ditches along each side of the road and preparing for the vitrified pipe culverts for drainage purposes and for the small bridges which were to be constructed.

Following this, harrows and drags leveled the rough places and broke up the big clods, and rollers following behind consolidated the roadway. Many of the teams and laborers were furnished by the farmers having land close to the road. Wives of the farmers and of the leading citizens of both cities distributed baskets of luncheon among the workers at noon. By the time the sun had set, the road, which was over a rough and hilly country, and on which not even a sod had ever been turned, had been graded and rolled into an excellent thoroughfare.

One of the most difficult problems solved in this rapid construction was getting oil distributed over the entire 18 miles of roadway. One of the local oil companies originated the scheme adopted, which consisted in laying a line of pipe (which was borrowed from several of the oil companies) along the line of the road and placing hose connections with stop cocks at regular intervals along the same. On account of the extreme drought it was believed, when the road was constructed, that the earth surface was too dry for effective use of the oil at that time, but it was decided to wait until the first heavy rain, which would permit better consolidation, and then drag and roll the road and apply the oil by hose attached to the several connections along the pipe line.

LIABILITY OF MUNICIPAL OFFICERS

On Unauthorized Contracts—Not Liable When Acting in Good Faith—Court Decisions in Several States

It must be taken to be well settled by repeated decisions that when officers of a municipal corporation, acting in good faith, contract in their official capacities with parties having full knowledge of the extent of their authority, or who have equal means of knowledge with themselves, they do not become individually liable, unless the intent to incur a personal responsibility is clearly expressed, although it should be found that through ignorance of the law they may have exceeded their authority.

An instructive case is that of *Newman v. Sylvester*, 42 Ind. 106. Here it appeared that the common council of a city passed an ordinance for the improvement of a street, and a contractor whose bid was accepted for the work completed it to the satisfaction of the city engineer. An estimate was made and allowed against an abutting lot owner, who denied liability. The Mayor and Council refused to order a precept on the ground that the lot was not within the limits and jurisdiction of the city. The contractor sued the Mayor and Common Council, alleging that by advertising for and receiving proposals for the work they had held forth that they had jurisdiction over that part of the street when they knew that they had not and thereby intended to and did deceive; that the plaintiff had no knowledge to the contrary, and believed they had, and by their action was thrown off his guard and prevented from making inquiry. The defendants in their answer alleged that they had voted for the passing of the ordinance by mistake, without fraud or intentional wrong, and under a misapprehension as to the locality of that part of the street; that the plaintiff had the same knowledge as they had, and that they acted in good faith without any intention whatever of defrauding the plaintiff. In the court below a demurrer to the answer was sustained and judgment given for the plaintiff. The defendants appealed. The action was maintained on the theory that the Common Council was acting as a mere agent, governed by the same rules and liable to the same extent as ordinary agents for private persons, and so, having no authority, was personally liable to the party contracted with, either upon the contract or for deceit.

The court held that the action of the Council in passing the

ordinance and its proceedings under it were not calculated to throw the plaintiff off his guard or prevent him from making inquiry about the city limits. It was not expressly stated by it that the street was within the city. The most that could be said was that it acted as if it believed it to be. Nothing was said or done to prevent the plaintiff from ascertaining for himself whether the place was within the city limits.

On the general question of the liability of one assuming to act as agent for another without authority the court, adopting a view favorable to the agent, said:

If he enters into the contract in the name and as the agent of another, and does it honestly, fully disclosing all the facts touching the authority under which he acts, so that the one contracted with, from such information or otherwise, is fully informed of the authority possessed or claimed by him, he is not liable on the ground of deceit or for misleading the other party. It is material in such cases that the party complaining of a want of authority in the agent should be ignorant of the truth touching the agency. If he has a full knowledge of the facts, or of such facts as fairly and fully put him upon inquiry for them, and he fails to avail himself of such knowledge, or the means of knowledge reasonably accessible to him, he cannot say he was misled, simply on the ground that the party assumed to act as agent without authority, in the absence of fraud.

On the question of liability as public officers the court said:

If the party contracts as a public officer, and in that capacity acts honestly, he will not ordinarily be personally liable. If his authority to act is defined by public statute, all who contract with him will be presumed to know the extent of his authority, and cannot allege their ignorance as a ground for charging him with acting in excess of such authority, unless he knowingly misled the other party.

For these reasons the Supreme Court held that the facts alleged in the answer constituted a bar to the action and that the demurrer thereto ought to have been overruled, and reversed the judgment of the Superior Court.

In *Houston v. The Board, etc., of Clay County*, 18 Ind., 396, it was held that if township trustees, acting as such, exceeded their authority in making a contract for the erection of a bridge which they were not authorized to do by statute, and did so innocently, under a mistake of law, in which the other contracting party equally participated with equal opportunities of knowledge, neither at the time of making the contract looking to personal liability, the trustees would not be personally liable, nor would the township be liable.

In another case village trustees, acting as such, made a contract for the building of abutments for a bridge within the village. After completion of the work and payment in part by the village it repudiated liability. The contractor's assignee sued the trustees individually. It was held that the defendants, being officers of the village, acting *bona fide* and without concealment or fraud, were not personally bound upon the contract. It was not necessary to pass upon the liability of the village, but the court intimated that it was difficult to see why it should not be both legally and equitably liable. *Lyon v. Irish*, 58 Mich., 518.

Two village trustees were alleged by a plaintiff to have made a contract of employment with him to act as chief of police. He knew their position as trustees and that his appointment would have to be confirmed by the board of trustees. He sued them individually for damages for nonperformance of the alleged contract. There was no proof of any special obligation or intent on the part of the defendants to become personally liable on the contract. They were held not liable. *Miller v. Board*, 15 Mis. (N. Y.), 322, 37 N. Y. Supp., 766.

Where highway commissioners, in a proceeding to lay out a highway, being unable to agree with a land owner as to the damage he would sustain, submitted the matter of damages to arbitration, and executed their bond in their individual names containing an express covenant to abide by and perform the award, they having no power to bind the town in this manner, it was held that they were not individually liable on the bond. *Mann v. Richardson*, 66, Ill., 481.

The members of a board of education requested an architect to make plans for a school building and subsequently made an agreement for his employment. They afterwards notified him

to cease work on the plans as they did not wish them. He sued the city unsuccessfully and then sued the members of the board individually. It was held he could not recover, as the board's want of statutory power was as much within the plaintiff's cognizance as in the defendants', and as both parties acted in good faith, there being no guaranty by the defendants of their authority. *Lawrence v. Toothmaker*, 75 N. H., 148.

A statute vested the power to engage special counsel for cities in the Mayor and Common Council. An ordinance of the city attempted to delegate this power to the City Collector. Acting under the direction of the void ordinance the City Collector entered into a contract engaging special counsel for the city. The contract was held invalid, and in an action thereon by the attorney engaged, against the city and the collector, the latter was held not liable under the rule. *Edwards v. City of Kirkwood (Mo.)*, 127 S. W., 378.

A contract for grading a city street provided that the work should be done according to the plans on file and in obedience to the directions of the city engineer "as to the mode of doing the work." The engineer set his stakes wrong, so that they indicated a grade higher than called for by the contract. The contractor conformed the grade to the stakes, and subsequently sued the city and the engineer for the extra work caused him. The engineer was held not liable, the error being an honest one, and no bad faith on his part being charged or any intention to injure the plaintiff. *Wilson v. St. Joseph (Mo.)*, 10 S. W., 600. And where a director of a school district executed as such a note for the benefit of the district, believing (in good faith, though erroneously) that he was authorized to bind the district, it was held that he was not personally liable on the note. *Humphrey v. Jones*, 71 Mo., 62.

In *Southworth v. Flanders*, 33 La. Ann., 190, the Mayor and administrators of the City of New Orleans were sued by the Recorder of Mortgages for the Parish of Orleans for \$10,000 under the following circumstances. The defendants, in their official capacity, passed a city ordinance authorizing the Recorder to obtain and record certain certificates and copies of tax payments at a cost not exceeding \$10,000. The Recorder accepted and complied with the contract. It was held that assuming that the ordinance was illegal, the defendants were not personally liable. The court stated its understanding of the general rule of law on the subject to be that when officers of a municipal corporation, clothed with legislative functions involving a legislative discretion, make a mistake as to the extent of their powers, a mistake which is shared by the party with whom they contracted, having equal opportunities of information touching the powers delegated to such officers, and there is nothing in the proceeding looking to personal responsibility, the officers in such case are not personally liable.

The court also said that if any action did lie in such a case against the officers personally it would not be on the contract but would be *ex delicto*. That would also be the case in most of the other states, but in some the officers, if liable, could be held upon the contract.

STREET LIGHTING BY PORCH LIGHTS IN GREENWOOD

At the beginning of 1910 the municipal electric light plant of Greenwood, S. C., reduced by 10 per cent their rates for current, which were already low, but the increased business during the year has caused the financial showing to be the best in the history of the plant, we are informed by Mr. A. J. Sproles superintendent of the plant. The rates, we believe, are to be continued this year the same as last, but the Commissioner of the water and electric light plant decided on Jan. 4 to furnish current free of charge for porch lights, providing the residents use current for lighting and that they furnish a 40-watt tungsten lamp on the front porch on a rigid pendent fixture so located that it will give as much light as possible to the street or sidewalk. This light must be used only between the hours of 6 p. m. and 7 a. m. While the owners must provide the lamps, the Commissioners will furnish these to them at actual cost.

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239 West Thirty-ninth Street, New York
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A. PRESCOTT FOLWELL, Editor
F. E. PUFFER, Assistant Editor

Business Department

S. W. HUME, President
T. MORRIS, Manager. A. PRESCOTT FOLWELL, Secretary

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JANUARY 11, 1911

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Sewage Disposal Patents

Up to ten years ago little was heard of patented processes
or appliances for purifying sewage. The results of the in-
vestigations of private engineers and sanitarians, as well as of
city, State and national boards, were published and given freely
to the public. About that time Cameron patented the septic
tank apparatus in England, and that and the process in this
country, and the process patent, with certain limitations, has
been sustained by our highest court.

We believe that no patent is claimed for contact beds or
sprinkling filters, but the various styles of moving sprinklers
used in England are, we believe, all patented; and one of the
sprinkler heads which is being used in the United States is

patented, as are most of the dosing appliances which have been
invented.

Much has been said recently about what bids fair to be a
successor of the septic tank—the Emscher or Imhoff tank.
This has been patented in this country by Mr. Imhoff, and
quite recently the same engineer has patented a combination
of such tanks with a biological filter. (See our issue of
January 4, page 40.) This is a modification of the Travis
tank, and the English papers have stated that Mr. Imhoff may
find trouble in collecting royalty because of Dr. Travis' previ-
ous invention. And both these are modifications of the septic
tank. The complication which all this might seem to involve
is, we are informed, actually threatened in one or two cases.
Purification plants at Atlanta, Ga., for which contracts have
been let, are to include Emscher tanks, for which it is proposed
to pay a royalty to Mr. Imhoff. But the holder of the Ameri-
can septic tank patent is demanding royalty because of the
same tanks. And it is possible that the troubles of this same
city will not end there. We understand that a method of
aerating the filter by ventilators to the sub-drains (described
in our January 4 issue) is to be adopted in that plant; and
also that a patent (No. 656,665) by Mr. Burton J. Ashley
is claimed to cover such ventilation.

It will be extremely unfortunate if this multiplication of
patents on engineering inventions should retard progress in
sewage treatment rather than advance it, as is the aim of the
patent system. And yet this is likely to be the case if there is
an uncertainty among engineers and city officials as to just
what disposal methods are covered by patents and who is en-
titled to the royalty. Much of this trouble might have been
avoided had the several State and municipal investigating bodies
taken out patents on their discoveries and given the same freely
to the world. What is now to be hoped for is an early sub-
mission of such cases to the highest courts and the prompt
decision of these, based upon a more intelligent appreciation
of the engineering, chemical and biological principles involved
than has been the case in several such decisions of late.

Sewage Purification Plants as Nuisances

In a paper before the Institute of Chemical Engineers, Mr.
George C. Whipple, in a paragraph headed "Purification Plants
as Nuisances," called attention to certain precautions which
should be taken in designing and locating sewage purification
plants. The paragraph was as follows:

Purification works themselves may be a source of nuisance.
There is a natural opprobrium attached to a region where such
works exist that results in a recognized deterioration of prop-
erty values. The processes used for the purification of sewage
not infrequently result in odors that may be distributed over
considerable areas. Where the purification works are entirely
covered, as some kinds of works may be, little or no nuisance
may result, but where, for example, the sewage is first sub-
mitted to putrefaction in a septic tank and the septic effluent
then sprayed into open air upon the surface of sprinkling
filters this exposure of the atomized liquid results in the libera-
tion of odors that may reach distances of half a mile from
the plant, depending upon the amount and character of sewage
treated, the local topography, prevailing direction of the wind,
humidity in the atmosphere and other conditions.

Frequently high winds will carry the spray itself for several
hundred feet with inevitable bacterial pollution of the air. In
the operation of sprinkling filters also it has been found that
at certain seasons of the year swarms of flies breed in the
porous beds. These are very troublesome in the immediate
vicinity of such works. In considering the need of sewage
purification it is proper to balance these nuisances against
those resulting from the discharge of unpurified sewage into a
body of water. It not infrequently happens that the installa-
tion of sewage purification works merely substitutes one
nuisance for another.

A cause of nuisance, possibly even more common than those
mentioned, is the failure to use sufficient care in operating the
plant, either to prevent nuisance or to secure the highest effi-
ciency. It is altogether too common for cities, having once
constructed a plant, to expect it to operate automatically, with
no attention whatever, or to place in charge some one with no
great amount of intelligence and no experience whatever in

purification plants, and thereafter pay no attention to the results obtained by him. In some cases State Boards of Health are empowered to require the construction of sewage purification plants, but have no control over their operation; and a city upon which the construction of such a plant has been forced by the State Board, finding that it has no further authority in the matter, absolutely neglects the plant. A plant so neglected is almost certain not only to fail to make any adequate return for the money invested in it, but may result in actual nuisance. In either a water or a sewage purification plant care in operation is fully as important as in designing or construction.

TAKING TRAFFIC CENSUS

In a recent paper on road construction Prof. A. H. Blanchard, of Providence, R. I., gives some useful hints on methods of making traffic counts on highways, the desirability of which was recently commented upon in these columns. He said:

The principles underlying the essential elements of any classification of traffic may be stated briefly as follows: Differentiation between horse-drawn vehicle traffic and motor car traffic; a division of each of these classes of traffic into pleasure and commercial traffic; the determination of the weight per linear inch of width of tire of all types of commercial traffic, a factor of the utmost importance in the design of the substructure of the road; subdivision of pleasure motor car traffic upon the basis of weight and speed, since in many instances the greatest damage to ordinary macadam road is caused by seven-seat touring cars, limousines or landaulets traveling at speeds of forty to sixty miles per hour.

As a practical, economical and efficient plan the following method is proposed for adoption under average conditions. For the open season from April to October, inclusive, the traffic should be taken during four periods of three days each, one period being in April, May or June, one in July, one in August and one in September or October. As local conditions may dictate, either Friday, Saturday and Sunday or Saturday, Sunday and Monday could be taken, thus insuring information relative to the usual abnormal Sunday motor car traffic, and in some cases, traffic above the week day average on Saturdays, while the Friday or Monday traffic would give a fair indication of the normal week day traffic. It is evident that by this plan more reliable and essential facts are secured relative to traffic than by the other methods considered.

HYPOCHLORITE AT NIAGARA FALLS

Among the many cities in the East which have been using hypochlorite for water sterilization is the city of Niagara Falls, New York. The Norwood Engineering Company is constructing a water-purification plant for improving the supply of the city, which is obtained from Niagara River, and is one of the most seriously polluted in the country. As it is some time before the filtration plant can be completed and put into service, the city is, meantime, under the direction of this firm, relying upon the use of hypochlorite as a temporary expedient for reducing the typhoid rate.

Considerable complaint is being made by the citizens and by certain of the daily papers against this use of hypochlorite, it being stated that a decided and unpleasant taste and odor are given to the water thereby. One or two experts have already visited the city to ascertain whether this objectionable feature can be prevented and how, and it is reported that the application of the hypochlorite is to be placed at once in the hands of a chemical and a bacteriological expert, both professors in the University of Buffalo.

There seems to be no doubt that there has been more or less taste in the water since the application of the hypochlorite, and we believe that it is no longer denied that the taste is due to the addition of that substance. The water commissioners, however, believe that the possible saving of life or sickness from typhoid warrants the temporary annoyance which this causes. The city bacteriologist, Dr. E. B. Horton, however, is opposed to the continuation of its use, claiming, in a letter to us, that it is "a most needless procedure, adding a poisonous drug to drinking water, when we have a safe and sane method of purification in slow sand filtration." While there has been a considerable reduction in typhoid since the use of hypochlorite was begun,

Dr. Horton believes this to be caused by the general boiling of the water by the citizens rather than by the hypochlorite. He has sent us a number of figures of tests made by him of raw and treated water, in which the number of bacteria per c.c. in the two respectively were as follows:

Date	In raw water	In filtered water
Oct. 21	14,400	130
Nov. 4	30,700	120
" 8	6,600	50
" 11	32,500	600
" 14	20,200	1,600
" 16	15,900	750
" 21	17,500	1,750
" 23	16,600	2,000
" 29	36,000	4,800
Dec. 4	20,000	6,800
" 7	16,000	3,300
" 11	9,000	1,900
" 14	9,700	1,200
" 18	4,400	350

On November 27 liquefying colonies destroyed all the plates from raw water in 36 hours; the bacteria in the treated water amounting to 8400.

These results the doctor does not consider as being very satisfactory. The tests given above show an average reduction of bacteria of 90.1 per cent. While this is not nearly as satisfactory a result as should be given by either a slow or rapid sand filter, nor as good as has been produced by the use of hypochlorite at other places, it would seem almost certain that it reduces the danger from typhoid by a very large percentage, and is well worth while, unless it is reasonably certain that the hypochlorite is causing injury to the people generally. It has been claimed by all advocates of this method that no harm whatever can be caused by the hypochlorite. This is something which, if there is any question about it, should be ascertained at once by recognized medical experts, as the use of hypochlorite is being adopted in scores of cities throughout the country.

OIL FOR PRESERVING WOOD BLOCKS

Readers of MUNICIPAL JOURNAL AND ENGINEER have been kept advised of the discussion which has been continued during the past year or two concerning the nature of the creosote or preservative oil which should be specified and used in the preparation of wood paving blocks. In our issue of Oct. 26, 1910, were printed the specifications recommended by a committee of the American Society of Municipal Improvements, which differed in only a few respects from those which had previously been recommended by a committee of the Organization of City Officials for Standardizing Paving Specifications.

Since our publication of these specifications, we understand, they have been criticised as providing for an oil which could not be obtained in the open market, and certain comments of this nature have found their way into print. These criticisms were called to the attention of the committee, and their reply to the same will be of interest to all who are concerned in this matter of wood block paving.

The committee states that it "is readily understood and appreciated by any one acquainted with the tar industry that any coal tar can be filtered so as to produce a tar sufficiently free from carbon which, when mixed with a proper creosote oil, will produce a product such as is called for in these specifications. [Those of the American Society of Municipal Improvements.] The by-product coke-oven tars produced in Nova Scotia are well adapted to the manufacture of such an oil." The committee also is informed that one of the large manufacturers of paving blocks obtains oil meeting these specifications from two different sources which are entirely independent of each other.

The committee quotes from a letter written to the chairman by Dr. Gellert Alleman, professor of chemistry at Swarthmore College, as follows:

I have no hesitation in stating that any dealer in tar can fulfill the specifications to which you refer by either filtering the tar and adding a certain proportion of creosote oil to it, or, in some cases, by adding creosote oil to the unfiltered tar. There are a number of coke oven tars now made in this country

which contain less than 8 per cent of free carbon, and, at the same time, possess a gravity of about 1.15. Such tars unfiltered, when reduced with creosote oil, will yield the material you require. There are two Philadelphia oil firms which could supply this material, but would be unwilling to do so unless the order were quite large.

The committee also refers to the Bulletins of the Bureau of Municipal Research of Cincinnati, treating at some length the question of creosote for paving blocks, one of which bulletins was abstracted by us in our issue of August 10, 1910. One of these reports stated that a coal tar is in common use for treating wood paving blocks which is produced as a mixture of coal tar creosote of a gravity approximately between 1.03 and 1.08 and of a coal tar or pitch with a gravity of 1.10 or higher and containing small percentages of free carbon less than four. This bulletin states that this mixture is commercially feasible and readily obtainable in large quantities at prices from six to eight cents per gallon.

The committee further states that, if it is the case that this oil can be furnished in large quantities by only one or two firms in this country, it is not because of any monopoly or patent, but because these firms are ready and willing to furnish it at such low cost (it has an offer in writing of seven cents a gallon) that there is no inducement for others to compete in the business, at least until the wood paving industry attains larger proportions than at present.

This particular discussion is not as to the desirability of using the creosote called for by the specifications, but only as to whether they would permit of sufficient competition among paving contractors to insure reasonable prices under them. It would appear as though a test of this might be obtained by efforts to secure bids under these specifications, and we hope that such a test will shortly be made by some city or cities which will give a definite proof as to the correctness of the committee's claim that any wood block manufacturer can obtain the creosote called for at a price which will permit of full competition.

THE IMHOFF TANK—AN EXPLANATION

Editor MUNICIPAL JOURNAL AND ENGINEER,

239 West Thirty-ninth street, New York City.

January 3, 1911.

SIR:—It has just come to my notice that some persons have expressed the supposition that I had some other than a purely professional interest in the Imhoff tank because I have recently on several occasions called attention to it and advocated it for the separation of the coarse suspended matter from sewage and for the treatment of the deposited sludge.

I hope you will permit me through your columns at once to disabuse the minds of such persons by emphatically denying any basis for such a presumption and stating that I have not and never will have any commercial interest, directly or indirectly, in any apparatus or process forming a part of any work which, as a consulting engineer, I have recommended or may recommend to public or private clients.

Since my last return from Europe it is true that I have repeatedly called special attention to the Imhoff tank. But this was done because I now consider it to form one of the most important and useful steps of progress in sewage treatment we have made for a number of years, and because I desired that my own country, where so many cities and towns can be benefited by it, should enjoy its advantages as soon as possible. My interest is purely and solely a professional one, and my communications have been made frequently, partly by invitation and partly to advance the subject more rapidly than might otherwise have been the case.

It may be proper to add a few words as to what my relation has been to the sewage sludge question since the time when in 1880 I first studied it in England. At that time and up to the present, as everyone knows, the sludge disposal has been the most troublesome feature of sewage work wherever it was necessary to separate the gross suspended matter from the sewage. The trouble was due to the nuisance created by the offensive odors at the place of treatment and to the difficulty of quickly drying the sludge for permanent disposal.

One proposition after another failed to prevent the usual foul odors, and with the advent of the septic tank these had practically come to be considered a "sine qua non," a wide belt of land being generally reserved around the works to secure immunity from the nuisance. Such a condition never appealed to me as a final one, and I considered that the question of

sludge treatment still remained the most pressing one for solution. I was, therefore, on the constant lookout for any favorable progress in that direction.

What appeared to me the most promising work in this direction was that of Dr. W. O. Travis, of Hampton, south of London, England, who was separating into two compartments by gravity most of the suspended from the liquid matter, and who deserves a large share of the credit in this modern movement. I then became acquainted with Mr. Wattenberg, Engineer of the Emscher district in Germany, a few years before his death, who was studying the Travis tank with reference to its introduction in his district.

During that study, Dr. Imhoff, then also an engineer of the Emscher district, discovered certain facts which made it possible to improve upon the Travis tank, and not only to get a sludge decomposition which was inoffensive, but a sludge that would dry quickly and allow of a non-odorous and economical removal and disposal.

These promising discoveries, after the unsuccessful efforts of many years in both America and Europe, were one of the causes for making a trip to Europe in 1908 to witness the actual conditions and results. Apparently these were satisfactory, but the experience had been so short that I was not yet entirely sure of a permanent success, and intended to make another visit two years later, which was last summer.

After returning home in 1908 my hopeful anticipations were not shared by most of those with whom I spoke, and naturally my assurance was not increased thereby, the subject being more of a chemical and bacteriological than an engineering one.

Fortunately, the Engineering Department of Philadelphia, through its Chief Engineer, Mr. George S. Webster, determined to erect a small Imhoff tank and to get experience data regarding the process under American conditions. The results after nearly a year's trial were confirmatory of those obtained in Europe. Meanwhile, conversations with Dr. Imhoff, during his visit to America in 1909, and further European correspondence and publications, proved that no serious difficulties were appearing.

Last summer I again visited a number of such plants in Germany and without exception found them inodorous and yielding quickly drying sludge, without incipient troubles of any kind. There were then already over 25 plants in operation.

Therefore, as all my own doubts had been removed regarding a large sphere of usefulness for these tanks (whatever modifications might later be found advisable under some special conditions) and as I learned that the royalty charge was very small, I felt it to be my duty to my American confreres to call attention to this advance, so that we might keep abreast of the progress which is being made elsewhere.

RUDOLPH HERING.

RETAINING MUNICIPAL POSITIONS.

We have been requested by a subscriber to print the following letter, which speaks for itself:

MUNICIPAL JOURNAL AND ENGINEER.

New York City.

GENTLEMEN: Why is it that the superintendent and employees of a municipal electric light plant are always uneasy at the time of municipal elections. Is it possible that professions have gone so deeply into politics? It is true that city officials like to undo what the former officials have done; and when such is the case something turns upside down usually. Why is it that the operatives of the city's machinery take any hand in the municipal elections? On the other hand, if they are doing their duty they should make such a record that the new city officials would be glad, exceedingly glad, to have them remain. Let us, as professional men, superintendents and employees of municipal electric light and water and ice plants, strive to run our end, no matter who is head of the city; strive to make it pleasant for him and those whom we serve. Do not mix politics with professions.

I have a record of the last five or six years where changes have been made on account of new city officials, and in several cases where politicians rather than professional men have been appointed and have taken charge of municipal plants, boilers have blown up, generators have been burned out, engines have been wrecked and the city has had law suits on account of the lines not being kept up and poor service generally. Good men are scarce and their services should be appreciated.

Yours respectfully,

F. B. HARRIS,

Superintendent Water and Light Plant,
Covington, Ga.

NEWS OF THE MUNICIPALITIES

Current Subjects of General Interest, Under Consideration by City Councils and Department Heads — Streets, Water Works, Lighting and Sanitary Matters — Fire and Police Items — Government and Finance

ROADS AND PAVEMENTS

Year's Work on Streets in Atlanta

Atlanta, Ga.—The annual report of City Engineer R. M. Clayton gives the amount of work done by the Street Department as follows: Curbing and sidewalks laid during the year 1910, 35.8 miles, at a cost of \$179,809.86. The majority of the sidewalks were paved with cement. The total cost of it all was charged against the property owners and thus cost the city nothing. Wherever sidewalks were laid, curbing was put down also, so the figures quoted above mean that much of both has been finished. Total sewers laid during the year were 12.43 miles, at a cost of \$100,983.57. Of that amount 2.62 miles, costing \$47,329.47, were paid for with bond issue money. The cost of the remaining was assessed against the property owners. No less than 10.94 miles of new street paving was put down in the year. That includes chert, bitulithic, bituminous macadam, old granite block and creosoted wood block. The total cost was \$282,640.81. Of that amount \$249,425.10 was paid by the city and the property owners combined, the city paying a third and the property owners the balance. The other cost, or \$53,215, was paid by the street railway company.

More Grade Crossings Going

Buffalo, N. Y.—Nine more Buffalo grade crossings are to be abolished. These are the Erie crossings at Main, Genesee, Doat and Colvin streets, Delevan, Kensington, Walden and Delaware avenues and the Military road. The contract, which was signed last week by the Grade Crossings Commission and the Erie Railroad Company, also provides for a crossing not at grade at East Amherst street when that thoroughfare is opened. With these crossings abolished there will be few left to deal with. All of these crossings are dangerous and have been the cause of complaints for years.

One Grade Crossing Change to Cost \$600,000

Cincinnati, O.—City Engineer Shipley says that the Rookwood crossing of the Pennsylvania lines would probably be the first grade crossing to be abolished with the funds provided by the recent sale of the grade crossing bonds. The estimated cost of the work is \$600,000, one-half of which is to be borne by the railroad and one-half by the city. Of the city's portion, the Cincinnati Traction Company will be required to bear a just and equitable share. This, however, shall not exceed one-half of the city's burden of the cost.

Will Widen Streets in Burned District

Cincinnati, O.—Councilman Robert O'Brien has proposed to remedy the evils of traffic congestion in the vicinity of Sycamore street, where a large area was recently burned, by having the city condemn portions of the property affected for the purpose of widening streets.

Plan Laws for Suburbs to Give Better Streets

Clayton, Mo.—Delegates from each municipality in the county met at Clayton last week to discuss legislation beneficial to the suburban towns. The principal subject discussed was the drawing up of a bill which, if made a law, will allow the County Court to spend on work in the towns 60 per cent of the road taxes paid by the municipalities. Under the existing law residents of municipalities in the county pay the regular tax of 40 cents on the \$100 valuation in addition to the 20-cent special road tax, and the county is not allowed to spend money on their roads. The grade-crossing question was also discussed. Senator Buel L. Matthews, of St. Louis County, has announced that he will introduce a bill in the Legislature giving the officials of municipalities and the judges of the county courts power to eliminate grade crossings. Samuel Hodgdon, of Webster Groves, presided. Addresses were made by Judge Herman Hackmann and Wilfred Jones.

Big Increase in Improvements

East Orange, N. J.—In an annual report made to the East Orange City Council, which, by reason of the fact that he is soon to relinquish his office, is in effect a valedictory, City Engineer Frederic A. Reimer showed that the construction of new improvements under his supervision during the year 1910 was between four and five times as great as that of 1909, and the purely maintenance work over \$7,000 in excess of that of the previous year. The value of new improvements aggregated in the present year \$305,702.73, and that of 1909 \$67,369.73, according to the report, while the figures for maintenance work were respectively \$54,881.63 and \$47,510.42. In the new work was included 9793 feet of sewer extensions, 8752 feet of drainage extensions, 29,936 feet of new paving, 22,238 feet of new sidewalks, 11,540 feet of new curbs and gutters in Park avenue and 168 new street lamps. The maintenance work embraced resurfacing of 34,154 feet of roads, resetting 25,106 feet of curbs, relaying 2476 square yards of gutter, oiling 26.84 miles of streets, cleaning 153 streets and repairing 13,273 feet of sidewalks. Besides that snow and ice was removed from sidewalks at a cost of \$4,096.77 to the property owners.

Year's Street Work in Minneapolis

Minneapolis, Minn.—According to figures compiled by the City Engineer, \$2,274,015 was spent during 1910 in street improvement work. Sixteen miles of paving was laid at a cost of \$525,000, and \$99,700 was expended in constructing 51 miles of curb. Other expenditures were: 26 miles of sewers, \$530,000; 40 miles of water mains, \$380,000; 28 miles of sidewalks, \$73,900; roads, \$90,593; filtration plant, \$65,000; bridges, \$29,822; Street Commissioner work, \$480,000.

Nine Grade Crossings to Go

New York, N. Y.—The Public Service Commission has ordered nine grade crossings to be abolished by the Long Island Railroad on its north side division in Flushing. The Legislature at its last session appropriated \$200,000 for such work in Queens County, inasmuch as the law requires that the city and State shall each pay one-quarter of the cost. The remaining half is to be paid by the company. With the amount thus available the Commission could only order an improvement to cost not more than \$800,000, but inasmuch as the Commission substantially approved the plan submitted by the Long Island for a general improvement covering about 13,000 feet of roadbed, which the city's engineers also approved, the company has agreed to pay the extra cost which will bring the entire amount to more than \$1,000,000.

Pouring and Spraying of Oil Compared

Plainfield, N. J.—During the season of 1910 two carloads of Standard road oil were spread by means of Saybolt pneumatic wagons, by which method the oil is forced out in a fine spray under air pressure. This process met with general approval from the fact that the street could be used immediately after the application of the oil. While much less oil is used than in the pouring process the treatment does not last as long and should be repeated at intervals of four or six weeks. The street committee, in their annual report, say that, judging from two years' experience, the expense of treating all streets so that they should be dustless during the entire season would be more than the city can now afford.

Opposes Acceptance of Any More Macadam Pavements

Schenectady, N. Y.—Commissioner Quackenbush, in his annual report, says that he is opposed to the acceptance by the city of any more macadam pavements, as they wear out quickly and are expensive to repair. The street repair account, last year, as given in the report of Superintendent Charles Hogan, was \$7,000.

Cement Pavement Disintegrating

Portland, Ore.—Several thousand square yards of Hassam pavement on East Twenty-first and Milwaukee streets, laid within the last four months, will have to be removed for the reason that it is disintegrating, according to a statement made by Manager George H. Hyland, of the Oregon Hassam Paving Company. This is due, he says, to the fact that the cement used in the pavement was worthless, which fact was unknown to the paving company when the pavement was laid. The pavement will be replaced immediately with good cement at the expense of the cement firm which produced the inferior material. The loss to the cement firm will reach approximately \$50,000, it is said.

Lien on the Streets

Topeka, Kan.—For the first time in the memory of the officials of the city, Topeka has had a lien served on some of its streets, sidewalks and alleys. Claiming that John Ritchie, a local paving contractor, owed them various sums, the Topeka Vitrified Brick & Tile Company and C. A. Ritchie have notified them that a lien has been served on considerable paving work. The brick company claims that Contractor Ritchie owes them \$755.95 for materials. C. A. Ritchie claims \$2,535.50 for work and material.

Paving Record in South Bend

South Bend, Ind.—Brick pavements costing \$55,746.99 were laid during the year, while \$30,219.69 was spent in the construction of macadam pavements. Asphalt pavements, which were contracted for in 1909, were completed this year at a cost of \$15,681.11.

Points to Be Covered by Indiana Road Law

Indianapolis, Ind.—A subcommittee consisting of William F. Elliott, chairman; B. J. T. Jeup, secretary; C. A. Kenyon, William Fortune, L. Ert Slack and W. L. Slinkard, representing the Indiana Good Roads Association, has begun work on the draft of a bill to be presented to the General Assembly in January, under which it is hoped that better roads for Indiana may be obtained. This committee was appointed by Addison C. Harris, who has been elected chairman of the general legislative committee of the Indiana Good Roads Association. Although this committee is not bound by restrictive instructions from the general committee, it has been asked to report one or more bills which will embrace these general points: A state highway commission and its powers; State aid in constructing and maintaining roads; special taxes on vehicles; use of convict labor, and amendments to present statutes. These ideas were selected by the general committee after a long discussion, embracing the fundamentals of needed legislation for relief in road matters in the State.

City Engineer Reports on Paving Work Done

Syracuse, N. Y.—Public improvements costing \$495,087.83 have been completed during 1910, according to the report of City Engineer Henry C. Allen to Commissioner of Public Safety Frank M. Westcott. During the year more than 5.69 miles of pavement have been laid, which is a larger mileage than any previous year in the history of the city with the exception of 1898 and 1899, when 6.39 and 6.94 miles, respectively, were laid. At present the city has 74.43 miles of pavement, or more than one-fourth of the total of approximately 270 miles.

The report shows the following work carried to completion during the year: Pavements, 5.69 miles, costing \$285,743.64; sewers, 5.64 miles, costing \$65,236.35; sidewalks, 9.26 miles, costing \$23,633.60; streets graded, 1.47 miles, costing \$14,311.47; miscellaneous contracts, including street sprinkling, flushing and the like, cost \$106,162.77; total, \$495,087.83.

Annual Report on Streets

Springfield, O.—Springfield has an area of 11.1 square miles, parks of 225.71 acres, 14.69 miles of paved streets, 17 miles of macadam streets, 48 miles of graveled streets, 46 miles of sewers, 2,426,525 square feet of cement walks and 284,856.45 feet of cement curb and gutter, according to a report of the engineering department of the city government submitted to the service director by Engineer M. J. Bahin. During the year 320 permits for laying cement curb and gutter were issued, a total of 122,250 square feet being laid and 12,271 feet of curb and gutter.

SEWERAGE AND SANITATION

160 Miles of Sewers Laid in Four Years

Baltimore, Md.—Chief Engineer Calvin W. Hendrick, of the Sewerage Commission, has submitted to Mayor Mahool, for use in the latter's annual message to the City Council, a statement showing that in the four years of the Mayor's incumbency 160 miles of sanitary and storm water sewers have been laid. Mayor Mahool regards this evidence of work that has been accomplished in Baltimore's biggest municipal undertaking with particular pride. The statement from Mr. Hendrick calls attention to the fact that the enormous disposal works on Back River have been practically completed, and the roof almost laid over the new sewerage pumping station on East Falls avenue. The pumps for this station, almost the largest of their kind in existence, have been completed and are awaiting shipment from the factory. Mr. Hendrick still sticks by his promise that the completed portion of the system in the eastern and northeastern sections of the city will be ready to be put into operation by 1912.

Contamination of Water Increases Yearly

Cleveland, O.—Proof that the city's water supply is becoming more contaminated each year is seen by Superintendent Ford, of the Health Department, in a report showing the results of the bacteriological examination of water from the new intake each day since the year of the completion of the new water tunnel. The bacteriological report shows that during the year 1904 the presence of colon bacilli was discovered in the water only on 12 days. In 1905, 11 days was the total. The total for 1907 was 29 and in 1908 it jumped to 40 days. In 1909 it was 43, and for the first 11 months of the present year it was 57. Indications are that the complete report will show a total several points above 60. Health officials compare this bacteriological showing of the water supply with the typhoid reports. The total number of typhoid deaths for this year will run to about 104, as against 67 for the year 1909.

Sewer and Water Pipes in Same Trench

Mt. Jackson, Va.—The town has just completed an up-to-date water and sewer system. With a natural drainage the town was adapted to an easy disposal of its sewage. When the water system was voted on favorably last summer some of the citizens agitated a sewer system along with the gravity water system. Acting upon this, a committee secured the necessary money to purchase the pipe. This pipe was laid in the same trench with the water line, and the entire work was completed at a cost of a little more than \$12,000. Kneisley Bros., of Woodstock, Va., had charge of the work, Mr. H. A. Kneisley, of the firm, supervising it. A reservoir of 600,000 gallons has been built in Massanuttn Mountain, several large springs furnishing the water. A pressure of 110 pounds has been developed.

No Public Drinking Cups Allowed in Idaho

Boise, Idaho.—The public drinking cup was abolished as an institution within the borders of Idaho January 1. Drinking fountains in the public buildings probably will be supplied with paper cups which can be used only once. The new law prohibits the use of common drinking cups on all railroad trains, railroad stations, hotels, stores, public and private schools and a number of other institutions. Circulars have been issued by the railroad companies ordering their employees to remove all cups from passenger cars while traversing Idaho.

Sewers Choked by Street Flushing

Philadelphia, Pa.—Complaints have come from many sections of the city because of the filthy condition of the streets, but more particularly because Contractor Vare's men are pushing the filth, left after the snow melted, into the sewers instead of carting it away. One result has been the choking up of the inlets, rendering the smaller sewers useless, and in some sections causing water to back up into cellars. Besides the trouble with sewers, there has been considerable complaint from the water officials regarding the use of filtered water at a time when it may be necessary to pump raw water into the mains.

WATER SUPPLY

Watervliet Water Situation Serious

Watervliet, N. Y.—A mass meeting of Watervliet citizens was held last week in Corporation Hall, when action was taken on the present water situation. The meeting was called by Mayor Hanratta and the Water Board. The large hall was packed with prominent residents of the Arsenal City. Mayor Hanratta said in calling the meeting to order that he and the Water Board had done all in their power to protect the city from fire. He made arrangements with the Roy Mill, where thousands of gallons of water are being pumped from the Hudson into the mains, and the Watervliet Arsenal and Green Island Water Company are furnishing several thousand gallons daily. The Mayor said he had visited Commissioner of Public Works Mann, of Troy, and that official assured him that the Collar City will furnish fire engines in case of a fire occurring in Watervliet. "Gentlemen," said the Mayor, in closing, "I am out for a municipal plant. The Hydraulic Company is not trying to help us out." Other speakers expressed themselves as favoring a municipal plant.

Favor New Water Rate

Cleveland, O.—A special committee of Council, appointed some months ago to look into the question of establishing new water rates will advise that a ready-to-serve charge of \$1 be substituted for the present minimum charge of \$1.25 for houses of six rooms or less and \$2.50 for houses containing more than six rooms. This single minimum of \$1 would be charged whether water is used or not and would entitle the consumer to the use of 2500 cubic feet of water without additional charge. Above this \$1 charge there would be a charge of 40 cents for every thousand feet of water used.

Water Company Sues City

Connersville, Ind.—The Connersville Hydraulic Company has brought suit in the Circuit Court to enjoin the City of Connersville from tearing down and removing the engines, boilers and pumps of the city water works, located on the hydraulic company's ground, to the city's new plant. The city formerly received its water supply through the canal maintained by the hydraulic company, and erected a pumping station on the company's ground, the lease for which expired about 18 months ago. The hydraulic company alleges that by the terms of its lease to the city, after the expiration of the time it was to run, the buildings and pumping machinery, if not removed before, become the absolute property of the company. The president of this company is E. Dwight Johnston. Finly H. Gray, Mayor; the members of the Council, the contractors and T. H. Stoops, of this city, are defendants.

Water Contract Renewed

Elizabeth, N. J.—The contract between the City of Elizabeth and the Elizabeth Town Water Company has been renewed for a period of three years. In the contract, however, were important alterations to benefit the city. The special committee on water supply that had in charge the matter of resuming the contract first reported favorably, and later a resolution empowering the proper city officials to execute a contract in accordance with the recommendations of the report was adopted. The new contract will reduce the cost of water for each fire hydrant from \$15 to \$10 and the water company will agree to furnish free water for street sprinkling. The rates to municipal buildings and fountains will remain the same, as will the rates for houses. The discount on bills paid at the proper time will be 10 per cent, instead of 5 per cent. So that the city may be protected there will be a clause in the contract providing that the city can revoke the contract at any time after giving a notice of 90 days. This clause was inserted, it was explained, so that if the city at any time thought it proper to install a municipal water plant—as recommended by Mayor-elect Stein—it could be in a position to do so. The new contract took effect on December 31.

Year's Work of Minneapolis Water Department

Minneapolis, Minn.—During 1910, up to Dec. 29, the City Waterworks Department spent \$779,897.58. Of this, \$550,000 was for construction work. The total receipts for the year up to Dec. 29 were \$516,764.22, with approximately \$35,000 to be added before the new year, making all told \$551,764.22. Construction work this year has been unusually heavy, work on the filter plant alone costing \$76,352.46. Then large feeder mains have been laid, entailing heavy outlay. The cost of material used amounted to \$270,340.33. It has been necessary to draw over \$200,000 on the surplus of \$414,000 of last year. The revenue this year was \$90,000 more than a year ago, \$347,330.96 for water being collected in 1909, as compared with about \$430,000 for 1910. During the year 4170 meters were installed, compared with 3455 last year, and 3612 taps were made, compared with 2978 in 1909.

Must Drink Raw Water

Philadelphia, Pa.—Street cleaners have opened fire plugs and otherwise wasted water to such an extent while flushing streets recently that the water in the Oak Lane reservoir was so depleted that it was necessary for the Water Bureau to supply raw water to make up the deficiency for that section of the city depending upon that source of reserve supply for filtered water. It was several days before the pumping stations and filtration system were able to catch up with the loss sustained by the wasteful use of water in flushing the streets. Manufacturers in the northeast have complained of the lack of water to properly operate their mills. One concern on Lehigh avenue, where many plugs were opened at one time and cleaners refused to use the hose as directed, there was but one pound of water pressure, and it was impossible in some instances to feed water to boilers which were supplying power without shutting down the plant and reducing the steam pressure.

Considerable complaint has been made of freezing fire plugs, which Chief Dunlap declares is avoidable, and is the result of the constant opening and closing of plugs which freeze while the water is permitted to drip from an improperly closed plug. The fire plugs are so constructed that when the flow is properly shut off the valve is so low in the ground that it will not freeze. The water left in the plug when shut off quickly leaks through a duct into the earth, entirely emptying the exposed section of the plug.

Improvements in Water and Light Plants

Mishawaka, Ind.—In the Electric Light and Water Department the electric light extensions and improvements cost estimated \$4,000; 9000 feet of water mains cost \$8,005; three pure water wells, 10 inches in diameter, about \$3,500. Total in department, \$16,000. The Water Department now has 1816 patrons and the Electric Light Department 1460 patrons, a fine growth. In 1911 the city will in all probability build a pumping plant in East Mishawaka, giving the city pure water in the mains.

Water Meters in Petersburg

Petersburg, Va.—City Engineer Robert Budd, on a visit to Norfolk, made the following statement of the results obtained in Petersburg from the use of meters:

No city which ever adopts meters is willing to abandon them. There was a feeling against their use in Petersburg when they were put in the ground, but that city will not give them up now, for they are profitably used. Before meters were installed Petersburg was pumping 2,500,000 gallons of water a day. The first few months after the installation of the meters the pumpage was reduced 90 per cent. The daily pumpage now is 800,000 gallons. The average household charge in Petersburg, under meters, is 65 cents per month. Before they were used I was paying \$36 a year for water.

There was a panicky feeling in Petersburg when the meter system was adopted. The pumpage fell very low, and there was a cry that the city would not get enough revenue from its water rents to maintain the water department. Gradually this feeling subsided as the people became accustomed to meters.

Despite the revenue of the Water Department of Petersburg has been reduced by the installation of meters, this has been more than offset by the decrease in the operating division of the department. We are able to shut down our pumps at midnight sometimes and the great decrease in pumpage has cut the coal and other bills way down.

City Liable for Damages in Supplying Bad Water

St. Paul, Minn.—The Supreme Court has handed down a decision declaring that a city with its own water works system is liable for damages that citizens suffer by getting bad water. The case may mean damage suits aggregating millions of dollars for municipalities where typhoid epidemics can be traced to the water supply. The decision was given in the cases of Della Keever and Kate Flanagan, two Mankato women whose husbands died during the typhoid fever epidemic in that city in 1907 and who sued the city for \$5,000 damages each. The lower court ruled against them and the Supreme Court reversed the case. The attorneys for the defendant said in their argument before the court last spring if it was decided that the city was liable it would mean damage suits aggregating \$10,000,000 would be filed against the city. This, they said, would bankrupt the city and threaten its very existence, as the assessed valuation of property in Mankato is only \$4,000,000. The cases now go back to the Blue Earth County District Court for retrial, and it will be a question of fact for the jury to determine whether the husbands of the defendants got the typhoid through the water supply and whether the city was negligent. It was commonly understood that the typhoid epidemic was due to a leak from the sewer system into the water system, but it may be a difficult matter to prove in court that it was the city's fault.

Sheboygan's Municipal Water Plant Is Paying

Sheboygan, Wis.—With revenues of \$81,664.70 for the year the Sheboygan Water Works plant, under the second year of municipal ownership will show a large increase in profits. It being estimated that the net receipts of the plant will exceed \$57,000. The gross revenues of the plant for the previous year are given at \$77,000, showing a gain of \$4,664 for 1910, the fiscal year for which closed June 30. Accompanying the report is a recommendation of the City Water Commission for a 10 per cent reduction in water rates to consumers.

Water Company Treats City Liberally

Bridgeport, Conn.—At the solicitation of Mayor Buckingham, and as a New Year's gift to the city, the Bridgeport Hydraulic Company has released the municipality from any obligation to pay for water supply for the hydrants. The historic controversy over this contract is done away with without legal entanglements and the resultant cost of time, harmonious feelings and money. The announcement was made New Year's day, and is considered to be an excellent example of a corporation helping a city in its growth and general prosperity; also an example for other water supply corporations in other cities. The contract with the city has about 16 years more to run. During years past this has been a point of issue between individuals and the hydraulic company. For this purpose the sum of \$12,000 is appropriated annually by the city. By its action it is estimated that, even if the city has no growth and there is no increase in the number of hydrants, the company practically makes a present to the city of \$192,000, the total of 16 years' payment of \$12,000 annually. Surely the city and Mayor Buckingham are to be congratulated over this result. But here will be a notable increase both in the size of the city and the number of hydrants. Although impossible to predict the amount of increase, a conservative increase places the present at a total of \$250,000.

New Filtering Plant Completed

Eugene, Ore.—When the university students returned last week they were able to secure pure water from the city mains. One of the largest modern filtering plants in the State has been recently completed. The type of filter, which is the same as that in use at Oregon City, has been approved by the university and State authorities. It will cost the city over \$60,000. Before this the city water was filtered, and repeated tests showed it to be pure, but the plant was a small one, and suspicion and caution have prompted many to boil the water or to use well water. It is thought that the latter is responsible for half a dozen cases of sickness in the last few weeks. It was noticed the sickness occurred immediately after a flood of the Willamette, and it is thought that the heavy rains and high water washed surface water into the wells and contaminated them.

STREET LIGHTING AND POWER

Ornamental Lighting Movement Spreading

Atlanta, Ga.—Since the turning on of the "Great White Way" on Peachtree, Whitehall and Mitchell, the beauty and value of this scheme of ornamental public lighting has gradually grown into the good graces of the people generally, and it is now generally recognized that Atlanta, in its main artery of retail traffic is the handsomest lighted city in the South. These ornamental lighting standards are being placed on Marietta to Cone and on Forsyth street from Marietta to Peachtree, on Broad street from Marietta to Peachtree and on Luckie from Forsyth to Peachtree. This second installation will probably be turned on about the first of February, thus adding another large portion of the downtown business streets to the system of lighting that so beautified the central thoroughfares. It has long been recognized as a logical and proper thing to do to light in this same manner Pryor street from Peachtree on through at least to the railroad and the intersecting streets between Peachtree and Pryor. The various people who have interests on Pryor street have in the last few days gotten together and have signed up practically all frontages, thus insuring the spread of the lights to Pryor street, and it is probable that other adjacent streets in the very near future will also be canvassed and added to this third installation. The property owners and merchants on Pryor street are very enthusiastic about this movement, as they have plainly seen the value of the lights to the street and how dark it is in comparison to the other streets thus lighted. Never before has Atlanta had the opportunity to note how truly "business follows the lights." It is generally conceded as a fair and proper move for the City Council to light and maintain the system on other downtown business streets and undoubtedly this will be the attitude of the Council when the recently canvassed blocks have been presented for their consideration.

New Contract and Improved Lights

Defiance, O.—The ten-year contract between the Defiance Gas & Electric Company has been signed by President William T. Morris, of the Defiance Gas & Electric Company, and the Director of Public Service. This means the end of the much-discussed lighting problem and the poor light service, as the company will immediately begin the work of installing the new system of street lights.

The principal points in the contract are as follows:

It is for a period of ten years. Street lamps numbering between 83 and 100 are to be on the rate of \$70 per lamp per annum. The lamps are to be of modern inclosed type, the long burning series and produce a much better light than the present old style lamp. On the business part of Clinton street the company is to install six Boston flaming arc lamps, which give a much greater light than the ordinary arc lamp and are more expensive to install and more costly to operate. Electricity for commercial use is to be charged at the rate of 9 cents per kw-hour with a discount of one cent per kw-hour if the bill is paid by the tenth of the month. Gas is to be charged at the rate of \$1.35 a thousand, with a discount of 10 cents a thousand if the bill is paid by the tenth of the month. The city is to have the privilege of carrying the fire alarm wires on the poles of the company. The poles of the company are to be painted in accordance with instructions of the Director of Public Service.

Want City to Pay for White Way

Des Moines, Ia.—The Commercial Club will make a big fight next year to compel the city to pay for the electricity used in the downtown electrolier street lighting system, according to Secretary Geis Botsford. "With the current paid for by the city the system would be extended to practically every business block in the city," Mr. Botsford said recently. "The city is not playing fair. A year ago it was intimated that after another year the city would pay for the current, but the commissioners seem to be making no plans to do so. Instead, the citizens are paying for the lighting of downtown streets as individuals. The city turns off its arc lights in the downtown districts until after midnight, when the electroliers go out."

St. Maries Will Have Good Light

St. Maries, Idaho.—The citizens in the west end are having installed a new street lighting system which, when completed, will be the only one of its kind in the Northwest. The lights form an arch across Front avenue at each corner, with 150 four-candle power tungsten lamps and one huge arc light in the center.

Power Plant in Connection with High Dam

St. Paul, Minn.—In reply to the criticism of G. W. Lewis, secretary of the Mississippi River Boulevard Association, anent the advisability of constructing the high dam for power purposes in which it is pointed out that in planning for the generation of electricity no provision has been made to pay for the installation of an auxiliary steam plant in case of low water, Mayor Keller declared the steam plant provision has been under consideration by the business corporation, comprising the officials of the Twin City and the university authorities, ever since the question of using the high dam for power purposes was first taken up. The Mayor said the engineering departments of the two cities and the dean of the school of engineering of the university had given the auxiliary power plant installation considerable investigation, and he believed a detailed estimate of this plan had been included in the general estimate of the expense which would have to be borne by all parties interested in the improvement.

Gas Company Says It's Going to Quit

Cleveland, O.—The East Ohio Gas Company, recently denied a franchise giving it the right to increase the price of artificial gas, has taken the first step toward making good its threat to shut off the supply by notifying all the employees at artificial gas plants of their dismissal to take effect Jan. 17, 1911. Over 1000 men are affected.

City Gets a Good Natural Gas Well

Iola, Kan.—Drillers for the Municipal Gas Department have brought in the best gas well in recent years on the Arnold lease in the west field. Other wells will be drilled in the vicinity of the new gasser in the near future.

FIRE AND POLICE

New Auto Apparatus Received

Augusta, Ga.—The new Webb auto chemical hose and ladder wagon, just received, has been named Thomas Barrett, Jr., in honor of the Mayor. The apparatus differs in some details of design from any other in the country. The ladder receptacles are made according to suggestions of Chief Reynolds and Chairman Kalbfleisch.

Driving over Fire Hose to Be Stopped

Baton Rouge, La.—City Fire Chief Hugh Waddill announces that after Jan. 1 any person who drives over city fire hose will be promptly arrested and prosecuted before the city court. There have been a great many complaints from firemen over the way persons have been in the habit of driving over hose at fires. The weight of a carriage does serious damage to the hose. There is a city ordinance against driving over the hose, and the Fire Department officials say that the ordinance will be strictly enforced.

Self Government for Police of Berkeley

Berkeley, Cal.—Chief of Police August Vollmer has announced that hereafter the men of the Police Department are to govern themselves, settle their petty differences by a jury of their peers and hear complaints made against them both by members of their own corps and the general public. In the latter cases the approval of the Chief and Commissioner of Public Health and Safety is required before the findings are regarded as final. Chief Vollmer has been considered as one of the most progressive police chiefs in the country, and the result of his experiment will be watched with interest. A year ago he established the golden rule policy. The soft non-fracturing club was adopted some time ago as the official weapon of patrolmen.

Police Department Buys Bloodhounds

Chattanooga, Tenn.—The Chattanooga Police Department now owns two fine-looking bloodhounds, and from all reports their record is as good as their looks. The new hounds were received in the city last week and were at once turned over to Detectives Clark and Gibson, who will have charge of them. They came from Brushy Mountain State Prison, and have a record of making a number of good catches at the prison. The hounds are the property of the city, and will be used in cases of arson, housebreaking, larceny and all cases where work of this kind is needed.

Water Supply Failed—Town Nearly Destroyed

Granville, N. Y.—The village of Granville was saved from destruction by fire Jan. 3, by a sudden shift of the wind after the flames had consumed ten blocks of business buildings, three hotels and seven residences. The loss was \$300,000. There were no casualties. The fire had free sway owing to the failure of the water supply. Long lines of hose were strung to the Pawlet River, but the stream which was pumped was too feeble to be of much service. The fire started in a clothing store. Its cause has not been ascertained. Granville has a population of about 5000.

Fire Chief Advises Against Special Privileges

Milwaukee, Wis.—Fire Chief Clancy has advised the Council Committee on Public Buildings and Grounds not to grant any special privileges to vacate or build over alleys in the downtown district on account of the danger through fires. "I am strongly against closing up alleys or building over them with nothing but a driveway for the reason that it would give the Fire Department no opportunity to fight fires," he said. "No ladders could be erected and the flames would be given an added impetus to do damage. We must not only fight fires, but also prevent them."

New Fire Chief for Auto Apparatus

Minneapolis, Minn.—Charles W. Ringer, who has recently been appointed Chief Engineer, is reported to have said that no more horse-drawn fire apparatus will be purchased or ordered built, if he can direct it. He is in favor of motor-propelled vehicles. "It is time Minneapolis had apparatus on automobile trucks," he said, "and I am going to start construction of a motor-propelled combination hose and chemical wagon in the repair shops as soon as I can."

Fire Chief to Investigate

Elkhart, Ind.—Mayor Chester has announced that Fire Chief Ulrich would at once begin a thorough investigation of conditions in all business buildings and other large structures, especially the basements. The object is two-fold—first, to order correction of improper conditions and, second, to acquaint the firemen with the "lay of the land" in order to be better able to meet emergencies. The Chief will be accompanied by different firemen at different times.

Steam Engine and Paid Department Are in Service

Navarre, O.—The Navarre Fire Department has disbanded. It held its final meeting last week, read and approved the minutes, transacted some business and adjourned sine die. Hereafter the protection of the village will rest with a department consisting of 15 men who will work under the direction of a chief, an assistant chief and an engineer. A new steam engine has been purchased and the old hand engine serves no other purpose than to show posterity with what apparatus their ancestors worked. The City Council, which purchased the new engine, has assumed supervision of the new Fire Department, which is expected to do wonders in the future. Navarre residents say that they will never work more faithfully or more loyally than did the old company with the hand engine. That, they say, would be impossible.

Fire College for City

New York, N. Y.—For three months or more Commissioner Rhinelander Waldo and Chief E. F. Croker have been perfecting a project which Hugh Bonner often talked about—the establishment of a "Fire College," so that the lore of fire fighting, gained by individuals in years of fighting thousands of fires, might be preserved instead of dying with the individual. Practical work in machine shops, lectures on explosives by well-known chemists, talks and demonstrations by electrical engineers on the new problems offered by the high voltage electrified railroads, the handling of blazes in high buildings, a better understanding of the high pressure system, and very practical lessons in the scaling of walls, jumping into life nets, and the handling of all kinds of tools used by firemen, all these subjects and many more of a practical nature will be taken up and drilled into the force by the fire college. The fire college is not intended to supplant the regular drill school, but is inaugurated for the purpose of carrying on higher work.

New Fire Hose, All Good

New York, N. Y.—Commissioner Waldo has completed the purchase of 60,000 feet of fire hose, of which two-thirds will be used in Manhattan and the other third in Brooklyn and Queens. A new system was used in testing this hose. Every link was tested to make sure that it was up to its contract requirement of resisting pressure of 400 pounds to the square inch. The average strength of the new hose was found to resist 600 pounds pressure. The date of purchase is marked on a piece of red rubber at the coupling of each link. Under the former system only selected pieces of hose were tested.

Fire Alarm Boxes Provided with Lights

Rochester, N. Y.—In order to make the fire alarm boxes clearly recognizable at night they have been equipped with an incandescent lamp enclosed in an outer red globe. No change was made in the fire-alarm posts, a special fitting at the top being equipped with a shade holder and a 40-watt, clear-bulb, tungsten lamp over which is a red globe with the words "Fire Alarm" etched in it. The lighting circuit to the post is run underground either from the underground system or from a pole line, the leads in the latter case passing down the pole in conduit to the fire alarm post. Where the lighting circuits are on the opposite side of the street



Courtesy Electrical World

ELECTRICALLY LIGHTED FIRE-ALARM BOX

the circuit is placed underground in an iron pipe, a single conductor being used for one lead and the pipe itself for the other lead. In this way the extra cost of a double conductor is saved and the small transformers—for all the lamps receive energy from an overhead or underground 16-volt, 40-watt transformer connected to the constant-current arc lighting circuits—are effectually grounded. The small transformers are in most cases set in the manholes adjacent to the fire-alarm posts. The invention is the outcome of an incident that occurred some time ago, when a fire made considerable progress because a citizen could not find a box at night. It is the joint work of City Engineer Fisher and officers of the Rochester Rail and Light Co.

Schenectady's Annual Fire Record

Schenectady, N. Y.—According to the annual report of Chief Henry R. Yates, of the Fire Department, there were 280 fires during the year, with a total loss of \$62,307.01, as against 250 fires, with a total loss of \$152,086.71 in 1909. On the buildings in which there were fires during the year the insurance amounted to \$419,349.94, and their contents were insured for \$126,760, a total insurance of \$546,109.94. The insurance paid on the buildings was \$30,639.41 and on the contents \$26,882.60, with an estimated uninsured loss of \$4,685. These latter amounts added together are taken to represent the total fire loss of the year, \$62,307.01.

GOVERNMENT AND FINANCE

Enjoyed Being Mayor

Detroit, Mich.—Mayor Philip H. Breitmeyer, who retired from office on Jan. 1, was asked in what light he now viewed his policy of making his office a universal social club during his two-year incumbency, and how much it had cost him. The Mayor's chief object seems to have been to be a jolly good fellow to everybody. He has given banquets and other entertainments galore, and the invitations to the same have been sent out with a free hand. The Mayor said he had kept no account whatever of what it had cost him, but when different figures were suggested to him he admitted that it might have been in the neighborhood of \$40,000. "Do you think the fun was worth the price?" he was asked. "Young man," he replied, "I would have paid just three times as much for the honor of being Mayor of a city like Detroit. It has been a great experience. These have been the two happiest years of my life."

New Municipal Government Bill in Indiana

Indianapolis, Ind.—State Representative Adolph Roggan, of Allen County, has prepared a bill which he will introduce into the General Assembly, giving Indiana cities of the first, second and third classes the right to change their form of city government by abolishing old and creating new offices and prescribing the method of procedure. According to the draft of the bill a petition signed by 25 per cent of the total vote cast at the last city election asking a change in city government and setting forth the proposed change, shall be filed with the Mayor or City Clerk. An election must then be called to be held the first Tuesday after the first Monday in the month of November following. The Roggan bill offers an avenue for the substitution of the commission form of government for the present form in any Indiana cities voting the change, although the commission form of government is not mentioned in the proposed bill.

Busy Year for Public Service Commission

New York, N. Y.—At the close of business for 1910 the Public Service Commission, Second District, had presented to it for action 2071 different matters. These included 1438 complaints which were handled informally by the Commission and settled without the necessity of formal orders, 371 formal complaints and 262 applications from various corporations for authorization by the commission. During the year the Commission disposed of and closed 1670 of the matters presented. In addition to daily sessions and consideration of disposition of cases, the Commission held 554 hearings covering a period of 196 days. During the year the Commission authorized capitalization to the amount of \$151,048,108. In 1909 there was authorized \$142,855,035.85; in 1908, \$92,253,900; for the last six months of 1907, \$17,730,745.90, a total for the 3½ years of \$403,887,789.34.

Springfield, Ill., Votes for Commission

Springfield, Ill.—Springfield, the first city of Illinois to hold an election under the commission form of government statute, adopted the commission plan by a majority of 790. The people turned out despite a blizzard and voted for the new plan. The vote was 3790 for and 3000 against.

Spokane Adopts Commission Form

Spokane, Wash.—By a majority of 2237 out of a total of 10,463 votes, the commission plan charter, drawn by a committee of fifteen freeholders was accepted at the election of Dec. 28. The following will be the immediate effects of the new charter:

Any official filling an elective city office may be recalled. Any new ordinance may be introduced by initiative petition and election. Referendum may be applied to any ordinance except emergency ordinances, ordinances ordering local improvements and those ordering the annual tax levy and appropriations. Any provision of the new charter may be amended by petition and election. Succeeding elections of city officials will be under the new commission system, the next general election to be on March 7.

The other powers of the charter—those which directly affect the administration by the commission—will go into effect when the first commission has been elected and has qualified.

Waldo Urges Bureau for Prevention of Fire

New York, N. Y.—Fire Commissioner Rhinelander Waldo recently testified as follows before a legislative committee on the subject of fire prevention:

The question of the Fire Department divides itself into two branches, the extinguishing of a fire and the prevention of a fire. In my opinion, the prevention of fire is the subject in which greatest development for the future lies. The extinguishment of fire is now being handled extremely efficiently by the New York Fire Department. The fire prevention is, however, as I said before, a subject which I believe is most susceptible to improvement. To-day we have many devices of fire prevention. We have the automatic sprinkler system. We have the perforated pipe systems; we have the standpipes and the introduction of fire extinguishers and automatic fire alarm telegraphs giving notice of a fire at its start. I think the Fire Department should have some legislation which would make this bureau of fire prevention a separate one from the bureau of fire extinction, and it should have authority to compel the introduction of these devices in premises where the business carried on is of a hazardous character, such as in workshops and storehouses and department stores. I think if the Legislature would pass some act which would give the Department authority to do that it would greatly limit the loss. Also another subject which I think you ought to take up is the one preventing the fire insurance companies from overinsuring. A man can to-day get out an insurance without having his property adequately inventoried and thereby give him an incentive to incendiarism. I think it ought to be made a penal offense to insure any property unless a careful inventory has been taken by the insurance company. There is no question but what a large percentage of all fires here is of an incendiary nature and are incurred by the laxity of the insurance companies in inventoring.

Police Will Be Provided with Rifles.

Pittsburg, Pa.—Chagrined by the escape of a score of burglars during the last month for lack of long-range weapons, William Bennett, Chief of Police of Braddock, a suburb, has ordered ten regulation Springfield rifles. Councilmen argued it might not be legal for policemen to carry such firearms, whereupon Chief Bennett, a Civil War veteran, wrote Secretary Knox at Washington for an opinion. The answer was satisfactory and the Council approved the bill.

STREET CLEANING AND REFUSE DISPOSAL

Metal Garbage Cans and Trolley Loading Stations Recommended

Baltimore, Md.—Declaring that rats are overrunning many sections of the city, Col. Joseph L. Wickes, Commissioner of Street Cleaning, in his annual report to the Mayor will make another earnest plea for the passage of the ordinance requiring all householders to use covered metal receptacles for their garbage. According to Colonel Wickes, the rodents are becoming more and more numerous in Baltimore and bolder in their devastations. He attributes their growth and activities to the contributory negligence of householders who expose their garbage, and thus provide food for rats. Colonel Wickes will also recommend again the reorganization of the system of collecting and disposing of non-perishable waste, such as ashes and rubbish. He will recommend the establishment of the system used in Brooklyn, where central collection points are provided from which the waste is carried out of the city on trolley cars.

Preventive Measures to Aid in Street Cleaning

Cincinnati, O.—An active campaign toward keeping the streets clean was launched at a conference between Mayor Schwab and Street Cleaning Superintendent Maag. The attention of the officials was called by the Woman's Club, which made many valuable suggestions as to how the matter could be remedied, and to the practice of littering streets by sweeping dirt out of stores onto the sidewalks.

Will Continue to Measure Snow Wagons

New York, N. Y.—Commissioner of Weights and Measures Walsh and Leo Arnstein, secretary of the Borough of Manhattan, have devised a plan for continuing the measuring and sealing by the Bureau of all wagons used in snow removal. During the recent storm Mr. Walsh found that the extent of the work was such that it taxed the capacity of the Bureau and kept his inspectors from attending to their regular duties. The failure of the inspectors to prevent delay in handling the wagons was also assigned by Street Cleaning Commissioner Edwards and others for the almost unprecedented delay in getting the streets of the city cleaned up. Mr. Walsh and Mr. Arnstein have decided to draft a large number of men from other Departments and Bureaus, principally from the offices of the Commissioner of Accounts and Borough President McAneny, to do this work.

RAPID TRANSIT

Impossible to Supply Seats Even in Non-Rush Hours

New York, N. Y.—With the statement that it is impossible to provide seats for all passengers in the subways in the non-rush hours, Theodore P. Shonts, president of the Interborough Company, has given notice to the Public Service Commission that its orders could not be observed. Mr. Shonts asked for a new hearing on the order increasing service, but at the same time states that the company has no intention of carrying out the improvements suggested. Mr. Shonts suggests that if the Commission persists in demanding better service in the non-rush hours the question of the legality of such orders will be taken to the courts. The Commission granted the request for a new hearing and set the date for January 12, before John E. Eustis. "The terms of the Commission's orders are not accepted by this company," Mr. Shonts wrote. "The terms are impossible of performance. The order makes no provision for temporary prevention from complying with its terms by accident or other controlling emergency. The terms are unjust and unreasonable. The order deprives this company of the right of ownership and management and protection of its property and the property of others committed to its care."

May Abolish Three-Cent Fare

Cleveland, O.—Wall Street threatens to put an end to Cleveland's enjoyment of a three-cent street car fare. This rate has been in effect for over a year. The service has been good, but Wall Street has been asked to furnish funds for certain improvements the Cleveland Railway Company desires to make, and the money kings insist that the fare be raised before they put up the cash. Cleveland Railway Company officials will open negotiations this week with Mayor Baehr and other authorities to have the Taylor franchise amended to meet suggestions of N. W. Harris & Co., of New York, who offer to finance the property under certain conditions. The amendments suggested are of such a nature as to make certain an increase in the rate of fare. "Never mind. There will be no increase in the rate of fare," was Mayor Baehr's only comment on the situation.

MISCELLANEOUS

Dock Commissioner Plans System of Open Piers

New York, N. Y.—Dock Commissioner Calvin Tompkins is slowly working out a plan for the reorganization of the pier system of the city, by which the piers will not all be turned over to steamship companies and private corporations for their exclusive use at nominal rentals, but many of them will be held as "open piers," on which privileges will be let to various business concerns. This will relieve the lack of pier facilities for the small business man, and in the course of time will substantially add to the city revenues.

Close First Year of Separate Park Department

South Bend, Ind.—Maintaining the park system of South Bend during 1910, the first year it became a department separate from the Board of Public Works, cost the city \$22,851.59. Of this amount \$5,308.24 was spent for salaries, while \$8,095.19 was paid out for labor in the parks. The park system was separated from the Board of Public Works the first of last year when Fred C. Winkler, Simon Greenebaum, Richard Elbel and Col. George M. Studebaker were named Park Commissioners. With the death of Mr. Winkler, who was president of the Board, Mr. Elbel became head of the department, while Dr. E. J. Lent was appointed to fill out the unexpired term of the deceased member. Herman Beyer was retained as superintendent of the park system. Other expenditures in the department for the year shown in the annual report compiled by Clerk A. P. Perley, follow: Miscellaneous articles, \$1,752.17; tools, \$268.91; seats and buildings, \$902.02; lights, \$70.07; plants and shrubs, \$587.57; rinks, \$776.02; roads and paths, \$321.16; concerts, \$1,192.10; fuel, \$100.90; repairs, \$271.34; plumbing, \$6.10, and zoo expenses, \$785.80. Donations for the purchase of land during the year amounted to \$785.80.

Small Measures Generally Short from Wear

Massillon, O.—Sealer Martin, in a report, said that during the six months he had been in office he had found 216 scales correct and 83 needing adjustment. He said he found 88 correct half-bushel, peck, half-peck and quarter-peck measures, but all quart and pint dry measures short. He said there was no intention on the part of the dealers to defraud their customers, but the weights had become short through usage and wear. The testing equipment, he said, had cost \$198.36; incidentals, \$11.50; office supplies, \$8.50; salary, \$150.

Co-operative Town to Be Established

Muskogee, Okla.—To establish a town on a co-operative basis, with all of the conveniences for a city and in close proximity to Muskogee, is the hope and ambition of a number of working men in this city, and the plan has crystallized to such an extent that articles of incorporation will soon be filed. The scheme is to secure sufficient land to enable 100 men to own conveniently sized lots on which to build a home. The homes will radiate from a business section laid off with a view to having enterprises which would supply the entire town. A co-operative store, a farmers' union warehouse, a gin, cannery and creamery are also provided for, as well as sites for a central temple or convention hall, a theatre, school house, park and green house and nursery. Altruria will probably be the name of the town.

Cannot Prosecute Dealer for Sale of Short Measure Goods

Grand Rapids, Mich.—That the public of this city are being systematically defrauded in the sale of matches and clothes lines through no fault of the retail dealers was discovered to-day by City Sealer Byrne, who, after a consultation with Assistant City Attorney Ferguson, was forced to acknowledge that the retailer was not responsible under the law for the practice and cannot be prosecuted. City Sealer Byrne's attention was attracted to the practice by a complaint which reached him last week. A woman in the south end of the city had two clothes line poles set in her yard a hundred feet apart and went to her retailer to procure a line. The retailer sold her two packages of line which was represented by the label to contain 50 feet of line per package. She purchased two and went home to find that the two packages lacked 16 feet of reaching from pole to pole. She reported the matter to City Sealer Byrne and he started an investigation which resulted in his finding that every package of this brand of clothes line measured only from 42 to 43 feet in length. He ordered the retailer to stop the sale, but the merchant pleaded innocent with manifest justice and Assistant City Attorney Ferguson upheld him in his innocence. Then a complaint about matches was received and the City Sealer bought several packages of matches and in one on which the label represented the box to contain 500 matches he found only 250 matches and this count was substantially borne out by a count of several boxes. Assistant City Attorney Ferguson says the retailer, while he can be prohibited from selling these short measure goods cannot be prosecuted because he is not primarily responsible for the contents of the package and buys them in good faith, relying on the representation of the package label, and sells them with the same good intent. The city ordinance or State law cannot reach the manufacturer, and the only hope for the people Mr. Ferguson sees is the enactment of a National Sealer of Weights and Measures to operate under a national law that will reach every manufacturer, and this coupled with a uniform system and State laws applying to weights and measures.

Accepts \$500,000 for Fountain

Detroit, Mich.—The Detroit City Council has voted to accept the \$500,000 set aside by the will of James Scott, among a picturesque figure of this city, to be used in building a memorial fountain and life-sized statue of him in Belle Isle Park. For more than a month the clergy and various citizens and organizations fought against accepting the gift because they considered its giver not the proper person to be remembered by any public object, even if he left the money for it. The clause in the will setting aside the half million dollars for the memorial has been dubbed "Jim Scott's last joke."

Topeka Will Operate Amusement Park

Topeka, Kan.—Topeka will have a new amusement park next summer—and it will be under municipal control. The Board of City Commissioners have decided to make Garfield Park into an "electric white city" and the City Clerk has been asked to advertise for bids from different amusement firms for the purpose of carrying out the plans. Boating, band concerts, figure 8, merry-go-rounds—and concessions and attractions of all kinds have been placed on the list of required amusements. Everything of an entertaining nature which is included in an up-to-date metropolitan amusement park will be sought for Garfield, and the gates must be opened for the grand opening early in the summer. It is believed by the city officials that a park of this kind would be greatly appreciated as well as patronized by the people of the city. It is also figured that the royalties and the revenue to be obtained from such a park will be a profitable undertaking to the city.

Will Muzzle Dogs for Year

Boone, Ia.—Mayor Wilder has ordered that all dogs in the city be muzzled for a period of one year. This unusual order is the result of the death from rabies of a four-year-old child and the injury of nearly a dozen citizens by being bitten by dogs within a few months. Mayor Wilder is considering the advisability of ordering all dogs in the city killed.

Want Municipal Telephone System

Thief River Falls, Minn.—The Tristate Telephone Company, which holds a franchise for a telephone system in this city and which has been running the local exchange for two years has been prohibited by the city authorities from setting poles in the alleys of the city. There has been more or less dispute between the company and the Council for some time, the city claiming that the franchise is not legal and the company claiming it is. When the company sought to string wires or set poles they met with opposition and it is likely that the trouble will have to be settled in the courts. There is a strong sentiment in the city in favor of a municipal ownership of the system, as the city owns its own electric plant and makes it pay handsome returns annually. The water works are also city owned and in the near future the city may install a telephone system. This is the chief reason why no further extensions of the present lines will be permitted by the authorities.

Washington Streets Flushed with Hose

Washington, D. C.—Following the partial melting of snow the streets were in unusually bad condition. Seven gangs of six men each were put to work flushing the streets. Wagons borrowed from the Water Department were used to carry the hose from hydrant to hydrant. The work was so effective that in two or three days walking and automobiling had resumed their normal state.

For City Aviation Landings

Modesto, Cal.—Visions of the days when men shall fly as they now ride in street cars are called up by a provision in the new charter adopted by the citizens of Modesto. Power is given to the city to construct and operate aviation landings as a municipal enterprise, and it is said that the clause is wide enough to enable the city fathers to conduct aerial contests and to build aviation parks.

Mayor Would Have Municipal Laundry

Petoskey, Mich.—As a means of increasing the popularity of Petoskey and alleviating the troubles of housewives, Mayor Reycraft advised the Council to consider the project of building a municipal laundry. As a result of the recent installation of new machinery in the city light plant, more power is generated than is needed, and the Mayor suggested that it be put to this use. Water could be heated by means of electricity, and a great saving of time and labor to private citizens would result.

State to Share in Expense of Grade Crossing Changes

Trenton, N. J.—The Board of Public Utility Commissioners has recommended in its annual report to the Governor that a law be passed under which the State, as well as the municipalities and railroads affected, shall share the burden of expense of abolishing grade crossings.

LEGAL NEWS

A Summary and Notes of Recent Decisions—Rulings of Interest to Municipalities

Flooding Land—Measure of Damages

Ewing et ux. vs. City of Louisville.—Where a municipal corporation establishes an original grade on a street it is not liable for injuries thereby to adjacent property. Where the city established an alleyway without a culvert or drain, which caused surface water to back up on plaintiff's premises, it is liable under the direct provisions of the constitution, which allows compensation for property injured or destroyed, as well as that taken, for a public use. When a case is reversed, instructions on retrial should conform to the view of the law expressed above. Where water is turned on plaintiff's premises, the measure of damages if the nuisance is permanent is the depreciation in the market value of the property and one recovery must suffice; but if the injury is temporary, it is the reasonable cost of repairing and the depreciation of the rental value of the property during the time sued for or the damage to its use. In an action against a city for constructing an alleyway that caused water to back up on plaintiff's land, the city cannot show to mitigate damages that the alley renders the property more convenient and valuable.—Court of Appeals of Kentucky, 131 S. W. R., 1016.

Contractor's Bond—Material Man

Gate City Lumber Company vs. City of Montesano et al.—Laws 1909 provide that any municipal council contracting for the performance of any public work shall require a bond of the contractor for the payment of all material men and just debts incurred by the contractor. Section 2 makes the city itself liable on failure to take such a bond. An action was brought against the contractor, its receiver and the municipality for which the contract work was done to recover the contract price for material furnished to the contractor. It appeared that a part of the material furnished was neither used in the work nor delivered upon the ground to be used therein. Held, that neither as a material man nor as one to whom a just debt had been incurred in the performance of contract work could plaintiff recover of the city for material not used or delivered on the ground for use.—Supreme Court of Washington, 111 P. R., 799.

Street Improvement—Delays—Waiver

Cushing vs. Bullock et al.—Invalidity of tax bills for a street improvement on account of the contractor's failure to complete the work within 90 days, as required by his contract, was not waived by an owner requesting the contractor within such period to complete the work according to the contract, and agreeing that if the work should be completed to the satisfaction of the City Engineer "as aforesaid" that the owner would not contest the tax bills, though the work was actually completed within a six-months extension of time granted by the city.—Kansas City Court of Appeals, Missouri, 131 S. W. R., 713.

Public Improvements—Proceedings—Objections

Johnson vs. City of Indianapolis et al.—An owner of a part of agricultural lands annexed to a city by ordinance, adopted as authorized by acts 1905, who feels aggrieved by the action may, as authorized by section 243, appeal to the Circuit or Superior Court, and where he fails to avail himself of such remedies he cannot in proceedings to construct a sewer so as to create a lien on the land in the territory annexed insist that the council did not have sufficient reason for annexing the territory.

Under acts 1905 authorizing the Board of Public Works to hear persons interested or whose property will be affected by a proposed improvement on the question of special benefits, etc., the board may exercise its own honest judgment, and it need not decide the question of benefits on the weight of the evidence formally presented at the preliminary hearing.—Supreme Court of Indiana, 93 N. E. R., 17.

Change of Grade—Paving

Lawrence vs. City of Corning.—Corning City Charter provides that the grade of a street shall not be changed, except on petition of resident owners of more than one-half the lincal feet adjacent, nor unless compensation to persons damaged be made on agreement or by award of Commissioners. Section 113 provides for "paving or macadamizing" streets on petition of adjacent owners. On a petition for "paving" and "grading" of a street, no proceedings were taken under Section 112 to ascertain the compensation; but a radical change was made in paving the street, raising the roadbed several feet. Held, that this could not be regarded merely as grading incidental to paving, and the city was liable as for a change of grade. Under Corning City Charter, providing that, when the grade of a street "has been established" by the Common Council and the street graded accordingly, no change shall be made without compensating persons damaged, it is not necessary that the establishment of the grade must have been made by some formal action of the Common Council.—Supreme Court of New York, 125 N. Y. S., 682.

Municipal Elections—Disfranchisement of Negroes

Anderson vs. Myers et al., Howard vs. Same, Brown vs. Same.—Acts of Maryland, 1908, prescribing the qualifications of voters at municipal elections in the city of Annapolis, declares that the register shall register all male citizens of 21 years or over having resided in the city for one year, not convicted of a crime and assessed on the city tax books for at least \$500, also all duly naturalized citizens of 21 years of age, all citizens who, prior to January 1, 1868, were entitled to vote in Maryland or any other State at a State election, and all lawful male descendants of any person who, prior to January 1, 1868, was entitled to vote in Maryland or in any other State of the United States at a State election, provided that no person not coming within one of the enumerated classes should be registered as a legal voter in the city or be qualified to vote at any municipal election held therein. Held that, though such act did not provide a race or color disqualification in terms, it nevertheless effectually disfranchised and discriminated against negroes, and was therefore unconstitutional as violating Const. U. S. Amend. 15.—United States Circuit Court, 182 F. R., 233.

Contractor's Bond—Materials

E. I. DuPont De Nemours Powder Company vs. Cullin-Pace Contracting Company et al.—Statutes 1904, entitling labor and material claimants to the benefit of a municipal contractor's bond, treats the bond as security for the payment of the contractor's debts, where mechanics' liens would attach if the owner were a private person, and gives a claimant an enforceable interest as if the bond were a fund for his benefit; and, if the penal sum is insufficient to pay all sums, they share in proportion to the amount due to each. One furnishing material to a municipal water works contractor has no right of action against the city on account of his claim. A municipal water works contractor's bond to secure payment for "material" under Statutes 1904 covers dynamite used in the work and fuses used to explode it.—Supreme Judicial Court of Massachusetts, 92 N. E. R., 1023.

Defective Sidewalk—Motive—Sufficiency

Gregorius vs. City of Corning.—Notice to a Sidewalk Inspector and to one member of the Board of Public Works of a defective sidewalk was not notice to the Mayor within Laws 1905, exempting a city from liability for injury caused by defective ways, unless notice of the unsafe condition has been given to the Mayor or the City Clerk a reasonable time previously.—Supreme Court of New York, 125 N. Y. S., 534.

Defective Streets—Loose Grating

Clark vs. City of Lancaster.—In an action by plaintiff to recover for injuries received from stepping on a loose grate over a gutter in a street, where two witnesses apparently contradict each other as to whether the grate was visibly loose and out of place, and it is not clear whether plaintiff could have seen it, a nonsuit was improperly entered.—Supreme Court of Pennsylvania, 78 A. R., 87.

MUNICIPAL APPLIANCES

Eureka Tape Splice

THE Eureka tape splice is a metallic sleeve for repairing tapes, which is sold by the Engineering Agency, Inc., Monadnock Block, Chicago, Ill. It consists of thin sheet metal folded in the shape of a sleeve and coated with a combination of solder and flux so sensitive it will make a perfect adhesion with the tape by the heat of one common match.

The use of rivets and soldering irons is avoided and there are no ugly knots on the tape. The repair can be made in the field in one minute and look as neat as if done by a jeweler and as strong as a blacksmith could do it. One dozen of these sleeves weigh less than half an ounce and occupy too little space to be noticed. They are furnished in a small round wooden box with screw cover. They are made in sizes to fit any tape, and are specially adapted for light pocket tapes, as it does not interfere in coiling in the case.

The directions for using are as follows:

Clean the broken ends of the tape with a knife or sand paper; insert the broken ends in the sleeve; hammer the sleeve slightly so it closes well down on the tape; hold a lighted match under the sleeve while it burns itself out. Let it cool and do not move it while it is cooling.

Rectifiers Charging Batteries of Fire Alarm System

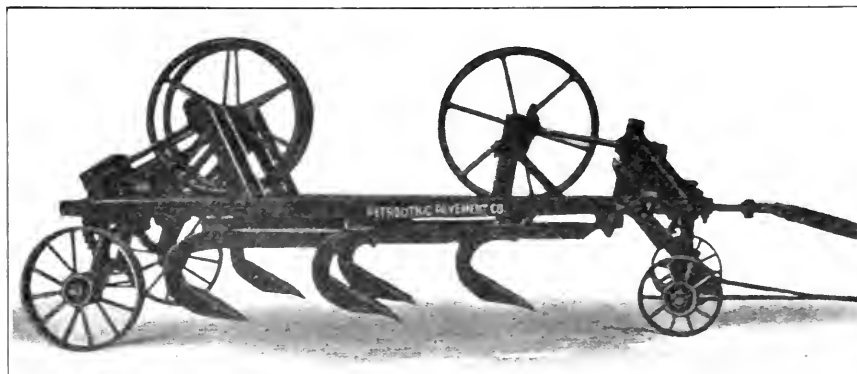
THE mercury arc rectifier shown in the illustration has been installed for charging the storage batteries which operate the fire alarm system of the city of Sandusky, Ohio. The battery consists of four sets of 15 cells each, chloride accumulator, type CT, and with the present system 50 fire alarm boxes can be pulled at once.

Previous to the installation of the rectifier a gravity battery consisting of 108 cells operated the fire alarm system. The new installation is said to effect a saving of \$300 per year as the expense of cell renewals, which, when gravity batteries were used, was a large item of expense. The first cost of the new equipment, including rectifier, battery and distributing board installed complete was \$589, while the cost of power for its operation is about \$1.40 per

month at a 10-cent per kilowatt-hour rate.

This equipment is operating very satisfactorily and during the six months that it has been in operation absolutely no trouble of any kind has been experienced with it.

The rectifier panel was furnished by the General Electric Company, Schenectady, N. Y.



HEAVY GANG PLOW FOR ROOTING OR SCARIFYING

Gang Road Rooter

THE Petrolithic gang road rooter is a plow first developed for their own special work by the Petrolithic Pavement Co., 336 Pacific Electric Building, Los Angeles, Cal., but adapted also for other road uses, such as scarifying macadam or other roads. The plows can be raised and lowered quickly and easily by hand wheels, worm and sector. The rooter is of steel construction wherever possible and weighs 3100 pounds. It is claimed to break anything plowable 16 inches deep or as much less as is desired, 5 feet wide, and to stand up under the hardest work behind traction engine or heavy roller. An ordinary roller pulls it 8 or 9 inches deep in hard material. The front truck cuts under so that it turns in a narrow space.

Cork Flooring for Engine Houses

A FLOORING material composed of chips of cork bound together into a brick by means of an asphalt binding material is made by the Armstrong Cork Company, Beaver Falls, Pa. The

headquarters of the Beaver Falls Fire Department has been paved with this material, and it is reported to be giving good satisfaction: in fact, it is said to be a great improvement on the wooden blocks, cement and artificial stone floors at present in use. The danger of slipping, about which complaint is made in regard to hardwood floors, is avoided, as the cork bricks give a foothold approaching that of rubber. The cork bricks, in the instance cited, were laid on top of a hardwood floor, but they can just as well be laid over other material. This

new composite flooring proves easy on the horses' feet, whether in starting out with the apparatus or standing in their stalls. The floor is water-tight, because the asphalt makes the blocks impervious and the joints between them are rendered tight with asphalt. The noiseless nature of the material is a notable feature. In the stalls the blocks were laid on a concrete foundation with a sand cushion. The stall floor is said to be absolutely odorless after washing once a day. The horses used by this department weigh 1500 pounds each, and the wagon weighs 6200 pounds, so the floor which has been in constant use for six months and shows no signs of wear has been subjected to at least ordinary use.

Sanitary Stall for Fire Engine Houses

A SANITARY stall which is adapted for use in fire engine houses, police patrol stations, as well as for general purposes, is made under patents by W. W.



RECTIFIER AND SWITCHBOARD, FIRE ALARM SYSTEM

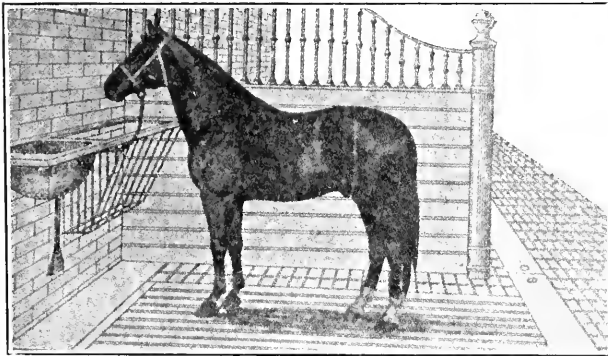


SIMPLE TAPE REPAIRING SLEEVE

Schouler, 45 Clinton street, Newark, N. J. The stall has been used by fire and other city departments in the house of the inventor and neighboring cities, and is approved by them as combining sanitary qualities with conditions promoting the comfort of the horses. The stall consists substantially of a flooring of wooden slats permitting drainage, on which the horse stands and a foundation of cement. The accompanying illustration represents the new and improved slat floor for horses, the slats being adjustable, may be taken up and replaced with very little labor. Having an open space between each slat, unobstructed by bolts, etc., they may be readily cleaned by a hook, leaving the passage free for the water to run to the gutter. This system of stall floors is designed especially where concrete foundations or artificial stone is used, and the manner in which they are applied leaves only the artificial stone and iron in the stall when the slats are removed. The portion occupied by the slats is 7 x 3 feet, with the artificial stone brought up on a level with the top of the slats in front and on each side, where a horse seldom, if ever, puts his feet.



STORAGE BATTERY, SANDUSKY, O., FIRE ALARM SYSTEM



CEMENT STALL WITH WOODEN FLOORING FOR HORSE TO STAND ON

New Monahan Trench Machine

THE new Monahan trench machine, which is being placed on the market by the Marsh Company, Old Colony Building, Chicago, is claimed to be suitable for all trenching purposes and its parts are designed of special strength in order to avoid the breakages which so often interrupt the operations of ditch-digging excavators. The excavator is of the chain, belt and bucket type, and delivers the excavated material onto a conveyor which throws it up on the side of the ditch. The links of the chain of the excavator are of special Gropenhau steel, the cutters are manganese steel and the cutter holders are crucible steel. These cutters are so arranged that they can be taken off and sharpened by the removal of a cotter pin. All gears and pinions are of steel. The buckets are all one piece 1 x 6-inch bar steel. The buckets are loose and fly away from the chain at both ends of the boom and have a positive cleaner. There are no backs on the buckets and they deliver the dirt to the conveyor close to the ground.

The conveyor is made in three parts and the delivery can be changed to either side of the machine at the will of the operator. A backfiller can be attached to the machine so that the dirt can be delivered back to the truck or loaded in a wagon on either side.

The wheels are on the inside of the frame, the back ones being 30 inches of

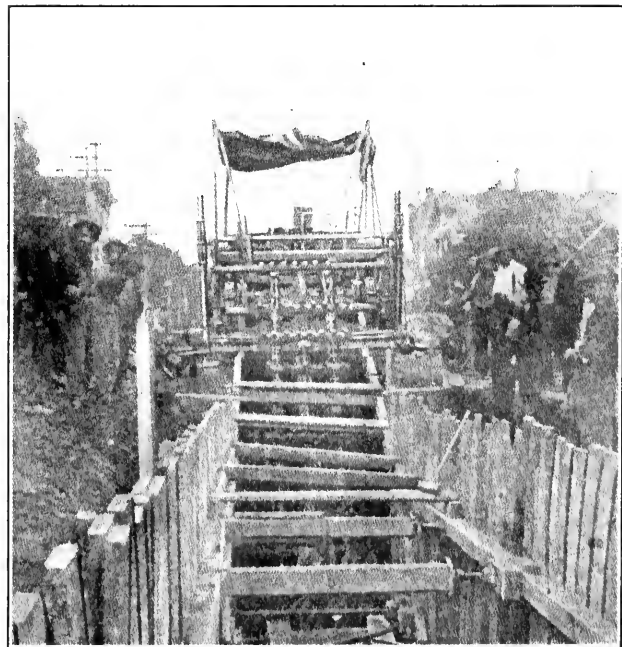
The buckets are provided with a safety device which prevents breakage of the machine, which, in case a pipe, boulder of too large a size to pull out or other obstruction is met with, shears off a pin and can be replaced with a new one in a few minutes with a very slight expenditure.

The machine illustrated is cutting a ditch 92 inches wide and 14 feet deep, cutting through 18 inches of rip rap and macadam, 4 feet of lake sand, 4 feet quick sand, and the remainder clay and very wet. The same machine will cut as high as 120 inches wide and up to 20 feet deep with some slight changes. The top stringers, shown in the cut, are pulled behind the machine by the machine itself and permit sheeting past the

boom. This machine is driven by a four-cylinder, four-cycle, 100-horsepower gasoline engine.

Large Pulley Block

A pair of the largest pulley blocks ever constructed in this country was recently made by the W. W. Paterson Co., Pittsburg, Pa., for the Seaboard Construction Company, Philadelphia. The safe working load of the two blocks is 125 tons. They are to be used for the upper lift of a large derrick car designed to handle 50-ton loads. All of the plates in the blocks are of 1/2-inch steel. The side straps are 8 inches by 3/4 inch. The head pin is 4 1/2 inches in diameter and the sheave pin 3 inches. The bottom bolt, to which the triple block is attached, is 2 1/2 inches in diameter. The sheaves are grooved for 7/8-inch cable. Each block weighs 1804 pounds. There are no shackles for the blocks as they are attached directly to the derrick by 4 1/2-inch pins.



MONAHAN UNIVERSAL DITCH EXCAVATOR

NEWS OF THE SOCIETIES

Minnesota Roadmakers' Association.

—The third annual meeting was held in the Senate Chamber of the old Capitol, St. Paul, December 20. The following resolutions embody the practical results of the meeting:

We strongly recommend the expenditure of State funds be made under the supervision of the State Highway Commission by duly appointed assistants under its control, and that all such supervision and all necessary engineering in the matter of State roads and bridges be done at the expense of the State.

We recommend that the Legislature pass an act to put into effect the one-quarter mill tax levy for public roads, as provided for in the constitution, and that a new amendment be submitted to the people providing for a tax of one mill for that purpose.

Realizing that the future of the road system of this State depends upon a more solid and permanent construction than has heretofore obtained, we recommend that the Legislature provide for the establishment of stone crushing plants at favorable locations in the State at the discretion of the State Highway Commission.

That an appropriation of \$150,000 a year be made to enable the State Highway Commission to carry out the recommendations contained in the foregoing resolutions and especially to provide for a corps of practical roadmakers to co-operate with the local authorities in securing a better system of highways throughout the State.

That the association realizes the value of material co-operation in the construction of the highway system of the country and recommends that our representatives in Congress be urged to support any measure looking to the continuance of a liberal policy toward the Department of Public Roads.

These resolutions were prepared by a committee consisting of R. C. Dunn, of Princeton; N. Y. Taylor, of Litchfield; V. R. Hoag, of Minneapolis; Gebhard Kimpel, of Norwood, and Louis E. Guidinger, of Winona.

The following officers were elected: James T. Elwell, Minneapolis, President; George H. Hazzard, St. Paul, Vice-President; John H. Mullen, St. Paul, Secretary.

Indiana Good Roads Association.

The following officers have been elected: President, Clarence A. Kenyon, Indianapolis; Vice-Presidents, Carl G. Fisher, Indianapolis; John E. Lamb, Terre Haute; Stephen Stratton, Richmond; L. Ert Slack, Franklin; Marcus Sulzer, Madison, and A. M. Beardsley, Elkhart; Secretary-Treasurer, W. J. Oobyns, Indianapolis. The Legislative Committee includes L. Ert Slack, Franklin; W. D. Brandt, Brookville; V. L. Slinkard, Bloomfield; John O. Potter, Muncie; Morton H. Downey, Anderson; W. K. Hatt, Lafayette; Jorace Stillwell, Anderson, and C. E. Pittenger, Muncie.

Chamber of Commerce of Harrisburg, Pa.

—A report has been made to the Board of Trade suggesting the formation of a Chamber of Commerce, consisting of the present Board of Trade, the Civic Club, Municipal League, Merchants' Association and the various organizations. The new organization will be divided into the following bureaus: Bureau of Merchants, Civic Affairs, Municipal Affairs, Industries, Labor, and Education and Professions.

Kentucky Good Roads Association.

At the Congress, Louisville, Ky., December 28-30, Senator George Thomas Wyatt, Logan County, was elected chairman and J. V. Beckman secretary. Harry A. Sommers, Elizabethtown, presided before a chairman was elected. Fred W. Keisker, Louisville, delivered the address of welcome. Two hundred delegates were present at the opening session. M. C. Rankin spoke in behalf of the delegates in response to the address of welcome. The all important matter considered by the meeting was the synopsis of a good roads bill which will be presented to the next Legislature. This bill will provide, among other things, for a tax levy of 10 cents on the \$100 of assessable property for the purpose of aiding the counties in the building of good roads. This tax is expected to net the State about \$500,000. Each county will then bond itself for a certain amount to carry on the work, the aggregate being more than a million dollars a year available for the construction of roads. The following are the members of the association who will draw up the bill: Senator Joseph F. Bosworth, Middlesboro; H. A. Sommers, Elizabethtown; George L. Pickett, Shelbyville; W. E. Rowe, Lexington, and Senator G. T. Wyatt, of Logan County. One of the provisions of the bill much discussed was the clause stating the proportions of expense to be borne by the counties and by the State. It was finally decided that each should pay half. The manner of selecting the highway commission was discussed and the matter was finally left to the discretion of the committee. The following is the text of the clause regarding the raising of funds of the counties: "No county shall receive the benefit of State aid in the building of metal, concrete or gravel roads unless said county has first levied and provided for a county tax for the maintenance of roads in the county, and that each fiscal court in the State of Kentucky shall have the right to make a levy of not less than 10 cents nor more than 40 cents on the \$100 for the maintenance of the roads in the several counties." The impression seemed to prevail that the Legislature would act favorably upon the suggestions made.

Minnesota Surveyors and Engineers' Association.

—According to a resolution passed at the recent convention a new law will be submitted to the Legislature making the office of County Surveyor a more important one. The idea is to make the office of County Surveyor more an office of record, where a great deal of information now sought in the office of the Register of Deeds will be readily accessible to the public. The task of framing such a law is in the hands of its Legislative Committee, Nathan Butler, of Minneapolis; N. Y. Taylor, of Litchfield; J. E. Hill, of Anoka, and C. W. Gove, of Windom. Prof. W. R. Hoag, Minneapolis, President; W. C. Fraser, Rochester, Vice-President, and Charles A. Forbes, St. Paul, Secretary and Treasurer, were re-elected. It was decided to hold the next annual meeting at Duluth about the middle of January, 1912. The Minnesota Roadmakers' Association will be asked to hold its annual meeting in that city at the same time. The members of the St. Paul and Minneapolis Civil Engineers' societies will be invited to attend. It is planned to have these four organizations take a joint excursion through the Iron Range district and view the mining region.

American Society of Agricultural Engineers.

—At the convention, Perdue University, Lafayette, Ind., December 28, the objects and need of the society were stated in an address by Dr. Samuel Fortier, chief of the United States Irrigation Investigation Bureau. Dr. Fortier asserted that every land grant college should establish a course in agricultural engineering without delay, as the need of agricultural engineers was great, with practically none available. He said a course in agricultural engineering should include farm water supply and sanitation, rural architecture, drainage, irrigation, farm machinery and motors and public roads. Farm water supply and sanitation were much neglected, most of the water being bad and the sanitation worse, while rural homes, as a rule, were poorly designed and constructed and were uncomfortable and unhealthful, he said. He told of the many millions of acres of unreclaimed swamp lands, and said the drainage and irrigation questions were of vital importance to America.

The following officers were elected: C. A. Ocock, Madison, Wis., president; W. F. McGregor, Racine, Wis., first vice-president; J. B. Bartholomew, Peoria, Ill., second vice-president; J. B. Davidson, Ames, Ia., secretary; E. A. White, Urbana, Ill., treasurer; councilman, Howard W. Riley, Ithaca, N. Y. Nominating committee for 1911—M. L. King, Ames, Ia.; H. J. Podlesak, Moline, Ill.; John Evans, Guelph, Ontario. Research committee, chairman, C. I. Guinness, of Fargo, N. D.

Indiana State Association of Councilmen.

—Plans were laid January 2 at the meeting of the association at the Denison Hotel for the preparation and introduction of a bill in the Legislature for amendments to the cities and towns law which would give the City Council more power in the matter of initiating public improvement resolutions and the Mayor less power in cities of the third, fourth and fifth classes, and which would also increase the powers of the Council in cities of the first and second classes. A temporary organization of the association was made some time ago by members of the Council in several cities in the northern part of the State, but the permanent organization was not effected until this meeting, when Henry Whitaker, member of the Hammond Council, was elected president; Carl Markmuller, also a member of the Hammond Council, was elected secretary, and G. W. Greenleaf, of Terre Haute, treasurer. Members of the councils of the following cities were present: South Bend, Terre Haute, Ft. Wayne, Evansville, Michigan City, Gary, Hammond, Lafayette, Peru, Logansport and New Albany. The following committee was appointed to prepare the bill: Dr. W. H. Johnson, Indianapolis; G. W. Greenleaf, Terre Haute; C. A. Hanley, Michigan City, and Marcus Castleman, Gary.

Norfolk Good Roads Association.

—A good roads meeting will be held at Williamsburg, Va., for the furtherance of the movement for a straight and improved highway from Newport News to Richmond. The meeting will be under the auspices of the Norfolk Good Roads Association, the Richmond Automobile Association and the Chamber of Commerce of Richmond, Newport News and Norfolk. The meeting will also be a general peninsula highway convention. A movement for a highway between Richmond and Washington via Fredericksburg will be discussed.

Thurston County (Wash.) Good Roads Association.—A big meeting will be held at Olympia, January 18, for the purpose of endorsing the good roads bill that is being prepared by Judge J. T. Ronald, Seattle, in behalf of the Pacific highway project through the State of Washington. The interest of British Columbia authorities in the project is shown by the fact that among the speakers will be Hon. Thomas Taylor, Minister of Public Works of British Columbia; A. E. Todd, Vice-President Victoria Board of Trade, Victoria, B. C., and E. S. Rowe, Vancouver.

Calendar of Meetings

- January 10-14.**
Organization of City Officials for Standardizing Paving Specifications.—Second Meeting, Engineering Societies Building, 29 W. 39th street, New York, N. Y.—John B. Hittell, Secretary-Treasurer, Chief Engineer of Streets, Chicago, Ill., Hotel Reclor, New York, N. Y.
- January 11-13.**
Michigan Engineering Society.—Annual Meeting, Lansing, Mich. Alva L. Homer, Secretary, Grand Rapids, Mich.
- January 12-13.**
New York Tax Reform Association.—State Conference on Taxation.—A. C. Pleydell, Secretary, New York, N. Y.
- January 12-14.**
Montana Society of Engineers.—Annual Meeting, Helena, Mont.—Clinton H. Moore, Secretary, Leysen Block, Butte, Mont.
- January 12-14.**
National Civic Federation.—Annual Convention, New York, N. Y.—D. L. Case, Secretary, 1 Madison avenue, New York, N. Y.
- January 12-14.**
Indiana Engineering Society.—Annual Meeting, Hotel Denison, Indianapolis.—Charles Brossman, Secretary, Union Trust Building, Indianapolis, Ind.
- January 16-20.**
Canadian Cement and Concrete Association.—Annual Convention and Exhibition, Toronto, Ont.—R. E. W. Hagarty, Secretary, 662 Euclid avenue, Toronto, Ont.
- January 17.**
Engineers' Society of Western Pennsylvania.—Annual Meeting, Pittsburgh, Pa.—Elmer K. Hiles, Secretary, 803 Fulton Building, Pittsburgh, Pa.
- January 17-19.**
American Institute of Architects.—Annual Convention, San Francisco, Cal.—Glenn Brown, Secretary, Octagon, Washington, D. C.
- January 18.**
Municipal League of North Carolina.—Annual Meeting, Raleigh.—Mayor J. S. Wynne, Raleigh.
- January 18-19.**
American Society of Civil Engineers.—Annual Meeting, New York.—C. W. Hunt, Secretary, 220 W. 57th street, New York, N. Y.
- January 20.**
Illuminating Engineering Society.—Annual Meeting, New York, N. Y.—P. S. Millar, Secretary, 29 W. 39th street, New York, N. Y.
- January 24-26.**
American Society of Heating and Ventilating Engineers.—Annual Meeting, New York, N. Y.—W. M. Mackay, Secretary, P. O. Box 1818, New York, N. Y.
- January 24-26.**
Ohio Engineering Society.—Annual Meeting, Columbus, O.—C. J. Knisely, Secretary, New Philadelphia, O.
- January 25-27.**
Illinois Society of Engineers and Surveyors.—Annual Meeting, East St. Louis, Ill.—E. E. R. Tratman, Secretary, 1636 Monadnock Block, Chicago, Ill.
- February 1-3.**
Nebraska Cement Association.—Western Cement Exposition, Omaha, Neb.—Peter Palmer, Secretary, Oakland, Neb.
- February 6-11.**
National Brick Manufacturers Association.—Annual Convention, Louisville, Ky.—T. A. Randall, Secretary, Indianapolis, Ind.
- May 29.**
American Water Works Association.—Annual Convention, Rochester, N. Y.—J. M. Diven, 14 George street, Charleston, S. C.
- May.**
City Commission Congress.—Meeting, Galveston, Tex.—Mayor Lewis Fisher, Chairman of Committee, Galveston, Tex.

PERSONALS

ANDERSON, E. PAUL, Lexington, Ky., has been appointed Consulting Engineer.

BARRETT, J. W., Athens, Ga., has been elected Consulting Engineer at Gainesville, Ga. E. B. Epps has been elected City Engineer.

BAUER, J. L., has been appointed Engineer for Garwood, N. J., Borough.

BUCK & SHELDON, INC., Consulting Engineers, Hartford, Conn., have opened a branch office in Willimantic, Conn., in charge of H. R. Turner.

COLLIN, D. F., Kansas City, Mo., until recently manager of Bell Telephone Co., became business manager of the W. H. Palmer Co., engineers, Dwight Building, Kansas City, Mo., on Jan. 1.

CROCKER, R. Leslie, for fifteen years with the Boston Elevated Ry. Co., has opened an office in the Park Row Building, New York City, for general practice of engineering and surveying.

DIMMICK, J. K., on Jan. 1 assumed presidency and active management of the Dimmick Pipe Co., Birmingham, Ala. He is senior partner in pig iron and coke firm of J. K. Dimmick & Co., Philadelphia.

DE CLAMECY, Philip, New York City, has been appointed Chief Engineer with the Coffin Valve Co., Boston, Mass.

FLOYD, RICHARD, was elected Mayor of Huntsville, Ohio, in place of Mayor Knotts, who resigned.

FOLSOM, W. C., Washington, D. C., has been appointed Chief Sanitary Inspector at Cincinnati, Ohio.

HENDRICK, Calvin W., Chief Engineer of the Baltimore Sewerage Commission, has, with the consent of the Commission, accepted an invitation to report on the best source for a new water supply for the Maryland Tuberculosis Sanatorium, a State institution, in Frederick County.

JACOBS, Taylor J., has been elected Mayor of Rockport, Ind., vice Mayor Kercheval, deceased.

MACCARTHY, Timothy J., Holyoke, Mass., has been appointed City Engineer, succeeding James E. Tighe.

MCCORKLE, W. H., has been appointed Chairman of the Board of Public Works, Lexington, Ky., and Newton L. Stout member of the Board of Police and Fire Commissioners.

MOSHER, Edward, Elizabeth, N. J., has been appointed Township Engineer, Cranford, N. J.

NUGENT, JAMES, Newark, N. J., has been reappointed City Counsel.

RANSOM, Wm. A. Elizabeth, N. J., has been elected President of the Board of Water Commissioners, and David Gage was chosen as Engineer.

RICHMOND, Wm., Lockport, N. Y., has been reappointed Water Commissioner; J. F. Frchsee has been reappointed City Engineer and Surveyor; Frank J. Reynolds and Alexander Clark have been reappointed to the Police Board, and John R. Mahaney and James W. Hearn become members of the Fire Board.

SNOW, Wm. H., Holyoke, Mass., has been appointed Manager of the Gas and Electric Department; Philip M. Judd, member Board of Fire Commissioners, and Michael F. Walsh member of the Board of Public Works.

WALSII, Thom:s J., Boston, Mass., has opened an office at 141 Milk street, for the practice of electrical engineering. Mr. Walsh is a graduate of the Sheffield Scientific School, a junior member of the A. S. M. E. and an Associate Member of the A. I. E. E. He has been connected with the Stone & Webster Engineering Corporation for several years.

TRADE NOTES

Cast Iron Pipe.—Chicago—Foundries expect to book a large tonnage before spring, although prices are low and unsatisfactory. Quotations: 4-inch, \$25; 6 to 12-inch, \$24; 16-inch and up, \$23.50. Birmingham—Aggregate stocks on hand January 1 were larger than a year ago. Still the outlook is considered more favorable than a year ago. Quotations: 4 to 6-inch, \$19 to \$19.50; 8 to 12-inch, \$18 to \$18.50; over 12-inch, average, \$17. New York—Conditions continue quiet. Quotations: 6-inch, carload lots, \$22.

Lead—Prices are firm. New York: 4.50c.; St. Louis, 4.35c.

Cement Magazines.—Cement Age, of New York, and Concrete Engineering, of Cleveland, O., have been consolidated into one publication under the name "Cement Age, with Which Is Combined Concrete Engineering." Robert W. Lesley will be editor and Allen Brett and Edward A. Trego associate editors of the new publication. The New York office, 30 Church street, will be in charge of Frederick F. Lincoln, president of the Cement Age Company.

Sale of Water and Traction Company.—The franchise and all the properties of the Somerset Water, Light & Traction Company will be sold at public outcry by a special master commissioner of the Pulaski Circuit Court, Somerset, Ky., on January 6, for the purpose of satisfying the stockholders and creditors of the company. The company was capitalized at \$250,000 and was organized by Dr. W. Godfrey Hunter. About two years ago a number of the stockholders joined in a suit to have the affairs of the company and its entire management and control taken out of the hands of Dr. Hunter and placed in the hands of a receiver, which was done, and it has been in the hands of a receiver since that time. The organization of the Somerset Water, Light & Traction Company was the consolidation of the Water Company, the Light Company and the franchise for a street railway. Soon after these companies were taken over by Dr. Hunter he constructed the electric street car line, which has been in operation for two years or more, and is now being operated by the receiver.

Water Company Reorganization.—The syndicate headed by C. Terry Treadway, president of the Bristol National Bank, which has been bidding several weeks past for the controlling interest in the stock of the Bristol Water Company, has secured it.

New High-Pressure Centrifugal Pump.—The Hayton Pump Company, Hannibal, Mo., has been incorporated to manufacture turbo-centrifugal high-pressure pumps. The pumps are the invention of T. R. Hayton, and it is claimed they show a large gain in efficiency over many others now on the market, the gain ranging from 20 to 50 per cent. The company has made arrangements with the Leader Foundry Company, Quincy, Ill., for the manufacture of the pumps.

Garbage Receptacles.—The Buffalo Receptacle Company, Buffalo, N. Y., has been incorporated with a capital stock of \$150,000, and will establish a plant in that city for the manufacture of garbage cans and refuse receptacles. Considerable machinery will be required in the way of shears, punches, presses, riveters, etc. Gustave Steinwachs, 1047 Genesee street, is manager.

Water Petition.—Forty residents of Berlin, Conn., have petitioned the General Assembly for a charter for a water company. The petition recites that common convenience and necessity require that the different communities in the town of Berlin be supplied with running water for the purpose of domestic use and fire prevention, and that there are within the town streams of water, springs and ponds available for such supply. Among the signers of the paper are: O. Clark, E. I. Clark, H. H. Damon, G. B. Norton, D. E. Bradley, J. Molumphy, Francis Deming and John Norton.

Water Meters.—The Neptune Meter Company, New York, N. Y., has asked the Board of Control, Norfolk, Va., for permission to take up and test two or three hundred of the water meters installed by that concern four years ago. As the meters have been given no attention, simply having been placed on the water run through them without registering, this concern, desiring to again compete for a Norfolk meter contract, wishes to inform itself regarding the condition of the old meters, and how they have stood the peculiar "service" to which they have been put. The Board of Control referred the application to Thomas B. Dornin, chief engineer of the water department. In the city's last meter purchase 3500 meters were bought from the Neptune Company.

General Electric Plant at Erie, Pa.—One of the largest projects calling for machinery expenditures expected to come before the trade this year is that of the General Electric Company, Schenectady, N. Y., which is establishing a large plant at Erie, Pa. The company is owned a tract of land at Erie for several years, and it now has a large laundry and other smaller buildings erected. It is expected eventually to erect a general machine shop, and inquiries now out indicate that the company's plans will mature before the year is over.

Steam Shovel Companies.—The Marion Steam Shovel Company, Marion, Pa., which has been in business for 26 years, brought suit against the Marion Shovel & Dredge Company, recently incorporated, seeking to restrain the latter from the use of its name on the ground of the similarity being likely to lead to the diversion of trade. The court decided adversely to the suit, holding that the name of the new company is a sufficiently distinct designation.

Park Lighting Standards.—The Elmer P. Morris Company, of 90 West Street, will furnish 500 posts for Tungsten park lighting in the City of New York. About half of these are of a new type and will be used for the lighting of the transverse roads through Central Park and the balance for regular installations.

Snow Plow.—The Street Committee of Plainfield, N. J., in its annual report, says that the new Twentieth Century sander has proved a very efficient sidewalk cleaner as well as a gutter scraper.

Patent Paving Suit.—The Rudolph S. Gome Company, Chicago, Ill., has received notice on Sioux City, Ia., that the city will be made the party to a lawsuit in which certain concrete pavements are laid according to specifications under which suits were recently received.

Pipe Suit.—An action for \$5,560 has been filed by the Central Foundry Company of New Jersey against the City of

Shattuck, Okla. The company alleges the city has failed to pay for purchased water mains.

A Wire Rope Trade Inquiry.—The Broderick & Bascom Rope Company, manufacturer of wire rope, St. Louis, Mo., addressed 60 or more of its agents scattered throughout the country, taking in every State, asking for their views concerning the outlook for trade for 1911. A summary of the replies has been printed by the company. These replies, with very few exceptions, take an exceedingly hopeful view of business for the coming year. The wire rope trade is regarded by the company as a fair barometer of the general commercial condition from the fact that it is not confined to any one line, wire rope being largely used in lumber and logging camps and by oil well drillers, mining companies and boat builders, elevator builders, contractors, etc., so that consumers' interests are much diversified. The tenor of these replies is radically different from the views of James J. Hill, published by the Associated Press about December 1, which caused the inquiry to be made by the company. The Broderick & Bascom Rope Company states its opinion that 1911 will be a banner year unless trade should be interfered with by tariff tinkering, adverse railroad legislation or general labor troubles.

Change of Address.—The Lackawanna Steel Company announces that after January 19 its general offices, now at 2 Rector street, New York City, will be located at its works at Lackawanna, Erie County, N. Y., where all correspondence and communications for the President, Vice-President and General Manager, Secretary, Treasurer, general sales department and traffic department should then be addressed. The office of the assistant to the President will remain at 2 Rector street, New York City, where the company will also maintain a district sales office.

Oxy-acetylene Flame in Bridge Wrecking.—The use of an oxy-acetylene flame in removing the 450-ton turntable drawspan, 330 feet long, of the Madison avenue bridge in New York City, is estimated to have saved several weeks' time, the actual work of removal having been done in one week. One oxy-acetylene outfit, with two torches and a total consumption of about 1500 cu. ft. of oxygen and 450 cu. ft. of acetylene gas, were used in the cutting operation. The method of operation was as follows: The bridge was swung open and supported by cribbing built up on the fender pin to provide for unbalanced reactions as the work of removal progressed. Two floating derricks were made fast to one end of the span and the top and bottom ends were cut through vertically about 50 feet from the end. The main diagonal eyebars were also cut, the stringers disconnected from the floorbeam and the end of the span was detached and lowered by the derricks. By similar methods the span was cut into seven pieces, two weighing 25 tons each, two 66 tons, two 75 tons and the center tower 130 tons.

NEW INCORPORATIONS

Huntsville, Alabama, Gas Light & Fuel Co., Camden, N. J.; capital, \$300,000. Incorporators: William P. Huston, M. Rea Gano and Howard L. Miller. The company is to deal in stocks, bonds, debentures, securities, etc.

Federal Water Proofing Co., Akron, O.; capital, \$100,000. Incorporators: H. B. Ball, F. S. Nash, H. H. McCloskey, W. H. Miller and R. A. Carrell.

PATENT CLAIMS

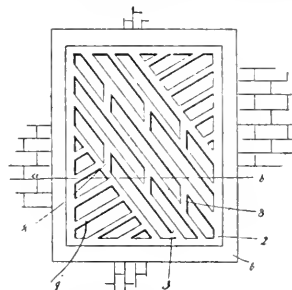
979,146. **CORRUGATED SECTIONAL NESTABLE CULVERT.** Charles A. Foster, Portland, Ore.—Serial No. 437,214. An improved culvert, comprising upper and lower semicircular sections, each formed of sheet metal corrugated throughout its length along lines substantially at right angles to its longitudinal axis, a number of retaining plates fixed to one side of one of said semicircular sections, said



plates being spaced apart from each other and being firmly fixed at one end to the adjacent semicircular section and each having its body portion slightly spaced apart from the adjacent portion of the section to which it is attached to admit the edge of the other semicircular section between the plates and the section to which they are attached.

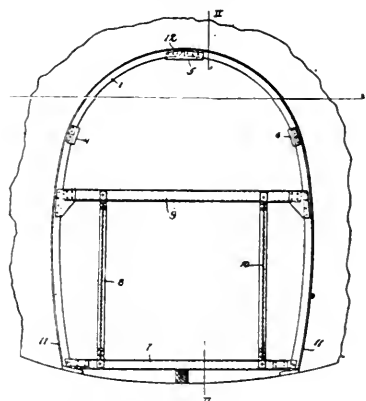
979,182. **CATCH-BASIN COVER.** James H. MacDonald, New Haven, Conn. Serial No. 471,787.

In a catch-basin cover, the combination with an open oblong rectangular frame having an inwardly extending bearing-flange, of a grille transversely bowed on its longitudinal axis so as to present a concave upper surface and consisting of a rim adapted in form and size to be set into the said open frame and having a main



rim only between opposite corners of the said group of long parallel bars extending diagonally and reinforced by short bars arranged parallel with each other and with the sides of the said rim and at an angle to the said long bars, and the triangular spaces between the two remaining corners of the rim and the outer edges of the outermost of the said long bars being respectively filled by groups of parallel bars differentiated in length and joining the sides and ends of the rim at an acute angle and the said outermost bars at substantially a right angle, the open spaces produced in the grille by the described construction and arrangement of bars being large and yet disposed so as to prevent a wheel rim from entering them and getting caught.

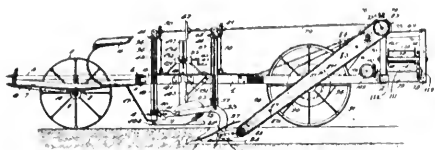
979,185. **TUNNEL FORM.** Charles D. McArthur, Pittsburg, Pa., assignor to Blaw Collapsible Steel Centering Company, Pittsburg, Pa., a Corporation of New Jersey. Serial No. 542,065. In combination in a tunnel form, a series



of spaced ribs comprising channels having inwardly directed flanges, bearing strips of less width than the channels secured to the outer faces thereof, lagging plates having their end edges resting upon the bearing strips; and means for securing the plates detachably to the flanges of the channels.

979,442. DITCHING MACHINE. John Louis Crismon, Eagle, Col. Serial No. 507,218.

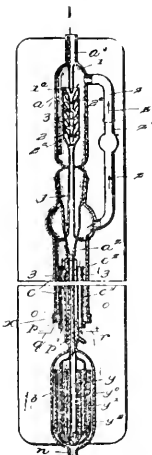
In a ditching machine, the combination with a frame mounted on front and rear wheels, of horizontally disposed vertically adjustable bars mounted on said frame; a plow connected at its opposite ends to said bars; an inclined conveyor secured at its lower end to said plow in position to



receive earth therefrom; means for adjusting said plow laterally upon said bars, and said inclined conveyor simultaneously therewith; a laterally adjustable horizontally disposed conveyor on said frame adapted to receive the discharge from the inclined conveyor; means for changing the direction of travel of said horizontally disposed conveyor; and vertically adjustable plows on said frame in front of said rear wheels, having their mold boards facing each other.

979,999. APPARATUS FOR THE STERILIZATION OF WATER OR OTHER LIQUIDS. Casimir Stanislas Piestrak, Paris, France. Serial No. 579,475.

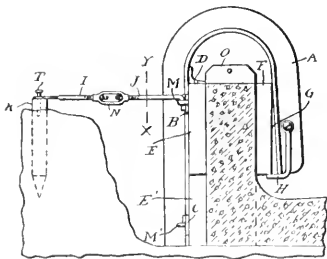
An apparatus for sterilizing water and other liquids by means of ozone comprising a vacuum tube, said vacuum tube con-



taining mercury, an electrode mounted within said vacuum tube, an outer electrode arranged concentrically with and surrounding said inner electrode, an air passage between said electrode and means for aspirating air through said air passage and into contact with the liquid to be sterilized.

979,863. CEMENT - FORM. Francis T. Leeder, Sioux City, Ia., assignor to Lewis & Leeder, Sioux City, Ia., a Copartnership. Serial No. 557,405.

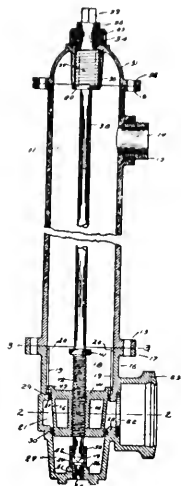
In a cement form for curbs, the combination with boards for inclosing the cement, of an inverted U-shaped holder one leg of which is longer than the other, guides se-



cured to the boards on the long side of the holder in which the holder is held in position, a hook pivoted to the short end of the holder and adapted for adjustment under the board on the short or gutter side of the holder, and a stop on the long side of the holder adapted to rest on the top board inclosing the cement, substantially as described

979,941. HYDRANT AND VALVE THEREFOR. John Lansing Fuller, Schaghticoke, N. Y. Serial No. 577,932.

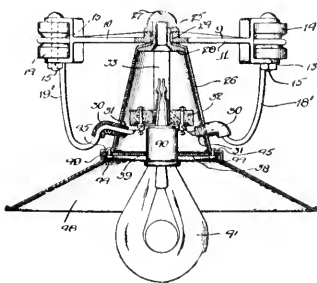
In a hydrant, a stand pipe; a bottom portion; a lateral inlet; a vertically movable main valve; a valve stem having rotary movement for raising and lowering



said valve and a limited vertical movement with respect thereto; and a waste outlet in said bottom portion below said main valve including a valve seat and an aperture above said valve seat, said valve stem being constructed and fitted to engage said outlet valve seat and thereby to close said outlet.

979,459. ELECTRIC STREET LIGHTING. Carl Henry Froelich, St. Louis, Mo. Serial No. 570,326.

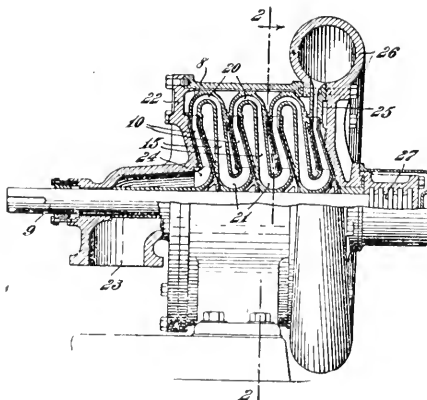
In electric street lighting, the combination of a suspension member having three



arms, flexible supporting elements respectively connected to said arms, a lamp-holder secured to said member, and an electric light socket supported by said holder.

979,634. ROTARY PUMP. Nicholas W. Akimoff, Philadelphia, Pa. Serial No. 484,884.

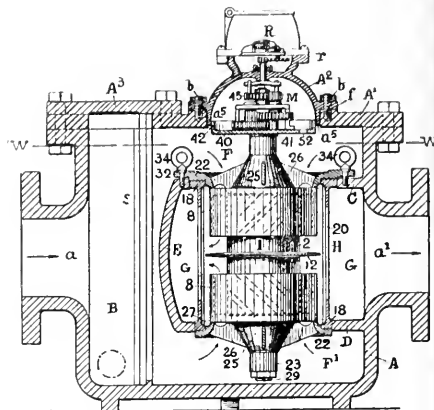
In a pump of the character described, a shaft, a plurality of impellers secured to



said shaft, said impellers being inclined backwardly substantially as and for the purpose set forth.

979,518. WATER METER. William H. Larrabee, Worcester, Mass., assignor to Union Water Meter Company, Worcester, Mass., a Corporation of Massachusetts. Serial No. 462,022.

In a water meter, a meter wheel or propeller, consisting of a cylindrical body having near its respective ends similar oppositely disposed series of projecting helical vanes with water ways between, each

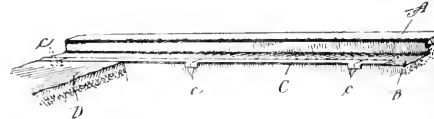


series surrounded by an outer cylindrical shell attached thereto, and a circumferential projecting flange around the cylindrical body midway between the respective series of vanes; in combination with wheel-supporting means having guide passages for directing currents of water downward and upward onto the respective series of vanes, at the upper and lower ends of the wheel.

979,577. PROCESS OF AND TEMPLAT FOR USE IN LAYING PAVEMENTS.

Eugene Geo. Schwendeman, Oak Park, Ill., assignor to The American Asphalt Paving Company, Chicago, Ill., a Corporation of Illinois. Serial No. 584,183.

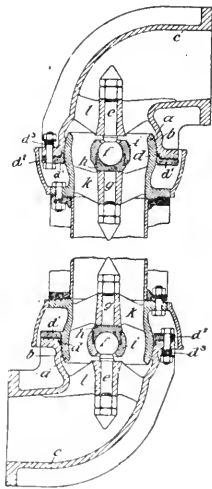
A templet for the purpose specified com-



prising a long flat strip having one or more ears projecting therefrom and extending transversely thereof at one edge.

979,513. FLEXIBLE PIPE JOINT. Johann Koenig, Riga, Russia. Serial No. 485,436.

A flexible pipe joint comprising two pipes making a ball and socket joint with each other, and, located within the pipes



and connecting them, a second ball and socket joint whose center point coincides with that of the said first joint, and which consists of a ball member connected to the one pipe and engaging a bearing cup connected to the other pipe and having a cap by means of which the ball member is confined in the bearing cup, so that the inner ball and socket joint is adapted to take off the outer joint the pressure in either longitudinal direction

THE WEEK'S CONTRACT NEWS

Relating to Municipal and Public Work—Street Improvements—Paving, Road Making, Cleaning and Sprinkling—Sewerage, Water Supply and Public Lighting—Fire Equipment and Supplies—Bridges and Concrete Work—Sanitation, Garbage and Waste Disposal—Police, Parks and Miscellaneous—Proposals and Awards

To be of value this matter must be printed in the number immediately following its receipt, which makes it impossible for us to verify it all. Our sources of information are believed to be reliable, but we cannot guarantee the correctness of all items. Parties in charge of proposed work are requested to send us information concerning it as early as possible; also corrections of any errors discovered

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREET IMPROVEMENTS				
Minnesota	Minneapolis	Jan 13, 7:30 p.m.	Furn. paving material during 1911, inc. sandstone, creol. wood and vit. paving block; granite and sandstone curb, crushed granite, cement.	Henry N. Knott, City Clerk
Illinois	Chicago	Jan. 14	Furn. at bldgs and viad. approx. 4,000 sq. yd. sect. wood pave.	B. J. Mullaney, Comr. Pub. Wks
New York	New York	Jan. 14	Regulating, grading, setting curbstones, flagging sidewalks, etc., Jerome ave. to Macomb's Road, and Gun Hill Rd. to Burke av.	Pres. Bronx Boro, 177th St. & 3d Ave
California	Fresno	Jan. 14	Construction of mountain road from plains to old Millwood road and Happy Gap. Approx. 2 1/2 miles.	Board of Supervisors.
California	Los Angeles	Jan. 16, 2 p.m.	Improving portions of Huntington Drive in Los Angeles County Bldg. sidewalks, etc., 3 jobs: concrete walks: 14,325, 23,000 and 13,300 sq ft.; concrete driveways: 820, 800 and 380 sq. ft.; concrete gutters: 2,900, 3,946 and 1,2520 lin. ft., granite curb: 2,900, 3,940 and 2,500 lin. ft.; L. A. Washington, City Engineer.	C. G. Keyes, County Clerk
Kentucky	Paducah	Jan. 16, 3 p.m.		
Ohio	Lakewood	Jan. 16, noon	Paving 3 ayes., and one road; Wm. H. Evers Eng. Co., Arc. Clvld	Board of Public Works
Oregon	Salem	Jan. 16	Paving 175,000 sq. yds. street surface with hard surface pave...	B. M. Cook, Village Clerk
California	Sacramento	Jan. 16	Constr. Huntington Drive rd. from Los Angeles to Pasadena and from Bairdston to Alhambra.	W. A. Morse, City Recorder.
Washington	Olympia	Jan. 18	Grad., drain, mac., etc., State Aid rd. 99, Walla Walla Co.	State Hwy. Comr. Sacramento, Cal.
New Jersey	Mt. Holly	Jan. 19, 11 a.m.	Grav. rd. through Akron from Garlner's Cor. to Atlantic Co. line	H. L. Bowlby, Sec'y. St. Hwy. Bd.
Virginia	Roanoke	Jan. 19, noon	Constructing granolithic sidewalks; grading two streets.	Earl Thomson, Co. Engr., Camden.
Ohio	Cincinnati	Jan. 20, noon	Improving Dayton Pike	W. L. Craft, City Clerk.
Ohio	Hamilton	Jan. 20, noon	Imp. Dayton Pike Sycamore twp., Spec. No. 127; Bond \$1,000.	Fred Dreihls, County Clerk
New Jersey	Alpine	Jan. 21	Bldg. stone rd. 2,570 ft. long, from Tenafly to Alpine, Sylvan av.	Fred Dreihls, Clk. County Comrs
Alabama	Wetumpka	Jan. 23	Road improvements to cost \$170,000.	Franklin W. Hopkins, Mayor.
California	Los Angeles	Jan. 23	Improving Valley Road.	Solomon Norcross, C. E., Atlanta, Ga
California	Hemet	Jan. 25	Imp. Harvard st. incl. cement curb and gut & conc. culverts	C. G. Keys, Clk. Bd. Superv.
Indiana	Hawler	Feb. 1, noon	Construction of one mile of gravel road in Benton County.	C. G. Hamilton, City Clerk.
West Virginia	Huntington	Feb. 6, 1 p.m.	Grad. and pave. 20 streets with vit. brick, bitulithic, sheet asphalt, asphalt block or concrete asphalt.	Lemuel Shipman, County Auditor.
Florida	Palatka	Feb. 7, 7:30 p.m.	Constructing approx. 16,500 sq. yd. concrete sidewalks.	John Coon, Comr. of Streets.
Canada	Vancouver, B. C.	Feb. 7	Furnish road roller, weight not less than 15 tons.	B. M. Cook, City Clerk
Oregon	Portland	Feb. 23	Constructing pavement on Jersey st.	Wm. McQueen, City Clerk. J. W. Morris, City Engineer
SEWERAGE				
Minnesota	Minneapolis	Jan. 13, 7:30 p.m.	Furn. Portland cement for sewer and street work, etc., in 1911.	H. N. Knott, City Clerk.
Oklahoma	Oklahoma	Jan. 14	Constructing sanitary sewer system.	W. J. Pattison, City Clerk.
New Jersey	Elizabeth	Jan. 16, 8:30 p.m.	Furn. and lay 570 ft. 10-in. 505 ft. 8-in. sewer, m.h., etc.	N. K. Thompson, Street Comr.
Oklahoma	Checotah	Jan. 16	Bldg. 11 miles 8, 10 and 12-in. san. sewer, disposal works, etc.	W. W. Southard, City Engineer.
Kentucky	Paducah	Jan. 16, 3:30 p.m.	Constructing c.i. drain pipes, paving, etc., 2 sts.	L. A. Washington, City Engineer.
Pennsylvania	Masontown	Jan. 16	Constructing a sewer and water system for borough.	C. V. Cloud, Chm. Council Com.-in-C
New Jersey	Elizabeth	Jan. 16, 8:30 p.m.	Con. 570 ft. 10-in. 505 ft. 8-in. sewer pipe, calked joints, etc.	N. K. Thompson, St. Comr.
Maryland	Annapolis	Jan. 17, 11:30 a.m.	Constructing sewers in Carroll and 5th sts., Brooklyn.	S. O. Tilghman, Clk. Co. Comrs
Ohio	Cincinnati	Jan. 17, noon	Constructing sewers in Otto ave.	John J. Wenner, City Clerk.
Washington	Spokane	Jan. 20, 2 p.m.	Furn. 7,000 ft. of 10-in. corrugated drain pipe, perf. bottoms.	John Gifford, City Purch. Agt.
Ohio	Elyria	Jan. 20	Constr. trunk sewer, cost approx. \$26,000.	Rose Moriarty, City Clerk.
Kentucky	Louisville	Jan. 20	Constr. sewer known as 2d St. sewer, incl. 2,430 ft. of 42 and 48-in. concrete sewer.	Comr. of Sew., 605 Equitable Bldg.
New York	Syracuse	Jan. 26 10 a.m.	Bldg. harbor brook intercepting sewer and imp. stream.	G. D. Holmes, Ch. Engr. Inter. S. Bd
Manitoba, Can.	Souris	Feb. 1	Furn. 31,000 ft. vit. sewer pipe, etc. spring and summer, 1911.	C. R. Heath, Health Engineer.
WATER SUPPLY				
Washington	Spokane	Jan. 13, 2 p.m.	Bids in triplicate for 100 4-in. and 30 6-in. hydrants; 50 6-in., 25 8-in. 25 10-in. and 25 12-in. valves, c.i. bell and 50 6-in. valves, Kal. bell.	John Gifford, City Purchasing Agt
Kentucky	Dayton	Jan. 16	Franchise to construct and operate w. w. system for 18 years.	C. V. Cloud, Chm. Council Com
Pennsylvania	Masontown	Jan. 16	Constructing a water and sewer system for Borough.	A. E. Fortier, Town Clerk.
Ontario	Pembroke	Jan. 16	Furn. water main and piping.	D. F. Mackenzie, City Recorder.
Minn.	Faribault	Jan. 16, 8 p.m.	Drilling artesian well approx. 1,000 ft. and casing old wells.	John T. Geary, City Clerk.
New York	Yonkers	Jan. 16	245 lengths of 12-in. pipe.	Jos. G. Armstrong, Dir. Pub. Wks.
Pennsylvania	Pittsburg	Jan. 17	Furn. and erect, 1,000,000 and 6,000,000 gal. pumping station	J. A. Leinbach, City Clerk.
Pennsylvania	Lancaster	Jan. 17	Furn. elec. driven centrif. pump having capacity 10,000,000 gals. in 24 hours.	
Michigan	Grand Rapids	Jan. 19, 8 p.m.	Bldg. fireproof w.w. and filtration plant, one story, 178x178 ft., and repair shop, two stories, 40x66 ft.; cost \$400,000; Hering & Fuller, Engrs. 170 Broadway, New York City.	S. A. Freshney, Gen. Mgr., Bd. P. W.
Texas	Fort Sam Houston	Jan. 19, 11 a.m.	Con. 3 reinforced concrete water troughs, etc.	P. W. Guiney, Com. Q.M.
Arizona	Douglas	Jan. 19, 1 p.m.	Con. reservoir, water mains, valves, hydrants, etc.	R. G. McArthur, Sec'y. W. W. Com.
Illinois	Chicago	Jan. 19, 11 a.m.	Furn. and install two 20,000,000 gal. centrif. pumps and two 1,000 h.p. elec. motors, with wir., pip., etc., at pump station.	B. J. Mullaney, Comr. Pub. Wks
Ohio	Newburg	Jan. 21, noon	Constructing water mains.	L. W. Shimek, Clk. Bd. of Control
Oregon	Astoria	Jan. 23, 2 p.m.	Furn. labor and material for wood stave pipe.	Jars Bergsvik, Engr. Wt. Com.
Missouri	Kansas City	Jan. 26	Bldg. horizontal shaft centrifugal pump, direct connected to vertical cross-com. engine, capacity 30,000,000 gals.	W. Kiersted, Ch. Engr. Water Dept
Washington	Spokane	Jan. 30, 2 p.m.	Furn two 14 in. single suction, hor. shaft, two-stage centrifugal pumps, valves, etc.	John Gifford, City Purch. Agt
Manitoba, Can.	Souris	Feb. 1	Furn 425 tons c.i. water pipe, specials, fire hydrants, gate valves and boxes, pig lead, etc., in spring and summer of 1911.	J. W. Breakey, Secy.-Treasurer.
Iowa	Rippey	Feb. 6, 8 p.m.	Construction of water works system.	J. A. Haberer, Town Clerk.
BRIDGES				
Ohio	Cincinnati	Jan. 13, noon	Bldg. concrete bridge on Cooper ave.	Fred Dreihls, Clk. Co. Comrs.
California	Fresno	Jan. 14	Constr. eight bridges on mountain road.	Board of Supervisors
Kansas	Wichita	Jan. 16	Bldg. pile bridge in Lincoln twp.	Jesse Leland, County Clerk.
Ohio	Jefferson	Jan. 16, 1 p.m.	Constructing superstructure of bridge over Grand river.	A. V. Hillyer, County Clerk.
Indiana	Indianapolis	Jan. 18, 10 a.m.	Constructing bridge over canal at College ave.	Albert Sahn, Co. Auditor.
Dist. of Col'bia	Washington	Jan. 23, 2 p.m.	Strengthening Calvert st. bridge. Approx. \$25,000.	Wm. V. Judson, Engr. Comr
Virginia	Richmond	Feb. 1, 4 p.m.	Plans, designs, detailed drawings, strainsheets, specifications and proposals for \$225,000 rein. concrete bridge over James ri.	Charles E. Bolling, City Engineer

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
LIGHTING AND POWER				
Ohio	Columbus	Jan. 13, 9 a.m.	Elec. wiring and heating plant for Ohio Penitentiary	Marriott & Allen, Architects.
New Jersey	Perth Amboy	Jan. 15	Structural iron work on 200x200 ft., power house, 50 ft. high	Public Service Electric Company
New York	Albany	Jan. 16	Lighting streets in Albany	F. N. Bresler, City Clerk.
Maryland	Annapolis	Jan. 17, 11 a.m.	Lighting sts. in Arundel County by arc or incan. elec. lamps for terms of one, two, five or ten years.	S. O. Tilgman, Clk. Co. Comrs.
California	Ft. Winfield Scott	Jan. 19	Constr. oil stor. tank, pipe line, pump, motor, etc.	Maj. Geo. McK. Williamson, Q.M. U.S.A.
Washington	Spokane	Jan. 20, 2 p.m.	Furn. induction motor and switchboard complete; also 3,000,-000 gal. two-stage horizontal shaft pump.	John Gifford, City Purch. Agt.
Illinois	Peoria	Jan. 24	Construction of bridge across Illinois river.	Fred B. Tracy, City Clerk.
Georgia	Fort Screven	Jan. 30, 11 a.m.	Constructing electric light system.	Constructing Quartermaster.
Iowa	Atlantic	March 1	Imp. Elec. Lt. and Power Plant, probable cost \$40,000.	T. E. Nichols, City Clerk.
FIRE EQUIPMENT				
Washington	Tacoma	Jan. 16, 3 p.m.	Furn. motor-driven comb. chemical engine and hose wagon; one motor-driven Aerial ladder truck; also auto roadster to carry four persons	L. W. Roys, Comr. Pub. Safety.
Rhode Island	E. Providence	Jan. 21	Furnishing automobile fire truck	W. E. Smyth, City Clerk.
MISCELLANEOUS				
Minnesota	Minneapolis	Jan. 13 7:30 p.m.	Furn. Portland cement for filter plant, st. and sew. work in 1911	Henry N. Knott, City Clerk
Louisiana	Lake Charles	Jan. 16	Erect. \$165,000 Court House, Fayrot & Livadais, Archts., New Orleans.	Police Jury.
New York	New York	Jan. 16	Furn. mat. and resurfac. floors, City Hosp. Blackwell's Island.	M. J. Drummond, Comr. Pub. Char.
Pennsylvania	Schuylkill Haven	Jan. 17, noon	Con. sewage disposal and power plant; also main bldg.	Charles Straughn, County Recorder.
New York	New York	Jan. 17	Disposition of garbage in Manhattan and Bronx.	W. H. Edwards, Comr. St. Clean.
Pennsylvania	Philadelphia	Jan. 20	Bldg. superstruc. of Vine st. pier; cost about \$35,000.	J. F. Hasskarl, Act. D. Dt. W. & D.
North Dakota	La Moure	Jan. 20, 2 p.m.	Furnishing cor. galvanized culverts needed during 1911.	C. J. Ahlster, County Auditor.
Minnesota	Minneapolis	Jan. 21, noon	Dredging in Lake Calhoun and filling low lands and boulevard adjacent; 500,000 cu. yds. material to be moved; \$1,000 check with bid.	J. A. Ridgway, Secy. Bd. Pk. Comrs
Oklahoma	Ardmore	Jan. 23, noon	All furniture to furnish and equip new County Court House.	R. F. Seivaly, Chm. B.I. County Co.
California	San Jose	Feb. 6	Constructing tuberculosis ward, county hosp. Est. cost \$10,000.	Roy Walter, City Clerk.

STREET IMPROVEMENTS

Corning, Cal.—Laying of 1½ miles of concrete sidewalks is being considered.—Trustees Wm. Dale and Samuel Benton, Special Committee.

Los Angeles, Cal.—Board of Supervisors has adopted specifications for about 11 miles of road near Lamanda Park; bids will be asked at once.

Reedley, Cal.—Citizens are urging County Supervisors to ask for bids for building 14-ft. road in mountains above Millwood and Happy Gap; cost \$25,000.

Upland, Cal.—Contract will soon be let for paving 10th st.

Bridgeport, Conn.—Streets and Sidewalks Committee has recommended that the Board of Aldermen give permission to Legislature to bond city to amount of \$100,000 in order to put permanent pavements on all of streets.—Alderman H. J. Clampett, Chairman.

Wilmington, Del.—Court of General Sessions is considering opening of road in Brandywine Hundred.

Washington, D. C.—Engineer Department favors extension of Lamont st. N. W.; total cost \$12,900.

Macclenny, Fla.—County Commissioners, J. R. Barnes, Chairman, will improve main thoroughfare east and west across county this year.

Pensacola, Fla.—Geo. Roummel, Jr., will prepare plans and supervise proposed road improvement work; \$250,000 bonds sold.

St. Augustine, Fla.—St. Johns County is considering construction of surfaced highway from this city to Bayard, in Duval County.

Athens, Ga.—Mayor Rowe has recommended extension of granolithic sidewalks.

Glencoe, Ill.—Bids have been rejected for construction of 12,650 yds. 3-course macadam pavement, including 9,723 lin. ft. 4 to 22-in. vit. tile drain.—Wines & Marsh, 598 Birch st., Wrennetka, Engineers.

Evansville, Ind.—Improvement of 1st ave. road is being considered by Board of County Commissioners.

Mishawaka, Ind.—Residents of Niles, Washington and Indiana aves. have petitioned for bitulithic pavement.

Portland, Ind.—Jay and Randolph County Commissioners will soon ask bids for construction of proposed connecting three-mile gravel road.

Council Bluffs, Ia.—Paving of East Pierce st. and McPherson ave. is being considered.

Des Moines, Ia.—Council has decided to pave Eighth st. with creosote wood block of tamarack or southern long-leaf pine.—Jas. J. Hanna, Mayor.

Red Oak, Ia.—Council has decided to grade curb and pave number of streets.—Richard Roberts, City Clerk.

Louisville, Ky.—Good Roads Congress has recommended passage of bill allowing over \$1,000,000 each year for construction of good roads.

Baltimore, Md.—Specifications for regrading of South Eutaw st., between Henrietta and Cross sts., incident to work of Balti-

more and Ohio Railroad in abolishing its grade crossings in South Baltimore, will be submitted to the Board of Awards by City Engineer B. T. Fendall.

Colesville, Md.—Colesville district has petitioned for construction of 2½ miles of dike on Columbia road.

Boston, Mass.—Mayor Fitzgerald is considering proposed widening of Pleasant st.

Easton, Mass.—City proposes to construct 10 miles of granolithic or other pavement sidewalks.—L. K. Rourke, Superintendent of Streets.

Brockhaven, Mass.—Lincoln County has voted \$150,000 of bonds for construction of about 60 miles of gravel road in District No. 1.

Dedham, Mass.—City has sold \$7,740 street and bridge bonds to Adams & Co.

Fall River, Mass.—Mayor Higgins has recommended systematic improvement of streets and more extensive street sweeping.

Gloucester, Mass.—Mayor Patch has recommended improvement of Main st. and continuing work on parkway along Western ave.

Lowell, Mass.—Mayor John F. Meehan has recommended loans for additional smooth paving and sewer work.

New Bedford, Mass.—Mayor Ashley has recommended widening of Mt. Pleasant st. and Tarklin Hill road.

Northampton, Mass.—Mayor Calvin Coolidge has recommended improvement of streets.

Taunton, Mass.—Mayor Woods has recommended improvement of streets in outskirts of city.

Duluth, Minn.—Highway Commissioner B. J. Morrisset will improve 18th st. road for distance of 11 miles; road will be widened to 20 ft and macadamized.

Duluth, Minn.—Cost of paving Superior, Jenswold and Oneonta sts. has been estimated at \$211,415, provided bridges at 40th and 43d sts. be filled with dirt one year previous to paving.

South Stillwater, Minn.—Citizens have voted \$5,000 bonds for street and electric light improvements.

Bogota, N. J.—Mayor Wm. N. Smith has recommended macadamizing from curb to curb Larch ave. from South st. to the borough line; completion of all sidewalks and crosswalks; asphalt oiling of all the principal streets in borough; opening and macadamizing of such new streets as will be justified by increase of taxable values of abutting property of borough and immediate improvement of Trolley st.

Camden, N. J.—Mayor Chas. H. Ellis has recommended highway improvements in Eleventh and Twelfth Wards.

Elizabeth, N. J.—Mayor Alfred A. Stein has recommended abolition of Central Railroad grade crossings in downtown section of city.

Hasbrouck, N. J.—Mayor A. C. Austin has recommended improvement of boulevard.

North Plainfield, N. J.—Mayor N. B. Smalley is favorable to widening of Somerset st. from Jackson ave. north.

Rahway, N. J.—Mayor Wm. Howard has recommended extensive oiling of roads during year and paving of Lewis st. from Irving to Main st. with brick.

Roselle Park, N. J.—Mayor Geo. H. Horning has recommended paving of certain streets.

South Amboy, N. J.—Mayor Michael Welsh has recommended improvement of Broadway.

Trenton, N. J.—Board of Park Commissioners is considering extension of Riverside ave.

Albany, N. Y.—Mayor Jas. B. McEwen has recommended widening of State st. and extension of North Pearl st.

Albany, N. Y.—Award of good roads contracts, estimated cost \$3,750,000, has been held up by Gov. Dix, who has requested State Highway Commission to defer the opening of bids until John A. Bensel, State Engineer, has examined plans and specifications and reported to him; contracts, which were for 50 or more sections of work, were to have been awarded on Jan. 9, 11 and 13.

Binghamton, N. Y.—Council has ordered specifications for paving Main and Leroy sts. with brick and wood block.

Kingston, N. Y.—Mayor Roscoe Irwin has recommended permanent paving of number of streets.

Lackawanna, N. Y.—Citizens have voted to pave portion of Ridge road; estimated cost, with brick, \$76,000, and with stone, \$90,000.

Lockport, N. Y.—Mayor Jas. J. Moran has recommended repair of streets leading to main roads.

Newburgh, N. Y.—Cost of paving Front st. has been estimated by City Engineer Blake at \$4,100.

New Rochelle, N. Y.—Council has decided to curb, gutter and sidewalk Lafayette and Winthrop ave. and Brook st.

Poughkeepsie, N. Y.—Mayor Sague has recommended continuance of street improvements.

Rochester, N. Y.—Council is considering laying of asphalt pavement on Northview Terrace at cost of \$12,000; cement walks and asphalt pavement on St. Paul st., \$99,650, and asphalt pavement on Goodman and Circle sts., \$26,000.—Thos. Dramfield, City Clerk.

Schenectady, N. Y.—Cost of repairing State and other streets has been estimated by City Engineer J. Leland Fitzgerald at about \$100,000.

Sharon, N. D.—Commercial Club is interested in proposed construction of roads.

Ashtabula, O.—County Commissioners are considering construction of macadam road from Bunker Hill to Austinburg; distance 7 miles.

Canton, O.—Council has passed resolutions for paving S. Rex and High sts.

Cincinnati, O.—Chief Draughtsman F. L. Raseling has completed surveys for construction of proposed grade crossing viaduct.

Cincinnati, O.—Committee on Streets and Parks is considering eight ordinances for

paving certain alleys in neighborhood of Vine and Liberty sts. with brick.

Toledo, O.—Plans of the Cherry Street Business Men's Association for repaving of Cherry st. between Summit and Bancroft on the present foundation have received approval of Council Committee on Public Improvements.

Toledo, O.—Council has received petition to pave Detroit ave. from Central to Colingwood.

Youngstown, O.—Good Roads Commissioners of District No. 1 have advertised sale of \$125,000 of good roads bonds for improving a number of short stretches of road connecting up main highways in the Townships of Youngstown, Boardman, Austintown and Jackson.

Sharpshville, Pa.—Town will lay about 25,000 to 30,000 sq. yds. brick paving during the year.

West Chester, Pa.—Taxpayers of Honeybrook, East Caln, West Nantmeal, Wallace, Caln and East Brandywine Townships are urging construction of highway between Downingtown and Honeybrook boroughs by way of Glendale.

Cranston, R. I.—Mayor Edw. M. Sullivan has recommended \$5,000 expenditure for highways.

Newport, R. I.—Mayor Patrick J. Boyle has recommended repairing of roadbeds and laying of granolithic sidewalks.

Providence, R. I.—Mayor Henry Fletcher has recommended paving of business streets.

Pierre, S. D.—County Commissioners have decided to considerably improve highways during year.

Surter, S. C.—Council is considering election on \$25,000 bonds for improvement of Main st.—L. D. Jennings, Mayor.

Palestine, Tex.—City Commissioners are considering opening of Line st.

Taylor, Tex.—Board of Aldermen is considering purchase of road roller.

Norfolk, Va.—City Engineer W. T. Brooke has been requested by Board of Control to ascertain cost of laying smooth pavement at intersection of Boush and Freemason sts.

Portsmouth, Va.—Local Board of Seventh Ward has decided to make permanent repairs to South st.

Portsmouth, Va.—If city will agree to improve Glasgow st. to a permanent extent as far as present limits of city, Permanent Road Improvement Commission of Norfolk County will extensively improve continuation of street in county territory.

Centralia, Wash.—City will pave 10 blocks in spring; cost \$70,000.

Olympia, Wash.—Resolutions have been presented before State Highway Board for State aid road in Benton County from Byron to Kennebec passing through Prosser, a distance of 40 miles, and for one in Columbia County from Hawksville to Marenango, about 20 miles.

Seattle, Wash.—Council has passed resolutions for paving three streets and filling Railroad ave.

South Bend, Wash.—Council is considering paving of main business street.

Huntington, W. Va.—City Commissioners are planning to expend \$170,000 on street improvements during coming summer.

Sheboygan, Wis.—Board of Public Works has recommended paving of North 6th and other streets.

Fergus, Ont., Can.—Ratepayers have passed by-law for permanent sidewalks.

CONTRACTS AWARDED

Los Angeles, Cal.—Paving Evergreen ave., to Frank Gillespie, about \$13,206.

San Bernardino, Cal.—Paving E. st. from First to Mill, to Ernest Frenzell, Redlands, 9.6c. per sq. ft. for oiled macadam and 2.5c. per sq. ft. for oiled surface; total cost will be \$10,000.

Stockton, Cal.—Paving nine streets with macadam, to O. Moreing & Sons, city.

Denver, Col.—Grading streets and constructing concrete curb and gutter in East Denver Improvement District No. 6, bidders all of Denver: To Westcott-Doan Investment Co., \$45,515; other bidders: The Denver and Pueblo Construction Co., \$16,233; the Municipal Construction Co., \$49,823; the Commonwealth Construction Co., \$49,882; J. Fred Roberts, \$50,806; Thos. J. Tully, \$51,497.

Jacksonville, Fla.—By County Commissioners: Paving with brick, to Fred Ogram, \$8,943; shell paving on 64th st., to D. M. Baker, \$6,062.

Jacksonville, Fla.—Grading, paving and curbing the Panama road with brick, to Fred Ogram, \$8,943.25; grading 64th st., to C. F. Slater, \$612.97; shell paving 64th st., to D. M. Baker, \$6,062.27; grading Lake Shore blvd., to J. Collier Brown, \$2,369.63.

Chicago, Ill.—Paving, to following bidders: F. K. Shobe Co., 524 W. 63d st.; Jno. A. McGarry & Co., 1001 Security Bldg.; Parker Washington Co., 920 Chamber of Commerce Bldg.; R. F. Conway Co., 720 Chamber of Commerce Bldg., and Jas. A.

Sackley Co., 307 Chamber of Commerce Bldg.

Glencoe, Ill.—Paving with macadam from plans of Engineers Windes & McGray, 598 Birch st., Winnetka, to John A. McGarry & Co., 1001 Security Bldg., Chicago, as follows: 21,400 sq. yds. macadam, avenue depth $\frac{9}{16}$, \$1,02 $\frac{1}{2}$; 12,900 cu. yds. excavation, 30c.; 10,400 sq. yds. of sod, 28c.; 691 sq. yds. paving brick cross walks, \$1.85; 82 concrete end curbs, complete, \$5; 73 catch basins, 250-lb. covers, \$29; 1 manholes, 250-lb. covers, complete, \$29; 1,280 lin. ft. of 4-in. drain, 4 ft. deep, 26c.; 6,460 lin. ft. of 6-in., 36c.; 3,892 lin. ft. of 8-in., 40c.; 960 lin. ft. of 10-in., 19c., and 150 lin. ft. of 12-in., 5 ft. deep, \$1, and 1,200 lin. ft. of 20-in. drain, 6 ft. deep, \$2.80; total, \$41,319; Jas. Cape & Sons Co., 468 Water st., Racine, Wis., bid for this work \$41,917.

Covington, Ind.—To Fred Cunningham, Bloomfield, to construct gravel road, \$10,480.

Greencastle, Ind.—By Commissioners of Putnam County for construction of a gravel road in Greencastle and Monroe Townships, to Mahoney & Allen, city.

Logansport, Ind.—To Frank Justice for constructing Harvey gravel road between Cass and White Counties, by County Commissioners, \$8,900.

Wichita, Kan.—Paving with brick portions of Water, 3d and 1st sts., to H. L. Miles, \$1.99 per sq. yd.

Springfield, Mo.—Paving as follows: Elm st. with brick, to J. C. Likes, \$2.24 per sq. yd.; Mt. Vernon and Commercial sts., with Hassan, to Mackliffe-Gibson Construction Co., \$1.75 per sq. yd.

Elizabeth City, N. C.—Asphalt street paving, to J. L. Robinson, Baltimore, Md., \$1.61 per sq. yd.; paving Water st. with Belgian blocks, to J. L. Lawson, Norfolk.

Cleveland, O.—Grading and loaming Parkway, Harvard to Washington road, to Alex. Tubman & Wm. Burkhardt, 2153 Fairmount st.

Circleville, O.—To James T. Lynch, of Flint, Mich., for paving streets, \$73,052.

Marion, O.—Paving Marion and Agosta pike, to D. C. O'Connell, \$5,950.

Bartlesville, Okla.—To Kraul & Co., for paving East 3d st., including curbing, guttering, grading and laying of sewers, \$2.38 per sq. yd.

East Providence, R. I.—Supplying 132,000 granite paving blocks, to New England Granite Co.; 50,000, to John Catto; both contracts are to be filled at Westerly quarries and 100,000 will be supplied at \$60 per M and \$2,000 at \$59 per M.

Portsmouth, Va.—To E. Parks Lindsay, city, by Norfolk County Permanent Road Improvement Commission, for construction of macadamized boulevard from Cross roads in Tanner's Creek magisterial district to Ocean View, \$16,163; other bidders: E. J. McGuire, Norfolk, \$16,270, and Dalby, Nottingham & Co., Norfolk, \$16,297.20.

Olympia, Wash.—By State Highway Board, for four miles of road, running east from Tomasket in Okanogan County, known as road 92, to Wood & Rubert, about \$5,000.

BIDS RECEIVED

Los Angeles, Cal.—By County Board of Supervisors for improving El Monte-Cornia Road, 9.05 miles long, requiring 28,820 tons of oiled macadam: A. C. St. John, \$40,348; Oiled Macadam Paving Co., \$43,382, and F. E. Prondgeast, \$41,313.

Hartford, Conn.—Construction of State road work: Town of Sterling, three sections gravel-teford road, on the road leading from the Sterling railroad station to the Rhode Island State line, (a) first section, 5,810 lin. ft., (b) second section, 6,268 lin. ft., (c) third section, 9,442 lin. ft., (d) telford, (e) rubble drain; Ahern Bros., Norwich, (a) \$6,730, (b) \$8,720, (c) \$7,033, (d) 60c., (e) \$1; Roger Kennedy, Middletown, (a) \$8,541, (b) \$9,778, (c) \$12,189, (d) 60c., (e) \$1.25; A. Vito & Co., Thompson, (a) \$8,100, (b) \$10,730, (c) \$7,380, (d) 75c., (e) \$1.25; O. T. Benedict, Pittsfield, Mass., (a) \$7,500 (b) \$11,350, (c) \$8,250, (d) 75c., (e) 95c.; A. D. Bridge's Son Co., Hazardville, (a) \$9,607, (b) \$13,155, (c) \$11,700, (d) 75c., (e) \$1. Town of Canton, 6,123 lin. ft. gravel-teford road, including one reinforced concrete culvert, 8-ft. span, on Indian Hill section: B. D. Pierce, Jr., Co., Bridgeport, lump sum, gravel \$18,000, telford 75c. per lin. ft., rubble drain 90c. per lin. ft.; William Maloney, West Hartford, \$18,027, 60c., 75c.; C. A. Rossi, Torrington, \$18,065, 65c., 75c.; Joseph Mascetti, Torrington, \$11,266, 50c., 60c.; F. Arrigoni & Bro., Durham, \$27,422, 50c., \$1.25; Pierson Engineering and Construction Co., Bristol, \$16,838, 50c., \$1.25; Sternberg & Cadwell, West Hartford, \$13,899, 50c., \$1.25; C. W. Tyron, Meriden, \$18,062, 50c., \$1.25. Town of Brooklyn, 5,050 lin. ft. macadam-teford road, on Main st.; Roger Kennedy, Middletown, \$1.79 per lin. ft. for macadam, \$2.30 per lin. ft. for telford, \$1 per lin. ft. for rubble drain, 65c. per sq. yd. for cobble gutters; C. T. Bene-

dict, Pittsfield, Mass., \$2.53, \$3.23, \$1.75c., Tony Leo, Thompson, \$2.89, \$3.71, \$1.05, 89c.; A. D. Bridge's Son Co., Hazardville, \$2.57, \$3.27, \$1.60c. Town of Preston, 7,825 lin. ft. graded telford road, including one reinforced concrete arch culvert, 8-ft. span on the road from Sterling station to the Rhode Island State line, (a) grading, lump sum, (b) telford, (c) rubble drain, (d) rubble walls; Ahern Bros., Norwich, (a) \$19,590, (c) \$1, (d) \$6; Roger Kennedy, Middletown, (a) \$14,000, (b) 60c., (c) \$1, (d) \$5.50; O. T. Benedict, Pittsfield, Mass., (a) \$19,595, (b) 75c., (c) 96c., (d) \$5.95; William B. Wilcox, Norwich, (a) \$21,000, (b) 70c., (c) \$1, (d) \$6; Clayton T. Curtiss, Glastonbury, (a) \$11,001, (b) 90c., (c) \$1.10, (d) \$5; Tony Leo, Thompson, (a) \$15,870, (b) 81c., (c) \$1.19; Tony Carbond, Norwich, (a) \$21,235, (b) \$3.30, (c) \$1, (d) \$3.25; Eldredge Construction Co., Mystic, (a) \$13,728, (b) \$2.18, (c) 90c., (d) \$1; A. D. Bridge's Son Co., Hazardville, (a) \$18,553, (b) 60c., (c) \$1, (d) \$6. Town of New Fairfield, four sections graded telford road, aggregating 160 lin. ft., including one I-beam reinforced concrete culvert, (a) first section, 1,815 lin. ft., (b) section, 1,000 lin. ft., (c) 630 lin. ft., (d) 630 lin. ft., (e) lump sum price for four sections, (f) telford, (g) rubble drain; Goodman Trumbull, Litchfield, (a) \$1,495, (b) \$2,966, (c) \$1,176, (d) \$1,110, (e) \$9,776.40, (f) 90c., (g) \$1.25; Joseph Mascetti, Torrington, (a) \$2,717, (b) \$530, (c) \$450, (d) \$2,000, (e) \$6,300, (f) 60c., (g) 60c.; Norris Hatch, New Fairfield, (e) \$10,800; E. G. Pardee, Bethany, (a) \$10,000, (b) \$2,500, (c) \$2,000, (d) \$2,500, (e) \$17,000, (f) 65c., (g) \$1; E. N. Beard Co., Shelton, (e) \$12,210, (f) 65c., (g) \$1. Town of Litchfield, 3,100 lin. ft. graded telford road, and Town of Harwinton, 732 lin. ft. graded telford road; road for elimination of two dangerous grade crossings, East Litchfield; work involves much heavy cutting and filling; both sections: The B. D. Pierce, Jr., Co., Bridgeport, \$11,000 for entire grading, 85c. per lin. ft. for telford, 85c. per lin. ft. for rubble drain; A. Vito, Thompson, \$16,861, 90c., \$1.25; F. Arrigoni & Bro., Durham, \$17,081, 99c., \$1; John de Michael & Bro., Torrington, \$15,902, 50c., \$1; William Maloney, West Hartford, \$14,178, 60c., 75c.; O. T. Benedict, Pittsfield, Mass., \$13,987, 60c., 75c.; Pierson Engineering and Construction Co., Bristol, \$11,000, 75c., \$1; Joseph Mascetti, Torrington, \$11,266, 50c., 55c.; Sternberg & Cadwell, West Hartford, \$10,900, 50c., \$1.25; C. W. Tyron, Meriden, \$11,071, 50c., \$1.

Mt. Vernon, N. Y.—Paving East Lincoln ave., Louis Petrillo, new curb, 80c.; old curb, 43c.; asphalt block, \$2.30; brick pavement, \$1.68; brick pavement relaid, 25c.; new flag walks, 65c.; Jas. Piro, new curb, 65c.; old curb, 25c.; brick pavement, \$2.25; relaying brick pavement, 10c.; new sidewalks, 70c.; old sidewalks relaid, 10c.; new brick pavement, present foundation, \$1.63. Frank Nordone, new curb, \$1; old curb, 50c.; asphalt pavement on 6-in. concrete foundation, \$2.95; asphalt on cement foundation, \$2.75; brick pavement, \$2.45; brick pavement relaid, 10c.; brick pavement on present foundation, \$1.59; sheet asphalt, \$2.60; sheet asphalt on 2-in. concrete foundation, \$2.50; new flag sidewalks, \$1; old flag sidewalks relaid, 15c.; Charles Molotla, new curb, 70c.; old curb, 33c.; asphalt on 6-in. concrete foundation, 85; asphalt on 2-in. cement foundations, \$4.50; brick pavement, \$2.50; new flag sidewalks, 60c.; brick relaid, \$1.05; bricks on present foundation, \$1.55; sheet asphalt on 6-in. concrete foundation, \$5; sheet asphalt on 2-in. cement foundation, \$4.75; new flag sidewalks, 60c.; old flag sidewalks relaid, 10c.; Barber Asphalt Co., new curb, \$1.34; old curb, 74c.; asphalt block, \$3.28 $\frac{1}{2}$; asphalt block on 2-in. cement foundation, \$2.51 $\frac{1}{2}$; brick pavement relaid, 35c.; sheet asphalt on 6-in. concrete foundation, \$2.94; sheet asphalt on 2-in. cement foundation, \$2.20 $\frac{1}{2}$; new flags, 90c.; old flags, 25c.; James Garofano, new curb, 75c.; old curb, 20c.; brick pavement, \$2.75; old brick pavement relaid, 10c.; new flags, 65c.; old flags, 20c.; new brick pavement on present foundation, \$1.69; Charles Sillery, new curb, 75c.; old curb, 20c.; brick pavement on 6-in. concrete foundation, \$2; brick pavement relaid, 50c.; brick pavement on present foundation, \$1.64; new flags, \$1; old flags, 30c.; Harlem Contracting Co., new curb, 78c.; old curb, 30c.; asphalt on 6-in. concrete foundation, \$2.78; asphalt on 2-in. cement foundation, \$1.88; brick pavement relaid, 25c.; new flag walks, 85c.; old flag walks, 18c.; Sabino Guarino, new curb, 75c.; old curb, 15c.; brick pavement on 6-in. concrete foundation, \$2.20; brick pavement relaid, 10c.; new sidewalks, 60c.; old sidewalks, 10c.; new brick pavement on present foundation, \$1.71.

Akron, O.—Paving sections of Akron Hudson road; Section 1, E. McShaffrey & Son, city, \$36,682; Section 3, Wildes & Davidson, city, \$63,264; Section 5, Paul & Henry, Barberton, \$106,652.

Atlanta, Ga.—Constructing Peachtree Creek disposal plant: To (a) Chester A. Dady, Brooklyn, N. Y.; other bidders: (b) Nichols Constr. Co., Atlanta; (c) Piedmont Constr. Co., Atlanta; (d) Hard & Worm, New York, N. Y.; (e) Municipal Engr. & Constr. Co., Chattanooga, Tenn.

Table with 5 columns (a-e) and multiple rows of construction items and their costs. Totals are listed at the bottom.

SEWERAGE

Concord, Cal.—Plans will soon be prepared for installation of complete sewer system.

Los Angeles, Cal.—Bids will be received about Jan. 15 by H. B. Ferris, Secretary Board of Public Works, for sewers in Wilmington district.—Homer Hamlin, City Engineer.

Fort Morgan, Col.—City Engineer H. P. Oliver has prepared plans for installation of sewer in Fulton Heights; cost \$7,328.

Palatka, Fla.—City will at early date lay 4,000 lin. ft. 24-in. storm sewer.

Sarasota, Fla.—Issuance of \$20,000 bonds for sewerage and water works is being urged.

Athens, Ga.—Mayor Rowe has recommended extension of sewerage facilities.

Danville, Ind.—Citizens will vote Feb. 2 on installation of sanitary sewer.

Gary, Ind.—Bids will be received by the Board of Public Works for construction of sewers: 3,120 ft. of 60-in. brick sewer, 2,055 lin. ft. of 36-in. brick sewer, 3,160 lin. ft. of 31-in. brick sewer, 3,320 lin. ft. 20-in. pipe sewer, 3,900 lin. ft. of 8-in. pipe sewer, 6,540 lin. ft. of 24-in. brick sewer, 4 gutter inlets, 5 catch basins, 12 manholes.—Harry G. Moose, City Clerk.

Madisonville, Ky.—Engineers Alvord & Burdick, 140 Dearborn st., Chicago, have been selected to prepare plans for \$60,000 sewerage system and purification plant.

Lowell, Mass.—Mayor John P. Meehan has recommended loans for additional sewer and smooth paving work.

New Bedford, Mass.—Mayor Ashley has recommended asking Legislature for permission to issue \$300,000 bonds for new sewers.

Gordon, Neb.—Citizens will vote Jan. 17 on \$4,600 bonds for installation of sewer system.

Bridgeton, N. J.—Council has declared contract for building sewerage system forfeited and has instructed Engineer Clyde Potts to take necessary steps to have work finished either by city doing it itself or by new contract.

Caldwell, N. J.—Mayor John Espy has recommended improvement to sewerage facilities.

Hasbrouck, N. J.—Mayor A. C. Austin is favorable to establishment of sewer system.

Hackensack, N. J.—Mayor Chas. W. Ball has recommended that matter of sewerage disposal be taken up in near future.

Plainfield, N. J.—Mayor W. V. Moy has recommended increasing of sewerage disposal beds.

East Aurora, N. Y.—Installation of \$100,000 sewer system is being considered.—F. W. King, Buffalo, Engineer.

Niagara Falls, N. Y.—Bids will be received about Jan. 17 for sewer in Ashland ave.

New York, N. Y.—Bids opened Dec. 23 by Cyrus C. Miller, President Bronx Borough, for constructing sewers in Walker and Benson aves. and other streets and avenues: (a) Vinton Contr. Co., 141 E. 125th st., \$75,689; (b) W. F. Murray, 215 W. 125th st., \$79,229; (c) L. J. Moran, 562 Burnside ave., \$71,898; (d) Geo. M. Dunn, \$61,593; (e) Leahy Contr. & Constr. Co., 1146 Prospect ave., \$66,954; (f) Stalwart Constr. Co., 5186 Bway., \$76,019; (g) Melrose Contr. Co., 147 E. 125th st., \$73,380; (h) Anita Constr. Co., 3975 Marion ave., \$66,927; (i) Alamo Contr. Co., 215 W. 125th st., \$67,480; and (k) Armanca & Lyons, 8 Van Cortlandt ave., \$68,448.

Table with 11 columns (a-k) and multiple rows of construction items and their costs.

Rome, N. Y.—Mayor Kessinger will secure expert advice on construction of proposed sewage disposal plant.

Wilmington, N. C.—Plans for a complete sewerage system have been submitted to State Board of Health by local Sewerage Commission; cost about \$180,000.

Akron, O.—E. D. Bradberry, Columbus, will prepare plans and specifications for proposed sewage disposal plant.

Bellefontaine, O.—Bids will be received Jan. 30 for \$75,000 sewer bonds.

Bryan, O.—Village is considering installation of sanitary sewer system, including disposal plant.—Riggs & Sherman, The Nasby, Toledo, Engineers.

Hominy, Okla.—Citizens have voted \$36,000 sewer and water bonds.

Oklahoma City, Okla.—Citizens have voted \$15,000 for enlarging sewer system in downtown district.

Altoona, Pa.—Department of Health has recommended completion of Fourth District sewer.

Grove City, Pa.—Bids will be received about March 1 for construction of sewers at cost of about \$15,000.—L. E. Burnside, Borough Engineer.

Pottstown, Pa.—Council has defeated motion to employ engineer to make survey for proposed sewer system demanded by State Health Commissioner Dixon.

Providence, R. I.—Mayor Henry Fletcher has recommended extension of sewerage pumping plant.

Watertown, S. D.—Council is considering construction of sewer on 2d st.

Seattle, Wash.—Board of Public Works has approved specifications for trunk sewer in Virginia st.

La Crosse, Wis.—City will lay number of sewers during coming year.

Goderich, Ont., Can.—Ratepayers have passed by-law to raise \$26,000 for building storm sewer.

item 2, \$13; item 3, \$20; item 4, \$7; item 5, 30c.; item 6, \$1.05; item 7, 95c.; Tenleytown, item 1, excavation; item 2, sewer brick masonry; item 3, 15-in. pipe; item 4, 12-in. pipe; item 5, 10-in. pipe; to W. F. Brenizer Co., city, item 1, 50c.; item 2, \$13.50; item 3, 68c.; item 4, 60c.; item 5, 55c.; Florida ave., item 1, excavation; item 2, brick masonry; item 3, concrete masonry D; item 4, 6-in. subdrain pipe; to same bidder item 1, 80c.; item 2, \$21; item 3, \$7; item 4, 30c.; Rock Creek, item 1, excavation; item 2, sewer brick masonry; item 3, vit. brick masonry; item 4, concrete masonry B; item 5, concrete masonry C; to same bidder, item 1, \$24; item 2, \$20; item 3, \$25; item 4, \$15; item 5, \$14.

Keewatin, Minn.—To H. L. Bartlett Co., Virginia, for installing storm and sanitary sewers.

Marble, Minn.—To H. L. Bartlett Co., Virginia, for installing sanitary sewers.

St. Louis, Mo.—Constructing sewer in N. Harlem Joint district, to Herman Construction Co., 444 S. Theresa ave., \$326,447.

Hackensack, N. J.—Installing sewers in Richmond and Ethelbert aves., to Union Construction Co.

Chester, Pa.—Sewer work, to Henry Pritchard, Central ave., \$1,785.50; Flower st., \$2,030; Ward st., \$448.10; 9th st., \$344.20; Edwards st., \$481.50; Pennell st., \$669; Lloyd st., \$1,335; to John Hanna & Sons, Academy st., \$350.90; Edgmont ave., \$505.40; 22d st., \$400.34; 20th st., \$1,768.30; 5th st., \$381.80; Bromall st., \$370.50; Madison st., \$275.80; Front st., \$375.66; Potter st., \$1,475.75; Chestnut st., \$1,631.50; No. 1, inlets, to Henry Pritchard, \$88 each; No. 2, inlets, to J. & J. Hanna, \$86.89; grate top inlets, \$83.39; No. 3, inlets, \$71.17; grate top inlets, \$70.27; to John J. Williams Co., to build 36-in. iron pipe extension to Welsh st. sewer, \$3,995.

Duquesne, Pa.—Building sewer, to Wm. Jones, Carnegie, \$37,500.

CONTRACTS AWARDED

BIDS RECEIVED

Trinidad, Col.—Building sanitary sewer on Chestnut st., to John McEwan, \$6c. per lin. ft. for excavation; \$46 each for man-holes and \$10 for flushers.

Washington, D. C.—Sewer work: Anacostia, item 1, excavation; item 2, sewer brick and masonry; item 3, 12-in. pipe; to Geo. Hyman, city, item 1, 49c.; item 2, \$13; item 3, 54c.; Bureau of Engraving, sewer A, item 1, excavation; item 2, sewer brick masonry; item 3, 24-in. pipe; item 4, 21-in. pipe; sewer B, item 1, excavation; item 2, sewer brick masonry; item 3, 24-in. pipe, to same bidder, sewer A, item 1, 25c.; item 2, \$13; item 3, 90c.; item 4, 90c.; sewer B, item 1, 25c.; item 2, \$13; item 3, 90c.; Langdon, item 1, excavation; item 2, sewer brick masonry; item 3, vit. brick masonry; item 4, concrete masonry D; item 5, 6-in. subdrain pipe; item 6, 24-in. pipe; item 7, 21-in. pipe; to same bidder, item 1, 49c.;

Washington, D. C.—Construction of intercepting sewer on Rock Creek, between P st. and Military road, section 1, between P st. and Massachusetts ave.: (1) W. F. Brenizer Co., city, (2) E. G. Gummel, city, (3) Alfonso A. Alfieri, Morgantown, W. Va., (4) Whiting & Middleton Construction Co., Baltimore, (5) B. F. Sweeten & Sons, city; ordinary excavation (1) 77c., (2) 55c., (3) 63c., (4) \$2.29, (5) \$1.50; brick masonry, (1) \$14, (2) \$14, (3) \$10, (4) \$20, (5) \$20; vit. brick masonry, (1) \$22, (2) \$20, (3) \$19.47, (4) \$23.75, (5) \$30; concrete masonry, "D," (1) \$2.25, (2) \$7, (3) \$7.73, (4) \$8.03, (5) \$9.

Baltimore, Md.—Sanitary Contract No. 61, lateral sewers in District No. 40-C and Storm Water Contract No. 11; Sanitary Contract No. 61-B, F. Sweeten & Son, 820 Sharp st., \$92,090; Wm. McCarthy & Co., 1007 American Bldg., \$94,737; Irwin Bros.,

Greenville, O., \$102,088; David Peoples, 60 Knickerbocker Bldg., \$103,658; W. H. & T. F. Thompson, \$127,283; Ryan & Reilly, American Bldg., \$129,635; the Whiting-Middleton Construction Co., Sexton Bldg., \$138,493; Storm Water Contract No. 11, Wm. McCarthy & Co., 1007 American Bldg., \$14,841; B. F. Sweeten & Son, 820 Sharp st., \$15,297; W. H. & C. F. Thompson, \$15,845; Shreve & Capie, 848 Equitable Bldg., \$16,143; the Whiting-Middleton Construction Co., Sexton Bldg., \$16,469; David Peoples, 60 Knickerbocker Bldg., \$18,371; Ryan & Reilly, American Bldg., \$19,457; McCay Engineering Co., 9 East Lexington st., \$22,378.

WATER SUPPLY

Modesto, Cal.—Trustees Thede and Knowles have been appointed as a committee to arrange with Engineer Clark to change plans for water works from underground to an overhead system, including overhead tank of 80,000 gals. capacity on a over 100 ft. high.

Washington, D. C.—District Commissioners have ordered laying of additional water mains in number of streets.

Daytona, Fla.—Council is considering establishment of water softening plant.

Ocala, Fla.—Cost of installing water system has been estimated at \$80,000; issuance of bonds being considered.

Sarasota, Fla.—Issuance of \$20,000 bonds for water works and sewerage is being urged.

Athens, Ga.—Mayor Rowe has recommended installation of plant for hypo-chloride of lime treatment of water as suggested by City Engineer Burnett.

Joliet, Ill.—City Engineer Stevens is preparing plans for pumping station to be built at west side well.

Mattoon, Ill.—City will construct \$20,000 filtration system.

Wheaton, Ill.—City will install pumping outfit, including concrete storage reservoir, engines and central well.—A. L. Webster, City Engineer.

Vincennes Ind.—Vincennes Water Co. will purchase quantity of water mains.

Boone, Ia.—Bids will be received Jan. 18 on bonds for additions and extensions to water works.—K. C. Kastberg, City Engineer.

Goodland, Kan.—County Commissioners have voted \$10,000 to install artesian well.

Patterson, La.—City is considering construction of water works; power to be furnished by F. B. Williams Cypress Co.

Beverly, Mass.—Mayor Fred A. Dodge has recommended investigation into manufacture of cement lined pipe for water department.

Woburn, Mass.—Mayor Hugh D. Murray has recommended improvement of water system at cost of \$200,000.

Worcester, Mass.—Mayor Jas. Logan has recommended immediate action to develop Aseubumskit water system.

Flint, Mich.—Wm. G. Clark, Toledo, Consulting Engineer, will supervise construction of proposed water works.

Grand Rapids, Mich.—New pump will be purchased by Board of Public Works and be installed in new city pumping station as reserve engine.

Holland, Mich.—Board of Public Works is considering construction of \$12,000 pumping station at 21st st.

Duluth, Minn.—Council has passed ordinance for election in February on \$300,000 water and light bonds.

St. Paul, Minn.—Assembly Committee on Streets has decided to report favorably on the resolution authorizing Water Board to issue \$100,000 bonds for improvements and extensions.

Worthington, Minn.—Citizens have voted \$12,000 bonds for extension of water mains and erection of tank.

Plattsburg, Mo.—City has selected Rollins & Westover, Beals Bldg., Kansas City, to prepare preliminary plans for water works and electric light plant; cost \$50,000.

Battle Creek, Neb.—Citizens will vote Jan. 15 on \$10,000 bonds for construction of water works.

Gordon, Neb.—Citizens will vote Jan. 17 on \$12,000 bonds for installation of water works system.

Omaha, Neb.—South Omaha Water Co. will erect storage reservoir, capacity 4,000,000 gals., in spring.

Caldwell, N. J.—Mayor John Espy has recommended municipal water supply.

Elizabeth, N. J.—Mayor Alfred A. Stein has recommended municipal ownership of water works.

Glen Ridge, N. J.—Mayor Giles W. Read has recommended municipal ownership of water system.

Lyndhurst, N. J.—Citizens have voted to issue \$25,000 bonds for extending water system.—J. F. Woods, Township Clerk.

North Plainfield, N. J.—Mayor N. B. Smalley has recommended installation of public water plant.

Perth Amboy, N. J.—Water Commissioners are considering installation of 24 or 30-in. water main to connect city with water works at Runyon; cost about \$70,000.

Plainfield, N. J.—Mayor W. V. Moy has recommended installation of municipal water works.

South Amboy, N. J.—Mayor Michael A. Welsh has recommended necessity of providing adequate supply of water.

Hornell, N. Y.—Citizens have voted \$100,000 for water storage reservoir.

Utica, N. Y.—Consolidated Water Co. will install additional sterilization plant.

Cincinnati, O.—Plans for sterilization plant at the California filtration station have been completed and work on the construction will soon be begun; Water Works Superintendent Laidlaw has estimated cost at \$6,500.

New Carlisle, O.—City has sold \$20,000 bonds for construction of water works system.

Sylvania, O.—Village is considering construction of water works.—Riggs & Sherman, The Nasby, Toledo, Engineers.

Youngstown, O.—Council has passed ordinance directing Director of Service to expend \$23,000 for water works supplies.

Delaware, Okla.—Citizens have voted \$25,000 bonds for construction of water works.

Hominy, Okla.—Citizens have voted \$36,000 water and sewer bonds.

Toledo, Ore.—Engineer D. J. Sidney will make preliminary survey for proposed water works system; \$25,000 available.

Lebanon, Pa.—Water Commissioners have recommended duplication of machinery at Hammer Creek pumping station, erection of dwelling house at Hammer Creek for engineers, building of fourth dam at South Mountain watershed and laying of terra cotta pipes to carry water of streams in vicinity of dam No. 3.—E. H. Shroff, Superintendent.

Somerset, Pa.—Council has sold \$10,000 water bonds to Farmers' National Bank.

Wyomissing, Pa.—Borough is considering issuance of \$60,000 bonds for water works and electric light plant.

Providence, R. I.—Mayor Henry Fletcher has recommended storage reservoir for city's water supply.

Pierpoint, S. D.—Installation of water works system is being urged.

Etowah, Tenn.—Prices are desired by Mayor T. F. Peck on deep well pumps.

El Paso, Tex.—Installation of additional engine and pump to force water into city from Mesa pumping plant and sinking of eight new wells 14 in. in diameter is proposed by Superintendent of Water Works W. E. Race.

Palacios, Tex.—City has asked bids from private parties for constructing and operating water works.

Polytechnic, Tex.—City is considering construction of \$30,000 water works system.—John Mead, Engineer.

Trenton, Utah.—City is considering installation of water works system.

Seattle, Wash.—Council has passed resolutions for laying water mains in 12th ave N. W. and 25th ave. N.

Lethbridge, Alta., Can.—Preliminary surveys have been made for gravity water system; cost \$880,000.—C. W. Arnold, City Engineer.

Harrison, Ont., Can.—Citizens have passed by-laws for installation of water works.

North Vancouver, B. C., Can.—City will expend about \$40,000 during year in purchasing c.-i. pipe for proposed extensions.

St. Catharines, Ont., Can.—Ratepayers have voted \$180,000 for installation of water main to increase pressure and supply.

CONTRACTS AWARDED

San Bernardino, Cal.—To J. Wm. Smith, for drilling well near Penis reservoir site, \$5,600.

Winnetka, Ill.—Laying water mains on Laurel ave., Fig and Lake sts., to C. T. Partlett 827 Greendale st., Evanston, \$1,747.—Winds & Marsh, 508 Birch st., Engineers.

Mitchell, Ind.—Building water system, to S. S. Royland.

Ft. Cook, Neb.—Reservoir and well at post, to J. W. Turner Development Co., Des Moines, Ia., \$28,500.

Lincoln, Neb.—Furnishing water pipe, to American Cast Iron Pipe Co., of Birmingham, Ala.; 295 tons 16 and 12-in. pipe, \$23.55 per ton; 159 tons 6-in. at \$23.00, and 75 tons of 4-in., \$24.95 and 5 tons specials, 24c. per lb.

Newark, N. J.—Laying pipe line for fire protection at Hospital for Contagious Diseases, Soho, to Wm. H. Jacobson, \$1,151.06.

Oriskany Falls, N. Y.—Construction of a gravity system of water works, consisting of 15,000,000-gal. reservoir, concrete dam, approximately 25,000 ft. of 12, 10, 8 and 6-in. pipe, 37 hydrants, 36 valves and all accessories, material, tools and labor neces-

sary to complete the system, to John Siegrist, Utica, \$26,794.

Cincinnati, O.—Furnishing 48-in. check valve to Water Works Department, to Rensselaer Valve Co., \$1,947.50.

Somerset, Pa.—To D. W. Rhoads, city, for construction of the pipe line from new well just north of town to reservoir, which is necessary in carrying out plans of Engineer L. E. Chapin, of Pittsburg, for enlarging water works; about 4,300 ft in length.

Appleton, Wis.—To O'Keefe-Orbison Engineering and Construction Co. for building dam at Appleton to cost from \$90,000 to \$100,000.

Greybull, Wyo.—Building water works system, to Garrard Construction Co., Sheridan, \$31,960.

BIDS RECEIVED

Hudson, N. Y.—Laying larger water main on Second st.; Harper, Javo & Kehoe, Quincy, Mass., \$2.28, and Patterson & Malone, city, \$2.30; total, about \$4,857.

LIGHTING AND POWER

Murfreesboro, Ark.—Plans are being prepared by W. A. Fuller, 1616 Chemical Bldg., St. Louis, Mo., for power plant to be erected by Pike County Water Co.; cost about \$850,000.

Meridian, Cal.—Pacific Gas and Electric Co. is preparing to extend its power lines from this city to Colusa.—J. A. Britton, San Francisco, General Manager.

Redding, Cal.—Fred Dakin is interested in proposed installation of gas plant.

Willow, Cal.—Board of Supervisors has granted franchise to Sacramento Valley Power Co., Redding, to construct and maintain power line in Glenn County.

Ventura, Cal.—County Supervisors have granted to Ventura Power Co. franchise to lay and maintain 36-in. reinforced concrete pipe line.

Norwich, Conn.—Board of Gas and Electric Commissioners will install 750-kw steam turbo generator set and make other improvements to electric light plant; \$35,000 available.

Jacksonville, Fla.—Jacksonville Electric Co. will erect power house on Riverside ave.—Geo. J. Baldwin, Savannah, Ga., President.

Kooskia, Ida.—F. J. Engelhorn has asked for franchise to supply electric lights and power.

Pocatello, Ida.—J. A. Jones is considering construction of \$200,000 gas plant.

Farmland, Ind.—J. T. Moorman and Ed Goodrich, of Citizens' Water and Light Co., Winchester, have closed contract with Town Council to furnish Farmland with 38 electric street lights; also supply lights for all the residents and business men of Farmland who want them; work on extension from Winchester will commence as early as possible.

Iowa City, Ia.—The Cedar Rapids and Iowa City Interurban Railway Co. is planning to expend \$80,000 this year on improvements; company will erect substation, also remove substation from Coralville to North Liberty.

Webster City, Ia.—Council will purchase site on Superior st. for erection of power house.

Frankfort, Ky.—City has granted franchise to E. M. Wallace, manager Capitol Lumber Co., to construct electric light system.

Midway, Ky.—City is considering granting franchise to E. M. Wallace, manager Capitol Lumber Co., Frankfort, to furnish city with electric light; system is to be extended from Frankfort, distance 14 miles.

Springfield, Mass.—Mayor Edw. H. Lathrop has recommended municipal ownership of gas and electric lighting systems.

Escanaba, Mich.—Council has authorized Board of Public Works to secure site for erection of proposed city gas plant.

Iron Mountain, Mich.—L. Sterling and O. C. Davidson are interested in proposed erection of hydroelectric plant on Menominee River.

Duluth, Minn.—Citizens will vote in February on \$300,000 light and water bonds.

Minneapolis, Minn.—Plant of the Minneapolis General Electric Co. has been destroyed by fire and explosion.

Minneapolis, Minn.—Mayor J. C. Haynes has recommended replacement of old-style gasoline lamps with incandescent lamp beads and burners, making of new contract for incandescent gas street lighting and for electric lighting.

South Stillwater, Minn.—Citizens have voted \$5,000 bonds for improvement of lighting plant and streets.

Tower, Minn.—Citizens will vote on bonds to erect power plant at Pike River Falls, cost about \$15,000.

Plattsburg, Mo.—Rollins & Westover, Beals Bldg., Kansas City, are preparing preliminary plans for electric light plant.

Penacook, N. H.—Penacook Electric Light Co. is considering extension of transmission line.

Camden, N. J.—Mayor Chas. H. Ellis has recommended installation of additional lights along main thoroughfare.

South Amboy, N. J.—Mayor Michael A. Welsh has recommended appointment of committee to consider matter of municipal electric light plant.

Buffalo, N. Y.—Public Service Commission at Albany has granted Niagara and Erie Power Co. of Buffalo permission to issue \$500,000 bonds for improvements.

Watertown, N. Y.—Public Service Commission has authorized Ober River Power Co. to exercise franchise granted in towns of Champlain and Denmark.

Hickory, N. C.—The Water Power Electric Co. has selected Connell & Connell, 90 West st., New York, as Chief Engineers for construction of water power electrical plant.—Louis R. Abel, 258 Broadway, New York, Resident Engineer.

Hastings, Okla.—Prices on wire and poles are desired by Mayor J. A. Marley.

Oklahoma City, Okla.—Oklahoma Street Railway Co. will erect addition to Belle Isle Power plant; will also enlarge substation at Olive ave. and 2d st.—A. J. Bemis, General Manager.

Cottage Grove, Ore.—Citizens have voted to extend franchise of present electric light company for period of 25 years.

Freewater, Ore.—Pacific Power and Light Co. will construct eight-mile electric power transmission line.

Conneautville, Pa.—Application has been made to Council by newly organized company for franchise to install electric light and heating plant.

Lansdale, Pa.—The Montgomery Heat and Fuel Co. is planning to erect complete plant.

Wyomissing, Pa.—Borough is considering issuance of \$60,000 bonds for electric light plant and water works.

Watertown, S. D.—Definite plan for lighting city is being urged by Manager Ferris, of light plant.

Etowah, Tenn.—Prices are desired by Mayor T. F. Peck on insulated or bare copper wire.

Fort Stockton, Tex.—Clay Bros., San Angelo, have been granted franchise to install electric light plant.

Wichita Falls, Tex.—Council has granted J. W. Culbertson and associates 25-year franchise to supply natural gas.

Morgantown, W. Va.—Morgantown and Dunkard Valley Railroad Co. is considering plans for erection of power house.

Walla Walla, Wash.—Practically whole of distribution system of Pacific Power and Light Co. south of Main st. will be rebuilt in near future, while system on other side of Main will also receive considerable attention and improvement.—W. B. Foshay, Manager.

Bowmanville, Ont., Can.—Seymour Power and Electric Co., Ltd., has been granted franchise.

Hespeler, Ont., Can.—Ratepayers will raise \$4,000 for extension of electric light for street lighting.

Kingston, Ont., Can.—Ratepayers have passed by-law for electric light improvements.

Waterloo, Ont., Can.—Ratepayers will raise \$40,000 for electric light purposes.

CONTRACTS AWARDED

St. Augustine, Fla.—Lighting city, to St. Johns Light and Power Co., renewal.

Belvidere, Ill.—Lighting streets for ten years, to Public Service Operating Co.

Albany, N. Y.—To Wells-Boughton Co., Troy, for construction of hydroelectric plant at Crescent Dam, \$42,940.

New York, N. Y.—Furnishing 500 posts for Tungsten park lighting, to Elmer P. Morris Co., 90 West st.; about one-half are for regular installations and rest of new type and will be used for lighting of transverse roads through Central Park.

Defiance, O.—City has contracted with DeFrance Gas and Electric Co. to furnish light for 10 years; street lamps are to be at rate of \$70 a year a lamp; commercial lighting is to be at rate of 9c. per kw.-hour.

Parksville, Tenn.—By Eastern Tennessee Power Co. for electrical equipment for power plant, to Westinghouse Electric and Mfg. Co., Pittsburgh, Pa.

Dallas, Tex.—To Dallas Electric Light and Power Co., to install and maintain decorative system of lighting on Elm st.

FIRE EQUIPMENT

Birmingham, Ala.—Council has authorized purchase of 15 new motor-driven fire hose wagons at cost of \$65,000.

Montgomery, Ala.—Finance Committee has recommended erection of fire station on McDonough st.

Trinidad, Col.—Fire Chief Robert A. Daugherty has recommended erection of the station on north side, purchase of combination auto-chemical and hose wagon, ca-

capacity 2,000 ft. of hose and 65-ft. aerial truck, also installation of modern fire alarm system.

Cartersville, Ill.—Fire department has been organized.—J. M. Brann, Fire Chief.

Joliet, Ill.—Police Chief McMasters has recommended purchase of auto.

St. David, Ill.—Town is considering purchase of chemical fire engine.

New Albany, Ind.—Finance Committee is considering \$2,500 appropriation for erection and equipment of reel house in Seventh Ward.

Burton, Kan.—City is considering purchase of fire engine.

Chicopee, Mass.—Mayor S. E. Fletcher has recommended purchase of motor-driven vehicle capable of serving as pumping engine and hose and chemical engine combined.

Fall River, Mass.—Mayor Higgins has recommended placing of all fire alarm wires underground and installation of more fire alarm boxes.

Gloucester, Mass.—Mayor Patch has recommended purchase of auto combination wagon for fire department.

Malden, Mass.—Mayor Fall has recommended auto chemical for Maplewood and auto for Fire Chief.

Waltham, Mass.—Mayor E. A. Walker has recommended purchase of auto chemical and auto for Fire Chief.

Worcester, Mass.—Mayor Jas. Logan is favorable to auto fire apparatus.

Manchester, N. H.—Mayor E. C. Smith has recommended purchase of modern, properly equipped aerial truck.

Bayonne, N. J.—Mayor John J. Cain has recommended erection of fire house.

Bellevue, N. J.—Township is considering need of motor fire engine.

Caldwell, N. J.—Mayor John Espy has recommended establishment of fire alarm system.

Camden, N. J.—Mayor Chas. H. Ellis has recommended location of fire house in Eleventh Ward for combination hose and chemical wagon, auto being favored; installation of light steamer at present east side house and auto for Chief.

Elizabeth, N. J.—Mayor Alfred A. Stein has recommended erection of fire station in Eleventh Ward; also new home for company in Station No. 6 on Magnolia ave. and house in city yards, High and Port sts., for Engine No. 3 and additional truck company.

Englewood, N. J.—Chief Engineer Emile Rush has suggested need of auto fire engine.

Glen Ridge, N. J.—Mayor Giles W. Read has recommended new headquarters for fire department.

Hackensack, N. J.—Mayor Chas. W. Bell has recommended better equipment of fire fighting apparatus in Mercer st. fire house; auto apparatus favored.

Hasbrouck, N. J.—Establishment of fire alarm system is being considered.—A. C. Austin, Mayor.

Jersey City, N. J.—Architect Robert B. Morrison has submitted tentative plans for fire headquarters to be erected on Merseles st. at cost of \$250,000, including site.

Roselle Park, N. J.—Mayor Geo. H. Horning has recommended installation of fire alarm system and purchase of combination chemical hose cart.

Roselle, N. J.—Mayor Chas. W. Macquoid has recommended need of equipping fire department with modern apparatus.

Somerville, N. J.—Purchase of combination wagon is being considered.

South Amboy, N. J.—Mayor Michael A. Welsh has recommended that hook and ladder company be provided with hose carriage and sufficient quantity of hose.

Trenton, N. J.—President Chas. G. Cook, of Fire Board, has recommended erection of fire house and extension of fire alarm system.

Albany, N. Y.—City will try out gasoline propelled chemical and hose wagon; purchase of auto for Chief of Fire Bureau is being considered.

Bath, N. Y.—Village Trustees have decided to purchase 1,000 ft. of hose and rubber gloves and coats.

Elmira, N. Y.—Fire Commissioners have approved plans for erection of fire house on Roe ave.

Endicott, N. Y.—Fire house, cost \$20,000, will be erected next spring.

Hornell, N. Y.—Citizens have voted \$36,000 for erection of central fire house station.

Mt. Vernon, N. Y.—Plans by Architect Stickle have been accepted for erection of \$10,000 fire house on 6th ave.

Syracuse, N. Y.—Mayor Edward Schoenbeck has recommended that central fire alarm system be installed.

Voorheesville, N. Y.—Erection of fire station is being considered.

Elyria, O.—Purchase of combination chemical auto engine and hose wagon and erection of fire house is being considered.

Norwalk, O.—Council is considering re-advertising for bids for proposed fire truck.

Old Fort, O.—Fire house will be erected and necessary apparatus installed.

Altoona, Pa.—Fire Chief T. W. Allemann has recommended purchase of combination chemical engine and hose motor car, auto for Chief, 1,000 ft. of 2½-in. rubber-lined cotton hose and turret pipe.

Catasauqua, Pa.—Fire station will be erected at cost of \$7,000.

Lebanon, Pa.—Fire Alarm Superintendent S. A. Burkholder has recommended additional and better equipment for city hall fire alarm apparatus, including switch-board and automatic repeater.

Stowe, Pa.—West End Fire Co. will purchase 500 ft. of hose.

Pawtucket, R. I.—Mayor Giles W. Eastbrooks has recommended changing of present hose wagon into motor-driven apparatus.

Providence, R. I.—Mayor Henry Fletcher has recommended extension of underground system of fire alarm service.

Chattanooga, Tenn.—Board of Public Works will at once ask bids for repairs to Whiteside st. fire hall.

Clarkston, Wash.—Fire department has been organized.—Geo. Bursell, Chief.

Olympia, Wash.—City is considering erection of two-story concrete fire station and city hall.

Seattle, Wash.—Board of Public Works has approved specifications for fire house at Hillman City.

Toppenish, Wash.—Fire station will be at once erected on east side.

Collingwood, Ont., Can.—Ratepayers have voted to erect fire hall and install modern equipment.

CONTRACTS AWARDED

Rochester, N. Y.—To Standard Underground Cable Co. for 2,000 ft. of 20-conductor cable for fire department, \$556, and for 2,500 ft. of 8-conductor cable, \$357.50.

BRIDGES

Los Angeles, Cal.—Ivory B. Noble, County Surveyor, has completed plans for bridge across Arroyo Seco at Garvanza, connecting with Lincoln Park-South Pasadena district.

Jacksonville, Fla.—Board of Public Works has authorized City Engineer to advertise for bids for construction of a reinforced concrete bridge across Hogans Creek, on East Bay st., to replace the present wooden structure; \$2,500 available.

Batavia, Ill.—State Highway Commission has prepared plans for erection of bridge at Wilson st.

Kansas City, Kan.—Engineer Kenneth Hartley, 349 Greeley st., will prepare plans and specifications for Mill and 18th st. viaducts.—Otto Anderson, Commissioner of Public Works.

Boston, Mass.—Council has passed \$10,000 loan order for preliminary work on proposed Chelsea north bridge.

Dedham, Mass.—City has awarded \$7,740 bridge and street bonds to Adams & Co.

Ashland, Neb.—Construction of bridge over Platte River is being urged.

Toledo, O.—Council has instructed Chief Engineer to supply estimate as to cost of rebuilding the old Cherry st. bridge at Ash and Consaul sts.

Philadelphia, Pa.—Survey Bureau has completed plans for widening of Chestnut st. bridge; \$90,000 available.

Philadelphia, Pa.—City has appropriated \$25,000 for bridge repairs.—Geo. Stearns, Commissioner of Public Works.

Pittsburg, Pa.—County Consulting Engineer E. M. Bigelow has recommended erection of bridge and tunnel from 1st and Ross sts. to Bell Tavern; cost about \$2,000,000.

Reading, Pa.—Berks County Court has approved recommendation for bridge across Schuylkill River between Reading and West Reading.

Fredericksburg, Va.—Supervisors of Spotsylvania County have decided to build bridge over Hazel Run and over Massapanox Run, on road leading from here to Spotsylvania Courthouse; bridges will be either concrete or steel.

Chippewa Falls, Wis.—Plans will be prepared for erection of \$35,000 bridge.

CONTRACTS AWARDED

Red Jacket, Minn.—Building concrete bridge, to Marsh Engineering Co., Des Moines, Ia., \$12,650.

David City, Neb.—Bridge construction in county for year: Wooden bridges, to Nebraska Construction Co., Lincoln; cement culverts, to Wilson Reinforced Concrete Co., Nebraska City; metal culverts, to Nebraska Culvert Manufacturing Co., Wahoe.

Hastings, Neb.—To Standard Bridge Co., Omaha, for county bridge contract for year.

Youngstown, O.—Bridge with steel joists over Powers River for County Commissioners, to Hunter Construction Co., city, \$13,120.

MISCELLANEOUS

Gadsden, Ala.—Etowah County will consider erection of jail.

Arkansas City, Ark.—Desha County is considering erection of addition to court house.—C. H. Halley, Judge.

Los Angeles, Cal.—Dennis & Farwell, Irrigator Bldg., will prepare plans for erection of sub-police station on Boyle Heights.

Petaluma, Cal.—Citizens have voted \$20,000 bonds for purchase of Kenilworth Park.

San José, Cal.—Park Commissioners will ask for bond issue of \$125,000 for following improvements: Bath house, two new bridges, septic tank, development of new mineral springs and of general water supply.

Bridgeport, Conn.—Council is considering \$5,000 bond issue for erection of hall of records.

Bridgeport, Conn.—Board of Park Commissioners has asked for following appropriations: Playground paraphernalia, \$2,500; improvements at Beardsley Park, \$1,000; miscellaneous, \$13,000.

Bridgeport, Conn.—Police department has asked for \$40,000 appropriation for purchase site and erection of police station at West End.

Waterbury, Conn.—Mayor Wm. B. Hotchkiss has recommended issuance of 6,000 bonds for remodeling of city hall.

Waterbury, Conn.—Superintendent of Parks George C. Walker has recommended number of improvements to park system, including playground in Brooklyn district and swimming pool in western section of city.

Athens, Ga.—Mayor Rowe has suggested erection of city stockade and necessity of city park.

Chicago, Ill.—Committee on Bathing Beaches and Recreation Piers will urge \$40,000 bond issue for improvements.—A. J. Sherman, Theo. K. Long and W. P. Dunn are interested.

Mishawaka, Ind.—City will advertise for bids in near future for police alarm system. Harvey Frick, Chief of Police.

Portland, Ind.—County Commissioners will consider erection of court house.

Cambridge, Mass.—Citizens have petitioned for establishment of municipal hospital for caring for sick poor.

Lawrence, Mass.—Mayor Cahill has recommended city hall, police station and refreshment hospital.

Lowell, Mass.—Mayor John T. Meehan has recommended purchase of land for ball playgrounds in congested centers.

Lynn, Mass.—Police Chief Burekes has recommended purchase of auto chemical and touring car for Inspectors; also remodeling of police station.

Malden, Mass.—Mayor Fall has recommended use of some dust-laying preparation on streets.

New Bedford, Mass.—Mayor Ashley has recommended petitioning of Legislature to issue \$35,000 bonds to build and equip city hall, systematic tree planting, creation of public landing place and recreation pier, pairing of railings and better lighting of new Bedford and Fair Haven bridge and immediate equipment of lately secured playground.

Northampton, Mass.—Mayor Calvin Coe has recommended erection of city hall.

Quincy, Mass.—Mayor Wm. T. Shea has recommended development of city's 27 miles of water front.

Sandwich, Mass.—Town hall will be remodelled at cost of \$3,000.

Somerville, Mass.—Mayor Chas. A. Burns has recommended auto wagons for police department.

Taunton, Mass.—Mayor Woods has recommended erection of public comfort station near Taunton Green.

Winthrop, Mass.—City will receive bids Jan. 12 for \$5,000 playground bonds.

Cloquet, Minn.—Erection of modern two-story city jail is being considered.

Minneapolis, Minn.—Mayor J. C. Haynes has recommended establishment of poor house, erection of separate building for contagious diseases, erection of wing to City Hospital and alterations to old part; also building of branch and central library buildings.

Minneapolis, Minn.—Alderman John Peterson is urging establishment of municipal ice house.

St. Paul, Minn.—John Nolen, Landscape Architect, Cambridge, Mass., is preparing plans for elaborate city plan arrangement; Municipal City Plan Commission and City Club will carry on work.

Manchester, N. H.—Mayor E. C. Smith has recommended erection of house of detention for women.

Bayonne, N. J.—Mayor John J. Cain has recommended removal of ashes and garbage by contract.

Burlington, N. J.—Mayor Chas. P. Farmer has recommended creation of small city park.

Caldwell, N. J.—Mayor John Espy has recommended establishment of public park and better methods for garbage disposal.

Garwood, N. J.—Citizens will vote Feb. 18 on \$5,500 bonds for erection of borough hall.

Jersey City, N. J.—Architect Robert B. Morrison has submitted tentative plans for police headquarters to be erected on Merseles st. at cost of \$250,000, including site.

Jersey City, N. J.—Hudson County Park Commission has adopted plans for improvement of North Bergen site, providing for spacious playgrounds, many miles of drives and gravel walks, a large lake, a small pond and observation pavilion.

Newark, N. J.—Mayor Haussling has again recommended comprehensive study of general topography and layout of city with view to replanning of streets wherever necessary.

Roselle, N. J.—Mayor Chas. W. Macquoid has decided to appoint committee to take up question of better plan for disposal of ashes and garbage; also recommended advisability of placing street signs throughout borough.

Trenton, N. J.—Grounds and Buildings Committee of Park Board has been directed to receive plans and bids for public comfort station in Cadwalader Park.

Batavia, N. Y.—Plans have been completed by City Engineer Wentworth for garbage crematory.

Buffalo, N. Y.—Bids will soon be asked for constructing sections 3 and 4 of Buffalo River improvement.—Louis P. Fuhrmann, Mayor.

Kingston, N. Y.—Mayor Rosco Irwin has recommended erection of building to house apparatus of police and street departments.

Poughkeepsie, N. Y.—Mayor Sague has recommended cleaning of paved streets by means of flushing machine.

Rochester, N. Y.—James A. Salter, architect, has presented to Mayor H. H. Edger-ton plans for street paralleling Main st., for new city hall on Church st., for bridge across river and for a union trolley station over river bed at Central ave.

Syracuse, N. Y.—Mayor Edward Schoeneck has recommended that \$100,000 to be provided by bond issue be allotted to Park Commission for permanent park improvements and that playgrounds be provided for children in congested district.

Charlotte, N. C.—Crematory has been destroyed by fire.

Hamilton, O.—Geo. E. Kessler, Landscape Architect, Kansas City, Mo., has made offer to prepare plans for construction of proposed \$1,000,000 civic center.

Oklahoma City, Okla.—Plans will be prepared by Alex. Potter, New York, N. Y., for proposed garbage disposal plant.

Port Clinton, O.—Citizens will vote early in February on erection of \$25,000 city hall.

Newport, R. I.—Mayor Patrick J. Boyle has recommended establishment of playgrounds.

Providence, R. I.—Mayor Henry Fletcher has recommended rebuilding of Wanasquatucket River walls and establishment of more city playgrounds.

Pawtucket, R. I.—Mayor Giles W. Easter-brooks has recommended establishment of public docks, erection of comfort station and erection of police station.

Highmore, S. D.—Plans are being prepared by Black Hills Co., Deadwood, for erection of \$75,000 stone court house.

Fort Worth, Tex.—Police Commissioner Geo. Mulkey is favorable to establishment of municipal store room; also erection of levee to protect water plant.

Norfolk, Va.—Controllers are having plans drawn for lodge house at Forest Lawn Cemetery.—A. Eberhard, Architect.

Olympia, Wash.—City is considering erection of two-story concrete city hall and fire station.

Goderich, Ont., Can.—Ratepayers have voted to build municipal building.

CONTRACTS AWARDED

San José, Cal.—To Henshow, Bulkley & Co., to furnish sanitary street flushing machine, \$910.

Rochester, N. Y.—To Selden Motor Vehicle Co. for automobile for City Engineer Fisher's department, \$1,600 and old machine now in use in department.

Philadelphia, Pa.—Removing garbage for year, to Penn Reduction Co., \$570,000.

BIDS RECEIVED

Akron, O.—Furnishing auto for Chief Mertz; Kanawa Chemical Co., Kanawa, Pa., bid \$1,750; turned down because it was not accompanied by certified check; Auto Garage, city, \$2,875, and the Webb Motor Company, \$2,950.

TOO LATE FOR CLASSIFICATION

STREET IMPROVEMENTS

Los Angeles, Cal.—Board of Supervisors has instructed the Highway Commission to take immediate steps towards finishing the harbor boulevard.

Atlanta, Ga.—Council has adopted resolution instructing Chief of Construction to secure cost of widening Peachtree st.; also considering \$18,500 appropriation to pave Marietta st., and resolutions for paving portions of 11 streets.

Chicago Heights, Ill.—City is considering 900 sq. yds. vit. brick paving.—A. L. Fox, city Engineer; J. C. Mote, Mayor.

Mandeville, La.—Council has adopted ordinance ordinance, which requires banquette on Lake st. and in the business portion of town to be paved with bricks, shells or cement work; work will be commenced a Marigny ave. at early date.

New Orleans, La.—Plans have been submitted for installation of subsurface drains, curbs, gutter bottoms, etc., and the paving of North Cortez st., St. Louis to Toulouse st. with granitoid.

Portland, Me.—Estimates of cost will be finished for grading Seaside ave. and paving Franklin st. with granite blocks.

Laurel, Miss.—Mayor Noble has recommended substitution of other material for wooden walks.

Cape May, N. J.—County Freeholders will

be asked to build country road from Green Creek to Goshen.

Collingswood, N. J.—Highway Committee has been instructed to make a thorough inspection of all thoroughfares with view of determining which are most in need of improvement.

Millville, N. J.—Mayor W. Fred Ware has recommended paving of streets.

Cincinnati, O.—City Engineer Shipley has reported total cost of the wood block improvement of Ohio ave. as \$28,478.97; also submitted approximate estimate for paving with brick, Beldare ave., Tower to Vine sts., \$8,796.

Montpelier, O.—Special election will be held Jan. 31 to vote on proposition of issuing bonds for paving; Riggs & Sherman, Engineers, Toledo, have furnished an estimate for paving two principal streets at a cost of from \$50,000 to \$70,000.

Chester, Pa.—Property owners on Parker st., between Third and Fifth sts., have decided to petition Council to resurface roadbed of that thoroughfare with fib-berline paving material.

Hazleton, Pa.—Council has passed ordinance for paving North Pine st. from Broad to Holly.

Houston, Tex.—Council has received petitions for shelling Hardy and Saca sts.

Sherman, Tex.—Citizens will vote on \$10,000 bonds for street improvements.

Everett, Wash.—Board of Public Wks. will ask for bids for improving Hoyt ave. and Fair ground district; also for purchase of 50,000 ft. of lumber for Street Department.

Seattle, Wash.—Council has decided to pave University st., Ellicott ave. and Olympic way, also bridge roadway on Twenty-third ave. West.

South Bend, Wash.—Council will consider paving of Water st.; distance 1½ mi.

Spokane, Wash.—Board of Public Works has rejected bids for paving Wall st.; cost, about \$52,000; no bids were received for grading, curbing and sidewalking Bine Court; cost about \$1,830.

Pasco, Wash.—Council will consider paving of business district.

CONTRACTS AWARDED

Cincinnati, O.—Improving Elmore st. with brick, to Wm. P. Flynn, \$2,781.55; David st. with asphalt, to Kerschner Construction Co., \$3,501.20.

Chehalis, Wash.—To W. J. Murphy, Tacoma, for construction of nearly 10 miles of sanitary sewerage in southern and eastern portions of city, \$51,258 for a vitrified system.

BIDS RECEIVED

Spokane, Wash.—Paving with granitoid concrete Bernard st., Pacific to 8th ave.,

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREET IMPROVEMENTS				
Washington	Spokane	Jan. 16, 2 p.m.	Imp. Wall st. by grade, curb and pave.	J. C. Argall, Secy. Bd. Pub. Wks
SEWERAGE				
Iowa	Fort Dodge	Jan. 13, 1:30 p.m.	Constr. drainage dist No. 48, compr 700 ft of 8-ft. tile.	J. L. Hanrahan, County Auditor
WATER SUPPLY				
Washington	Spokane	Jan. 20, 2 p.m.	Furn. 1,950 lin. ft. 8-in. water pipe and 9,600 ft. 16 in. pipe.	John Gifford, City Purchas. Agt
FIRE EQUIPMENT				
Kentucky	Louisville	Jan. 24, 2 p.m.	Erect 64 fire hydrants.	Chas. Cronan, City Clerk.
MISCELLANEOUS				
California	Oakland	Feb. 1, 11 a.m.	Excavating for City Hall, grad. ath. field and park lands and around fire alarm building.	J. W. Nelson, Secy. Bd. Pub. Wks.
Washington	Spokane	Jan. 20, 2 p.m.	Furn. one auto propelled comb. police patrol and ambulance.	John Gifford, City Purchas. Agt.

and Boone ave., Pearl to Division st., Jas. Fife and Fife Bros. lowest bidders, \$37,500 on Bernard job and \$11,744 on Boone ave. work; City Engineer's estimates, \$36,900 and \$11,600, respectively; R. C. Blome & Co., holders of the granitoid concrete patent, bid \$11,200 and \$12,600 on two contracts; Boynton, Church & McCoy submitted bids on both these jobs, but they were rejected for reason that bids were made on condition that the city save bidder harmless from damages which might be claimed by Blome Co. for infringement of patent; Beirnard st., \$40,500; Boone ave., \$11,600; grading, curbing, parking and sidewalk Lacey st., 29th to 33d ave., Inland Engineering Co., \$6,550; Naylor & Norlin, \$6,589; estimate \$6,550; paving 8th ave. with brick, Cannon to Chestnut st., James Fife, \$4,352; estimate was \$3,550; sewerage Maine ave., Cedar to Ash st., G. Burgie, \$3,050; no bids were received for grading, curbing and sidewalking Bine Court from Bine st. to Crestline st.; estimate \$1,530.

SEWERAGE

Atlanta, Ga.—Council has adopted resolution instructing Chief of Construction to make surveys of streets in Tenth Ward that are without sewers and outfalls and to estimate cost.

Lexington, Ky.—Mayor Skein has recommended construction of main sewer in southeastern portion of city at cost of \$2,000.

Portland, Me.—Estimates of cost will be furnished for sewerage Stevens ave. and Belknap st.

McComb City, Miss.—Dr. Louis D. Dickerman, Chairman Board of Health, has recommended immediate installation of sewer system.

Glasgow, Mo.—Burns & McDonnell, Scarritt Bldg., Kansas City, are preparing plans for sewers and water works, cost \$35,000; bond issue declared legal.

Lestershire, N. Y.—Board of Trustees will consider extension of East Main st. sewer.

Watertown, N. Y.—Board of Public Works has passed a resolution ordering plans and specifications for sewer in Grove and Moulton sts.

York, Pa.—Dr. Bennett, Chairman, Sanitary Committee, has recommended early completion of sewerage system and \$10,000 appropriation annually for sewer work.

Corpus Christi, Tex.—Engineer F. H. Lancashire, Houston, will supervise construction of proposed sewer system; cost, \$75,000.

Corsicana, Tex.—Construction of sewer system to Truehart S. Jackson, San Antonio, \$16,433.30; other bidders: Collins Bros., Houston, \$19,588; Dallas Lime and Gravel Co., Dallas, \$18,440; H. W. Cardwell, Mena, Ark., \$18,450; Tarrant Construction Co. also bid.

WATER SUPPLY

Fort Smith, Ark.—Council plans to levy tax to raise funds for purchase of water plant, franchise of operating company having expired; plant valued at \$442,000.

White City, Kans.—Plans and specifications are being prepared by Burns & McDonnell, Scarritt Bldg., Kansas City, Mo., for municipal water works and lighting plant; approximate cost \$25,000.

Glasgow, Mo.—Plans and specifications are being prepared by Burns & McDonnell, Scarritt Bldg., Kansas City, Mo., for water works and sewers costing approximately \$35,000; bond issue has recently been declared legal.

Cape May, N. J.—By Council, to John W. Corson, Jr., for erection of 50,000-gallon stand-pipe for water works.

Akron, O.—Water Expert F. A. Barbour has been employed by city at expense of \$8,500 to prepare plans for new water works plant and to make estimate of cost of old water plant.

West Telford, Pa.—Council has granted the Telford Water Company permission to construct and operate a water system in borough.

Polytechnic Heights, Tex.—City Commission has instructed Clerk Valentine to secure plans for construction of water works plant.

Sherman, Tex.—Council has decided to call election on \$22,000 bonds of extension of water mains and improvement of pumping plants.

Pasco, Wash.—Council will consider distribution of water to outlying districts.

Snohomish, Wash.—Council has passed ordinance to adopt the plans to extend city water system by bringing water by gravity from the mountains; plan provides for dam on the Pilchuck, 16 miles from the city, and laying of 81,000 ft. 14-inch pipe line to city; system calls for 1,500,000 gallons a day of pure mountain water to be placed in two reservoirs, one now in use and one to be built fifty feet higher to accommodate residents of hill district. Cost, \$110,000; bond election will be held Jan. 24. Engineer C. H. Green, Spokane, engineer in charge of survey.

CONTRACTS AWARDED

Gloucester, Mass.—To L. E. Smith Company, to supply Department with car load of one and two-inch pipe, \$1,189.70; other bidders: Raymond, Dow & Company, Boston, \$1,198.40; J. H. Cunningham Co., Boston, \$1,202.50; L. E. Andrews & Company, city, \$1,190.50; George Uhler, Boston, \$1,248; W. H. Gallis & Company, Boston, \$1,354.66; A. P. Stoddard & Company, city, \$1,192.50, and Walworth Manufacturing Company, Boston, \$1,192.50.

LIGHTING AND POWER

Auburn, Cal.—Offer to install new system of street lighting has been made to City Trustees by Frank Bell, manager of Bell Electric Company; proposed to do away with present arc lights and put in Tungsten lights, one on each pole along the streets, system to cost between \$4,000 and \$5,000.

Fairbury, Neb.—Burns & McDonnell, Scarritt Bldg., Kansas City, Mo., are preparing plans for electric light and water works improvements; bonds sold; cost \$40,000.

White City, Neb.—Burns & McDonnell, Scarritt Bldg., Kansas City, Mo., are preparing plans for municipal lighting and water works plant; cost \$25,000.

Weiner, Tex.—Weiner Water, Light, Ice and Cold Storage Co., Wm. Hillje, president, will take over, enlarge and improve local electric light plant.

FIRE EQUIPMENT

Oakland, Cal.—Furnishing and installing in the new fire alarm building at Thirtieth and Oak streets relay and tape instruments as part of fire alarm equipment, to Gamewell Company, \$2,312.

Lexington, Ky.—Fire Chief Jesse has recommended erection of two fire stations, each equipped with motor comb. wagons; also purchase of first-size fire engine, self-hoisting 75-ft. aerial truck, preferably of motor type, and quantity of hose.

Millville, N. J.—Mayor W. Fred Ware has recommended better apparatus for firemen.

Trappe, Pa.—Fire Company has been organized by election of W. F. Rushong as President.

BRIDGES

Bridgeport, Conn.—Mayor Buckingham will be authorized to appoint committee to make all necessary arrangements for and to have charge of erection of bridge across Pequonnock River at East Washington ave.

Atlanta, Ga.—Finance Committee is considering appropriation of \$10,000 for purchase of lands to be used in construction of viaduct across railroad tracks at Bellwood ave. and \$60,000 for building span across tracks and approaches.

Dallas, Tex.—To Missouri Valley Bridge and Iron Co., for construction of the Wilmer, Hutchins and Malloy bridges across Trinity River, by the County Commissioners' Court; \$41,780.

MISCELLANEOUS

San Jose, Cal.—Chief of Police Kidder is considering installation of police "flash-light" signal and telephone system throughout business section of city.

Atlanta, Ga.—Finance Committee is considering erection of city prison; old stock-ade to be sold.

Lexington, Ky.—Mayor Skain is favorable to erection of proposed police station.

Holyoke, Mass.—Police Department has recommended installation of police signal system and purchase of auto patrol wagon.

Kingston, N. Y.—Plans have been prepared for erection of building on O'Reilly st. for storage of city apparatus.

York, Pa.—Dr. Bennett, Chairman, Sanitary Committee, has recommended erection of municipal abattoir.

Marlin, Tex.—Council has decided to install garbage crematory after plans suggested by State Health Officer Brumby.

CONTRACT AWARDED

Louisville, Ky.—Placing street intersection signs, to E. L. Winston & Co.

Lucedale, Miss.—To Hull Construction Company, Jackson, to build the George County Court House and Jail, \$33,296.



Hand-Wiped Joint

or lead flange, in from one to eight branch.

Gooseneck Headquarters

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Glauber Brass Mfg. Co. Cleveland

Municipal Journal

And Engineer

VOLUME XXX.

NEW YORK, JANUARY 18, 1911

No. 3



KINGSHIGHWAY, LOOKING SOUTH ALONG EAST EDGE OF FOREST PARK. SOUTH HALF.

ST. LOUIS PARKS AND BOULEVARDS

City Planning to Have the Finest Park System in the Country—Now Constructing the Kingshighway, a Parked Boulevard Connecting All the Large Parks—Details of Plan for This

BY CHAS. CLAUDE CASEY

THE City of St. Louis is well provided with small parks, there being fifteen or more of less than ten acres in area, seven of more than ten and less than one hundred acres, three of between one and three hundred, and one, Forest Park, containing 1,372 acres. A considerable part of these have been in possession of the city for a great many years, some of them since 1812 and all but three of those mentioned since before 1900. The total park acreage is approximately 2,200 acres, of which about 350 acres is in charge of special commissions. These parks are well scattered throughout the central part of the city, which is located along and near the bank of the Mississippi river, at a bend in the same. West of the business part of the city, extending from the river on the north to the river on the south, is a section of city in which there are few parks, one of which is the large Forest Park of 1,372 acres. The four large parks referred to are scattered at fairly uniform distances in a line just west of the central section of the city, and it is proposed to add still another park of about 100 acres in the same general line.

The nearly 2,000 acres included in the larger parks are to be united into a park system by a new fifteen-mile boulevard known as the Kingshighway. This boulevard extends from a 160-acre park—O'Fallon Park—four miles north of the court house, and swings around through the principal residence district and four to six miles back from the river, and, continuing to the southern end of the city, swings again to the east and ends in a small park on the Mississippi river bluff known as Riverside Park, more than five miles south of the Court House.

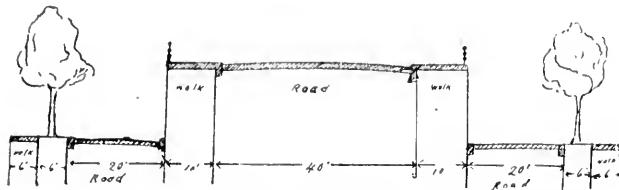
Most of the land needed for Kingshighway has been acquired, sufficient being obtained to give the boulevard a width varying from 100 to 350 feet through its entire length. Most of the boulevard is through streets already existing, and over a large part of its length it is necessary only to widen and continue the thoroughfare and lay out the parking scheme. Land damages have already been paid aggregating \$602,960, with the report of the court still to be heard from on several sections which it is sought to condemn. Contracts have been let for bridging, planting, grading and paving to the amount of \$485,715, this providing for the southern portion of the highway.

One of the features, and the most expensive section, of the boulevard is a monumental reinforced concrete viaduct nearly half a mile long spanning several railroad tracks. The contract for the construction of this has been awarded, amounting to \$336,380, this not including the filling of the approaches. The

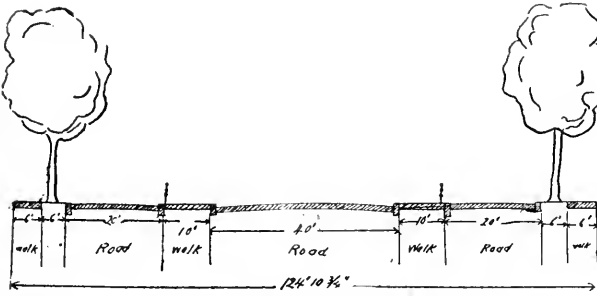
viaduct is to take the place of an old wooden one now being torn away, which was both unsightly and dangerous. The new structure is to be entirely of concrete, except for the steel reinforcing bars, the wood block paving and granite curbing. There are to be three main spans designed to act as a single elastic system and resting upon three concrete piers and concrete abutments. The bridge is designed and guaranteed to stand a maximum load of 24 tons on one wheelbase.

Besides the civil engineering problems to be overcome, the highway has required a vast amount of "diplomatic engineering," for the original scheme of building the thoroughfare as a "boulevard" had to be abandoned because of the excessive amount which the city would have had to pay. A bond issue of \$500,000 was authorized by the people to pay the city's portion of the cost of this improvement. When Mr. James C. Travilla, the present Street Commissioner, assumed that office and looked into the matter he found that, while this sum might pay the city's share of the improvement considered as a street, it would pay but a small part of what the city would be required to pay for the same if opened as a boulevard, since the city charter exempted all property from assessment for the construction of boulevards, except that immediately adjoining the same, while the cost of opening the streets could be assessed upon an entire district. It had been the plan to assess the cost of widening the boulevard against adjoining property, but it was found that the widening which was desired in some of the streets would cut off such a large proportion of many of the lots adjoining that there would not be enough left to assess any considerable amount of damages against. After long delay Mr. Travilla succeeded in having ordinances passed by the Municipal Assembly abandoning the boulevard plan and authorizing the original plans to be carried out as if the highway was an ordinary street. In this way the financial difficulty caused by the charter provision referred to was gotten around and the cost of the work is now being assessed against property "in the benefited district." It is the plan to construct a boulevard and add the necessary dignity after the expenses are paid which can be done by legislation restricting traffic on the highway.

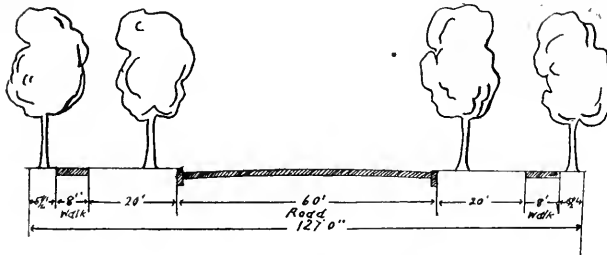
Plans for the parking, etc., are being prepared by George E.



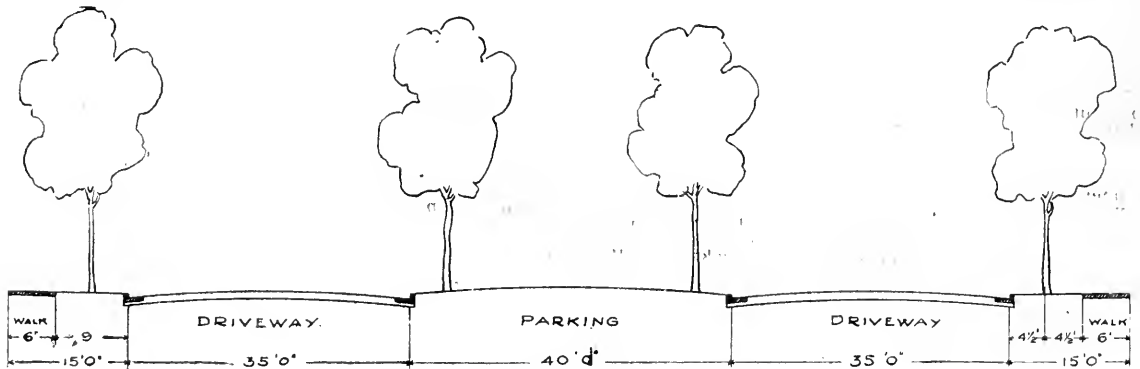
SECTION AT BROADWAY APPROACH TO RIVERSIDE PARK



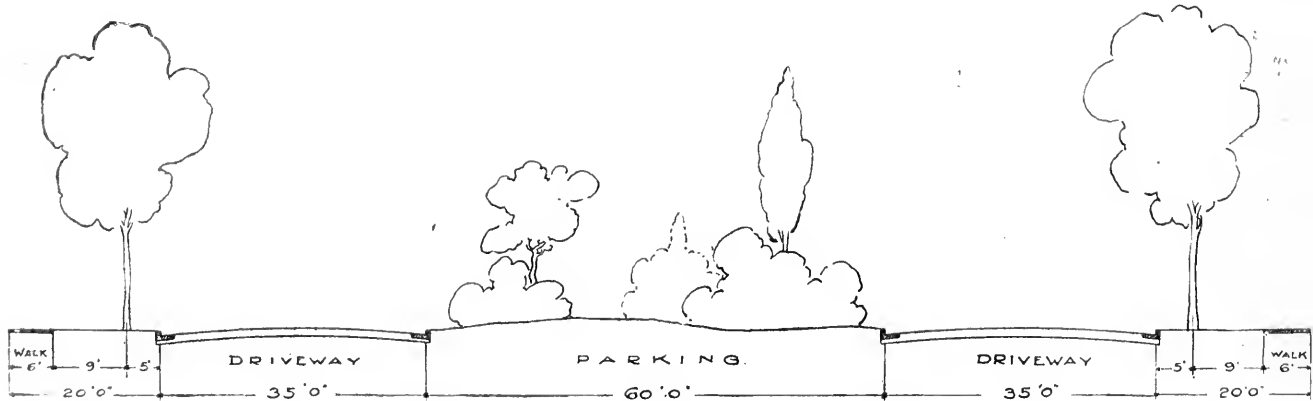
SECTION AT PENNSYLVANIA AVENUE



SECTION AT MICHIGAN AVENUE



TYPICAL CROSS-SECTION FOR 140-FOOT WIDTH



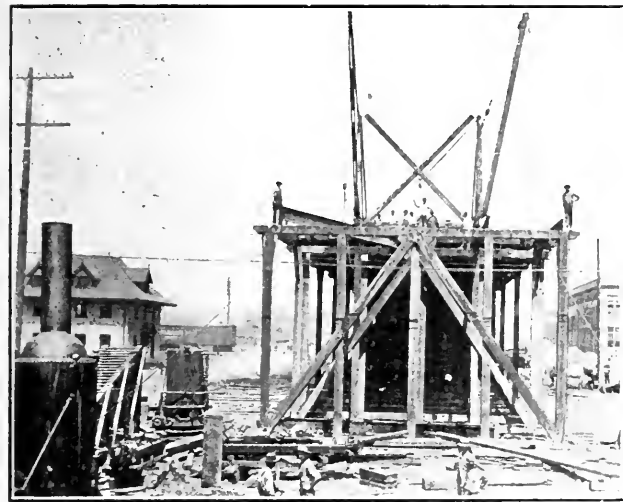
TYPICAL CROSS-SECTION FOR 170-FOOT WIDTH



OLD WOODEN VIADUCT, NOW BEING TAKEN DOWN

Kessler, city landscape architect. The contracts awarded for the southern sections, known as Kingshighway Southeast, show a cost for grading and planting of from \$1.97 to \$3.02 per front foot. The first (most southerly) section, from Riverside Park to Compton avenue, 1,500 feet, is to have 138 avenue trees, with no shrubbery. The next section, Compton to Grand avenue, 2,800 feet, is to have 464 avenues trees, and 1,278 and 211 trees in the parking spaces between the two driveways. The cost of the parking in the first section is to be \$345, and the grading, \$6,500. Parking the second section is to cost \$2,221, and the grading, \$8,000.

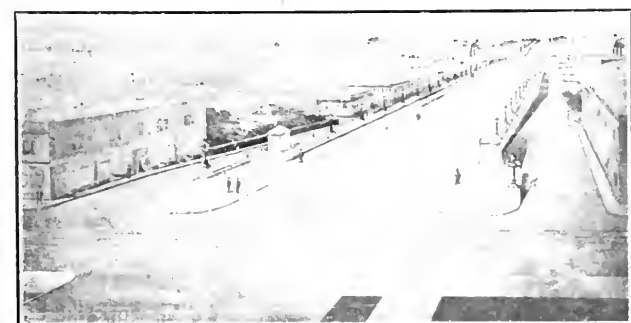
A great variety of trees and shrubs are being used. Nine different kinds of trees and more than a score of different kinds of shrubs are provided for the two sections named, birch, ash,



REMOVING OLD WOODEN VIADUCT

maples of different kinds and pin oak, Carolina poplar and American white elm being the trees that predominate. Other sections show a similar variation. Mr. Kessler's plan groups similar trees and shrubs, with changing but harmonizing varieties, along the parking spaces between streets with few single or scattered trees. Thirty-five groups are used in the parking space between Compton and Grand avenues.

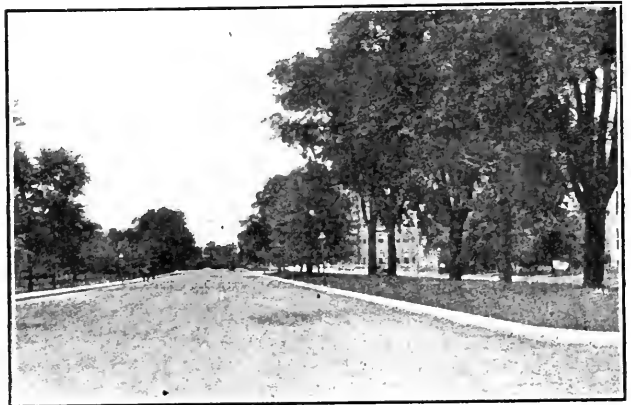
St. Louis is ambitious to have a system of parkways and boulevards that will set new world records. So far its park area does not exceed 2,500 acres, excluding public school parks,



MANCHESTER AVENUE (NORTH) ENTRANCE TO KINGSHIGHWAY VIADUCT, NOW UNDER CONSTRUCTION

private parks, places, etc. All but about 500 acres will be connected by the Kingshighway, and two extensions which are proposed and are likely will be carried out soon will tie to the system about 300 acres more of that. At the present time no two of the 28 parks (including three in the water-works reservation) are connected by direct parked thoroughfares. The movement for more parks, connecting and circling boulevards, and a better general city plan, has resulted in the organization of The City Plan Club, and a bill is pending in the Municipal Assembly to create a City Plan Commission. The Civic League has been working for a long time on the civic betterment of the city and is still an active factor in the movement.

At the general election last November a proposition was submitted to the people to create a park and boulevard reservation district, taking in 250 square miles. This was defeated but will be voted on at the election in November, 1912. This



KINGSHIGHWAY, LOOKING SOUTH ALONG FOREST PARK, NORTH HALF

plan included two long boulevards encircling the city on the west, forming approximate arcs of circles with radii of 10 and 16 miles respectively around the city hall as a center. Several park reservations also were included in the plan, which was to have been worked out by a commission to be appointed, had the proposition carried. The funds for the work were to have been provided by a small tax. The main purpose of the plan is to preserve in their present natural beauty many park and boulevard sites.

An additional boulevard is planned for the city, independent of the proposed outer-park plan. It is to be known as the River des Peres Boulevard, and consists of an approximate circular arc lying just within the city limits and seven or eight miles from the city hall. The plan is to change the crooked course of the River des Peres to approximately that of the boulevard, and to divert to the sewer which is now being constructed the sewage which is contaminating the river, the clear water being taken care of in an open channel, which will be paralleled by a driveway on either side. Connecting bridges are to be provided at cross streets, and parking spaces are planned to beautify the banks of the stream.

CITIES HAVING COMMISSION GOVERNMENT

SINCE publishing in our January 4 issue a list of cities which have adopted commission government, we have received a letter from the secretary of the Short Ballot Organization, stating that since preparing that list they had examined all the charters of the cities named therein and had found it desirable to revise the list because of "drawing a closer definition of what constitutes commission government." This revision includes the following changes: Omission of the cities of Bristol, Clarksville and Etowah, Tenn.; Charlotte, N. C.; El Paso and Waco, Tex.; Riverside, Cal., and St. Joseph, Mo. Also the addition to the list of Clarksdale, Miss.; Harbor Beach, Mich.; High Point, N. C.; Moline, Rock Island and Springfield, Ill.; Newport, Ky., and Terrell, Tex. Taunton, Mass., and Roswell, N. M., were included in the revised list, but as having a government which the investigators of the Short Ballot Organization defined as a modified commission government.

MUNICIPAL REFERENCE LIBRARIES

A Preventive for Repeating Mistakes in Municipal Government and Work—What Some Cities Have Done

By DR. HORACE E. FLACK,

Municipal Reference Librarian, Baltimore, Md., Chairman Committee on Municipal Reference Libraries, Nat'l Municipal League. Paper before 1910 Convention of the League.

THE question of securing good, efficient municipal government is one of the biggest problems confronting the American people of to-day. The people are awakening to the fact that inefficiency, poor laws and mal-administration result in high taxes, poor service and unsanitary conditions. They realize as never before what efficiency and poor laws really cost the community. Some of this cost is, of course, due to vicious and incompetent officials, but the greater part is due to ignorance, both on the part of the citizens and the officials. Honesty and sincerity on the part of municipal officials are not the only qualities needed to make our municipal governments what they should be; it is also necessary to have efficiency, and efficiency can only be secured, even with the ablest men at the helm, by a thorough knowledge of the facts and conditions relating to each and every question which comes up for consideration.

Every one admits that our city governments need improving, that efficiency is woefully lacking, but the difficult problem is how to secure efficient government. Experience has demonstrated that the best and ablest of officials have made mistakes. Many of these mistakes have been due to lack of knowledge. There has been too much self-complacency in the administration of city affairs, each city trying to solve certain problems or undertaking municipal enterprises regardless of the experiences of other cities. As a matter of fact, the officials of one city rarely know about the experiences of other cities. The result is that nearly every city goes through the same experience, and a dear one it has been. Instead of first seeing what other cities have done, how they have solved or tried to solve the same problems, the administration of each city and to a great extent each successive administration of the city undertakes to carry out certain preconceived notions, whether practical or not, and every one is familiar with the evil consequent results. It is a well-demonstrated fact that civilization is based on past experiences, and the failure of municipal government is largely due to the fact that our city governments do not profit by the past experiences of other cities.

During the past few years efforts have been made to improve the legislation of some of our States by means of Legislative Reference Bureaus. It may be said that these efforts have passed the experimental stage and that these bureaus or departments have been successful. Such departments have been of great benefit to members of the Legislature and to administrative officials who have tried to give their best services to their respective communities. The idea has spread until to-day such bureaus, in one form or another, are to be found in Wisconsin, New York, Ohio, Indiana, Pennsylvania, Rhode Island, Connecticut, Massachusetts, California, North Dakota, Michigan, Iowa, Montana, Alabama and Nebraska. The advantages to be gained by such departments were so apparent that the question occurred to some whether the same idea could be applied to cities with beneficial results. It would seem more essential to have such departments for cities than for the States, since so many matters vitally affecting the lives of those who reside in cities depend upon the city government. The water supply, milk supply, police and fire protection, schools, lighting, transportation and all other necessities requisite to life in cities are absolutely dependent upon municipal officials, and if the city government is inefficient, if the funds for the several municipal functions, or for any one of them, are improperly, unwisely or imprudently spent some other department must suffer for lack of funds and unsanitary conditions follow or proper school facilities, police or fire protection, etc., are wanting.

It may seem a small matter that \$10,000 is squandered here, \$50,000 there, etc., but the continued practice of this kind soon bears fruit, for it means that some essential or meritorious function is being neglected. Fifty thousand dollars appropriated to try some worthless experiment or \$100,000 wasted in the purchase of city supplies, \$200,000 for salaries for clerks not needed, either means that the health department, the schools and playgrounds, the police, the fire department or care of delinquent children will not get some needed appropriation or that an extra burden is put on the taxpayers, the result frequently being both.

What can be and should be prevented, however, is the repeated waste. It is perfectly proper for a city to try some new experiment if there is a prospect of success and if there is a reasonable hope that conditions can be improved by it. But there is not only no excuse, it almost seems criminal, that one city after another should try the same thing after it has been shown to be impracticable, harmful or useless. There might have been excuse for such a condition before the advent of the railroad, the telegraph and the telephone, but under present conditions there seems absolutely no excuse for it. It is not claimed that our city officials are criminal or that they do not desire to give good government, but their ignorance of what other cities have done or are doing makes progress slow and unduly expensive.

Recognizing this condition and impressed by the good results following the establishment of Legislative Reference Bureaus in several of the States, the National Municipal League in 1909 appointed a committee to report upon the feasibility and desirability of municipal reference libraries. The first work of the committee was, of course, to learn what was being done along this line, either by special legislative reference or municipal reference libraries, and inquiries were made of the librarians of the public libraries in all cities having a population of 50,000 or over. The replies indicate that there is almost complete unanimity as to the great need for the establishment of municipal reference libraries, but there was not the same unanimity as to how this should be done. The committee feels that these replies are strong evidence of the need of such libraries.

Nearly a score expressed the opinion that the municipal reference library should be located in the City Hall as a branch of the public library. Some were of the opinion that such a collection would be almost as useful in the public library building, but in these cases it was stated that the library was in very close proximity to the City Hall. Nearly all expressed the opinion that a municipal reference library should be under the control of the public library because it would make the maintenance and administration less expensive and would also be likely to keep them out of politics.

There are at the present time only three purely municipal reference libraries maintained at public expense, viz., those of Milwaukee, Kansas City, Mo., and Baltimore. The Baltimore library, called the Department of Legislative Reference, was created in 1906 by act of the Legislature and went into operation January 1, 1907. The Milwaukee library was created by ordinance soon after this and only within the past few months Kansas City has passed an ordinance creating such a library. Both of these follow very closely the law creating the Baltimore department. The board in Baltimore is composed of the Mayor, City Solicitor, President of the Johns Hopkins University, President of the Municipal Art Society and the President of the Merchants' and Manufacturers' Association; and that of Kansas City of the Mayor, President of the Commercial Club, President of the Industrial Council, President of the Kansas City Bar Association and the President of the City Club. The public library of Minneapolis has only quite recently established a municipal reference section as a part of the library. This is the first case in which a public library has undertaken this work and it will be quite interesting and valuable no doubt to watch the development of the work there.

The Civic League of St. Louis submitted certain recommendations to the Board of Freeholders now drafting a proposed

charter for the city, and among these was one for the establishment of a municipal reference library. At the present time the matter is being considered by the officials of the public library and it seems quite probable that St. Louis will soon have such a library, either as a branch of the public library or as a separate department of the city government, as is the case in Baltimore, Milwaukee and Kansas City. Boston and Chicago have had statistical bureaus for several years, but there is at present some agitation for establishing a municipal reference library in Chicago, and this may mean a merging of the present Bureau of Statistics with it. There is also a Bureau of Statistics and Information in Newark, N. J., the bureau being under the direction of the City Clerk. The chief objection to the latter is that the bureau is subject to political changes, which may interfere with its efficiency in the future.

The Universities of Wisconsin and Kansas have established municipal reference bureaus to furnish information to all the cities of those States. A Bureau of Municipal Research has also been established quite recently by the Finance Commission of Boston. Its main purpose is to collect information for the Finance Commission and to examine and study the city departments of Boston with a view to municipal improvement. The extent of the work will depend upon the attitude of the City Council in making appropriations. There is also a municipal reference bureau in Los Angeles, but in this case the bureau is under private auspices and management.

The question of establishing a municipal reference library is also being considered in Cleveland and steps will probably be taken in the near future with this end in view. Efforts have already been made to secure such a library in Washington, D. C., as a part of the public library, but Congress failed to make a sufficient appropriation for this at the last session. It is stated that the Board of District Commissioners realize the value of having such a bureau and hope to secure an appropriation for it.

That there is need for some such organization or department as the municipal reference library for the collecting, collating and filing of information on municipal, social, political and economic questions is apparent to every one who has ever given any thought to such questions or has tried to find out anything about his own or any other city government.

In the consideration of this question, the committee has been confronted with the proposition as to whether such libraries should be separate and distinct departments as in Baltimore, Milwaukee and Kansas City, or whether they should be under the control of the public libraries, and if the latter, whether in the public library itself or as a branch in the City Hall. The question of the qualifications of the head of such a bureau as well as the methods of his selection was also given careful consideration, for it was felt that these two points were vital to the success of the movement. Another very important feature considered by the committee was the scope of the work of municipal reference libraries; in other words, the functions of such libraries.

After careful deliberation the committee has reached the following conclusions:

1. That municipal reference libraries should be established in all large cities.
2. That, as a general rule, such libraries should be under the control of the public library.
3. That such libraries should be located in the City Hall where feasible.
4. That the qualifications for the head of such a library should be a liberal education, with special training in political science, economics, municipal government and methods of organization and administration, and he should be selected for merit alone.
5. That the head of the municipal reference library be selected by that method which, in the particular city, will, under the local conditions there prevailing, tend most completely to eliminate political considerations. In some cities the most satisfactory results may be obtained by lodging the ap-

pointing power with the public librarian or library trustees. In other cities conditions may make it advisable to have appointment made by a select, impartial and non-political board.

6. The functions of the library should not be restricted to any particular phase of work so long as that work relates only to the collecting, collating, compiling and disseminating of data or information. Of course, the principal work will be concerning municipal questions and special efforts should be made to secure such information for the city officials who are responsible for the administration of the city's affairs; but to be of the greatest value such a library must undertake to furnish information to the public generally. Such a bureau will be used extensively by the press and this is one of the best ways of reaching the public. Social, civic and improvement associations will also frequently have occasion to use such a library and its value to a city cannot easily be overestimated. If the bureau be under the control of the public library it would seem advisable to issue a bulletin containing interesting comments for newspaper purposes and showing how the reference library can be of assistance to officials and to the public as each matter of general interest gets the center of the stage.

It would also be expected that the reference libraries tear up and file all helpful things together—all the information possible on each particular subject, so that when one wants to know what has been said, for example, about the health department, police department, etc., it will not be necessary to go over 50 or 100 volumes.

The head of the library should by all means maintain a neutral attitude on all questions, for the very moment he begins to advocate or oppose any measure or proposition he will begin to make less effective the work of his department. He must not make it possible for any one to say that he is collecting information because of any personal bias of his own. His only interest should be to secure the data and let the facts speak for themselves.

In reaching these conclusions we were aware that conditions existed in some cities where better results might be had by the establishment of separate and distinct bureaus, but where this is done we cannot urge too strongly that the department be placed under the control of a non-political board. If such libraries become subject to political patronage they are likely to become not only useless, but really harmful. Unless they can be inaugurated under conditions which will keep them out of politics it would be better not to have them.

In presenting the above recommendations the committee realizes that such libraries of themselves will not bring about an immediate reform in city government nor will efficiency in municipal administration follow as a necessary result of their establishment. But it is respectfully submitted that such a library would be a valuable instrument or agency in the efforts to make our municipal governments more business-like and more efficient. The library will not of itself do away with the abuses which exist, but it will furnish the means whereby such abuses can be lessened, for it will be able to supply the date and the knowledge which are essential to all good government.

The Civic League, of St. Louis, in recommending such a bureau to the Board of Freeholders in February of this year [1910] made the following statement:

The value of comparative data in dealing with municipal questions can hardly be overestimated, especially when so many new problems are constantly arising. A department of this kind would prevent many ill-advised measures now advanced from becoming laws and would often save the city an actual loss by preventing the passage of ordinances which have proven unsatisfactory in other cities.

An officer, whose duty it will be to keep in touch with municipal movements everywhere and be ready to supply the information to those who are charged with making the laws and administering them, should, we believe, be provided for in the new charter.

Speaking at a conference of city officials and others soon after the organization of the Baltimore bureau, President Remsen, of the Johns Hopkins University, made the following statement apropos of the work inaugurated by that bureau:

It may fairly be said that that nation which makes most use of the scientific method is the most advanced nation, taking everything into consideration, and in the long run that nation will outstrip the others.

That the industries are dependent upon the cultivation of the sciences is well known. Innumerable striking examples of this could be given. It can also be shown that in the study of the problems of government, whether these problems are those of a municipality, of a State or of a nation, the scientific method is of vital importance. What this method is may be summed up in a few words. It is that method which proceeds in the most sensible way to solve problems. Whenever a wise man has a problem to deal with he first endeavors to find out what the facts are, and, after he has learned the facts, he proceeds to action; his conclusions are drawn from the knowledge of the facts. That is the scientific method; that is the only sensible method of going to work in any field, whether it be the field of nature, of business or of government. Progress in its broadest sense is due to the use of this method.

REFUSE CREMATORY AT HOUSTON

A CREMATORY has been in use for more than three years at Houston, Tex., and another of practically the same design, which is known as the "Thompson," in Austin, Tex., which is highly spoken of by the Mayor and the City Engineer. It is said to destroy all the refuse, including small dead animals, in the center of a well-built section of the city, without any objectionable effects. It is described by the makers as follows:

The furnace consists in the main of a vertical cylindrical combustion chamber which, by a series of three grates, is horizontally divided into four different compartments. The lower compartment is the ash-pit, which is provided with a clean-out door, through which the ashes are removed and by which also air can be admitted. For this purpose special air regulators are also provided.

The second compartment is the room between the secondary and main grate. Here the cinders and ashes which have passed the fires above and have dropped through the main grate are returned before they finally pass into the ash-pit, and therefore absolute combustion must take place. This chamber is also provided with all the necessary regulators.

The third compartment is the room above the main grate.

and, as the name implies, the hottest fire is maintained here on this grate. Stoke holes, air inlets and clean-outs are also provided here.

The fourth compartment is the room above the water-tube grate, and this compartment is connected with the chimney, which is built directly over it, thus securing the best possible draft conditions.

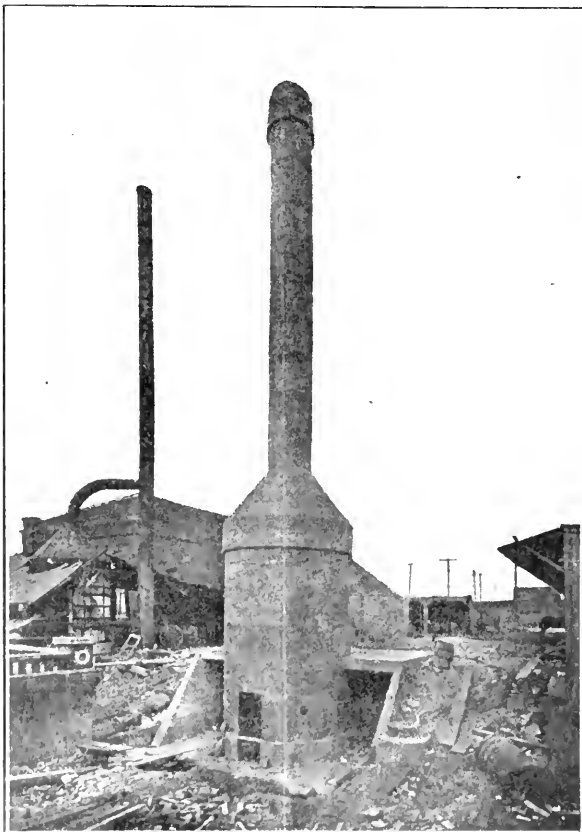
The furnace is charged through the feeding chute, which empties above the water-tube grate. This grate is so arranged that it holds the garbage like a basket and allows it to drop on the main grate only after a preliminary drying has taken place and after the more bulky materials have been partly reduced. In this manner any clogging of the main fire is most effectively prevented, and odorless combustion is possible at all times.

The water-tube grate is connected with a water tank, which is located under the charging floor, and a free circulation of the water through the tube grates is accomplished. All the steam generated in the tubes accumulates in this tank, and, if necessary, sufficient steam can be drawn from it to drive a fan or blower. If no use is made of the steam it will either escape through a steam pipe connected with the chimney or it can be condensed by a small condenser and the water can be thus saved. The water grates are so constructed that they can easily be cleaned in all parts, all main connections of same being located at the outside of the furnace.

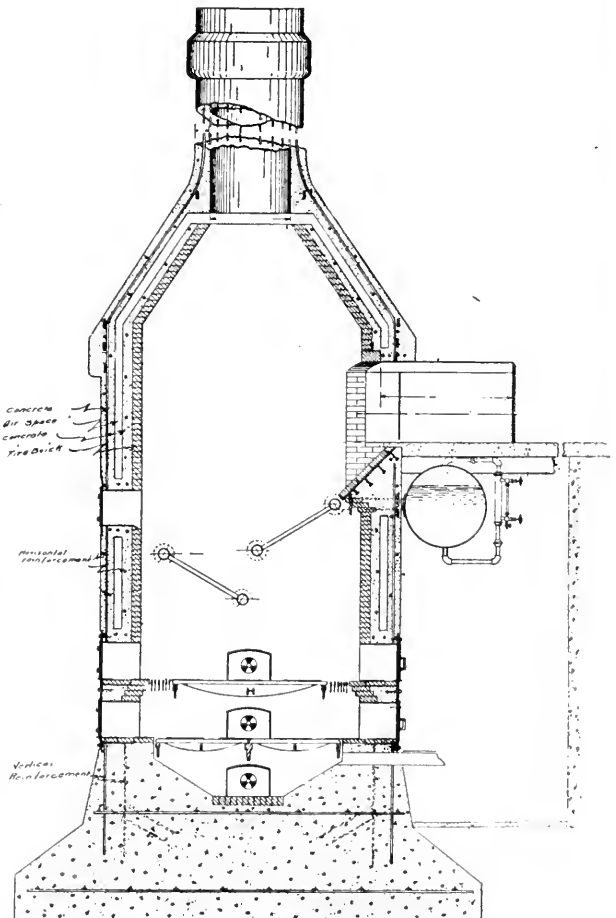
The Thompson crematories are built of two strongly reinforced concrete walls, with an air space between, and heavily lined with firebrick. The chimney is of reinforced concrete, built according to the Weber system. Air isolation chambers are provided to protect the outer concrete walls against excessive heat from the furnace within. All manholes, stokeholes, air regulators, charging chute, grates, dampers, water tanks, etc., are made of cast or wrought iron, as best adapted for their purpose.

The operation of the crematory is very simple. After a small fire has been started on the main grate with easily combustible materials, selected from the refuse, the plant is charged through the chute. Care must be taken to have the water tank filled before starting the fire, in order to prevent burning of the tube grates.

On the water tubes the garbage, etc., is suspended until it is dried and sufficiently charred to fall through them di-



HOUSTON GARBAGE CREMATORY



HOUSTON GARBAGE CREMATORY, VERTICAL SECTION

rectly upon and into the main fire, where it is fully consumed. The cinders falling through the main grate are retained on the secondary grate below, and only after they are completely incinerated can they pass into the ash-pit.

Tin cans, bottles, wire, iron, flower pots and similar materials are taken from the garbage by the man on the charging floor and thrown directly into the ash pile.

Three men are necessary for operating a twenty to thirty ton crematory. One of these men, who acts as foreman, should have some intelligence and must understand the operation of the plant in every detail. The two others can be common laborers, as their work consists only of feeding the furnace, removing the ashes, stoking, etc.

In view of the fact that the garbage is dried on the upper grate, from which the gases pass directly up the chimney, one familiar with garbage cremation would not expect the odors to be destroyed before reaching the air.

BITUMINOUS BINDER AND AGGREGATE

Importance of Aggregate Too Often Overlooked—Protecting Road by Cushion Coat—Grades of Oil Used in St. Louis for Surface Treatment

In a paper before the American Association for the Advancement of Science, Mr. James C. Travilla, Street Commissioner of St. Louis, called attention, among other things, to the importance of more care in selecting the aggregate for broken stone roads with bituminous binder than is frequently employed. In this connection he said:

In the construction of bituminous roads and pavements I am of the opinion that a great many bituminous materials, when properly used, may prove entirely satisfactory, but that the use of these same cementing products may result in complete failure if the mineral matter has not been suitable. Not only may the cementing properties of most bitumens be lost by the use of too much mineral dust, but, whether oil, asphalt, tar or pitch be used, it is fully as essential to study the character of the available mineral matter as it is to determine the nature and character of the bitumen to be used.

Experience has shown that the life of an asphalt or bitulithic pavement depends as much upon the character of the aggregate as it does upon the cementing bitumen, and this theory holds good in the formation of a bituminous concrete or a bituminous wearing surface for a macadam road.

Different bitumens vary in their ability to penetrate the mineral matter. Coal tar products possess a penetration property not usually found in oil asphalt cements; moreover, in using these last in the construction of a bituminous macadam road, it is necessary that the stone be free from dirt to secure proper adhesion, but with the coal tar products this precaution is not so essential. In a broad sense, however, mineral dust is about as objectionable as moisture in the construction of bituminous roads.

The life of a bituminous road or pavement depends as much upon the wearing qualities and the grading of the mineral matter which forms the roadway surface as it does upon the adhesive and cohesive properties of the bitumen. A soft limestone wearing surface of a bituminous macadam road, provided the road be constructed according to the generally accepted practice of placing the larger stone on the bottom, will not prove a success if subjected to heavy traffic. If the process of construction be reversed, however, good results may be obtained, since crushing strength varies as square of the lineal dimensions. . . . The life of the road may be increased by a cushion coat of fine mineral matter to absorb the impact of the calks of the horses' shoes and to lessen the abrasion caused by steel wagon tires.

Concerning the road oils in common use Mr. Travilla stated as follows:

The statement that certain heavy road oils on the market "carry" a certain per cent of asphalt does not mean much to a road engineer familiar with their use. It is admitted that the greater the per cent of asphalt, the better the oil for the work; but an oil carrying sufficient asphalt to have adequate adhesive and cohesive properties for making a bituminous concrete or bituminous wearing surface is other than what is ordinarily sold for the purpose. Such an oil-asphalt product could not be handled in the tank cars now in the service of the oil companies, since they do not possess the necessary steam coil capacity to raise the temperature sufficiently high for successful handling.

St. Louis has specifications for four grades of oil for surface treatment, and from careful study of results during the past three years I am fully satisfied that there is place for each grade.

The grades of oil used are as follows:

No. 1—Residuum oil having a gravity of 30 deg. Be., is applied cold, and is used on cinder roads and for the purpose of giving life to the surface of a road that has previously been treated with a heavier product and is becoming dusty. Being merely a dust layer, it should not be considered as having any binding properties.

No. 2—Residuum oil having a gravity of 20 deg. Be., is applied hot, and is recommended for park roads and roads that are not main arteries of travel.

No. 3—Residuum oil having a gravity of 16 deg. Be., is applied hot, and is used on the main thoroughfares having a mixed traffic, and acts as a temporary binder for the mineral matter.

No. 4—An oil-asphalt compound having a gravity of 12 deg. Be., is applied hot, and is recommended for any type of road, since it simply forms a binder for the mineral matter which actually bears the traffic.

In the use of all the grades of oil referred to, with the exception of No. 1, there should be a covering of mineral matter, uniformly distributed over the surface of the oil to a depth of from one-eighth to one-half inch, depending upon the amount and gravity of the oil applied.

MINNEAPOLIS WATER WORKS REPORT

THE Report of the Water Works Department of the City of Minneapolis for the year 1909 contains several suggestions worth considering by superintendents of other plants. Among these is a method of cleaning large water mains without opening the street surface. During the year there had been some leaks in the main supply pipe leading from one of the reservoirs, which had become cracked in two places, probably owing to the settlement of the pipes. One crack was 14 inches long and the other 23 inches long, each being in the bottom and on the bell end of a 42-inch cast-iron pipe. The cracks were repaired by fastening 3/8-inch steel plates on the inside of the pipe with tap screws. Access to the interior of the pipe for this purpose was had through a manhole. This method of repairing the pipe from the inside saved considerable expense for excavating to the pipe, which at this point had been laid some 25 feet deep.

The two reservoirs were emptied and thoroughly cleaned, during the year, of about two years' deposit of clay. The average depth of the deposit was probably less than three inches. The accumulated sediment was all washed out through the drain pipes, this method having been adopted in place of removing by hand shoveling and wheelbarrows, as in previous years. When taken out by hand it had formerly been necessary to wait several days for the mud to become dry enough to be handled. Last year, after the experience obtained in cleaning the first reservoir, it required six days to empty, clean and begin refilling the second reservoir. For washing out the clay, fire hose and a fire steamer were used, which were hired from the city fire department, \$200 being paid for the services. Supervisor Edmund T. Sykes believed that a permanent pumping plant, with discharge pipes leading to several places in the reservoirs, would make the cleaning easier and cheaper than by hiring the fire steamer. As it is, this method of cleaning cost about \$450 less than by shovel and wheelbarrow. The total cost of cleaning the reservoirs was \$1,072.18.

Early in the year the Water Works Committee directed the Supervisor to investigate the methods of filling the street sprinkling carts from the water mains, it being thought that the use of standpipes for this purpose was expensive. Letters were sent to 387 water works managers and replies received from 269 of these. As a result of this investigation the committee adopted the general rule of using sprinkler standpipes in the districts away from the main business centers of the city, and special hydrants used for this purpose only were located in the immediate business centers. Unless or until such special hydrants are installed, the use of special valves attached to the ordinary hydrant nozzles is recommended for the business centers.

The inquiry concerning sprinkler hydrants referred to contained six questions, from which the following informa-

tion was obtained: Three recommended filling sprinklers from standpipes and 13 filling flushers from the same; 3 filling sprinklers from special valves and 2 filling flushers from the same; 3 having special hydrants for sprinklers and 17 having them for flushers; none advised filling sprinklers or flushers directly from the fire hydrants.

As to actual practice, 142 used hydrants for filling carts; 99 connected directly to the nozzle of the hydrant, while 46 used a special valve attachment; 113 used standpipes or special hydrants; 83 used flushing carts.

As to satisfaction with the method used, 19 were satisfied with filling sprinklers from the hydrant and 67 were not; 72 were satisfied with filling sprinklers from standpipes and 3 were not; 20 were satisfied with filling sprinklers from a special valve and 24 were not; 14 were satisfied with filling sprinklers from special hydrants and 2 were not; 10 were satisfied with filling flushers from hydrants and 32 were not; 5 were satisfied with filling flushers from standpipes and none were dissatisfied; 3 were satisfied with filling flushers from special valves and 12 were not; 10 were satisfied with filling flushers from special hydrants and none were dissatisfied.

An illustration of a scientific method of studying the problem of the location of a pipe yard and warehouse is offered by Supervisor Sykes, who estimated that most of the street service force, including twelve single teams, are required to travel an average of four miles a day more with the present location than they would with the warehouse centrally located. In addition, there is an average of three miles extra haul per day for all the supplies and a large share of the pipe for each year's extensions. He therefore believed it conservative to estimate that there is a loss of time and labor costing \$9 per day, about \$2,700 a year, and that the lost time of teams is worth about \$240, or a total loss of \$2,940. Capitalized at 4 per cent, this is interest on \$73,500. He allows a reduction of 25 per cent for a possible east side service, leaving over \$55,000, which, according to this calculation, the city can afford to spend in securing a more central location. In addition, he calls attention to the fact that the time saved in getting from such centrally located headquarters to a break in a main in the important business section of the city would be a very important item.

WASHINGTON FILTRATION AND TYPHOID

As indicated in these columns several times during the past year or two, the condition of affairs as regards typhoid fever in Washington, D. C., is far from satisfactory, and this in spite of the fact that a water filtration plant has been purifying the entire water supply of the city for about five years. Naturally the general and continuous prevalence of typhoid in the city, giving death rates per annum per 100,000 inhabitants running as high as 111 during that time and having reached the rate of 60 per annum during the year 1909-10, was considered by many as reflecting upon the work of the filter plant. We have published the statements of the investigating board that the Washington water supply apparently had little to do with the typhoid cases, but that milk and general uncleanness were probably responsible for a considerable amount, while importation from summer resorts outside the city would account for a considerable percentage of cases.

In the Proceedings of the American Society of Civil Engineers for December, 1910, is the advance copy of a paper to be read before the society in February by Mr. E. D. Hardy, superintendent of the filtration plant, describing the operation of the plant up to and including June of last year. In this paper are tables showing the monthly records of deaths from typhoid fever and also of bacteria in applied and in filtered water and of bacillus coli. It seems almost certain that if the water was responsible for the typhoid cases there would be a more or less intimate relation between the fluctuations in such cases and those in the bacteria and especially in the B. coli.

We have plotted the data referred to, giving three curves, and found that there is absolutely no relation apparent between the death rate and the number of B. coli or of total bacteria. In fact, in almost every year high counts in bacteria follow from three to five months after high typhoid death rates. The peaks of the death rate curve occur in every year between August and October, there being one in each of those two months in 1905, 1906 and 1907, one in September, 1908, and one in September, 1909. The peaks in the bacteria curve occur in each case in January, with occasionally a second peak in February or March. The peaks in the coli bacillus curve seem liable to occur during any month of the year, but especially between December and March.

These records would seem to bear out the statement that the water was in no wise responsible for the prevalence of typhoid fever, and the fact that the highest rates occur at the end of the summer season would seem to offer legitimate argument for the belief that many of these cases were imported from summer resorts.

While looked at from this point of view the tables would appear to offer information which favors the filter plant, in some respects examination of the figures themselves is less reassuring. Especially is this the case when we consider the actual numbers of bacteria and B. coli in the filtered effluent. During the five years of operation the number of bacteria in the filtered water has shown monthly averages as high as 800 (January, 1910), and has averaged over 100 during five months of that time. Certain monthly averages have been quite low, the lowest having been eight, which average occurred in July and again in October, 1908. The averages for the fiscal years (from July 1 to June 30) have been as follows: 1905-'06, 33; 1906-'07, 31; 1907-'08, 55; 1908-'09, 21; 1909-'10, 143. The last high rate is due to a large extent to the averages for December, January and February, which were 250, 800 and 350 respectively.

The annual typhoid death rates for these same fiscal years were 47, 42, 32, 43 and 38, respectively. The rates for the five years immediately preceding the inauguration of filtration were 65, 68, 63, 46 and 39, respectively. The means of the two periods were therefore 56.2 before and 38.4 during the filtration of the water supply.

Examining the tables of tests for B. coli, these tables give the percentage of the tests made during a given month which were positive, with no attempt to indicate the number per c.c. Taking the ten-c.c. tests, we find that of the 54 months included in the table B. coli were found during 19 of these months, the percentage of tests in which they were found in any one month varying from 3.2 to 25.8. That more than one-fourth of all the tests of filtered water made in a given month should show the presence of B. coli is certainly far from creditable to the filter plant or its operation, to say the least.

It is not the least peculiar circumstance connected with the Washington problem that the month when this high rate was found, together with the month following, showed very low typhoid rates, only five other months of the entire five years showing lower rates. These months of high B. coli had been preceded by eight months when all tests for B. coli had been negative, but during those same eight months the annual rate per 100,000 of typhoid had varied from 24 to 60, or two to six times the rate during the months when the high percentages of B. coli were observed.

Making all allowance for incubation periods, there appears to be no relation between the bacterial content of the filtered water and the typhoid rate. On the other hand, the results obtained by the filter would seem to be far from creditable and to strongly substantiate the claims made by Mr. Hardy and other members of the department that the filter alone is not adequate for treating the Potomac River water, but that auxiliary treatment is necessary. Congress has been requested to provide funds for constructing coagulation basins, and experiments have been conducted for a number of months in the use of such basins and several kinds of prefilters. The results of these investigations are described by Mr. Hardy in his article and will be presented by us in abstract in a later issue.

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Incorporated

239 West Thirty-ninth Street, New York

Telephone, 2046 Bryant, New York

Western Office, 929 Monadnock Block, Chicago

A. PRESCOTT FOLWELL, Editor

F. E. PUFFER, Assistant Editor

Business Department

S. W. HUME, President

T. MORRIS, Manager. A. PRESCOTT FOLWELL, Secretary

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JANUARY 18, 1911

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Value of a Periodical

On another page of this issue appears the following:
It is perfectly proper for a city to try some new experiment if there is a prospect of success and if there is a reasonable hope that conditions can be improved by it. But not only is there no excuse, it seems almost criminal, that one city after another should try the same thing after it has been shown to be impracticable, harmful or useless. It is not claimed that our city officials are criminal or that they do not desire to give good government, but their ignorance of what other cities have done or are doing makes progress slow and unduly expensive.

This is quoted from a paper advocating municipal reference libraries in cities, but is equally applicable to the employment of other means for keeping informed of what cities generally are doing. While this necessarily is recognized by experts in all branches, so that as large a part of their time is occupied

in keeping themselves informed concerning the latest developments everywhere in their particular fields as in using this knowledge in their professional work; yet the average municipal official in this country, where holding municipal office is but an occasional incident in the life of a business man, finds himself called upon to advise on and administer department operations concerning which he has only the general knowledge of the well read citizen rather than the specialized knowledge which is necessary for efficiency and economy. It is therefore especially necessary for such an official to have at his command the most complete and reliable summary of available information, including both the standard principles and the latest developments.

For this purpose a municipal reference library, such as is outlined in the paper quoted from, would be of incalculable value in every city, and we urge that every city official read this article carefully and take such action as seems best adapted, in the case of his own municipality, to secure the establishment of such a library.

We feel all the more strongly in this matter because Municipal Journal and Engineer presents to its readers such abstracts of standard information, but especially such news of latest developments, as have just been referred to. It is our aim to furnish for city officials just the class of recent information which Dr. Flack considers necessary to efficiency in municipal government.

But the very qualities which make a valuable periodical are incompatible with its serving as a history or a text-book. The elementary principles and the condensed history must be obtained from books written with that as their purpose; and here is where the reference library is valuable. But to keep in touch with the latest developments and doings in any line it is necessary to read regularly the carefully selected and timely articles to be found only in a high-class periodical. The one is as fully necessary as the other for intelligent and efficient service.

Standard Specifications

The action taken relative to standard paving specifications by the Organization of City Officials for the Standardizing of Paving Specifications, which met in New York last week, is described briefly in our News of the Societies columns. Two or three of these decisions are of special interest because of the discussions which have appeared in print concerning certain features of them.

The character of the oil to be used in treating wood blocks is one of these. The committee on this subject recommended the adoption of the same specifications as those presented last year (see our issue of March 2, 1910), except that there was allowed a range of specific gravity between 1.14 and 1.10, instead of a minimum of 1.10 as before, and a range of 30 per cent to 40 per cent of distillate up to 315 deg. C., instead of 35 per cent. The committee considered that the treatment of wood blocks should include waterproofing as well as preserving from decay. It recognized that the oil called for would probably be manufactured by the addition of coal tar pitch to the creosote, of which there can be no monopoly. Oil of this kind, it stated, has been "rased or manufactured" at Mobile, Ala., Cincinnati, O., Indianapolis, Ind., Minneapolis, Minn., Chicago, Ill., and New York City. It recommended 20 pounds per cubic foot as last year, but considered that 16 pounds might be sufficient where the traffic is heavy.

The committee on brick paving recommended the use of the rattler test and the abandoning of the absorption test. For the former the rattler developed by the recent investigation of the N. P. B. M. A. (see Municipal Journal and Engineer, Nov. 16, 1910), was recommended. There were added to last year's specifications additional clauses covering coal tar paving pitch filler and asphalt filler. There was considerable opposition to this, but we decidedly approve of the action taken; for, whether or not cement filler is by far the best (as is claimed by the National Paving Brick Manufacturers' Association), there is a very considerable percentage of engineers who prefer the bituminous fillers, and these should be considered in providing specifications for general use.

NEWS OF THE MUNICIPALITIES

Current Subjects of General Interest, Under Consideration by City Councils and Department Heads—Streets, Water Works, Lighting and Sanitary Matters—Fire and Police Items—Government and Finance

ROADS AND PAVEMENTS

Big Road Machine Bought by County

Augusta, Ga.—Richmond County has ordered a road scarifier, to be sent to Augusta from New York, for trial and approval. Heretofore the county has been using an old-style road plow, which is found too slow for the work of tearing up the hard gravel roads. The county owns two power road engines and the scarifier can be used very effectively. The new machine is a modern, improved type, model 1909, weighs 5,500 pounds and will tear up six furrows. It will cost the county about \$500, if accepted. The commissioners believe that the new machine will improve the roads of the county very much. The order was given after conferences between Commissioner Pope, Secretary Gardner and Superintendent Stringer. If the machine proves to be entirely satisfactory other counties will undoubtedly decide to adopt more modern appliances.

Charges Are Filed Away

Macon, Ga.—The City Council has washed its hands, figuratively speaking, of the charges brought by Henry Horne in connection with the award of the paving contract to the Southern Paving Company. The special committee made a report, submitting the correspondence, and was discharged. Council will not pay any further attention to Mr. Horne's charges, having decided that he did not submit evidence in substantiation of his claims. A telegram received last week from the Lasleys, the owners of the Southern Paving Company, was read. It is as follows:

"Replying to your inquiry, we nor no one connected with our company have paid, or are now paying, or have ever paid, to parties mentioned in your letter of December 17 any money on account of paving in Macon." Signed, W. M. & T. H. Lasley.

Improvement in Assessment Procedure

Masillon, Ohio.—The city will be saved money and property owners spared inconvenience from accidental mistakes in the computation of their street improvement assessment if plans approved by City Councilmen and under consideration by Mayor Remley and Solicitor Davis are carried out. The officials are seeking to improve the process heretofore in effect preliminary to the starting of the annual street improvement work. In the past, it is said, the custom has been to carry on the books of the City Auditor the names of owners who did not pay in full assessments on their properties, instead of certifying them within the time required to the County Auditor for collection with interest through the channel of taxation. As a result the city has failed to collect interest on deferred payments. City Solicitor Davis is planning to have the Council authorize the certification of the accounts to the County Auditor as soon as all property owners have been given an opportunity to pay the assessments in full, and thus secure all the interest collectible when the payments are made in installments. Mayor Remley will make an effort to have incorporated into the assessment ordinances the names of owners and a description of the property fronting on the streets to be improved. This, he said, will not only make the record of the properties improved permanent, but will enable each owner to see for what frontage he, as well as his neighbors, is assessed, and detect any mistake in measurement. Under the system heretofore in effect, he says, the ordinance only mentioned the total frontage, and lacked details. The main argument in favor of publishing a list of the property owners and the frontage is that clerical errors can creep in and cause the assessment of any one of them more than his share. Officials who might be inclined to be unscrupulous might cause the assessment against any one owner to be canceled and the deficit made up by extra assessment on the city.

Won't Keep Highway Board

Albany, N. Y.—Governor Dix received to-day a delegation of Monroe County supervisors, escorted by Senator Ormrod, who entered a protest against the abolition of the State Highway Commission. The committee urged the retention of the commission, even though the governor substituted new men for the existing commissioners. Governor Dix intimated his intention of standing by his recommendation. He pointed out that several of the counties had determined to bond themselves and build their own good roads, which the Governor thought indicated that the present commission had not been as economical as it might have been.

Engineer Discusses Paving Prices

Baltimore, Md.—Commenting on a report made by him to the Mayor regarding the amount of paving work done during the Mahool administration, City Engineer Fendall has called attention to the fact that, while the lower cost of paving during the last four years has been largely due to the operation of the Bruce-Fendall law, the competition brought about by this ordinance is fast disappearing. With the exception of the competition offered in the use of vitrified brick pavement, Mr. Fendall declared that the asphalt people have practically no obstacle in their way in Baltimore at the present time.

"How long the vitrified brick will last as a club over the prices of the asphalt trust," said Mr. Fendall, "depends on the future conditions of the brick business, but I must say that I regret exceedingly the withdrawal of the Warren Bitulithic Pavement Company from the field. So long as the Warren company was here the asphalt trust was always willing to underbid the Boston concern in the hope of driving it away from Baltimore. Unfortunately, the Warren people were never able to reach the prices of the trust interests, and consequently were forced out. Personally, however, for the purpose of keeping up this show of competition, I would like to have seen the Board of Awards give the Warren company occasional contracts even at a higher price. Luckily, the vitrified brick pavement is still an independent commodity, and so long as it remains so we shall always have a club over the trust, for the moment the latter's prices go up I can come in and do work with vitrified brick and day labor. Under the Bruce-Fendall ordinance, which allows the Board of Awards to receive bids on all classes of material for each contract, the prices have gone down considerably in the last four years. We now get sheet asphalt laid at about \$1.75 a yard, when formerly we paid from \$2.25 to \$3.50."

Mr. Fendall's department in the last four years has laid slightly more than 10 miles of street, using for the most part sheet asphalt at a cost of between \$45,000 and \$50,000 a mile.

Brooklyn Asphalt Plant Has Much Work in Sight

Brooklyn, N. Y.—With the expiration of guarantees during this year the Municipal Asphalt Repair Plant will have 4,000,000 square yards to maintain. The plant is said by its superintendent, Charles K. Lennon, to have saved the city \$40,000 annually since its installation in 1907. Mr. Lennon was paving inspector for about 20 years before he took charge of the plant. During the more recent of these years he had general charge of asphalt repairs for the city, which were done by contract. The field of operations covers a very wide area and the position requires an intimate knowledge of localities and pavements.

Dallas Street Improvements in 1910

Dallas, Tex.—During the last year, according to the report of City Engineer J. M. Preston, the city has spent \$330,854 in street paving, resurfacing, building bridges and laying sewers. The city expended for street paving as follows: Bitulithic, \$122,216.08; vitrified brick, \$23,606.82; creosoted blocks, \$79,349.11; streets macadamized, \$20,674.22; streets graded, \$4,496.88; resurfaced with asphalt, \$12,597.64. Total, \$263,030.75. The amount of sidewalk curbing and gutter laid was as follows: Sidewalks, square feet, 674,489; sidewalks in miles laid, approximately, 30; curbing laid, lineal feet, 83,898; gutters laid, 24-inch, lineal feet, 37,433; gutters laid, 18-inch, lineal feet, 250. The total cubic yards of street grading was 20,224. Fourteen streets were macadamized at a cost of \$20,674.

Railroad Asks Town to Share Cost of Changing Grades

Montclair, N. J.—The Lackawanna Railroad Company has asked the town of Montclair to contribute \$50,000 as the municipality's share of the expense in the contemplated terminal improvements here. The company's plan provides for the elimination of all grade crossings in town, a viaduct on Grove street, the closing of Pine street to all except foot traffic on an overhead bridge, and depress Bay street so that the railroad tracks may cross over that thoroughfare.

Census of Traffic over New York Bridges

New York, N. Y.—The report of the Public Service Commission for the First District contains a count of the traffic over the East River bridges. This report states that from a count made on three different days it was learned that on the first day in question the Brooklyn Bridge handled 309,783 people; on the second day, 328,899; and on the third day, 342,909. At the same time the Williamsburg Bridge was serving 182,233, 213,487 and 242,251 people. The ferries in the same time took care of 161,938, 120,841 and 119,423 passengers. The subway to Brooklyn turned in this count: 159,708, 193,781 and 210,130 passengers for the three days noted. The total East River travel for the three days on which tests were made was 813,662, 882,311 and 978,561. On the three days 405,951, 443,754 and 490,965 came to Manhattan, while 407,711, 438,557 and 487,596 went to Long Island.

Pittsburg City Plan in Relation to South Hills

Pittsburg, Pa.—The section of F. L. Olmsted's report to the civil commission on the Pittsburg city plan relating to South Hills thoroughfare has been made public. The report holds that Forbes street and Sixth avenue is the most desirable point for South Hills traffic to reach the lowtown section. A roadway on the face of the hill is provided to enable traffic from the Southside flats to reach the elevated mouth of the tunnel, while the lower deck of the bridge will bring traffic from the flats to the downtown section. Provision has been made, as shown by a map accompanying the report, for traffic to reach all important sections of the South Hills on easy grades from the south end of the tunnel, which emerges on Washington avenue, east of the entrance to the present street car tunnel. By bending the southern end of the proposed tunnel to the west along Washington avenue, the grade of the tunnel and bridge, it is pointed out, may be reduced to from 3 to 3½ per cent. On account of the uneven nature of the Pittsburg site, problems of an exceptional nature are presented to the city engineers.

Four Cities Ask New Paving and Park Laws

Indianapolis, Ind.—The members of the boards of works of South Bend, Terre Haute, Evansville and Fort Wayne met last week at the Denison Hotel to discuss proposed amendments to the Thornton paving bill. With the board members were the Mayors and City Attorneys of these cities. Under the old law abutting property owners were charged not only with the work that benefited them directly, but with the paving of street intersections. The Thornton law charged street intersections against the city. When application of this statute was sought it was discovered that in most cases the city was taxed to the constitutional limit and that there were no funds to carry out needed improvements. The boards of works, the Mayors and the City Attorneys of the cities affected by the Thornton law propose that this statute shall be amended and that the law shall be like as was in the beginning. At the same time a meeting was held of officials of the same cities to frame a bill and have it introduced in the Legislature to apply to the cities of the second class the Indianapolis park law. Under this law the park board divides the city into park districts, and the cost of park improvements or park work in each district is borne by assessment on the property in that particular district instead of charging it up against all the property in the city. The law also authorizes the City Council to make a tax levy on all the property for park purposes, not to exceed a given amount each year. Under this law the park system in Indianapolis is being extended and the plan is working well.

SEWERAGE AND SANITATION

Defect in Law About Alleys Creates Unsanitary Conditions

Atlanta, Ga.—Thousands of Atlantans were astounded by the story in a recent issue of the *Constitution* in regard to the 3,000 houses in the city which are prohibited from using city water. The fact that Atlanta has a law which prevents this number of houses from using city water was generally regarded as evidence of a defect that should be remedied as speedily as official machinery can do it. As stated in the *Constitution*, the prohibition of water also keeps out sewers, and therefore all these 3,000 houses must use earth closets. It would not have been so surprising if these houses were located in some of the outlying districts, but when the statement was made that they were all within a mile and a half of the center of the city, and many of them within a stone's throw of the business center, a lot of people were set to thinking. The matter summed up is as follows: Three thousand houses are situated on alleys that are being used as streets; the city cannot lay water mains and sewers on alleys; the city cannot turn these alleys into streets because there is a law which says that no thoroughfare shall be accepted as a street which is less than 50 feet wide. It looks at the first glance as if all there is to be done is for the City Council to repeal the ordinance limiting the width of streets and then declare all the alleys streets. This looks "dead easy," but one obstacle in the way is that many of these alley streets are private property and cannot be taken over by the city unless condemned for such purposes. One suggestion that has been made is that Atlanta might adopt a blanket ordinance by which it can assume control and jurisdiction over all sorts of thoroughfares. When this is done the ordinance in regard to the width of streets can be repealed and then the alleys declared streets whenever it becomes necessary to lay water mains and sewers upon them.

City to Take Over Private Drains

Baltimore, Md.—The Sewerage Commission have issued the following notice relative to the incorporation of existing private drains in the municipal system:

NOTICE TO OWNERS OF PRIVATE DRAINS

The Sewerage Commission, in compliance with the Act of the Legislature, will incorporate any existing private drains that can be properly incorporated as a part of the general sewerage system, and herewith notify the owners of any private drains to forward at once to the Commission full information regarding them—namely, ownership, location, depth, size, date of construction, street number of houses connected; also state if any rain water enters the drains, and the names of parties having rights in these drains.

Proper compensation will be allowed for any private drains taken over by the city in accordance with the Act of the Legislature.

HARRY W. RODGERS,
Secretary.

W. D. PLATT,
Chairman Pro Tem.

Strenuous Work by Sanitary Men

Birmingham, Ala.—Chief Sanitary Inspector Walter Benson reports that the city began the new year in good sanitary condition, owing in large part to the strenuous work of his men, who made over 30,000 inspections in December. The nature of the inspections follows: Inspections, 22,778; no garbage can, 1,360; clean up premises, 2,793; throwing garbage in street, 161; stagnant water on lot, 1; connect closet with sewer, 256; no water on closet, 85; plumbing repaired, 121; sewer opened, 17; to fill open wells, 1; remove dead stock, 56; clean out stock yard, 15; clean out stable, 1,670; move manure, 102; clean out cow pens, 708; complaints answered, 640; bakeries, 88; restaurants, 164; meat markets, 85; stores, 469; flags, 71; typhoid fever cases worked, 6; fumigations, rooms, 110. Total, 31,550.

Dallas Sewers Laid in 1910

Dallas, Tex.—Sanitary sewers laid from April 30, 1910, to Dec. 31, 1910:

	Lineal ft.	Cost.
6-inch sanitary sewers.....	47,056	\$19,398.61
8-inch sanitary sewers.....	2,850	3,533.76
10-inch sanitary sewers.....	736	2,232.95
15-inch sanitary sewers.....	510	802.00
Totals	51,182	\$25,967.32

Amount of storm sewers laid from April 30, 1910, to Dec. 31, 1910: 11,641 lineal feet, from 12 to 50 inches in diameter; total cost, \$27,773.04.

Sewer Explosion

Eric, Pa.—An explosion occurred in a sewer at the intersection of Twelfth and Cranberry streets, Jan. 4. Man-hole covers were thrown high in the air, the roadway was torn up and telegraph poles thrown down. The explosion is attributed to gas or gasoline.

Payment for Sewers in Intersections

Indianapolis, Ind.—It has been the custom in many Indiana cities for the sewers to be built at the expense of the whole municipality, instead of by the property owners in certain limited districts, as in Indianapolis. This has been the custom in Terre Haute and Evansville, and, therefore, coming in addition to this, the drain on the general fund for the improvement of street intersections is said to be a great hardship. At the recent conference of Mayors to discuss paving and other laws Mayor Charles Heilman, of Evansville, was emphatic in his argument that the law should be changed so that the property owners directly benefited would be compelled to pay for the street intersection improvements.

Large Concrete Block Sewer Finished

Houston, Tex.—The Austin street storm sewer built of reinforced Parmley blocks by Contractors Horton & Horton and planned by Consulting Engineer Frank L. Dennant has



REINFORCED CONCRETE BLOCK SEWER

been completed. The sewer is a mile and three-quarters long and 11 feet in diameter at the mouth. It drains several hundred acres of territory and will prevent the flooding of many miles of streets even in the severest storms. A large part of the sewer was built in earth tunnel.

Anti-Spitting Ordinances to Be Rigidly Enforced

Walla Walla, Wash.—Chief of Police Mike Davis has announced that hereafter the anti-spitting ordinance will be rigidly enforced. By way of warning the large Red Cross anti-spitting cards will again be posted conspicuously about the city. One of the most impressive of these is the following: "A world without careless spitters would soon be a world without consumption."

Louisville, Ky.—Mayor W. O. Head has instructed Chief of Police H. Watson Lindsey to see that the spitting ordinance is rigidly enforced, especially in street cars which are close, stuffy and poorly ventilated because of the cold weather. Colonel Lindsey has called to the attention of all the men under him the ordinance which provides a fine of \$1 to \$50 for spitting in a public place. "The street car company has posted in all its cars a notice of a \$50 fine for spitting on the car," said the Mayor. "I don't think that Judge Boldrick would fine anyone that amount of money for expropriating in a public place, but I do believe that if the police arrest the spitters Judge Boldrick will not hesitate to fine the offenders \$1. This minimum fine would be a sufficient reminder that the law must be obeyed and would break up the obnoxious and dangerous practice." Colonel Lindsey has sent the police out with the placards bearing the anti-spitting ordinance and they will be put in all public places where the old signs have disappeared.

Sanitary Sewer Connections with Storm Sewers Condemned

Duluth, Minn.—In the annual report which he filed with Health Commissioner H. E. Webster, Plumbing Inspector George Kreager strongly recommends a discontinuance of the practice of allowing sanitary sewer connections to be made with storm sewers. He declares that it has come to be a most serious problem to the city. He states that in the dry season the stench from the catch basins of storm sewers which have sanitary sewer connections emptying into them is "awful." The sewers are not being flushed as is necessary and the odor is a nuisance to many parts of the city afflicted in this manner. Inspector Kreager also refers to the practice of allowing sanitary sewers to run into the different creeks in the city. He asserts that it is most unsanitary, causing not only much unpleasantness for the residents along their banks, but breeding disease. He believes that as far as possible every sanitary sewer now dumping into creeks should be cut out as soon as possible and connections made with sanitary sewers wherever it can be done.

WATER SUPPLY

Water Supply Getting in Good Shape

Altoona, Pa.—After a period of three months the Kittanning Point reservoir is again full and overflowing. The depth of the basin at the spillway is 37 feet, and it has overflowed four inches. This also had a perceptible influence on the impounding dam, which is now slowly filling up, the gain in one day being 14 inches, making the present stage 23 feet 10 inches. The Kittanning Point reservoir had not been full since October 2. It first ceased to run over the spillway on July 20, but later on, under the influence of fall rains, it filled up again, and this condition lasted for several weeks, or until Oct. 2, since when, until the present time, it was not full. Prior to the last breakup it was almost empty. The officials of the department are very much gratified at the conditions now existing and expect to see the impounding dam fill up very rapidly from this time on. The pumping station at Sugar Run, which was closed down a week ago, has been put in operation again, the idea being to draw upon the supply at Kittanning Point as lightly as possible, so that both basins may be filled. There is a good flow of water in both the streams, more than the daily consumption in the city, and at the present rate of gain it will not take long for the impounding dam to be full, when the restrictions may be removed.

Under-registration of Meters Alleged Cause of Decreased Revenues

Natchez, Miss.—The Municipal Water Works Commission has presented its eighth annual report to the Mayor and Aldermen showing that the gross income for water and sewer service last year was \$42,947.57, as against \$44,129.32 the year before. The loss was attributed to under-registration of the meters. The operating expenses, including fixed charges, but excluding betterments, were \$24,535.45. The expenditures for construction work amounted to \$15,307.90.

Poughkeepsie Filtration Plant Efficient

Poughkeepsie, N. Y.—At a recent meeting of the Board of Public Works Dr. R. W. Andrews, City Bacteriologist, presented his report, which showed the water used by the city to be practically pure, much more so than any country well, stream or spring. Raw waters contain 4,050 bacteria. The city filtration system removes 4,020, leaving only 6. In other words, 99.8-10 per cent are removed, and only 2/10 of 1 per cent remain.

Temple Water Allowance Raised

Temple, Tex.—The City Water Commissioners are considering plans whereby the minimum water allowance to families where meters are used will be raised from 6,000 to 10,000 gallons, without a corresponding increase in rates. Under municipal ownership and non-partisan management the Temple water works plant is now equal to that of any city in the State having 20,000 population and over and delegations from other cities are constantly visiting this city to obtain information, the last delegation being from Denison. It is felt that the water problem in Temple has been successfully solved for a period of twenty years at least.

Ask Receiver for Water Company

Akron, Ohio.—A motion has been filed in the city's suit in Common Pleas Court to have the Akron Water Works Company placed in the hands of a receiver. The city, through its legal department, claims that a contract was entered into with the Akron Water Works Company to furnish an "abundant supply of wholesome water" for 20 years. The contract was made in 1894. The city claims that the water company is insolvent and is unable to comply with the terms of the contract.

Seeks Information Regarding Water Plants

Chicago, Ill.—Oscar E. Hewitt, Deputy Commissioner of Public Works, has written to the engineering bureaus of 44 large cities in the United States asking information about their water plants, with the view of adopting every suggestion that promises an improvement in the present Chicago system. The cities asked for the information are those having a population of 100,000 or more which control their own water plants. Forty questions are asked in the letters. Number and type of boilers, furnaces and a technical value of coal used as relating to a high-pressure system are among the questions. Several recommendations made in the report of the Merriam investigating committee on the water bureau also are provided for in the list of questions.

Suit Over Water Company Taxes

Crookston, Minn.—This city and the Crookston Water Works, Power & Light Company, of which W. J. Murphy of Minneapolis is the head, are about to clash. The company has not paid a dollar of taxes since 1906 and its back taxes without penalties attached now reach the snug sum of \$39,000. The trouble arose over back taxes assessed four years ago, in which the personal property assessment was materially increased, the wires, water mains, etc., being assessed back for a number of years. County Attorney Maybury four years ago started a suit which was taken to the Supreme Court and it being about the close of his term was allowed to fizzle out. County Attorney Hagen did not take it up and now City Attorney Loring has been working on it for some time past and is about ready for action.

Must File Record of Water Tests

Escanaba, Mich.—At the last meeting of the Common Council, following the acceptance of the usual report from City Chemist A. J. Carlson relative to his analysis of the city water and its results, a motion was made and adopted that hereafter the city chemist should file a record of each water test made. Dr. Carlson reported that during the month of December he had made 12 analyses of the city water and each test revealed the water to be unsafe.

Municipal Plant Is Profitable

Moorhead, Minn.—The statement of the business of the city's water and light plant for the past year shows net earnings of \$17,128.30, which is \$1,800 in excess of the earnings for 1909. The number of light consumers is 750 and there are water consumers to the number of 376.

STREET LIGHTING AND POWER

Annual Report of Light Department

Marion, Ind.—According to the report of Otis Weesner, Superintendent of the City Lighting Plant, the cost of street light was \$40.20 per year. The total cost of operating plant was \$9,026. There are 224 street lamps now in use. The figures include \$4,192 spent for extension, including \$1,500 for a site for a new plant. The value of the plant is \$41,500.

Aurora Lighting Plant Soon Ready

Aurora, Minn.—The new dynamo and switchboard for the municipal lighting plant have arrived and are being installed. The engine was received some time ago and as all wires have been strung it is only a short time until the town will be lighted by electricity. Aurora now has a modern light plant, first class water and sewer systems, a fine municipal hall, and a \$125,000 high school building in the course of construction.

Regulating Maximum Price for Electricity

Toledo, Ohio.—That the maximum rate charged consumers of electricity for commercial and domestic use should be less than 7 cents a kilowatt hour is the contention of City Solicitor Schreiber. He believes it ought not to exceed 5 cents a kilowatt hour. The present maximum rate is 9 cents a kilowatt hour, with a discount of 10 per cent if the bill is paid within a stipulated time. The Council Committee on Gas and Light recently received the communication of the Solicitor notifying Council that the present ordinance regulating the price of electricity expires Jan. 12. When Council passes an ordinance, fixing a maximum price, then no company can charge a higher price than that fixed in the ordinance; if the company accepts the ordinance, Council cannot lower the price during the life of the ordinance; if the company does not accept it, then while it can charge no more than the ordinance fixes, Council can at its pleasure again change the price.

Explosion Ties Up and Darkens City

Minneapolis, Minn.—An explosion and fire which destroyed the main plant of the General Electric Company Jan. 6, injured three men, caused a loss of \$750,000, and seriously interfered with business throughout the city during the day, left the city at night in almost total darkness. Several office buildings got power for light and elevators from the street railway company and flour mills until 11 o'clock, but after that time all power was turned off. No street lamps were lighted and all save the main section of the city was without electric light all night. Fearing that the darkness of the city might induce lawlessness, the entire police and detective force was held in reserve with waiting automobiles. The General Electric Company put 500 men at work making arrangements so that the power from the company's plants in Taylor's Falls could be used.

The explosion, which plunged the city into darkness and almost paralyzed the commercial life of the city, was in the "13,000 wire" leading into the power plant at Third Avenue, Southeast, and Main street. A tangled mass of wire machinery was thrown in every direction by the explosion. Fire, which followed, completed the demolition. Three separate explosions were accompanied by car-splitting cracks and vivid display of blue electric flame. There is little left of the power plant beyond the charred wreckage level with the water in the river. Blinding arcs of electricity powerful enough to bore through steel girders rent the air, igniting coal gas in the boiler room and communicating with twenty dynamos on the top floor. Cables slapped and writhed, wheels ground and whizzed. Lights were all extinguished, and for a minute the building was outlined by ghastly blue light.

The general opinion is that the first explosion was caused by the blowing out of a fuse on a cable which carried 13,000 volts of electricity from the power house at St. Croix Falls to the Main street substation. That put out every electric light in Minneapolis, stopped every electric motor. If it had stopped there repair might have been comparatively easy. But coal or sewer gas in a subway underneath the Main street plant was ignited, it is believed, and exploded with terrific force.

City's Electric Plant Gone

Santiago, Chile.—The central station of the entire electric and telephone plant of the city was burned Jan. 7. The loss is estimated at \$2,000,000.

Would Grant New Power Franchise

Spokane, Wash.—Electric power companies seeking franchises in Spokane will have the support of the City Council. The Council power plant committee believes that others than the Washington Water Power Company should be given the right to compete with the local electric company. While dropping the idea of building a municipal plant at the present time, the committee points out that the Panhandle Electric Railroad & Power Company and the International Electric Company have offered to furnish electricity for domestic consumption in Spokane at a maximum of 6 cents a kilowatt hour, 4 cents less than the present rate. The opportunity to secure rates so much more favorable to the consumer will not be allowed to pass without recognition if the City Council has its way.

FIRE AND POLICE

Annual Inspection of Fire Department

Alliance, Ohio.—The annual inspection of the Fire Department was held, Jan. 2, by Mayor E. P. Speidel, Safety Director Thomas Doyle and Chief Arthur S. Aungst. The first station to be inspected was No. 3, an automobile station. The machine was started and ready to go in five and three-quarter seconds. It was started and run to the corner of Union and State streets in 32 seconds. A second run to same place, including laying of 100 feet of hose and developing pressure of 80 pounds, was made in 1 minute 49 seconds. At Station No. 1, a hitch by two men ready to go on receipt of alarm was made in 13 seconds. At Station 2 the same drill was made in 12 seconds.

During the year 75 alarms were answered. The value of buildings at risk was \$250,410; contents, \$236,944; loss, \$0,695; insurance paid, \$3,381.

Increased Efficiency of Fire Department

Dallas, Tex.—Strides toward modernizing the Fire Department of Dallas during the year 1910 have probably been as great as in any other one department of the city. At all times thoroughly equipped and efficient, the year has brought the installation of the latest types of fire-fighting apparatus to supplement the machines that were formerly used. One of the most noteworthy additions to the department equipment was the installation of automobile fire engines. The first automobile engine arrived and was put into service along in April, as Dallas was the first city of the State to have automobile apparatus. Since the first engine arrived others have been added until at present there are two automobile fire engines and two automobile chemical engines. A record of the effective work done by all of these machines would indicate that the purchases have been expenditures that brought large returns. Scores of fires that might have resulted most disastrously have been stopped in their incipency and thousands of dollars saved. Geared to high speed, these engines are able to answer alarms in less than half the time of horse-drawn apparatus, and many fires have been prevented that would have got beyond control without the automobile equipment. During the year 15 new fire alarm boxes have been installed, new horses purchased, the McKinney avenue station rebuilt and other improvements and additions made to the extent of nearly \$35,000. To man this new equipment and to keep pace with the growth of the city additional men have been employed in the department, this increase amounting to more than one man for each month. At the beginning of the year the members of the department numbered 114. At one time, during the water shortage, this number was increased to 139, and at present there are 128. During the year the department responded to 840 calls. There were 35¹/₂ second alarms, or calls for additional apparatus, and five general alarms. The figures are supplied by Acting Fire Chief Myers.

Will Inspect Apparatus and Accessories More Closely

Lestershire, N. Y.—Criticism has been rife since the fire in Arch street, Jan. 3, because of the seemingly long time of the department in responding to the alarm, but it is generally conceded that blame cannot justifiably be attached to the heads of the department or firemen on duty at the station. While it was some fifteen minutes before the apparatus arrived, this was due to a streak of unfortunate luck, so to speak, unlike anything that has ever occurred in the history of the local department. "Independent's" wagon was leaving the building on the first round of the alarm but in making the turn a wheel collapsed, making the apparatus useless so far as getting to the fire was concerned. A re-hitch was made in short order to the "C. F.'s" wagon but the harness broke in a vital place and further delay was caused. Fortunately the fire was of minor importance and had been extinguished some minutes before the apparatus arrived, but history may not always repeat itself and for this reason people have been heard to complain of the delay. The incident has inspired Chief Spies and his assistants to inaugurate a thorough inspection of apparatus and accessories to see that nothing of a like nature can occur in the future.

Bloodhounds for Police Force

Galveston, Tex.—The Police Department has purchased two bloodhounds and will have them trained to do police work, particularly the tracing of fugitives.

Insist on Hundred-Pound Pressure at Fires

Green Bay, Wis.—The Green Bay Water Company will be instructed by the city of Green Bay, through City Clerk W. L. Kerr, that it must furnish 100 pounds pressure for all fires that break out in the city. The clerk was authorized and ordered by the Council to impart the information that nothing less than 100 pounds pressure would be satisfactory hereafter. A resolution conveying the expression was introduced by Chairman Felix Biemeret of the committee on Fire Department, who, after putting the resolution said that the company was furnishing nearer 85 pounds pressure than 100 at recent fires. He added that he had it from Chief Sweeney that 100 pounds could be used to advantage. By the franchise which the company operated under it was required to furnish 125 pounds pressure.

Annual Report of Fire Department

Huntington, Ind.—According to the report of Fire Chief Gardner for the year 1910, the total expenses of the Department were \$6,629. The number of runs during the year was 66, of which 61 were by telephone, 13 by alarm boxes and 2 by police; there were 4 false alarms. The total fire loss was \$9,802. Number feet water hose laid, 14,850; chemical hose, 2600.

New Rules for Fire Department

Indianapolis, Ind.—With the assistance of Mayor Shank and Fire Chief Coots, the Board of Public Safety, at a special meeting, promulgated new rules for the conduct of firemen. The action is the result of a complaint by the Mayor that firemen at engine house No. 19 have been guilty of drinking while on duty, and that when he entered an engine house with the Fire Chief, recently, firemen on duty failed to show proper respect. Hereafter firemen who are found intoxicated, either on or off duty, will be tried by the board. Assistant Fire Chiefs are to make unannounced inspections of fire engine houses at least once a week, according to the new rules. It is also made the duty of firemen to report violations of rules to Assistant Fire Chiefs, as well as to the Fire Chief. The new courtesy rule, it is understood, will apply not only to officers of the Fire Department, but to the Board of Public Safety and the Mayor as well. Firemen not knowing members of the board or Mayor may become familiar with their countenances by looking at photographs on file in the board's office. The new rule follows:

"When any superior officer enters a fire station all men are to refrain from what they were doing, rise to their feet and salute and remain standing until dismissed by their superior officer."

The following emphatic postscript was added to the rule requiring firemen to pay their debts:

"Note—This rule hereafter must be lived up to and obeyed."

First Auto Squad Wagon in Service

Indianapolis, Ind.—The first automobile squad wagon of the Indianapolis Fire Department was placed in service Jan. 7, and will be stationed at fire headquarters. In order to make room for the new machine, chemical No. 1 has been moved to engine house No. 27, in East Tenth street. The new machine cost \$5,200, and it is the intention to place a second one in service when a new fire engine house is erected at South and New Jersey streets. Those who have been assigned to the squad wagon are young but experienced men, capable of filling any place in the department in fighting fires. It is intended to use the company largely in filling in companies that arrive at fires with less than their usual crews. For instance, at certain times of the day some hose wagons reach fires with only two men, one man being off duty, and another at a meal. For the time being the new wagon will answer all alarms in the territory between State avenue and White River, from Twenty-second street to Merrill street. It will also answer the box at Madison avenue and Morris street and the box at the Central Indiana Hospital for the Insane.

Police to Report by Telephone

Louisville, Ky.—Chief of Police H. Watson Lindsey recently issued orders to the men of the Police Department to the effect that in the future they must report all accidents, fires, robberies and other happenings on their beats by telephone to Central Police Station as soon as possible. In the past it has been the custom of the officers to make a written report of such things, but Col. Lindsey wants the headquarters at Central to be more in touch with the men, and for this reason ordered the telephone reports.

Fire Inspection in Entire City Daily

Minneapolis, Minn.—Life and property in Minneapolis are to be further protected against fire by a new system of inspection that will cover every section of the city and will include every building except dwellings. The plan is C. W. Ringer's, the new Chief of the Fire Department. Ringer outlined his plans to the captains and assistant chiefs last week. The inspection will be begun at once. Ringer hopes to minimize the danger from fire. Schools will be given special attention, and extra precautions taken to safeguard children. A fireman from each fire station in the city will be detailed every day of the year to make the rounds of buildings in the district surrounding each engine house. He will inspect buildings from top to bottom. He will see whether boilers are properly protected; whether debris is heaped in basements; whether elevator shafts are unprotected; whether ashes are dumped next to buildings. He will inspect fire escapes and report lack of fire escapes. "The firemen will study buildings so that in case of fire they will know exactly how to get into them and how best to fight flames. This inspection will include schools, churches, stores, halls, office buildings, flat buildings, hotels, warehouses, manufacturing plants; every important structure in the city. Through this inspection the captain of each company will be familiar with his own district, and be able to inform a chief of exact conditions in case of fire," said Chief Ringer.

Police Telephone Stations Established

New York, N. Y.—The Police Department, following out a scheme framed by Commissioner Bingham, has set up six police booths in remote parts of Staten Island which contain telephones and are tended by policemen, some of them bicycle men. The idea is to furnish substations from which a man can be moved more quickly to a place of trouble than if he had to travel from the precinct house. A booth also has been set up at the Manhattan end of the Brooklyn Bridge which is connected by telephone with police headquarters and with the Oak Street Police Station. Another booth which has been at the Manhattan end of the bridge for years is connected only with the various telephone stations on the bridge and at the Brooklyn end.

Asks State to Pay for Fireboat Maintenance

Oakland, Cal.—Upon recommendation of Mayor Frank K. Mott the Board of Police and Fire Commissioners have adopted a resolution recommending the passage of a bill by the State Legislature whereby the State would contribute half the expense of maintaining the San Francisco fireboats. This was done in view of the fact that an arrangement has been made between San Francisco and Oakland by which the latter city will be in a position to avail itself of the fireboats stationed in San Francisco bay, which can, in case of emergency, be used in connection with this city's recently installed high-pressure salt water system. This arrangement is not on a formal basis, and while no difficulty is feared by Oakland officials, it is thought that if such a bill is passed, making it mandatory for the boats to respond to various points on the bay in return for the payment of 50 per cent of the expenses of operation by the State, greater satisfaction will result.

English Police Would Carry Arms

London, England.—Since the killing of three police officers in the battle of Dec. 20 a movement has been started to allow the English police to go armed. Hitherto they have been unarmed. They wear, it is true, a short baton in a belt, but practically it is merely an emblem of office and authority and has not and could not be used as a weapon.

Books for Fire Houses

New York, N. Y.—In order that every member of the Fire Department shall have interesting and instructive reading matter at his command the chaplains of the Fire Department, acting with the approval of Commissioner Waldo, have taken steps to establish in every fire house a library. For weeks Chaplains Knapp, Smith, McGronen and Handel have discussed plans by which the firemen might be entertained and instructed during their long hours in quarters. Chief Croker is co-operating in the work. It was the desire of the chaplains to bring about the establishment of a special library for the firemen and the Commissioner took steps to interest those who are in a position to assist such a plan. Meantime, however, in order that the firemen shall have the benefit of such reading matter as they desire, arrangements have been made with the Public Library for a special supply of books. The Commissioner has designated Chaplain Knapp as the librarian for Manhattan, Bronx and Richmond, and Chaplain McGronen as librarian for Brooklyn and Queens.

Pittsburg, Pa.—A free circulating library in every fire engine house of the city of Pittsburg is one of the possibilities of the very near future. This move doubtless will be expedited by the fact that to meet the educational and recreative needs of New York firemen an eight-foot shelf of books, especially suited to meet the wants of the fire fighters of Gotham is to be established by the New York Public Library in every station.

When the matter was called to the attention of Samuel Harden Church, secretary of the Carnegie Institute Board, he said: "It is a capital idea and I am sure it could be worked successfully in Pittsburg. At present there are 175 branch distributing centers of the Carnegie Library located in different sections of the city to enable book lovers to secure books, so you see the New York idea is not altogether a new one. I see no objection to the plan and rather favor the idea of providing the firemen with books."

The New York plan originated from the fact that many firemen applied to public libraries near the stations for technical treatises on engines and hydraulics, as well as for novels.

Auto Chemical Is Good Hill Climber

Rome, N. Y.—The new Seagrave auto chemical and hose wagon arrived last week and was given a trial trip. With Fire Chief Harrington and a number of the firemen and city officials as passengers, the machine was run into what are considered the hardest places in Rome. It went out through East Rome, climbing the Reynolds hill on far Second avenue on high gear, in spite of its unusual load of 15 men. Coming back by devious paths, a trip was made to Shorter College Hill, the machine being driven into the college yard and backed out down to East Fourth and from there driven up the steep grade on Third avenue at the Conservatory of Music. These are places that not every runabout could negotiate and that are avoided by all automobilists.

Annual Fire Loss in Selma

Selma, Ala.—According to the annual report of Fire Chief Blakely, the Department responded to 121 alarms. The loss to property and contents was \$46,731, on which the insurance was \$43,000. The were two large fires, at one of which the loss was \$12,868 and at the other \$21,160.

Small Fire Loss

Wheeling, W. Va.—A report showing the total fire losses of the city for the past 12 years has been issued by Fire Chief Altmeyer, and is of a very gratifying nature, in that it shows an extremely small loss for the year just completed. The 1910 total was \$22,367.53, which was lower than that of any year since 1900, with the single exception of 1906, in which there were very few fires. In the year 1908 the loss was almost five times as great and in 1909 almost three times. The small amount, coupled with the large number of alarms and the fact that many of the fires would have been disastrous except for the excellent work of the department, reflects the highest credit on Chief Altmeyer and the firemen. During the year many radical improvements have been made and the department is on a modern and progressive basis. The present year will see still further improvements to equipment.

GOVERNMENT AND FINANCE

Adrian Council Is Ordered to Revise the City Charter

Adrian, Mich.—Copies of a writ of mandamus from the Supreme Court have been placed in the hands of Sheriff Knowles to be served on Mayor Treat, City Clerk Mawdsley and each of the City Aldermen, ordering them to proceed with a meeting for the purpose of electing commissioners to draft a new constitution for the city of Adrian. The serving of the papers is apparently the end of a long and arduous strife which has been waged ever since a resolution for charter revision was voted upon and carried at election nearly a year ago. The Council at the time refused to grant an appropriation for the work and the mandamus proceeding was taken up in the Circuit Court and finally carried to the Supreme Court.

Commission Government Adopted

Carbondale, Ill.—Commission government was adopted Jan. 7 by a vote of 441 to 172. Less than half of the full vote was polled.

Treasurer Demands Compliance with Law

Burlington, N. J.—Compliance with the State law that requires that every municipal bill shall be presented to the Mayor for his approval and signature will be forced upon Common Council by the action of City Treasurer Joshua Taylor, who has refused to pay any more bills unless the Mayor signs them. The City Treasurer's action has caused a stir, as strict compliance with the statute makes Mayor Farmer a censor of every expenditure. Business men and taxpayers generally are behind a movement that will reconstruct and put on a business basis the entire municipal financial system. They declare the City Treasurer, under the city charter, is the proper custodian for all municipal funds but that, by various methods which will not stand a legal test, large sums have been diverted to the custody of unbonded officials.

Theory of City Wages Discussed

Chicago, Ill.—City Comptroller Walter H. Wilson has written a letter to Mayor Busse, stating that he finds a discrepancy in the average wage received by city employees and employees of private enterprises amounting to 30 per cent in favor of municipal workers. In his communication Mr. Wilson states the argument of those who claim that the municipal employees should be higher paid. The theory is, "The city's employees should have greater compensation because when entering the civic service they give up the hope for material advancement which private business alluringly holds out for the future. It must also be borne in mind that the civil-service law permits the same compensation to the city's clerks of like position, without the power to differentiate as to personal ability and capacity permitted in private offices."

Insurgent Councilmen in Indiana

Hammond, Ind.—Every city in the Calumet region in Indiana, Hammond, Gary and East Chicago, has a majority of insurgent councilmen who have completely blocked the municipal government, the Mayors and the Boards of Public Works. Mayor Knotts, of Gary, is tied hand and foot. East Chicago's Council has balked at Mayor A. G. Schlieker's pet measures, the defiant majority declaring the Mayor had had his way long enough. The Hammond insurgent Aldermen rejected contracts made by the Board of Public Works and made it plain they were to rule according to lines laid down by the Indiana State Association of Councilmen, which will fight for aldermanic power or commission government.

Municipal Election in Mingo County

Kermit, W. Va.—At Kermit, Mingo county, where the Adkins family of feud fame is numerous, Dick Adkins was refused a ballot by the election commissioners. Adkins vowed that if he was not allowed to vote no one else should. Revolver in hand, he is alleged to have taken possession of the ballot box and tossed it into Tug River. This ended the election so far as Kermit was concerned. Adkin was arrested. The higher courts will be asked to determine what has been the result of the election.

Commission Government Elections

Moline, Ill.—Commission government was adopted January 3 by a majority of 535.

Rock Island, Ill.—Commission government was adopted January 3 by a majority of 812.

Springfield, Ill.—Commission government was adopted January 3 by a vote of 3699 to 3029. The opposition was led by local brewery interests, saloon windows having been placarded with "vote no" signs.

Rockford, Ill.—Commission government was defeated at an election January 3 by a vote of 4029 to 1097.

Texarkana, Tex.—Commission government was adopted January 3 by a vote of 108 to 47. The recall feature carried by a vote of 111 to 30. Only 155 votes out of a total of about 1,200 in the city were cast in the election.

Points in Montclair's Proposed New Charter

Montclair, N. J.—Charles H. Hartshorne, Chairman of the Law Committee of the Town Council, has explained the proposed new town charter as follows: In the new charter the Mayor is given the power of nominating all town officials, he said, and the Town Council approves or disapproves his choice. Other provisions of the new charter are the election of councilmen-at-large, the short ballot, through nominations of officials by the Mayor, non-partisan nominations, the appointment of a committee to examine into the fitness of the Mayor's candidates for office and a looser organization of town government by a division into four departments—town affairs, finance, public safety and roads and sewers, each eventually to be placed in charge of an expert.

City Funds to Be Deposited with Highest Bidder.

Muskogee, Okla.—An ordinance has been passed providing that the sinking and interest funds and all other city funds not needed for ordinary administrative expenses shall be placed as time deposits with the bank or banks offering the highest rate of interest upon daily balances. The Mayor and Council are empowered to require all depositories of city funds to put up a sufficient bond. Where two or more banks offer the same amount of interest the funds are to be equally divided.

New York Charter Report Ready

New York, N. Y.—The Charter Revision Commission has completed its work and its report is now being prepared for the Legislature. It will be presented about February 1.

Declares for Municipal Ownership and Control

Springfield, Mass.—Declaring that the experience of other cities and "good business" demands it, Mayor Edward H. Lathrop in his inaugural address in Memorial Hall declared that the time has come, if it has not passed, when the city should consider taking over the property and franchise rights of the gas and electric companies. He again urged that there be an auditing of the affairs of all the city departments, and severely questioned the value to the public of the merging of the Springfield & Eastern with the Springfield street railway. In the latter connection he said that it means the paying of \$36,000 a year in dividends on "nothing of value," and that the public should bear this in mind when improvements involving expense are asked of the company.

City Charter Completed

Oklahoma City, Okla.—Members of the Board of Freeholders have completed the work of drafting a new charter for Oklahoma City and have appointed Claud Weaver and Clark Hudson as a committee to arrange the final draft of the charter. The Board will present the document to the Mayor, after which time he may call an election for its ratification or rejection. The charter incorporates a pure commission idea of city government, ward lines left out except for school board purposes, the commissioners elected directly to their offices, which would be impossible under a system by which they were elected from wards, the initiative and referendum, the recall and the civil service. The Board held its first meeting six weeks ago, having completed the document in about one-half the time consumed by former boards.

STREET CLEANING AND REFUSE DISPOSAL

City's Streets Cleaned at Half Average Cost

Corning, N. Y.—From the report of Superintendent of Public Works Canfield it appears that regular sweeping of the paved streets was begun on March 20 and continued with a force of twelve men until October 21, and with a reduced force until December 2. The average length of pavement swept daily by each man was 2,475 lineal feet, or 625 square yards. The daily cost of sweeping per 10,000 square yards was \$1.66. In 1909 the cost was \$1.74; in 1908, \$1.90; 1907, \$2.16, and in 1906, \$2.28. From investigations made a few years ago of the cost of street cleaning in 210 cities it was found that the average cost of sweeping streets by machines averaged \$7.53 per 10,000 square yards, by hand \$2.45 per 10,000 square yards, and flushing the streets about \$3.18 per 10,000 square yards; that the cost per capita per annum of cleaning the streets in cities east of Mississippi was, in 1904-1905, 53 cents, and that the cost of those cities which kept their streets well cleaned was 63 cents per capita per annum. The entire sum expended on street cleaning this year was \$3,531.79, which is equal to 6 cents per capita, according to the last census.

Regulating Disposition of Rubbish and Care of Cans

West Orange, N. J.—On the recommendation of the West Orange Improvement League, an ordinance has been passed imposing a penalty of \$5 for throwing rubbish in the street, and requiring that all garbage and ash receptacles shall be removed from the street when emptied. The ordinance also provides the same penalty for destroying or damaging receptacles for refuse belonging to the town.

RAPID TRANSIT

Power to Void Street Car Company's Privileges

Indianapolis, Ind.—If the citizens of Indianapolis believe the Indianapolis Traction & Terminal Company has not complied with its franchise obligation in the matter of building cross-town street car lines and paving between the tracks, they have the privilege, under a State law, of bringing suit brought for the annulment of the company's franchise. In 1899 the State Legislature passed a law (the Indianapolis Street Railway Law) governing street railway companies in cities of more than one hundred thousand inhabitants, making it lawful for such companies to obtain from the city a franchise of not more than 34 years' duration. The franchise of the Indianapolis Traction & Terminal Company was granted in 1902 under this law.

City Said to Have Ample Power Over Traction Lines

New York, N. Y.—The rapid transit committee of the Chamber of Commerce has made a report which takes the position that the amendments made to the rapid transit act of 1909 give the city effective control of the future development and operation of transit lines. It is stated that the control given the city by the amendments carries with it the recall of any franchise and greatly strengthens the regulating powers relating already to the operation at present vested in the Public Service Commission.

Revive Claims for Damage by Electrolysis

St. Paul, Minn.—Assemblyman Kane believes the Common Council should put life into the electrolysis suit if there is any merit in the action brought by the city against the St. Paul Street Railway Company for \$500,000 for alleged damages to water pipe by electrolysis. With a view of learning the present status of the suit he succeeded in having adopted by the Assembly last week a resolution requesting the Water Board to furnish the Council with data covering all phases of the case from December, 1902, when the suit was instituted, to the present time. Dr. Kane said the suit had been continued from time to time and he doubted if any member of the Common Council could tell what shape it is to-day. He said much money had been expended to obtain scientific data bearing on the electrolysis question and material sums had been spent for special counsel for the Water Board. He also inquired if the company had agreed to pay any damages by reason of the continuations of the suit from time to time.

Trenton Trolley Passes Go

Trenton, N. J.—As a forerunner of the better service promised patrons, the Trenton & Mercer County Traction Corporation, which is now in temporary control of the lines of the Trenton Street Railway Company, has announced that all free transportation will be recalled. This will affect 500 persons, among them being many of the officials of this city and of Mercer county. No one will be permitted to ride in the cars as a "dead head" other than employees of the company and firemen and policemen, when in uniform. Among those who must give up their "annuals" are members of the Common Council and other city officials who have failed to respect the action a year ago of the Council, which directed that all passes should be returned.

MISCELLANEOUS

Ordinance Against Prize Fights and Pictures

Ardmore, Okla.—The Board of City Commissioners has passed an ordinance against the showing of prize-fight pictures or the holding of prize fights or boxing contests of any kind within the city limits.

New Department of Landscape Gardening

Columbus, O.—The semi-annual appropriation ordinance submitted to Council by Mayor Marshall provides for a new department, that of Landscape Gardening and Forestry. The sum of \$5,000 is allowed the department for the first year.

A Municipal Challenge

Memphis, Tenn.—Mayor E. H. Crump has sent the following telegram to Mayor F. H. Kreismann, of St. Louis, Mo.:

Mayor F. H. Kreismann, St. Louis:

The City of Memphis hereby challenges the City of St. Louis to a public comparison of their respective advantages, industrially, commercially, socially and educationally. We assert that Memphis is a better city to dwell in and do well in than St. Louis. It possesses greater advantages in each of the above particulars generally and specifically, and that a friendly, frank comparison of the two communities will prove the fact which Memphis claims. As chief executive of the great city of St. Louis, do you accept the issue?
E. H. CRUMP,
Mayor of Memphis.

Place Municipal Reference Library Under Public Library

Milwaukee, Wis.—Council has decided to place the municipal reference library under the jurisdiction of the public library and appropriated \$5,000 additional for the use of the library board to carry additional expense. The library is to be retained in the City Hall.

Enjoins Increase in Telephone Rates

Portland, Ind.—The City Council has directed the filing of an injunction suit to prevent an increase of the price charged for service by the Home Telephone Company. Recently the company announced an increase of 25 cents a month, making the price \$2.25 a month for business houses and offices and \$1.25 for residences. When the new rates became effective with the first of the year, perhaps fifty telephones were removed and others have served notice of similar action.

War on Bucket Shops

San Francisco, Cal.—Mayor McCarthy wishes the city of San Francisco to join forces with the postal department in the war on bucket shops. In a letter to the Board of Supervisors he urges the passage of an ordinance to outlaw the professional stock gamblers and to make it an offense even to enter their establishments. In the draft ordinance he presented penalties of \$500 and imprisonment up to six months are provided.

Plan Municipal Exhibit

Toledo, O.—To plan for a municipal exhibit to be held in Memorial Hall, Mayor Whitlock called all of the heads of city departments together in his office last week and started them at work in gathering material for the city show. The dates have not been announced. It is planned to hold the fair for a week, with a noted expert on some municipal topic to lecture each evening. The object of the show will be to acquaint the people with their government in all its branches and to make practical demonstration of the work that is being done.

LEGAL NEWS

A Summary and Notes of Recent Decisions—Rulings of Interest to Municipalities

Computation of Indebtedness—Deductions

Elliot vs. City of Philadelphia et al.—Act April 20, 1874, provides that the word "indebtedness" of a city shall include all manner of debt, floating, as well as funded, and that the net amount thereof shall be ascertained by deducting from the gross amount, the moneys in the treasury, outstanding solvent debts and revenues applicable within one year to the payment of such debt. Held that, while municipal authorities cannot arbitrarily say that every claim of the city is an outstanding solvent debt or that revenues necessary to pay current expenses can be set aside to pay outstanding obligations, yet where there are bona fide outstanding debts due the city and revenues not necessary to meet current expenses are available for the payment of debts within the year, such deductions can be made under the statute in ascertaining the net indebtedness.—Supreme Court of Pennsylvania, 78 A. R., 107.

Bonds for Manual Training School

Maxcy vs. City of Oshkosh et al.—Under statute 1898, as amended by laws 1903, authorizing a city to vote bonds "for the erection, construction and completion" of school buildings, a city may issue bonds for the erection, construction and equipment of a manual training school since a school building is not completed within the statute until it is ready for use and occupancy and since the word "completion" must be given some force, and is not synonymous with the words "erection" and "construction."—Supreme Court of Pennsylvania, 78 A. R., 107.

Action on Surety Bond—Extra Work

City of Fergus Falls vs. Illinois Surety Co.—While payments to a contractor in excess of the amounts stipulated in the contract will release a surety company pro tanto, mere irregularities in the issuance of estimates upon which such payments are based will not so release it unless actual prejudice has resulted. A secret and unlawful agreement between the contractor and the engineer in charge to share in the profits of the contract does not release the surety. A charter provision of a municipality, providing, in case of default by a contractor in the performance of a public improvement, that the city shall furnish the labor and materials necessary to complete the contract, is complied with by letting one or more contracts for such completion. When a contract provides for the ordering of extra work, the requiring of such extras does not violate or change the contract, so as to release the surety. Unless the new contracts let after the default for the completion of the original contract differ so materially from the original as to amount to a departure from it, resulting in enhanced cost, the surety is not released. Although the estimates for payment during construction contain improper items, if the amount actually paid does not exceed the stipulated percentage of the amount which might in good faith be properly allowed, the surety is not discharged. In an action upon a contractor's bond after default, when it appears that the original contractor performed extra work, its value should be added to the contract price and the sum so found deducted from the amount the obligee was compelled to pay.—Supreme Court of Minnesota, 128 N. W. R., 820.

Contract for Water—Violation—Burden of Proof

Antigo Water Co. vs. City of Antigo.—The water company having sued the city for hydrant rentals, under contract provisions of an ordinance, and the city having denied liability, alleging that the service was not rendered as provided in the ordinance in that the system did not meet a required test as to capacity, and therefore that nothing ever became due therefrom under the ordinance, the burden of proof was on the water company throughout the trial to establish its claim by a preponderance of evidence, by showing that the service furnished complied with the terms of the ordinance and was sufficient to meet the test required.—Supreme Court of Wisconsin, 128 N. W. R., 888.

Streets—Alleys—Boundaries

Town of New Castle et al. vs. Hunt et al.—The monuments marking the initial point for the only plat of defendant town which was ever made were destroyed so that no accurate survey can now be made. The lines of an alley abutting plaintiff's property were marked by permanent improvements as they now exist from the time the property was first occupied, and at two different times the city engineer marked the boundary lines in conformity with such improvements and the town's claim that such improvements encroached upon the alley was first made over 75 years after the property was originally occupied. The improvements marking alley line consist of a hedge fence, houses, etc., and a \$4,000 residence. Held, that the town could not now claim that the lines of the alley as marked by the improvements were not the true lines.—Appellate Court of Indiana, 93 N. E. R., 173.

Excavation in Street—Action for Death

Voelker vs. Hill-O'Meara Construction Company.—Under the rule that one suing for negligent death must prove not only negligence, but that decedent met his death by reason thereof, and the causal connection as a fact, it is sufficient where the facts proved are of such a nature and are so connected and related to each other that the conclusion therefrom may be fairly inferred. There is no presumption of law that decedent for whose death an action is brought committed suicide, and where the surroundings do not indicate how he came to be where he was when found, the presumption is that it was without design. In questions touching the conduct of men, motives, feelings and natural instincts constitute evidence for the jury. In an action against a contractor excavating in a sidewalk without guarding the excavation or maintaining warning lights as required by a city ordinance for the death of a pedestrian falling into the excavation, evidence held to justify a finding that decedent met his death by falling into the excavation while walking on the sidewalk, authorizing a recovery.—St. Louis Court of Appeals, Missouri, 121 S. W. R., 906.

City's Liability for Notary's Fee

Morgan vs. City of New York.—The city of New York is not liable for the official fees of a notary public or commissioner of deeds verifying affidavits at the request of a city or county official, but the remedy of the notary or commissioner is against the person procuring the service, and the fee must be demanded of the officer at the time of the rendition of the service or within such time thereafter as will enable the officer in the presentation of his claim for audit to include the same and he reimbursed.—New York Supreme Court, 125 N. Y. S., 1034.

Notaries' Fees—Responsibility of City

Bookman vs. City of New York.—Code civil procedure specifically allows a notary to demand his fee for administering an oath in advance, and section 3291 provides for the reimbursement of an officer who is required to take an oath, etc. Held, that in view of these provisions, a notary who administers an oath to a municipal officer must demand his remuneration from such officer, who in turn may be reimbursed by the city, but the city cannot be held liable directly to the notary.—Court of Appeals of New York, 93 N. E. R., 190.

Action for Injuries—Harmless Error

Barnes vs. City of St. Joseph.—Where, in an action against a city for injuries by falling into a hole in a sidewalk, the evidence showed conclusively that plaintiff fell into a hole in the walk which was made by surface water, and was of a size and depth sufficient to be dangerous to travelers, especially on a dark, rainy night, as was that in question, and that it had existed for four months before the injury, error in an instruction which assumed to cover the whole case, and directed a verdict for not requiring the jury to find that the hole made the sidewalk unsafe to pedestrians and not instructing that the city was entitled to a reasonable time after actual or constructive notice thereof in which to repair the defect was not prejudicial to the city and hence was not reversible.—Kansas City Court of Appeals, 132 S. W. R., 318.

City's Liability for Purity of Water Supply

Oakes Mfg. Co. vs. City of New York.—Where a municipality maintains a public water system it is acting as a governmental agency and is therefore not liable for negligence in maintaining the water supply. Where a ministerial duty is specifically imposed by statute or otherwise upon a municipality, it is liable for the negligence of its officers in the performance of such duty. Greater New York charter makes the consolidated city the successor of the constituent municipalities, with all their rights, powers and duties. Section 517 vests in the city of New York and places on the commissioner of water supply the rights, powers and obligations of Long Island City as to the public water supply. Sections 479 and 483 further charge the commissioner of water supply with maintaining the purity of the water supply. Long Island City Charter provided for water commissioners, with power to establish a water supply, and made it their duty to take all proper measures to preserve the purity and sufficiency of the water. Held, that even if a duty was imposed on the consolidated city in favor of inhabitants of Long Island City to provide a public supply of water, an error in selecting a source of supply which was subject to contamination by sea water was error in the exercise of a discretion judicial in its nature and imposed no liability on the consolidated city for damages.—New York Supreme Court, 125 N. Y. S., 1030.

Street Railway Franchise—Breach of Contract

City of York vs. York Railways Company.—That the city stood by and saw work done on the line after expiration of the period set for its completion, required the company to expend money in paving a street and accepted the percentage of the gross earnings on the track laid stipulated for in the ordinance did not estop the city from collecting the amount stipulated in the contract as damages for default in completing and operating the railway on time, where it did not appear that the city claimed a forfeiture of the franchise of the railway company or questioned its right to use the part of the line that the railway company had completed and was paying the percentage upon.—Supreme Court of Pennsylvania, 78 A. R., 128.

Street Improvement—Taxes—Injunction

Dubbert et al. vs. City of Cedar Falls et al.—A city council's resolution of necessity for a street improvement having been regularly adopted, notice thereof having been given, persons having made objection before the council, not only as property owners but as taxpayers, and the work having been ordered by proper action, the council acquired jurisdiction to proceed so that a tax thereafter levied for the street improvement fund, out of which the expenses of the improvement not taxable to abutting property were to be met was not a tax levied without jurisdiction. Mere irregularities on the part of the tribunal having jurisdiction to proceed with the levy of a tax to pay part of the expense of a street improvement cannot be raised by a taxpayer in an action to enjoin collection of the tax.—Supreme Court of Iowa, 128 N. W. R., 949.

USE OF SPACE UNDER STREETS**Street Titles—Ownership of Fee—Plats**

Williams vs. City of Chicago.—The plat of Ft. Dearborn addition to the city of Chicago, made by the United States in substantial compliance with the statute of Illinois then in force, vested in the city of Chicago the fee to the streets, alleys and public grounds designated on the plat as completely as if made by an unconditional conveyance in the ordinary form, so that the city could charge owners of lots abutting upon streets within the addition for the use of sidewalk space in the streets.—Supreme Court of Illinois, 93 N. E. R., 165.

Street Titles—Ownership of Easement

Northwestern Safe & Trust Company vs. City of Chicago.—Quincy street, in Chicago, being laid out in 1854 by plat not certified and acknowledged as required by the statute then in force, the city acquired only an easement and not the fee therein, which remained in the abutting owners.—Supreme Court of Illinois, 93 N. E. R., 160.

Street Titles—Ownership of Fee

Sheldon vs. City of Chicago.—The fee in all of the streets in the original town of Chicago rests in the city of Chicago.—Supreme Court of Illinois, 93 N. E. R., 167.

Title to Street—Invalid Dedication

Farwell vs. City of Chicago et al.—Where a Chicago street was opened by a plat made in 1851 and recorded in 1852, which plat was acknowledged before a county clerk in Connecticut, who was not authorized by statute to take acknowledgments of plats, the title to the street did not pass to the city; and the maker of the plat, when he subsequently conveyed lots abutting on the street, conveyed to the center of the street, so that the city could not require abutting owners to obtain a permit before using space beneath the surface of the streets adjoining their premises in a manner not interfering with the public easement.—Supreme Court of Illinois, 93 N. E. R., 168.

Use of Subsurface Space—Street Acquired by Condemnation

Illinois Trust & Savings Bank et al. vs. City of Chicago.—The plat of school section addition to Chicago being a common law plat, not having been certified, signed or indorsed as required by the statute in force at the time, the fee to Monroe street therein is in the abutting owners, and the city cannot require them to obtain a permit to use the space underneath sidewalks adjoining their property in such street in a manner not interfering with the public easement. Where a city condemns property for a street, it acquires only an easement therein, the fee remaining in the abutting owners, and they cannot be required to obtain a permit to use the space underneath the sidewalks adjoining their property on such street in a manner not interfering with the public easement.—Supreme Court of Illinois, 93 N. E. R., 160.

Rights of City to Compensation

Sears vs. City of Chicago.—An ordinance provided that no person should use space underneath the surface of a street or construct or maintain any structure thereunder without a permit from the city, and that every applicant for such a permit should file a \$10,000 bond to keep the city harmless from any claim of damage arising out of the use of such space or structure, and that a certain compensation should be paid for such use. Held, that the ordinance was valid as to owners of lots located upon streets in which the city owned the fee, but could not be enforced against owners of lots abutting upon streets wherein the city had only an easement.—Supreme Court of Illinois, 93 N. E. R., 158.

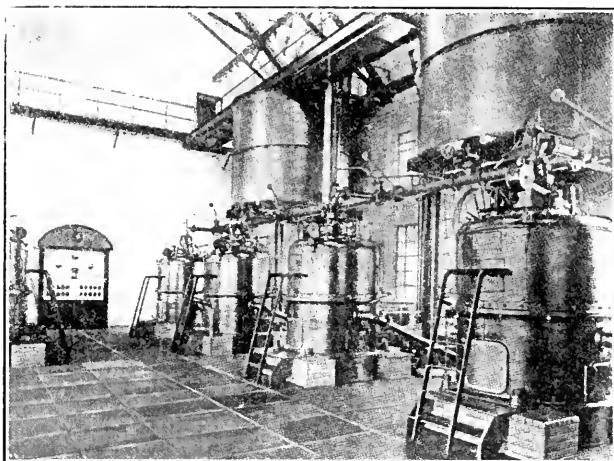
Permit for Use of Subsurface Space—Reasonableness

Tacoma Safety Deposit Company vs. City of Chicago.—An ordinance providing that no person shall use space under a street nor maintain any structure thereunder without a permit from the commissioner of public works of the city, requiring a \$10,000 bond to save the city harmless from claim of damage arising from the use of such space or structure and for maintenance of the street, exacting a rental, when the space so used does not extend more than 15 feet below the surface of the street and the adjoining property is subject to general taxation, of a sum equal to 4 per cent of the amount determined by multiplying the number of square feet of surface over the space so used by a sum equal to one-tenth of the land value of the average square foot in the lot abutting on such space, as fixed by the last assessment thereof for general taxation, the annual compensation in no case to be less than \$10, providing that the ordinance shall not apply to one using such space at the time under any ordinance theretofore passed requiring payment of compensation for such use, if such person is making such payments, nor so long as such payments are made according to the terms of such ordinance, and providing that, if any person using space underneath a street, sidewalk, etc., shall fail to take out a permit as provided in the ordinance within 90 days after it takes effect, the commissioner of public works shall proceed to remove such structure and close the space therein, as applied to streets in which the fee is in the city, is not unreasonable nor discriminatory.—Supreme Court of Illinois, 93 N. E. R., 153.

MUNICIPAL APPLIANCES

Sludge Drying Machine.

A GERMAN sewage sludge drying machine, called the Shafer-ter-mur, is being offered to municipal authorities by the Lathbury-D'Olier Company, Morris Building, Philadelphia, Pa. The dryer, which is a centrifugal machine, is claimed to convert raw sewage sludge rapidly into inodorous matter that can be easily handled. The machine works automatically, drying the sludge by centrifugal action until a sufficient amount of comparatively dry sludge is accumulated, and then discharging in such a manner that it is broken up and is easy to handle. The machine consists essentially of a drum which is fitted with a central tube for the introduction of the raw sludge, and contains a number of chambers. The chambers are provided with sieves fitted with checking devices. From a reservoir above the sludge enters the chambers by way of the central tube. As the cylinder revolves, the sludge is forced toward the outer walls. The water passes through the sieves and flows off by an annular pipe. Fresh sludge enters and goes through the same process until the chambers are filled with dry sludge. Then a door is opened, the sludge thrown out by centrifugal force and as it strikes the walls of the outer shell, in which the revolving cylinder is encased, it is broken up, falls to the floor and is wheeled away in barrows. The process is then repeated. In installations now in operation from 70 to 140 cubic feet per hour of raw material have been treated, giving a residue of dry sludge weighing from 660 to 1000 pounds. The power required to operate varies from 8 to 10 horsepower.

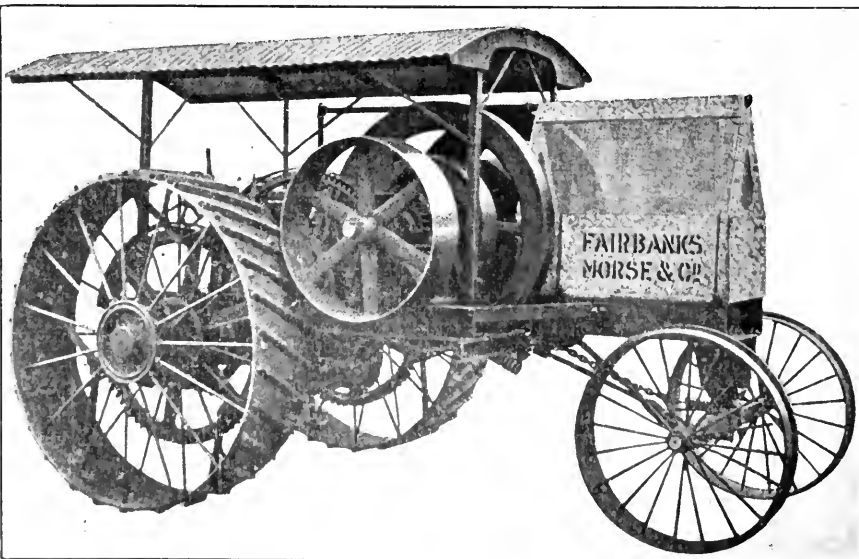


GERMAN SLUDGE DRYING MACHINE

Gasoline Traction Engine.

A TRACTION engine is made by Fairbanks, Morse & Co., Chicago, Ill., which is driven by a 25-horsepower, 1-cylinder, horizontal, water-cooled, 4-cycle gasoline engine of the usual Fairbanks-Morse construction. Make-and-break ignition is used with current from a magneto. Dry batteries are provided

for starting. The cooling water is circulated by a belted centrifugal pump and is kept cool by means of a screen cooling tank mounted at the front end of the frame. The tank has a peaked top consisting of two inclined screens. The heated water from the jackets is delivered at the peak of the tank and runs down over the screens, being cooled by evaporation. The engine is started by means of a hand pump with which the initial charge of air and gasoline mixture is forced into the cylinder. The transmission of power from engine to rear wheels is through a friction clutch, differential shaft and spur gearing. Only one gear ratio and a reverse are provided. The ratios are 1:20 forward and 1:32.5 on the reverse. Speeds of from 1.7 to 2.5 mi. per hr. are obtained by varying the engine speed from



GASOLINE TRACTION ENGINE—TWENTY-FIVE HORSE-POWER

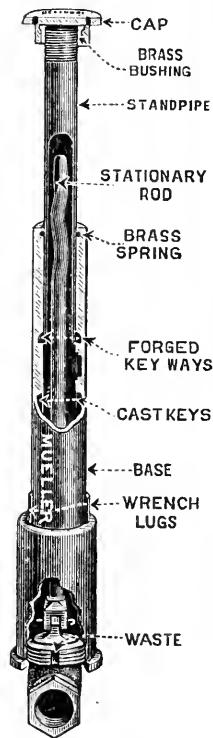
175 to 250 r.p.m. The maximum draw-bar pull available, after allowing for efficiency of transmission, should be about 2,700 lbs. The same clutch is made to serve for both the drive and the belt pulley. The truck frame is made of structural steel channels and l-beams. A removable canopy top of galvanized steel roofing is provided. The diameter of the rear wheels is 72 inches, with 20-inch face and diagonal cleats of malleable iron. The floor space occupied by the tractor is 8 feet 9 inches by 15 feet. The weight is 14,500 pounds. The manufacturers will send catalogue 1313 giving further details on request.

New Extension Service Box.

THE H. Mueller Manufacturing Company, Decatur, Ill., and New York City, have recently placed on the market a new extension service box of their own manufacture, which possesses many points of advantage. It is designed to obviate the annoyance and expense to which companies are subjected by reason of theft, breakage, and vandalism.

The box is made in the Arch and Minneapolis patterns, the latter being illustrated here:

The trouble arising with many service boxes, by reason of being raised by frost, cannot, it is claimed, occur with the Mueller Extension Service boxes. The standpipe slides freely in the base, and if there is any action by frost only the standpipe is moved. The base remains rigid. The standpipe returns to its original position under slight pressure. In case of a heavy weight on the cap the standpipe yields to the pressure and there is no strain on the base or the connection. The length of the box can be changed at any time through a range of one foot. On the lower end of the standpipe are two forged key ways which fit keys on the inside of the base, thus giving a double lock on the pipe. A strong circular spring in a recess of the base holds the standpipe to any desired position. The spring cannot be lost and it can only be removed by considerable effort.



The cap is extra heavy and has a brass bushing to fit the standpipe. The bushing is firmly imbedded in the cap. This is done by placing the flanged end up and permitting the iron to run around it when casting. It cannot be removed except by the actual destruction of the cap, and the cap cannot be taken from the box except by the use of the spanner.

The rod is of wrought iron with a malleable iron clamp forged on the lower end to fit flat or square head cocks. The rod is held in position on the cock key by means of an annealed heavy brass wire pin, which fits in holes drilled in both jaws of the clamp and

the key head. The upper end of the rod is forged to fit the shut-off key. In boxes for 1/2 to 1 1/4 inch cocks a wave is forged in the upper end of the rod to keep it in a central position. In the boxes for larger cocks the rod is of sufficient size to do this without the wave. The key for the smaller boxes is made of malleable iron, and for the larger boxes of wrought steel. All keys are of the combination type—that is, for taking off the cap and for digging away dirt and ice.

Dry Powder Extinguisher.

THE Manville Fire Extinguisher, made by the H. W. Johns-Manville Co., 100 William street, New York City, consists of a metallic tube 22 inches long and 2 3/4 inches in diameter filled with a dry chemical compound, composed of fire chemicals having the desired properties for extinguishing fire and harmless to anything else. This powder, when brought into contact with fire, generates a large quantity of carbon dioxide gas, which absorbs the oxygen in the air without which no fire can live. The extinguishers are hung on hooks placed conveniently where fire protection is needed. A downward jerk removes a friction cap at the top of the cylinder which carries the hook, and the extinguisher is ready for use. The Manville extinguisher will put out gasoline or other oil fires.

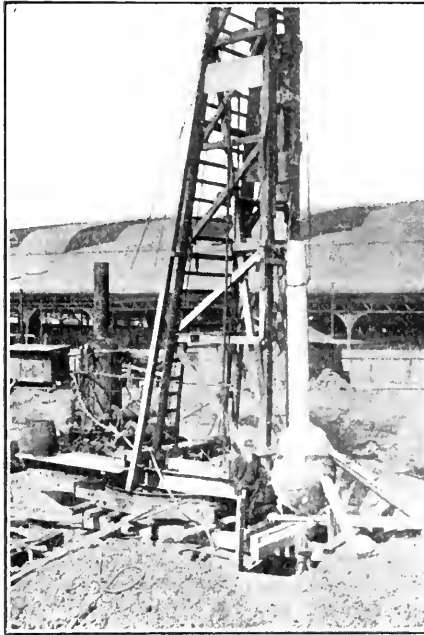
The Pedestal Pile.

THE apparatus necessary to form the pedestal pile consists of a casing and a core. The casing is a steel pipe, 16 inches in diameter and 3/8 inch thick, with outside reinforcing bands, top and bottom. The core is a smaller diameter pipe, with a cast steel point and an enlarged cast steel head. The core is inside the casing, its enlarged head engaging the top of the casing and its lower pointed end projecting some 4 or 5 feet below the casing. In the head of the core there is an oak driving block which receives the blows of the hammer. The core is fitted into the casing and both are driven into the ground to the desired depth.

The core is then pulled out, and a charge of concrete is dropped to the bottom of the casing. The rammer is lowered into the casing and driven down through this concrete. As a result the concrete is compressed and is forced out against the soil, pushing back and compacting the surrounding earth. The operation is repeated. The rammer being withdrawn, another charge of concrete is dropped down inside the shell and the rammer again driven through it, causing the concrete to be forced out still further into the surrounding earth. This process is con-

tinued until a sufficient volume of concrete has been rammed down to insure a footing of the desired size. The ram is then removed and the casing is filled to the top with wet concrete.

The casing is removed slowly and evenly, the concrete falling into position and filling out the thin space formerly occupied by the casing. For this reason, after the casing has been com-



PEDESTAL PILE EXCAVATED AND RAISED FOR INSPECTION

pletely removed, the surface of the concrete in the shell will be found to have sunk some 3 to 6 feet, according to the length of the pile. The volume of concrete represented by this sinkage has been found to agree exactly with the volume of the casing wall which it replaces. This fact has been confirmed with Pedestal Piles placed in mud, soft clay, trash fills and quicksand, proving conclusively that there is no flowing in of the earth after the casing is withdrawn. The resulting pile is a column 17 inches in diameter with an enlarged base or pedestal, as shown in the photograph.

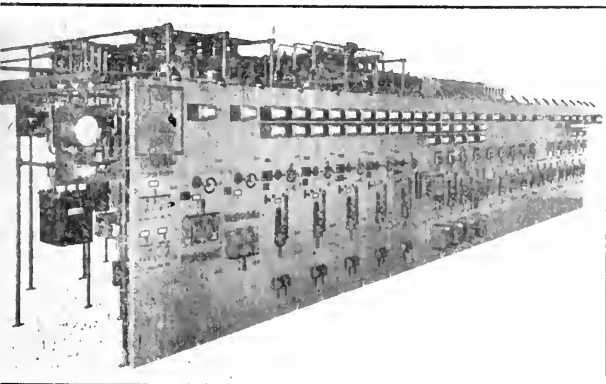
Switchboard for Kioto (Japan) Municipal Water Works.

Two switchboards of considerable size have lately been built by the General Electric Company of Schenectady, N. Y., for the Kioto Municipal Water Works, Japan. The generating station

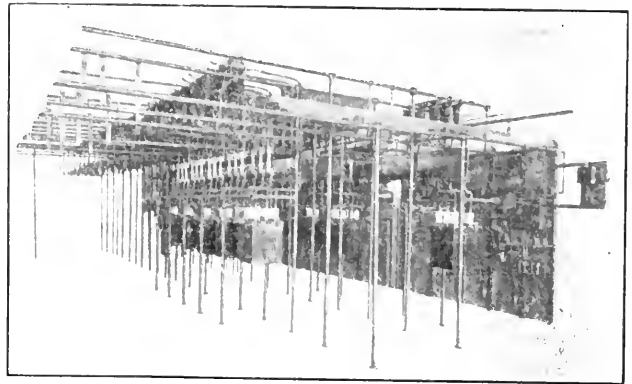
board is shown in the illustration. It is 40 feet long and consists of 24 3-section marble panels, supported on a pipe framework. This framework also carries the oil switches, disconnecting switches, instrument transformers and several sets of buses. The station equipment controlled from this board consists of 2 turbo exciters, 125 volts, 125 kilowatt; 5 3-phase turbo generators, 6600 volt, 1500 kilowatt, 60 cycles; 3 3-phase outgoing lines, 6600 volts, to sub-station; 1 bank of transformers, 6600/3500 volt; 7 3-phase feeders, 3500 volt; 3 3-phase, 4-wire feeders, 3500 volt.

Each exciter has a triple-pole, double-throw switch and a double set of buses so arranged that either exciter can be used to excite the generator fields, while the other is used for station lighting and auxiliary power. The alternating current generator panels, in addition to the usual instrument and synchronizing equipment, have reverse current relays for automatically tripping the oil switches on a reversal of current which might result from a short circuit in the winding of the generator or from a failure of the prime mover. The panels controlling the different lines and feeder circuits are equipped with inverse time limit overload relays in connection with automatic oil switches, in addition to the indicating instruments.

Continuity of service was considered of primary importance in the design of this switchboard, and to insure this an arrangement of spare equipment was adopted. For the transformer bank, consisting of 3 750-kilowatt single-phase units, one spare transformer of the same capacity was installed to take the place of any disabled unit. These four transformers are connected through transfer switches on the primary and secondary sides to enable the operator to disconnect any unit and connect the spare for service in the shortest possible time. Spare oil switches for both the three-phase, three-wire, and the three-phase, four-wire feeder systems, connect the main feeder bus with a set of emergency buses, to which any feeder circuit can be connected through transfer switches. The feeder oil switches are provided with disconnecting switches on each side and can be taken out of service for inspection and cleaning without interrupting the circuit. A ring-bus system is used, by which certain groups of feeders may be connected to different generators independent of other groups or of the whole system operated together. The sub-station switchboard consists of 12 marble panels and is very similar to the board for the generating station. Spare transformer systems and oil switch arrangements for the two stations are identical.



6600 AND 3500VOLT A.C. SWITCHBOARD



ARRANGEMENT OF SWITCHING APPARATUS

NEWS OF THE SOCIETIES

Organization of City Officials for Standardizing Paving Specifications.

The second annual convention was held in New York City, January 10 to 13 inclusive, the Executive Committee holding a final meeting on Saturday, the 14th. The convention opened Tuesday morning with an address of welcome, on behalf of the city, by President McAneny, which was replied to by Mr. John McVicar, of Des Moines. After the roll call the remainder of the day, up to 5 o'clock, was occupied with meetings of the Executive Committee and of the Committee on Credentials. At this time the convention reassembled and listened to the address of the President, report of the Secretary, etc. Thirty-two cities were represented by 73 delegates, and a number of contracting firms, associate members of the organization, were fully represented. Practically all of the corporate members were appointed on the several committees, and Wednesday and Thursday were devoted to the consideration by these committees of the nine specifications, reports of the committees being received from about 11 a. m. Friday until 7 p. m. The business meeting was held Friday evening. The time and place for the next meeting were left to the Executive Committee, which later decided upon New Orleans, and January 15, 1912. The election of officers resulted in the following: President, Geo. W. Tillson, New York; First Vice-President, Capt. W. J. Hardee, New Orleans; Second Vice-President, L. W. Rundlett, St. Paul; Third Vice-President, Geo. W. Craig, Omaha; Fourth Vice-President, Mr. Faris, Kansas City; Secretary and Treasurer, John B. Hittell, Chicago. Most of the committees presented what might be considered as final reports, and although no official action or intimation of the fact was made, it is quite probable that the next convention will see the winding up of all the work of revising specifications and the disbanding of the society, owing to the completion of the task which it set for itself.

A year ago we published the specifications recommended by the several committees of this organization, and there have been few changes made in these by the committees this year. Probably the most important change was the addition to the brick pavement specifications of clauses covering pitch and asphalt fillers. The three questions which seemed to have the most interest for the convention at large were this question of bituminous fillers for brick pavements, the creosoting oil for wood block and the specifications for asphalt in sheet asphalt pavements. The creosote oil specifications were left practically unchanged from last year, except that the specific gravity is defined as between the limits of 1.10 as a minimum and 1.14 as a maximum. The committee states that they recognize that the material called for must probably be formed by the addition of coal tar pitch. They consider it desirable to have the treatment provide waterproofing as well as preservative conditions. For wood they give as the standard "Southern yellow pine," as covering both long and short leaf. They would also, however, admit Norway pine, black gum and tamarack, with 20 pounds of preservative for pine and tamarack and 22 for gum; although 16 pounds may be permitted where the traffic is heavy, at the discretion of the

engineer. A five-year guarantee period was recommended.

The committee on brick unanimously decided to drop the absorption test and adopt the standard rattle and shot test of the National Paving Brick Manufacturers' Association. As stated above, they provided alternative specifications for coal tar pitch filler and for asphalt filler. They recommended a five-year guarantee.

The section of the sheet asphalt specifications which received the most discussion was the admission of the so-called artificial asphalts derived from Southern and Western oils. The specifications were finally reported in such form as to permit the use of asphalts from each of these districts. The committee on bituminous concrete (which is defined as a mixture for paving, consisting of broken stone, sand and bituminous cement, mixed before laying) recommended laying upon a macadam base from eight inches to four inches thick, depending upon the traffic. The specifications for the coal tar binder to be used should be based upon analyses of binders which have given satisfaction in the locality in question, so as to admit all the best of these binders. As to any patents which might be infringed by such mixture, this question was not considered, except to state that each city must do as it thinks best in this matter.

All of the specifications were adopted without any dissent, except for two negative votes in the case of the wood block specifications and four against the asphalt specifications. All of these specifications are to be withheld from the public until they can be printed and copyrighted by the association; consequently it will not be possible, or at least courteous, for us to publish the same at this time.

New York State Road Builders' Association—Seventy-six State road builders, all members of the State Road Builders' Association and representing over \$5,000,000 of "tied-up" capital, met at Albany January 9 and appointed a committee to wait on Governor Dix. The committee will place the position of the road builders before the Governor and ask that the delay in awarding the contracts for the summer's work be shortened as much as possible.

"We do not care whether the roads are built under the direction of a commission or the State Engineer," said Edwin F. Van Hoesen, a former deputy state engineer, "and our meeting has no political significance. We are not trying to force the issue of awarding the contracts, but simply wish to present our side of the case to Governor Dix, so that he may be aided in coming to a decision. The quicker the contracts are awarded the better it will be for the contractors and the cheaper for the state. If the road building firms do not get their contracts as early as possible, many of them will be forced to go into other branches of work. This will withdraw a number of them from bidding on the roads, and as the competition is lessened the prices will go up in proportion."

Following is the committee which called on the Governor: Chairman, Samuel Beskin, of Fishkill Landing; M. R. Aldridge, of Poughkeepsie; H. C. Merritt, of Tuckahoe; E. J. Cunningham, of Hudson Falls; T. C. Brown, of Schenectady; F. L. Cohen, of Buffalo; John Consalus, of Albany; H. B. Sproul, of Peekskill; E. C. Rynds, of Albany, and W. S. Smith, of Rochester.

From the road builders' point of view

it is essential that the work begin early in the spring as weather conditions will permit, for many reasons. Practical road builders and foremen are scarce, and for that reason many contracting firms keep a number of high salaried men on their payrolls during the winter, so that they will be sure of having competent superintendents when the building season opens. Many of them have to keep large numbers of horses during the winter, and one contractor said recently that his expense for this item alone was over \$35 a day.

Road building machinery cannot, in many cases, be used for any other kind of work, and if the contracts are not awarded as soon as possible in the spring, the contractors lose large amounts by reason of idle capital. In many cases the contracts specify local stone for use in building the roads. This stone has to be secured late in the winter or early in the spring before the farmers begin their planting, for the farmers will not allow the stone to be picked from their fields after the crop is in the ground.

Labor is also scarce, and all indications point to a greater scarcity this year than ever before. Many of the contractors carry many men in their "organization" over from year to year, but if the men can not secure work early in the spring, they go into some other branch of work, which leaves the contractor without the required number of men to carry on his work economically. As the season progresses labor becomes more scarce, so that in the months of July and August it is nearly impossible to secure enough men to even make a pretense of carrying on the contract. Then, if the work is not finished at the time specified in the contract, the contractors are forced to pay the State a fine of \$10 a day. The following officers were elected: President, Joseph Walker, of New Paltz; vice-president, John E. Consalus, of Albany; secretary, Edwin F. Van Hoesen, of Albany. M. R. Aldridge, of Poughkeepsie, and A. J. Rockwood, of Rochester, the former president of the association, were elected trustees for two years.

Carolina Municipal Association—The tentative program of the annual meeting at Raleigh, January 18, provides for addresses as follows: "Commission Form of Government," E. J. Justice, of Greensboro, and others; "County and City Government," Mayor Hawkins, of Charlotte, and Mayor John, of Laurinburg, and others; "City Taxation," Mayor McNeill, of Fayetteville, Mayor Wynne, of Raleigh, and others; "Municipal Sanitation," Dr. W. S. Rankin, secretary of the State Board of Health, and others.

Guilford County (N. C.) Good Roads Association—Dr. J. T. J. Battle, R. D. Douglas and S. L. Trogden compose a committee which is arranging with the county commissioners for a meeting in the spring, at which State Highway Engineer W. L. Spun will be asked to speak. The matter of road grading seems to be the problem of most immediate importance.

Virginia-Tennessee Agricultural and Industrial Association—At a meeting at Bristol, Va., January 5, the association endorsed the proposed State highway across Tennessee, whereby Memphis, in the west, and Bristol, on the Virginia border, are to be united by a road that will be fully 500 miles in length. Such a road, it is believed, will be of great value to the State.

Oklahoma Municipal League—The first annual convention was held in the city Council chamber, Oklahoma City, January 4-6. The sessions were opened by Mayor A. F. McGarr, president of the league. Mayor Dan V. Lackey delivered the address of welcome. H. L. Martin, Tulsa, responded. The following addresses were made: "Essentials of a State League of Municipalities," Hon. Frank G. Pierce, Marshalltown, Iowa, secretary of the Iowa League of Municipalities; "Benefits That Should Result from a State Municipal League," Hon. Grant Foreman, Muskogee; "The Dependence of the State of Oklahoma on Its Municipalities," Gov. Charles N. Haskell; "Importance of Uniform Municipal Accounting Among the Cities of the State," Prof. James H. Sawtell, chair of municipal science, State University, at Norman; "The State, the City and the Riparian Owner—The Sanitary Inter-relation," Alexander Potter of New York, consulting engineer for Muskogee and Oklahoma City; "Importance of a Sane Building Code for the Cities of Oklahoma," Charles W. Dawson, architect, Muskogee; "State Laws Governing Public Works in Municipalities of Oklahoma," Hon. Charles L. Daugherty, State Labor Commissioner; "Municipal Illumination," A. Larney, Cleveland, Ohio; "Municipal Franchises," Hon. Robert L. Williams, Associate Justice of the Supreme Court; "Legal Status of the Commission Form of Government Under the Constitution and Statutes of Oklahoma," Hon. W. A. Ledbetter, Oklahoma City; "Civic Righteousness," Bishop E. E. Hoss, Nashville, Tenn.; "Control of Public Utilities," Hon. James E. Ellison, chief engineer Public Service Commission, St. Louis; "Modern Fire Protection," J. Ed. Shantz, Dallas, Tex.; "How to Reduce Insurance Rates," C. T. Ingalls, Oklahoma City.

American Water Works Association—The thirty-first annual convention of the American Water Works Association will be held in Rochester, N. Y., June 10-16, 1911, with headquarters at Powers Hotel, where ideal arrangements for business sessions have been made.

The Water Works Manufacturers Association will have charge of the exhibits and entertainment features. The program will be arranged to allow ample time for entertainments and getting acquainted, yet the business features will not in any way be neglected. A number of excellent papers have been promised, and an interesting and instructive program will be supplied.

Special attention will be given to the "Question Box" and "Experience Meeting," for which ample time will be set apart. These features are of the greatest possible interest and benefit to water works managers. They give an opportunity to tell one's troubles, and receive the assistance of others who have had and overcome similar troubles.

A special circular concerning these features will be sent later. John W. Alford, 1207 Hartford Building, Chicago, Ill., is president, and John M. Diven, 14 George street, Charleston, S. C., secretary.

Engineers and Architects' Club of Louisville, Ky.—A committee of the club, composed of J. C. Murphy, G. Wilbur Hutley and Webster Gazlay, called upon Mayor W. O. Head last week and explained their views of what should be done toward planning the future development of Louisville. Mr. Murphy, who was the spokesman for the committee, informed the Mayor that at a meeting

of the Engineers and Architects' Club, resolutions were adopted in which the method of laying off streets and subdividing land were referred to as "deplorable and should be changed before the city is irretrievably ruined." Mr. Murphy called to the attention of Mayor Head that the foundation of all civic improvement is the proper planning of a city, and urged that the Board of Public Works and the General Councils provide a comprehensive plan of the city, so that all future extensions may be accomplished along rational lines. Mr. Murphy is in favor of a map being drawn that will show the extension of city streets for the next hundred years to come, so that factories locating in the county will be able to arrange their plants so as not to conflict with a future annexation, and subdivisions can be laid out uniformly with the city plan. A definite plan for the river front and for railroad tracks within the city is also deemed imperative by the Engineers and Architects' Club.

City Club of New York City—Dr. Ernest J. Lederle, Commissioner of Health, at a meeting January 7, spoke on what the department had accomplished and what is to be done for its improvement the coming year. Dr. Charles L. Dana presided, and told how, under the commissioner-ship of Dr. Lederle, the death rate had been reduced to less than 15 per 1,000. During the year, Dr. Lederle said, important changes had been made in the Sanitary Code, particularly in regard to the requirements in milk standards and in the killing of vicious dogs. The section regarding the smoke nuisance, particularly as applied to automobiles, was being rigidly enforced, he said, and since September 29, 947 arrests had been made for violations. The establishment of a bacteriological detective bureau had done effective work, especially in tracing the causes of typhoid fever. The Commissioner said the department had experienced a great deal of trouble from physicians who neglected to issue certificates of birth, but the department is going to strictly enforce the law. During past years, the Commissioner said, he had discovered that a large amount of whisky was consumed in the city hospitals, and an investigation had showed that it wasn't all consumed by the patients. He said he substituted another stimulant for whisky, and while 938 gallons had been used in 1906 only 25 gallons were consumed in 1910.

Kentucky State Fire Prevention Association—The annual meeting of the association was held at Louisville January 6. According to its report, one of the things which the Fire Prevention Association did during the past year was to secure much municipal legislation providing for better conditions. It has formulated a book of ordinances, which it seeks to have enacted in such cities as any member may feel there is a need for effective legislation. These ordinances provide for better fire equipment, improved water supply, the prevention of the erection of tile, terracotta, cement-block, brick-on-edge and metal flues; the prohibition of the storage of powder, explosives and combustibles in dangerous places; for the inspection of premises to prevent hazards and the regulation of garages and motion picture machines. The following officers were elected: William Sowards, Cincinnati, president; C. L. Foster, Lexington, vice-president; Miss Louise Stark, Louisville, secretary and treasurer.

Town Superintendents of Highways, New York State—The second annual convention was held at the Court House, Binghamton, N. Y., January 4. Deputy State Commissioner Frank D. Lyon in an address advocated the adoption of the patrol system of caring for roads. About 1,000 men would be required for the work. These patrolmen, according to the plan which he hopes to see adopted, would be employed for seven months of the year, and would travel over the dirt roads in their respective towns, making ordinary repairs after the manner of the patrolmen on the macadam highways. Though the men would be paid about \$75 a month, Mr. Lyon believed that they would do the work with less expense than is entailed by the present plan of intermittently sending out a "gang" of men to do the repair work.

The town superintendents also heard an interesting description of the method of caring for dirt highways by use of a "road hone," which is used like the "split log drag" to even the surface of roads, after rains, and level off the ruts. Superintendent of Highways John Hodgeman, of Saratoga County, who described the method, said that in his county it costs only about \$5 a mile to keep roads properly crowned and in good condition by the use of the "hone."

Calendar of Meetings

- January 16-20.
Canadian Cement and Concrete Association.—Annual Convention and Exhibition, Toronto, Ont.—R. E. W. Hagarty, Secretary, 662 Euclid avenue, Toronto, Ont.
- January 17-19.
American Institute of Architects.—Annual Convention, San Francisco, Cal.—Glenn Brown, Secretary, Octagon, Washington, D. C.
- January 18-19.
American Society of Civil Engineers.—Annual Meeting, New York.—C. W. Hunt, Secretary, 229 W. 57th street, New York.
- January 20.
Illuminating Engineering Society.—Annual Meeting, New York, N. Y.—P. S. Millar, Secretary, 29 W. 39th street, New York, N. Y.
- January 20-21.
Kansas Engineering Society.—Annual Meeting, Topeka.—W. S. Gearhart, Secretary, Kansas State Agricultural College, Manhattan, Kan.
- January 24.
New Jersey State Association of County Engineers.—Annual Meeting, State Home, Trenton.—Edward E. Reed, Secretary, Trenton.
- January 24-26.
American Society of Heating and Ventilating Engineers.—Annual Meeting, New York, N. Y.—W. M. Mackay, Secretary, P. O. Box 1818, New York, N. Y.
- January 24-26.
Ohio Engineering Society.—Annual Meeting, Columbus, O.—C. J. Knisely, Secretary, New Philadelphia, O.
- January 25-27.
Illinois Society of Engineers and Surveyors.—Annual Meeting, East St. Louis, Ill.—E. E. R. Tratman, Secretary, 1636 Monadnock Block, Chicago, Ill.
- February 1-3.
Nebraska Cement Association.—Western Cement Exposition, Omaha, Neb.—Peter Palmer, Secretary, Oakland, Neb.
- February 6-11.
National Brick Manufacturers Association.—Annual Convention, Louisville, Ky.—T. A. Randall, Secretary, Indianapolis, Ind.
- February 14-15.
Iowa Drainage Association.—Convention, Mason City, Ia.—W. H. Stevenson, Secretary.
- May.
City Commission Congress.—Meeting Galveston, Tex.—Mayor Lewis Fisher, Chairman of Committee, Galveston, Tex.
- June 6-10.
American Water Works Association.—Thirty-first Annual Convention, Powers Hotel, Rochester, N. Y.—John M. Diven, Secretary, 14 George street, Charleston, S. C.

TRADE NOTES

Cast Iron Pipe.—Chicago.—The city recently purchased 10,000 tons of 12 to 24 inch water pipe from the United States Cast Iron Pipe and Foundry Company for about \$24 a ton. Quotations: 4-inch, \$25; 6 to 12 inch, \$24; 16-inch and up, \$23.50. New York.—Pipe manufacturers are feeling much more cheerful as a result of increasing inquiries from private customers. Quotations: 6-inch, carloads, \$22. Birmingham.—Local quotations are unchanged, but are considered as firmer. Quotations: 4 to 6 inch, \$19; 8 to 12 inch, \$18 to \$18.50; over 12-inch, average \$17.

Lead.—Consumers are taking no interest in the lead market, but prices are held firmly. Quotations: New York—\$4.50; St. Louis, \$4.35.

Metal Culverts.—The Peoria Metal Culvert Company, Peoria, Ill., recently incorporated with \$40,000 capital stock, has erected a new factory building and has its equipment installed ready for operation.

Gasoline Traction Engine.—The Bates Tractor Company, Lansing, Mich., has been incorporated, with \$200,000 capital stock, of which \$125,000 is paid in. The company will manufacture a 20-horsepower engine. The erection of a plant will be commenced as soon as possible.

Sewerage Company.—The Texas City Light, Sewerage & Water Company, which was recently organized for the purpose of installing an electric light plant, sewer system and water works at Texas City, Tex., has begun work on the sewer system.

Municipal Street Cars.—The city of San Francisco, Cal., has ordered all supplies for the construction of the Geary Street Municipal Railroad, and if the work proceeds as planned a number of cars will be required before the end of the year.

New Bridge Company.—The Roanoke Bridge Company, Roanoke, Va., recently incorporated, is planning to build a structural steel and bridge plant. The main building will be of steel construction, 35 x 140 feet, with an addition 25 x 90 feet. An office building will also be erected. The total cost of the plant, including machinery, is estimated at \$30,000. E. C. McComb is president of the company.

Dryers.—The Atlas Dryer Company, Cleveland, O., have published a pamphlet entitled "A Thesis on the Art of Drying." It describes the principles underlying the construction and operation of the Atlas dryer for all classes of material.

Motor Patrol Wagons.—Six motor patrol wagons and ambulances have displaced 10 horse-drawn wagons and 36 horses in the Detroit Police Department. The efficiency of this branch of the department has been practically doubled since the installation was made, although considerable economy has resulted from the decreased number of drivers and helpers needed. Up to last September the first motor patrol wagon, which was placed in service last January, responded to 4203 calls and traveled 11,163 miles. The total expense incurred, exclusive of drivers' wages and depreciation, was \$731.85. Experienced police officers state that it would require 12 horses and two horse-drawn wagons, four patrolmen and one hostler to provide an equivalent service and that the cost for such an equipment for eight months would be practically \$4000.

American Concrete Mixers Abroad.—Vice-Consul-General Henry D. Baker, Sidney, Australia, reports that during recent visits to the scenes of public and private construction work he noted the popularity of American concrete mixers. A special advantage over other mixers was that the machines are more compact and can be worked in places where the others can not. Extensive irrigation works are requiring a large amount of concrete, and it is being used more extensively for buildings.

Garbage Disposal Plant.—Charles C. Fischer is now the owner of the Bridgeport (Conn.) By-Products Company's plant on Asylum street, the deeds having passed between John B. Livingston, representing the company, and his attorney, W. A. Boardman, and C. C. Fischer, representing the York, Pa., syndicate, and his counsel, A. M. Marsh. Mr. Fischer has taken possession and has already ordered new machinery. As soon as the plant is ready he will take the garbage from the city and reduce it at his price of \$1 per ton, which, it is said, leaves a good margin of profit. A clause in the contract was amended to read as follows:

In the event of a final judgment of the courts, at the suit of any land owner of the city of Bridgeport specially affected thereby, that the said Fischer, or his assigns, has been guilty of creating or maintaining a nuisance in the reception, reduction or disposal of said material so delivered under this contract, it is hereby agreed and stipulated that the said Fischer shall have a reasonable time in which to remove his plant to such place as will change the cause of said nuisance, if he can, but if such change and proper abatement of said nuisance cannot be made and had, then and in that case this contract may be cancelled at the option of the Board of Health, but nothing herein contained shall be construed as to waive any liability on the part of the said Fischer or his bondsmen to reimburse the city of Bridgeport for such damage as may be legally proven to the extent of said bond heretofore provided for. And it is also understood that the term "final judgment" is used in the sense of such termination of any action so brought against said Fischer or his assigns for creating or maintaining a nuisance after new trial, appeal or any proceedings that may legally be had in any court of law or equity; provided, however, that nothing in this paragraph contained shall be construed as a waiver or modification of any of the rights or obligations of the parties hereto as fixed and defined in any or all of the foregoing paragraphs hereof, and also provided that any proposed new location of said plant shall be satisfactory to the Board of Health of said city.

Auto Apparatus Received.—Savannah has received its auto fire engine. Notice was received last week by Superintendent Ballantyne that it has been shipped from the American La France Company, Elmira, N. Y. Savannah has been expecting this modern piece of equipment to arrive for the past several months. The engine was bought by the late Alderman Kavanaugh before his death and was to have been delivered last September. There was some delay at the factory, however.

Gas Lighting Contract.—The Rising Sun Street Lighting Co., Boston, Mass., of which P. J. Fitzgerald is President, has written a letter to Superintendent Rourke, declining to make a bid for street lighting under the present specifications, claiming that they are objectionable on account of indefinite features. The requirement that the contractor install any automatic device selected by the city at any time during the 10 years the contract is to run is objected to on the ground that the device might be a failure and the contractor suffer a large loss. It is also alleged that the requirement as to furnishing supplies is too indefinite to permit an intelligent bid.

Suit for Commission.—The Ames Iron Company, of Oswego, N. Y., which furnished the new engine and other equipment for the installation of the new city power plant at Portland, Ind., has been made defendant, together with the city of Portland, in a suit filed by Philip Bergman, seeking to collect \$625 alleged to be due him as commission on the sale of the property to the city. By reason of yet having in its hands \$6,000 of the purchase price due to the company, the city is made a defendant, and an attachment was served, tying up this money in the hands of Treasurer Jacob R. Jones, pending the hearing of the case. It is asserted the company was threatening to collect this money, and take it out of the State. Bergman asserts in his complaint that in the sale of the equipment to the city he acted as the agent of the Ames Iron Company, and was to receive for his services, if the deal was made, a commission equal to 5 per cent of the purchase price of \$12,500.

Paving Brick.—F. R. Ganengeiser, Sharon, Pa., is organizing a \$100,000 company for the manufacture of paving bricks. It is proposed to take over the J. V. Rose brick yard, near Rose's Crossing, Brookfield Township, Ohio, which has not been in operation for a year. Shale of the kind needed for the manufacture of paving bricks is said to be abundant near the works and in other parts of eastern Ohio and western Pennsylvania. The product will be called the Sharon Paving Block. Mr. Ganengeiser has been superintendent of the Bessemer Limestone Co.

New Quarry.—The Pacific Electric Company, Los Angeles, Cal., is preparing to open a rock quarry on the La Habra division.

Water Works Equipment.—The Weimer Machine Works Company, Lebanon, Pa., reports a very satisfactory growth in business in 1910, as compared with the previous year. Several large contracts in connection with water works equipment, which will take practically 12 months to complete, as well as numerous orders for cinder cars and blast furnace work, are on the books, and general business has been and is expected to continue in fair volume.

Foreign Trade Facilities.—The Bureau of Manufactures of the Department of Commerce and Labor, Washington, D. C., is establishing a file of the names of American manufacturers and traders, for use in distributing the valuable information which reaches it from time to time in regard to foreign trade. Those who desire to avail themselves of the facilities thus offered for extending their trade abroad should send to the bureau their names and advise it as to the class of business in which they are engaged.

Wheelbarrows.—The Cockburn Company, Monmouth and Twelfth streets, Jersey City, N. J., has been incorporated, with an authorized capital stock of \$50,000, to take over the business of the Cockburn Barrow & Machine Company, manufacturer of contractors' machinery, with a plant at the address given above. J. S. Harris is president of the new company.

Water Company Earnings.—The Terre Haute Water Works Company earned \$183,831 above the \$38,690 operating expenses in 1910. A 4 per cent dividend was paid on \$500,000 capital stock, and \$50,000 was spent in improvements. The city paid \$40,000 for hydrants. The company is the pet investment of N. W. Harris, the banker.

THE MUNICIPAL INDEX

Which Are Listed and Classified by Subjects All Articles Treating of Municipal Topics Which Have Appeared During the Past Month in the Leading Periodicals

It is our purpose to give in the second issue of each month a list of all articles of any length or importance which have appeared in all the American periodicals and the leading English, French and German ones, dealing more or less directly with municipal matters. The index is kept up to date, and the month of literature covered each time will be brought up to within two or three days of publication. Our chief object in this is to keep our readers in touch with all the current literature on municipal matters. In furtherance of this we will furnish any of the articles listed in the index for the price named after each article, except that where an article is continued in two or three issues of the paper, the price given is for each of said issues. In addition to the titles, where these are not sufficiently descriptive or where the article is of sufficient importance, a brief statement of its contents is added. The length also is given, and the name of the author when it is a contributed article.

ROADS AND PAVEMENTS

Highways of Indiana. Illustrated, 2 pp., Good Roads, December. 10 cts.
 New York State Roads. 1-3 p., Municipal Journal & Engineer, Dec. 14. 10 cts.
 Highways Development in the United States. Digest of papers before National Good Roads Convention, St. Louis. 4 pp., Surveyor, Dec. 23. 20 cts.
 United States Office of Public Roads. Legislative history, quarters, purpose, work, etc. Illustrated, 3 pp., Engineering Record, Dec. 17. 10 cts.
 State Aid in Road Building. Paper by Logan W. Page before American Road Builders' Assoc., Indianapolis. 2 pp., Engineering Record, Dec. 24. 10 cts.
 The Working of the "Road Development Act, 1909." By Reginald Brown. 5 pp., Surveyor, Dec. 9. 20 cts.
 Road Construction in Wayne County, Michigan. Illustrated, 2 1-2 pp., Good Roads, December. 10 cts.
 Annual Report of Road Commissioners of Wayne County, Mich. 6 pp., Public Officials' Magazine, December. 10 cts.
 Notes on Road Construction. From paper by W. Calder before Melbourne University Engineering Society. With drawings, 4 1-2 pp., Canadian Engineer, Dec. 29. 15 cts.
 Road Building Progress in Michigan. Paper before American Road Builders' Association. By T. A. Ely, State Highway Commissioner. 1 p., Contractor, Dec. 15. 10 cts.
 Road Construction and Maintenance. Discussion at Surveyors' Institution. 2 pp., Surveyor, Dec. 2. 20 cts.
 Parkway Construction at Portland, Me. By W. O. Thompson. Illustrated, 1 1-2 pp., Good Roads, December. 10 cts.
 How Oklahoma City Secured Its Park and Boulevard System. By W. H. Clark. Illustrated, 8 pp., American City, December. 10 cts.
 Earth Roads. Paper before Illinois Society of Engineers and Surveyors. By M. O. Eldridge. 2 pp., Good Roads, December. 10 cts.
 Gravel Roads, Notes on the Construction of. From Report of Michigan Highway Department. 1 1-2 pp., Engineering-Contracting, Dec. 21. 10 cts.
 Binding Materials in the Construction of Metalled Roads, Use of Paper before Brussels International Road Congress. By Robt. Drummond. 1 p., Good Roads, December. 10 cts.
 Experiments with Road-Binding Materials. Report of Ohio Highway Department. 1 1-2 pp., Surveyor, Dec. 30. 20 cts.
 An Experience in Road Treatment. Penetration method generally unsatisfactory. Results and cost of oiling, repairing and maintenance. From paper before Sanitary Association of New Jersey. By James Owen. 1 1-3 pp., Municipal Journal & Engineer, Dec. 14. 10 cts. 1 1-2 pp., Engineering-Contracting, Dec. 21. 10 cts. 1 1-2 pp., Engineering Record, Dec. 10. 10 cts.
 Road Tarring in Denmark. English Methods Studied and Applied. 1 p., Surveyor, Dec. 2. 20 cts.
 Experimental Roadways in the Borough of the Bronx. Illustrated, 2 pp., Good Roads, 1 December. 10 cts.
 Ohio Experimental Road Tests. Seventeen materials and methods tested. Conditions after year's use. Illustrated, 2 1-2 pp., Municipal Journal & Engineer, Jan. 4. 10 cts.
 Bituminous Nomenclature. 1-3 p., Municipal Journal & Engineer, Dec. 21. 10 cts.
 Automobiles Destroy Our Roads, To What Extent. Paper before Southern Appalachian Good Roads Association. By L. W. Page. 2 1-2 pp., Municipal Engineering, January. 25 cts.
 The Development of Road Locomotion in Recent Years. From paper before Institution of Mechanical Engineers by L. A. Legros. With chart, 3 1-2 pp., Dec. 2. 15 cts.
 Road Administration and Maintenance. From address at National Good Roads Convention, St. Louis, by Logan W. Page, Director U. S. Bureau of Public Roads. 1 p., Surveyor, Dec. 16. 20 cts.

Concrete Roads in Wayne County, Michigan. Method of Construction. 2-3 p., Engineering Record, Jan. 7. 10 cts.
 New Method of Compacting Concrete Roadways. Illustrated, 1 p., Good Roads, December. 10 cts.
 Concrete Pavement in Bozeman. 1-4 p., Municipal Journal & Engineer, Jan. 4. 10 cts.
 Oil Concrete Road in Pennsylvania. By R. D. Beaman, Deputy State Highway Commissioner. 1-3 p., Municipal Journal & Engineer, Dec. 28. 10 cts.
 Paving Streets and Roads. Materials in common use. Improvements in construction details. Bituminous binders. 1 p., Municipal Journal & Engineer, Jan. 4. 10 cts.
 Road Construction and Maintenance within Large Cities. By H. F. Culan, Supt. Works Dept., City and County, Borough of Belfast. 2 pp., Canadian Engineer, Dec. 8. 15 cts.
 Streets of Indianapolis. Illustrated, 6 pp., Good Roads, December. 10 cts.
 Asphalt Block Pavement in Washington, D. C. Specifications under which constructed. 1 p., Engineering-Contracting, Dec. 21. 10 cts.
 Bituminous Patent Suit. 1-4 p., Municipal Journal & Engineer, Dec. 28. 10 cts.
 Wood Block, Repaving the "Loop" District in Chicago with Cosecoted. By Wm. W. Marr, Assist. Chief Engineer of Streets, Chicago. With map and half-tones. 4 1-2 pp., Engineering News, Dec. 29. 15 cts.
 Granite Block, Method of Manufacturing Modern. Paper before American Society of Municipal Improvements. By W. A. Howell. 1 p., Good Roads, December. 10 cts.
 Repair Costs. An Incorrect Method of Determining When a Pavement Should Be Relaid Because of Increasing. Editorial, 1-2 p., Engineering-Contracting, Dec. 7. 10 cts.
 Paying for Pavements in New York. Editorial, 1-2 p., Engineering Record, Dec. 24. 10 cts.
 Assessing for Street Improvements. 1 p., Municipal Journal & Engineer, Dec. 21. 10 cts.
 Street Grading on Level Property in Savannah, Ga. Illustrated, 1-3 p., Municipal Journal & Engineer, Dec. 14. 10 cts.
 Correlating Sidewalk Grade to Curb Grade. Paper before American Society of Municipal Improvements, Erie, Pa., by Clark G. Anderson, City Engineer, Moline, Ill. 3 pp., Canadian Engineer, Dec. 8. 15 cts.
 Private Street Work as Administered under the Heywood Corporation Act, 1883. Paper before Institution of Municipal Engineers. By Tom Fogg, Assist. Surveyor, Heywood. With drawings, 2 1-2 pp., Surveying, Dec. 23. 15 cts. Illustrated, 1 1-3 pp., Municipal Journal & Engineer, Dec. 24. 15 cts.
 Sidewalks, Use of Space Under. 1 1-2 pp., Real Estate News, January. 25 cts.

SEWERAGE AND SANITATION

Sewerage of Seacoast Towns. By H. C. Adams. Drawings and half-tones, 2 1-2 pp., Surveying, Nov. 25; Drawings, 2 pp., Dec. 2; Drawings, 2 pp., Dec. 9; 1 1-2 pp., Dec. 16; Drawings, 2 pp., Dec. 23; Illustrated, 2 pp., Dec. 30. 15 cts.
 Sewerage and Sewage Disposal. Materials used for sewers and joints; pipe tests; amount of sewage purification necessary; methods available; possibilities and limitations of each; most recent developments. Illustrated, 2 1-2 pp., Municipal Journal & Engineer, Jan. 4. 10 cts.
 Sewerage and Sewage Disposal in 1910. Editorial Resumé. 1 p., Contract Journal, Dec. 28. 10 cts.
 Philadelphia's Sewerage System. 1-3 p., Municipal Journal & Engineer, Dec. 14. 10 cts.
 Sewer Construction, Difficult. 1-2 p., Municipal Journal & Engineer, Dec. 28. 10 cts.
 Syracuse Sewer and Creek Contract. Illustrated, 4 pp., Contractor, Jan. 1. 20 cts.
 Hartford East Side Intercepting Sewer.

To provide for sewerage and drainage during floods and prevent harbor pollution. Standard sections for good and bad ground; centers of steel and wood. Hauling broken stone by trolley. Illustrated, 5 pp., Municipal Journal & Engineer, Dec. 14. 10 cts.
 The North Shore Drainage Channel at Chicago. With half-tones, 1 p., Engineering News, Jan. 5. 15 cts.
 Laying Sewers in Wet Trenches. Methods employed by numerous engineers in all parts of the country. Planks and wedges, files, timber foundations. 2 pp., Municipal Journal & Engineer, Dec. 28. 10 cts.
 The North Trunk Sewer in Seattle. Problems presented in Seattle owing to irregularity of topography. With drawing and half-tones, 2 1-2 pp., Engineering Record, Dec. 10. 10 cts.
 New Drop Manhole Detail. Illustrated, 1-2 p., Municipal Journal & Engineer, Dec. 21. 10 cts.
 Intercepting Sewers and Outfall at New Bedford. Description of plans. Drawings, 1 p., Engineering Record, Dec. 17. 10 cts.
 Sewer Pipe Construction, History of Clay. By J. M. McCave. 1 1-2 pp., Contract Record, Dec. 21. 20 cts.
 Sewage Disposal Problems. Necessity for reliable automatic hypochlorite apparatus; better sprinkling nozzles; intensive sand filtration; disposal of sludge; utilization. 1 1-4 pp., Municipal Journal & Engineer, Jan. 4. 10 cts.
 Drainage Areas and Areas of Waterway for Highway Culverts and Bridges. 3-4 p., Canadian Engineer, Jan. 5. 15 cts.
 Sewage Treatment in New Jersey. Leads all states in preventing stream pollution. Brief description of 74 plants. Decreasing typhoid death rates. 1 1-4 pp., Municipal Journal & Engineer, Dec. 21. 10 cts.
 Sewage Disposal in Europe. Paper before American Institute of Chemical Engineers, by Rudolph Heing. 2 pp., Engineering Record, Dec. 17. 10 cts.
 Sewage Disposal Plans of Atlanta, Ga. By W. C. Waters. 4 1-2 pp., Municipal Engineering, January. 25 cts.
 London's Sewage. Its utilization with relation to relief for the unemployed. By Walter Taylor. 1 p., Surveying, Dec. 23. 15 cts.
 Peachtree Creek Sewage Disposal Works at Atlanta. With drawings, 4 pp., Engineering Record, Dec. 31. 10 cts.
 Principles of Sewage Disposal. From paper by George C. Whipple before Institute of Chemical Engineers. 3 1-2 pp., Engineering Record, Jan. 7. 10 cts.
 Trade Wastes, The Disposal of. Its relation to the purity of lakes and streams. Abstract from paper by George A. Johnson before New Jersey Sanitary Association, Lakewood. 1 p., Engineering News, Dec. 8. 15 cts. 1 p., Engineering Record, Dec. 31. 10 cts.
 Sludge Problem. How to dispose of sludge and prevent its production. From paper by W. C. Easdale, before Association of Managers of Sewage Disposal Works. 2 pp., Surveyor, Dec. 9. 20 cts. 2 pp., Surveying, Dec. 9. 15 cts.
 Sewage Sludge and Its Disposal. From paper before Association of Managers of Sewage Disposal Works, Manchester, by A. B. Ogden. 1 1-2 pp., Surveying, Nov. 25. 15 cts.
 A New Method of Handling Sewage Sludge. Describing method used in the Emscher District of Southwestern Germany. By Dr. Karl Inhoff, Chief Engineer, Sewerage Department, Emschergenossenschaft, Essen, Germany, and Charles Saville, Assistant Engineer. Drawings and half-tones. 4 pp., Engineering Record, Dec. 10. 10 cts.
 Sanitation of Villages and Premises without Sewers. By J. W. Hill. 6 pp., Bulletin, Ohio State Board of Health, December. 10 cts.
 Sanitation at Lebanon. 1-3 p., Municipal Journal and Engineer, Jan. 4. 10 cts.
 How to Abate Nuisances. By C. O. Probst. 3 pp., Bulletin, Ohio State Board of Health, December. 10 cts.
 Streams, Our Typhoid. By H. de B. Parsons. 9 pp., Stevens Indicator, January. 25 cts.

Sanitary Survey of the Ohio River in Pennsylvania. From report to Joint Ohio River Sanitary Commission by Samuel G. Dixon, State Commissioner of Health, and P. H. Snow, Chief Engineer, State Department of Health. 2 pp., Engineering News, Jan. 5. 15 cts.

Past, Present and Future of the Ohio River from a Sanitary Standpoint. By S. C. Swartsel. 6 pp., Bulletin, Ohio State Board of Health, December. 10 cts.

A Health Department Report on the Upper Ohio River. Joint report on pollution. 1-1-3 pp., Engineering Record, Jan. 7. 10 cts.

Board of Health, Powers of Ohio. Decision upholding constitutionality of the "Bense Act." May be appealed. Text of portions of this act relating to sewerage. 1 p., Municipal Journal and Engineer, Dec. 14. 10 cts.

Co-operation of Village and Township Boards of Health. By A. H. Hise. 3 pp., Bulletin, Ohio State Board of Health, December. 10 cts.

Physician's Duty to Boards of Health. By W. S. Rankin. 5 pp., Bulletin North Carolina Board of Health, October. 10 cts.

Milk Supply of Villages, How Shall We Improve and Protect the. By Dr. McKendree Smith. 2 pp., Bulletin, Ohio State Board of Health, December. 10 cts.

Examination of Milk from a Health Standpoint. By P. H. Lamb. 4 pp., Bulletin Ohio State Board of Health, December. 10 cts.

Measures to Be Taken at the Dairy When Typhoid Fever or Other Milk-Borne Diseases Occur. By Dr. H. W. Behmer. 3 pp., Bulletin, Ohio State Board of Health, December. 10 cts.

Hog, Shall the, Be Driven from Villages. By C. R. Campbell. 2 pp., Bulletin, Ohio State Board of Health, December. 10 cts.

WATER SUPPLY

Water: Its Purification and Use in the Industries. Ozone. By W. W. Christie. Illustrated. 4 pp., Industrial Engineering, January. 20 cts.

Wells, Types of; Their Comparative Cost and Merits and Methods of Protection from Pollution. From Water Supply Paper No. 255, U. S. Geological Survey, by Myron L. Fuller. Illustrated, 3 1-2 pp., Canadian Engineer, Dec. 15. 15 cts. Illustrated, 5 pp., Canadian Engineer, Dec. 22. 15 cts.

Methods and Cost of Sinking and Lining a Dug Well on Long Island. By J. J. Ingle. 1 1-2 pp., Engineering-Contracting, Dec. 7. 10 cts.

Water Supply and Sewerage of Chalons. By C. Dreyfus. 9 pp., La Technique Sanitaire, December. 50 cts.

Water System of Hankow. 1 p., Fire and Water, Dec. 14. 10 cts.

The Development of the Municipal Water Works of Spokane, Wash., and the Addition of an Electric Pumping Station. By Alexander J. Lindsay, Supt. of Water Department, Spokane. Illustrated with drawings and half-tones. 2 pp., Engineering News, Dec. 8. 15 cts.

The New Water Supply for Vancouver. How Obtained. From paper by H. M. Burwell before Canadian Society of Civil Engineers. 1 1-2 pp., Engineering Record, Dec. 24. 10 cts. Illustrated, 6 pp., Contract Record, Dec. 28. 20 cts.

Recent History of Buffalo Water Supply. 5 pp., Live Wire, January. 10 cts.

Outline of Sanitary Water Works in the Province of Quebec. By James O. Meadows, Sanitary Engineer of Board of Health, P. Q. 2 pp., Canadian Engineer, Dec. 8. 15 cts.

Association of Water Engineers. Extracts from papers read. 2 pp., Contract Journal, Dec. 11. 20 cts.

Water Works Report of Reading, Pa. Illustrated, 1 p., Fire and Water, Dec. 14. 10 cts.

Report on Dallas Water Supply. 2-3 pp., Fire and Water, Dec. 21. 10 cts.

Pipe, Unusually Tight Water, Springfield, Mass., Water Supply. 1-4 pp., Municipal Journal & Engineer, Dec. 14. 10 cts.

Protection Against Corrosion of Pipes. By P. C. Perkins. Illustrated, 1-2 pp., Fire and Water, Dec. 7. 10 cts.

Aqueduct, Large Portable Plant for Crushing, Mixing and Placing Concrete on Catskill. With drawings and half-tones. 6 pp., Engineering-Contracting, Dec. 7. 10 cts.

Water Tower Near Brussels, A Tall Concrete Block. With drawing. 1 p., Engineering Record, Dec. 10. 10 cts.

Concrete Protection Coating for Small Tank Power. With half-tone. 1-2 pp., Engineering News, Jan. 5. 15 cts.

A Reinforced-Concrete Water Tank with Dome Shaped Bottom. In use at University of Arizona, Tucson. Description of and method of construction. By L. A. Waterbury, Professor of Civil Engineering, University of Arizona. Illustrated, 1 p., Engineering News, Dec. 15. 15 cts.

Reservoir, Covered Reinforced Concrete.

Illustrated, 1 p., Fire and Water, Dec. 14. 10 cts.

Labor cost on Forms for a Covered Concrete Reservoir. From paper presented by J. D. Stevenson before Engineers' Society of Western Pennsylvania. 1 p., Engineering Record, Dec. 17. 10 cts.

Failure of a Reinforced Concrete Reservoir in Australia. Letters of C. O. Burge and E. M. de Burgh. 1-1-2 pp., Surveying, Dec. 2. 15 cts.

The New Central Reservoir of the People's Water Company, Oakland, Cal. Description and construction. By C. H. Fark and G. S. Jacobs, Assistant Engineers, People's Water Co. With half-tone and drawing. 1 p., Engineering News, Jan. 5. 15 cts.

Dams, Barrages and Weirs on Porous Foundations. A technical discussion, with drawings. By W. G. Bligh. 2-1-2 pp., Engineering News, Dec. 29. 15 cts.

Geology and Dam Construction. From paper by F. C. Wren before Institution of Civil Engineers of Ireland. 1-2 p., Engineering Record, Jan. 7. 10 cts.

Pumping, Cost of.—With tables. From report by Oscar E. Meizer, on the Ground Waters of New Mexico. 1-1-2 pp., Canadian Engineer, Dec. 22. 15 cts.

An Electrically Operated Municipal Pumping Station. Description of that at Spokane, by Alexander J. Lindsay, Supt. Water Department. Illustrated with drawings and half-tones. 2 pp., Engineering Record, Dec. 10. 10 cts. Illustrated, 2 1-2 pp., Electrical World, Dec. 29. 10 cts.

Electric Pumping in France. 1-3 p., Municipal Journal & Engineer, Dec. 21. 10 cts.

Report of Duty Trial on the Six Million Imperial Gallon Pumping Engine at the High Level Pumping Station, Toronto Water Works. By Robert W. Angus. With drawings. 5 pp., Canadian Engineer, Dec. 8. 15 cts.

Steam Turbine Centrifugal Pump. Paper before Central States Water Works Association. 2-3 p., Water and Gas Review, December. 20 cts.

Purification of Water Supply. Methods available. Slow and rapid sand filters; where each is most effective; cleaning filter sand; double filtration and "prefilters"; coagulation; hypochlorite sterilization; ozone treatment. Illustrated, 3 1-2 pp., Municipal Journal and Engineer, Jan. 4. 10 cts.

Water Purification Plant at Newport. From paper before New England Water Works Association. By Robert E. Milligan. Illustrated, 4 pp., Municipal Journal and Engineer, Dec. 28. 10 cts.

Filtration Plant at Portsmouth, England, New. Description of, with technical illustrations. Abstract of articles from "London Engineering." 1 p., Engineering News, Dec. 15. 15 cts.

Methods and Cost of the Construction of Pittsburg's Filtration Works. From paper by F. E. Field, formerly Division Engineer, Pittsburg Bureau of Filtration, before Engineers' Society of Western Pennsylvania. With drawings. 8 pp., Engineering Contracting, Dec. 28. 10 cts.

Filter Troubles Caused by Micro-Organisms at Louisville. Notes on filter troubles and methods of meeting them, by W. H. Lovejoy, chief chemist and bacteriologist. 1-2 pp., Engineering Record, Dec. 10. 10 cts.

Sprinkling Filter Plant for Suburban Community. Filters enclosed in building, provision for two hundred thousand gallons a day; preliminary and final sedimentation basins and dosing tanks; details of the plan; cost of construction. By Paul Hansen State Sanitary Engineer of Kentucky. Illustrated, 6 pp., Municipal Journal and Engineer, Jan. 4. 10 cts.

Methods and Costs of Construction of the Slow Sand Purification Works for the new Springfield, Mass., Water Supply. Paper before Boston Society of Civil Engineers. By C. R. Gow. Illustrated, 90 pp., Journal of the Association of Engineering Societies, December. 30 cts.

Contractor's Plant on Large Filters at Pittsburg. Paper before Engineers' Society of Western Pennsylvania. By F. E. Field. Illustrated, 5 pp., Contractor, Dec. 15. 20 cts.

Sterilization of Polluted Water by Ultra-Violet Rays at Marseilles, France. With drawing and table showing number of bacteria before and after treatment. 1-2 p., Engineering News, Dec. 8. 15 cts.

The Eliminating Effect of Chlorine upon the Bacteria of a River Water. From paper by Leslie C. Walker, Engineer, Reading Corporation of Water Works, before Association of Water Engineers. With discussion. 5 pp., Surveyor, Dec. 16. 20 cts. 2 1-2 pp., Canadian Engineer, Jan. 5. 15 cts.

Criticism of H. E. Jordan on Hypochlorite Treatment. By H. C. H. Shenton. 1 p., Canadian Engineer, Dec. 22. 15 cts.

Use of Hypochlorite of Lime in Filtration. Illustrated, 1 p., Fire and Water, Jan. 1. 10 cts.

Softening Plant, Wellingborough Water Works and Paper before Association of Water Engineers. By E. V. Harrison. Illustrated, 5 1-2 pp., Surveying, Dec. 30. 15 cts. 4 pp., Surveyor, Dec. 23. 20 cts.

Losses of Municipal Water Works. From paper before Pennsylvania Water Works Association. By Leonard Metcalf. 1 p., Public Service, January. 20 cts.

Water Waste and Leakage in Yonkers. One-fifth of supply unaccounted for with all services metered. Apparently unauthorized connections and surreptitious use. 1 p., Municipal Journal and Engineer, Dec. 14. 10 cts.

Toronto: Its Water Supply and Waste. Comment on conditions, and suggestions. 1 p., Canadian Engineer, Dec. 8. 15 cts.

Altering Factory Supplies. 1-2 p., Municipal Journal and Engineer, Dec. 14. 10 cts.

Rates in Fifty Cities, Water. By L. J. Kasson. 1-2 p., Bulletin, League of American Municipalities, October. 25 cts.

Method of Making Water Rates Ordered in Wisconsin. Result of complaint in Madison. 1-1-2 pp., Engineering Record, Jan. 7. 10 cts.

Revenue from Water Main Extensions. Relating to decision rendered on application of the Beloit Water, Gas & Electric Co., for a rehearing of a petition brought by the company against the city of Beloit, Wis. 1 p., Engineering Record, Dec. 10. 10 cts.

Management, Some Comments Upon Water Works, Suggested by the Recent Special Reports of the U. S. Commerce and Labor Department. From paper by Leonard Metcalf, before Pennsylvania Water Works Association, Atlantic City, N. J., with tables. 3 1-2 pp., Canadian Engineer, Dec. 29. 15 cts. 3 pp., Engineering-Contracting, Dec. 21. 10 cts. 2 pp., Engineering Record, Dec. 24. 10 cts.

Advantages of Co-Operation in Rural Water Supplies. From paper before Association of Water Engineers, by F. G. Fairbank. With map. 3 pp., Surveying, Dec. 16. 15 cts.

Accounting System and Costs, Pittsburg Filtration Plant. Summary of paper by Morris Knowles, Chief Engineer, before the Engineers' Society of Western Pennsylvania. 1 p., Engineering Record, Dec. 31. 10 cts.

Minneapolis Water Works Bookkeeping. 1-4 p., Municipal Journal and Engineer, Dec. 21. 10 cts.

Rainfall, Stream-Flow, Evaporation and Reservoir Capacity. By W. Gore and D. H. Thomson. With charts. 3 1-2 pp., Surveying, Nov. 25. 15 cts.

Flow of Water Through Submerged Screens. By Henry Ryon. Illustrated, 6 pp., Cornell Civil Engineer, December. 20 cts.

Pilot Tubes to Find the Direction of Water Currents. Results of experiments, given by Dr. Schuster, of the Society of German Engineers. 1-2 p., Engineering Record, Dec. 17. 10 cts.

Surges in Pipe Lines. A technical discussion, with charts. 2 pp., Engineering Record, Dec. 24. 10 cts.

Gauging and Recording the Flow of Streams. From paper by S. C. Chapman before Association of Water Engineers. 2 pp., Surveying, Dec. 16. 15 cts.

Circulation of Water in the Soil and Subsoil. By Rene D'Andrimont. Illustrated, 7 pp., La Technique Sanitaire, December. 50 cts.

Sluice Gate, An Automatic, to Ensure Constant Water Level. Dam now in course of construction in Bavaria. By E. Lauchli. Drawing and half-tone. 1-2 pp., Engineering News, Dec. 29. 15 cts.

Water Power Development, A Proposed Platform of Principles Governing State and Federal Control of. Plan drafted by Philip P. Wells, formerly Law Officer for U. S. Forest Service and now counsel for the National Conservation Association. 1-2 p., Engineering News, Dec. 15. 15 cts.

STREET LIGHTING AND POWER PLANTS

Street Lighting During 1916. Lighting by private enterprise. Arches, lamp clusters and brilliant arcs. By E. L. Elliott. 1-3-4 pp., Municipal Journal and Engineer, Jan. 4. 10 cts.

Street Lighting and Power Rates. 1 p., Electrical Review, Dec. 24. 10 cts.

Private Street Lighting Unsatisfactory. 1-4 p., Municipal Journal and Engineer, Jan. 4. 10 cts.

Outdoor Lighting in England. By N. H. Humphreys. 1 p., American Gas Light Journal, Dec. 12. 1 1-2 pp., Dec. 19; 1 1-2 pp., Dec. 26. 10 cts.

Street Illumination. Increasingly general adoption of electricity; disadvantages of gas; efficiency of electric lamps doubled in last five years; proportioning illumination to street needs; location of lamps. 1-1-2 pp., Municipal Journal and Engineer, Jan. 4. 10 cts.

Street Lighting by Modern Electric Lamps. From paper by Haydn T. Harrison before Institution of Electrical Engineers. 2 pp., Surveying, Nov. 25. 15 cts. 1-2 pp., Contract Journal, Nov. 30. 20 cts. 2 pp., Canadian Engineer, Dec. 22. 15 cts.

Street Illumination in Germany. By R. P. Pierce. Illustrated, 4 pp., Illuminating Engineer, January. 20 cts.

Automatic Street Lights, Liverpool's. By Consul H. L. Washington. 1½ pp., Daily Consular Reports, Dec. 15. 10 cts.

Lamp Posts of New York, Arc. Details of ornamental standards. Illustrated, 5 pp., Electric World, Dec. 8. 10 cts.

Electrical Illumination, New Era in. Flaming, luminous, arc and vapor lamps. By R. W. Hutchinson, Jr. Illustrated, 13 pp., Engineering Magazine, Jan. 25 cts.

Recent Progress in Electric Lighting. From paper by E. W. Marchant, of Liverpool University, before Illuminating Engineering Society. 1 p., Contract Journal, Dec. 14. 20 cts.

Lighting Situation. By Louis Bell. 1½ pp., Electrical Review, Jan. 7. 10 cts.

Comparative Cost of Producing Light with Different Illuminants. 1 p., Electrical World, Dec. 29. 10 cts.

Gas Mains, Laying Large, Under Harlem River. Paper before American Gas Institute. By C. C. Simpson. Illustrated, 3½ pp., Gas Light Journal, Jan. 9. 10 cts.

Methods and Cost of Pneumatic Calking with Lead Wool of 30-in., 36-in. and 48-in. Gas Mains. Paper by C. G. Simpson, Jr., before American Gas Institute. With drawings. 2½ pp., Engineering-Contracting, Dec. 7. 10 cts.

Gas Companies and the Public. Presidential address before National Gas Association. By E. N. Wrightington. 1½ pp., Progressive Age, Dec. 15. 20 cts. 2 pp., American Gas Light Journal, Dec. 12. 10 cts.

Public Deceived by Faulty Data and Misleading Analysis of Data. Paper before American Gas Institute. By A. C. Humphreys. 4 pp., American Gas Light Journal, Jan. 2. 10 cts.

Electrification of a Small City. Editorial. 1 p., Engineering Record, Jan. 7. 10 cts.

Use for Spare Current. ¼ p., Municipal Journal and Engineer, Dec. 14. 10 cts.

Water Power, Valuation of. Paper before American Water Works Association. By Robt. E. Horton. 3 pp., Water, Dec. 15. 10 cts.

The Disposal of Surplus Water and Electric Power from the Los Angeles Aqueduct. Discussion of situation by Burt A. Heintz, Wm. Mulhol and Chief Engineer of the Los Angeles Aqueduct; J. E. Lippincott, Asst. Chief Engineer, and E. F. Scattegood. Illustrated, 3½ pp., Engineering News, Dec. 9. 15 cts.

Financial Aspect of Water Powers. Paper before American Institute of Electrical Engineers. By R. C. Beardsley. Illustrated, 6 pp., Electrical Review, Dec. 17. 10 cts.

Hydro-Electric Power Plant of The Jhem River, Kashmir, India. By Heinrich Sommerger. Paper before Technical Society of the Pacific Coast. Illustrated, 9 p., Journal Association of Engineering Societies, Nov. 30 cts.

Power Sites, Investigation of. By the Geological Survey. Sites on public lands. p., Engineering Record, Jan. 7. 10 cts.

FIRE AND POLICE

Fires of the World, Great—Their Effects on Insurance Companies. By Lawrence Well. 2-3 p., Fire and Water, Dec. 28. 10 cts.

Account of the Disastrous Fire at Newark, N. J. 2 pp., Fireman's Herald, Dec. 5 cts. Illustrated, 1½ pp., Fire and Water, Dec. 7. 10 cts.

Fire Fighting, Apparatus for Efficient. ½ pp., Municipal Engineering, January. 10 cts.

Berlin and Its Fire Brigade. Illustrated. 4 pp., Fireman's Herald, Dec. 31. 5 cts.

High-Pressure Line in Bloomington, Ill. Invertible. ½ p., Municipal Journal and Engineer, Dec. 4. 10 cts.

Hose Purchasing Fire, in St. Louis. By Mas. Claude Casey. 3½ p., Municipal Journal and Engineer, Dec. 28. 10 cts.

Alarm System, New York Fire. Present system antiquated and liable to serious interruption; cables to be in subways; one special box to each circuit. Illustrated, 2 p., Municipal Journal & Engineer, Dec. 21. 10 cts.

Fire Resisting Qualities of Building Material. Illustrated, 1 p., Fire and Water, Dec. 14. 10 cts.

Gypsum a Fire-Resisting Material. From Bulletin by National Fire Protection Association. 2-3 p., Fire and Water, Dec. 14. 10 cts.

Roofing as a Fire Preventive. 2-3 p., Fire and Water, Dec. 28. 10 cts.

Factories and Prevention, Fires. By P. McKeon. 13 pp., Survey, Jan. 7. 25 cts.

Warding Off the Factory Fire Panic and

Its Loss of Life. By H. F. J. Porter. Illustrated, 12 pp., Survey, Jan. 7. 25 cts.

Gasoline Ordinance at Cochoe, N. Y. 1 p., Fireman's Herald, Dec. 17. 5 cts.

Mutual Assistance and Its Advantages. Paper before Chief Constables' Association of Canada. By Chief Detective Carpenter, Montreal. 2 pp., Canadian Municipal Journal, January. 10 cts.

GOVERNMENT AND FINANCE

Municipal Government, Presidential address before League of Nebraska Municipalities. By D. E. Love. 7 pp., Midland Municipalities, January. 10 cts.

Comparison of Des Moines and Indianapolis Forms of Municipal Government. By A. L. Mason. 4 pp., Municipal Engineering, January. 25 cts.

Commission Government, Cities Having. 1-4 p., Municipal Journal and Engineer, January 4. 10 cts.

Campaign for Commission Form of Government. By Christie Bennett. 3 pp., American City, December. 10 cts.

Advantages of Commission Form of Government in San Diego. Paper before League of California Municipalities. By A. E. Dodson. 6 pp., Pacific Municipalities, December. 20 cts.

Municipal Trading Relieves Rates. Tabular statement of British Official Reports. 2½ pp., Municipal Journal, Dec. 3. 15 cts.

Business Proposition, City as A. Paper before National Municipal League. By Wm. D. Fouke. 3-4 p., Municipal Journal and Engineer, Jan. 4. 10 cts.

Department of Public Works, Boston's New. Consolidation of present departments, embracing water distribution, paving, sewers, street lighting, and ferries. New departments of sewer and water, highways, and bridges and ferries. 2 pp., Municipal Journal and Engineer, Dec. 31. 10 cts.

Boston's New Department of Public Works Under One Engineering Head. Plan for promoting municipal efficiency through concentration of responsibility. By Benjamin Baker. With diagram. ½ p., Engineering News, Dec. 22. 15 cts.

Reorganization of the Boston City Engineering Departments. Comparison of old system with new. With diagrams. 1½ pp., Engineering-Contracting, Dec. 21. 10 cts.

Efficient Administration of Public Works. From address by L. K. Rourke, Supt. of Streets, Boston, before Society of Arts. 2-3 p., Engineering Record, Jan. 7. 10 cts.

Synopsis of the Report of the local Government Board. By John Burns. Illustrated, 2 pp., Municipal Journal, Dec. 31. 15 cts.

Public Service Corporations, Valuation of the. By N. T. Guernsey. 17 pp., Iowa Engineer, November. 10 cts.

Methods of Charging for Public Service. Paper before National Commercial Gas Association. By H. L. Dougherty. 3½ pp., Public Service, January. 20 cts.

Telephone Rates. Is a Rational Basis Possible for? From paper before National Municipal League, Buffalo, N. Y. By Dugald C. Jackson, Professor of Electrical Engineering, Massachusetts Institute of Technology, Boston, Mass. 1½ pp., Engineering News, Dec. 15. 15 cts.

Regulation of Massachusetts Telephone Company, State. 1½ pp., Municipal Engineering, January. 25 cts.

Franchises for Municipal Service Utilities, Some Provisions in Modern. Paper before American Society of Municipal Improvements. By C. C. Brown. 2 pp., Water and Gas Review, December. 20 cts.

Elements of a Constructive Franchise Policy. Discussion of Franchises as applicable to street railways. By Delos F. Wilcox, Chief of Bureau of Franchises, Public Service Commission for the First District, New York City. Part of paper before National Municipal League, Buffalo, N. Y. 1½ pp., Engineering News, December 8. 15 cts.

Accounting, Uniform Municipal. Paper before League of Kansas Municipalities. By F. G. Pierce. 4 pp., Midland Municipalities, December. 10 cts.

Bond Issues, Prodigality In. ½ p., Municipal Journal and Engineer, Dec. 21. 10 cts.

The Municipal Bond as an Investment. Description and reason for high rating. By John S. Gregory. 3½ pp., Munsey's Magazine, January. 10 cts.

Budgets and Balance Sheets. Paper before American Association of Public Accountants. By Harvey S. Chase. 11 pp., Journal of Accountancy, December. 25 cts.

New York Budget Exhibit of 1910. By H. G. Wade. Illustrated, 20 pp., Engineering Magazine, January. 25 cts.

STREET CLEANING

AND REFUSE DISPOSAL

Street Cleaning and Refuse Disposal. Flushing Methods of Cleaning; collecting ashes and garbage; refuse destruction by

high and low temperature furnaces; garbage utilization; disposal methods for small cities. Illustrated, 2½ pp., Municipal Journal and Engineer, Jan. 4. 10 cts.

Cleaning and Watering Streets in the Great Towns of England, Scotland and Ireland. By T. H. Yabbicom, City Engineer of Bristol, England. From report at International Road Congress, Brussels. 3½ pp., Canadian Engineer, Dec. 22. 15 cts.

Road Problem. Paper before Institute of Cleansing Superintendents. By R. O. Wynne-Roberts. 2½ pp., Surveyor, Dec. 30. 20 cts.

Snow Removal in New York. How contractor organizes force; kinds of carts and trucks in use; cost of labor and trucking; profits; both contractor and city robbed. By Walter G. Turini. 2 pp., Municipal Journal and Engineer, Dec. 21. 10 cts.

Removing Snow from Sidewalks. Methods employed in La Crosse, Wis.; organization of crews; notifying owners; opening gutters. By Geo. Falk, Street Commissioner. 3-1 p., Municipal Journal and Engineer, Dec. 21. 10 cts.

Refuse Collection in England. 1-2 p., Municipal Journal & Engineer, Dec. 21. 10 cts.

Refuse Disposal in American Cities. Early efforts, present methods, cost, etc. From paper by W. F. Morse before Boston Society of Civil Engineers. 2 pp., Surveyor, Dec. 9. 20 cts.

Incinerator, Easton's Garbage. Thirty-five ton plant; cost of operation at full capacity; fifty cents a ton; cost and method of collection. By John McNeal. Illustrated, 11-2 pp., Municipal Journal and Engineer, Dec. 28. 10 cts.

Milwaukee Incinerator. 1-4 p., Municipal Journal and Engineer, Dec. 28. 10 cts.

TRAFFIC AND TRANSPORTATION

Street Railways, Municipal. Reports of the U. S. Consuls regarding conditions in British Cities. 4 pp., Daily Consular Report, Dec. 2.

Rapid Transit System of New York. Illustrated, 1 p., Scientific American, Dec. 17. 10 cts.

Public Side of Street Railroading. By Patrick Calhoun. Abstract from paper before American Street & Interurban Railway Association, Atlantic City. 2 pp., Canadian Engineer, Dec. 8. 15 cts. 2 pp., Water and Gas Review, December. 20 cts.

Electric Railway Situation. Paper before New England Street Railway Club. By Thos. N. McCarter. 2-1-2 pp., Electric Railway Journal, Dec. 21. 10 cts.

Rates and Valuation, Discussion by Railway Commissioners on. 11-2 pp., Electric Railway Journal, Dec. 17. 10 cts.

Traffic, Freight and Express. Discussed in New England. 13-4 pp., Electric Railway Journal, Dec. 17. 10 cts.

Terminals in Large Cities, Railway Passenger and Freight. Planning and construction. From paper by F. A. Delano in Chicago Tribune. Illustrated. 1 p., Engineering News, Jan. 5. 15 cts.

Subway, Construction of a portion of the Fourth Avenue, Brooklyn. Drawings and Half-tones. 3 pp., Engineering Record, Dec. 17. 10 cts.

Approaches to the La Salle St. Tunnel, Chicago. How the difficulties were met. Drawings and half-tones. 3 pp., Engineering Record, Dec. 24. 10 cts.

Stability of Tramway and other Poles. By Eric E. Walker. With drawings. 2 pp., Surveying, Nov. 25. 15 cts.

BRIDGES AND STRUCTURAL MATERIALS

Bridge, Queen Street, Toronto. Method of construction. From address by R. E. Chadwick, Bridge Engineer, City of Toronto. Illustrated. 2 pp., Canadian Engineer, Dec. 29. 15 cts.

New Street Viaducts at Denver, Colo. Description and methods of construction. With drawings. 4 pp., Engineering News, Jan. 5. 15 cts.

New Charles River Bridge, Boston Elevated Railway. Drawings and half-tones. 3 pp., Engineering Record, Dec. 17. 10 cts.

White River Bridges in Indianapolis. Illustrated, 4 pp., Municipal Engineering, January. 25 cts.

Drawbridges, Electrical Operation of. Development and advantages. From paper by S. F. Nichols, before Railway Electrical Engineers' Assn. Illustrated. 5 pp., Canadian Engineer, Dec. 15. 15 cts.

Concrete Viaduct, Asylum Ave., Knoxville, Tenn. Description of and manner of construction. By L. W. Frierson. Illustrated. 1½ pp., Engineering News, Dec. 15. 15 cts.

Foundations, Grouting Natural Soils for Bridge and Building. By W. D'Rohan. ½ p., Engineering-Contracting, Dec. 21. 10 cts.

MISCELLANEOUS

Iron and Steel, Notes on the Corrosion of, and Its Prevention. By G. W. Thompson. Paper before American Institute of Chemical Engineers. 4½ pp., Chemical Engineer, December. 25 cts.

Concrete, Cost of Mixing. By C. E. Paul. Illustrated. 4 pp., Cement World, December. 15 cts.

Some Thermal Properties of Concrete. Paper read by Charles L. Morton, of Mass. Institute of Technology, before National Association of Cement Users. 2 pp., Engineering Record, Dec. 21. 10 cts.

Waterproofing Concrete Without Altering Its Appearance. From paper by C. M. Chapman, before National Cement Users' Association. 1 p., Canadian Engineer, Dec. 15. 15 cts.

Handling Concrete in Cold Weather. By J. H. Chubb. 2½ pp., Contractor, Dec. 15. 20 cts.

How to Put in Concrete in Winter Months. By Ernest McCullough. 1½ pp., Canadian Engineer, Jan. 5. 15 cts.

Tufa Concrete. Composition, uses, etc. From paper by J. B. Lippincott, Assistant Chief Engineer, Los Angeles Aqueduct, before National Association of Cement Users. Drawings. 2 pp., Engineering Record, Dec. 31. 10 cts.

Reinforced Concrete in Indianapolis Water Works Filters. By F. C. Perkins. Illustrated. 7 pp., Cement World, December. 15 cts.

Reinforced Concrete Pier Construction. From paper by Eugene Klapp, before American Society of Civil Engineers. Hall-tone and drawing. 2½ pp., Canadian Engineer, Dec. 29. 15 cts.

Forms of Concrete. Summary of ideas brought together during construction of Pittsburg Filtration works. From a paper by J. D. Stevenson, formerly division engineer on the work, presented before the Engineers' Society of Western Pennsylvania. 2 pp., Engineering Record, December 10. 10 cts.

Depositing Concrete Under Water in France. From paper by Henri Tavernier, in "Annales des Ponts et Chaussées." ½ p., Engineering Record, Jan. 7. 10 cts.

Cost of Seventy-foot Concrete Dam at East Earl, Pa. By H. L. Bauman. Illustrated. 1 p., Concrete, January. 15 cts.

Concrete Used for Gas Pipe and Joint Coverings. Use of simple wooden form or box to insure protection of joint or valve supporter. Illustrated. 1 p., Concrete, January. 15 cts.

Town Planning, The Practice of, under the Housing and Town Planning Act, 1909. From paper before Institution of Municipal Engineers, Manchester, by Frederick W. Platt, Building Surveyor, Salford Corporation. 3 pp., Surveyor, Dec. 16, 20 cts. 2 pp., Surveying, Dec. 16, 15 cts. 1 p., Municipal Journal, Dec. 17, 15 cts.

Economic Aspect of City Planning. Paper before Union of Canadian Municipalities. By Benj. C. Marsh. 1½ pp., Pacific Builder and Engineer, Dec. 17. 15 cts.

Buffalo's Plans to Transform Bird Island. By H. G. Anderson. Illustrated. 2½ pp., Municipal Engineering, January. 25 cts.

The planning of an Industrial Suburb. By E. A. Slater. With drawings. 3 pp., Surveyor, Dec. 2. 20 cts.

Housing and Town Planning. Regulations governing town planning procedure. 1 p., Surveyor, Dec. 23. 20 cts.

Housing and Town Planning. Paper before Union of Canadian Municipalities. By Robt. Green. 1½ pp., Surveyor, Dec. 30. 20 cts.

Housing Conditions in Milwaukee. By C. D. Thompson, city clerk. Illustrated. 10 pp., Survey, Dec. 3. 25 cts.

Slums in Berlin. By Joan Ihlder. 1½ pp., Survey, Dec. 17. 10 cts.

Housing Conditions in Indiana. By A. F. Pacon. Illustrated. 6 pp., Survey, Dec. 17. 10 cts.

Tenement Houses in New York. 3 pp., Bulletin League of American Municipalities, October. 25 cts.

Model Tenements of Rome, Italy. By H. M. Pellock. Illustrated. 5 pp., American City, December. 10 cts.

Congestion and Its Relief. 4 pp., American City, December. 10 cts.

From Cave Life to City Life. Pageant at Harvard Stadium. Illustrated. 5 pp., Survey, Dec. 3. 25 cts.

Recreation Centers, Evening. By C. A. Perry. 12 pp., Playground, January. 25 cts.

Small City Recreation Problems. By F. A. McLean. 7 pp., Playground, January. 25 cts.

Art Commission, New York. Abstract of report. Illustrated. 2 pp., Municipal Journal and Engineer, Dec. 24. 15 cts.

Ideals and the City. New. By J. H. Holmes. 2 pp., Survey, Dec. 24. 10 cts.

Trees to Go, Poplar. Illustrated. 3-4 pp., Municipal Journal and Engineer, Jan. 4. 10 cts.

Forestry in Germany. From official report of W. C. Fischer, Canadian Trade Commissioner at Berlin. 2½ pp., Canadian Engineer, Dec. 15. 15 cts.

Abattoirs, Public. By M. S. Dodington. 1 p., Municipal Journal, Dec. 17. 15 cts.

London's Public Abattoirs. Illustrated. 11-3 pp., Municipal Journal, Dec. 17. 15 cts.

Sepulchre, City. By Albert C. Dieffenbach. Illustrated. 11-4 pp., Municipal Journal and Engineer, Dec. 28. 10 cts.

Municipal Work, Supervision of. Some evils in city management. From paper by Will P. Blair before American Society of Municipal Improvements. 2 pp., Canadian Engineer, Dec. 8. 15 cts.

Contracting as a Specialized Business. By D. J. Hauer. 2 pp., Contractor, Dec. 15. 20 cts.

Contractors' Construction Camps. By D. J. Hauer. Illustrated. 2 pp., Contractor, Jan. 1. 20 cts.

Rock Crushing and Storage Plant at Tomkins Cove, N. Y. Drawings and half-tones. 4 pp., Engineering Record, Jan. 7. 10 cts.

Waterproofing of Tunnels. Paper before National Association of Cement Users. By A. H. Harrison. 1½ pp., Contractor, Jan. 1. 20 cts.

Structural Steel Designing, Elements of. By Wm. Snaith. 3 pp., Canadian Engineer, Jan. 5. 15 cts.

Coal, Clinkering of. Results of tests for effect of various constituents in the ash. By Lionel Marks, Harvard University. Illustrated. 4 pp., Engineering News, Dec. 8. 15 cts.

Engineering and the Engineer. Address by Archibald Barr, President, before Institution of Engineers and Shipbuilders in Scotland. 3 pp., Surveying, Dec. 2. 15 cts.

Influence of Pure Science in Engineering. From Presidential address by Sir J. J. Thomson, before Junior Institution of Engineers. 2 pp., Surveying, Dec. 9. 15 cts.

Limitations of Efficiency in Engineering Education. Extracts from address of Prof. George P. Swain, at opening of General Engineering Bldg., Union College, Schenectady. 3½ pp., Engineering Record, Dec. 17. 10 cts.

Adjustment of Theodelite and Level. How effected. By G. W. M. Boycott. With drawings. 4 pp., Surveying, Dec. 9. 15 cts.

Blue Printing. By W. E. Wilbur. 3 pp., Iowa Engineer, November. 10 cts.

Municipal Journal and Engineer, Aims and Purposes of the. ½ p., Municipal Journal and Engineer, Jan. 4. 10 cts.

PERSONALS

BALDWIN, NATHAN A., East Orange, N. J., has been re-elected President of the Board of Fire Commissioners, John Reeve, Vice-President, and Edward O. Wieters, Secretary.

BUTLER, M. B., has been appointed Police Commissioner at Niagara Falls, N. Y., by Mayor P. J. Keller.

BRUN, MORRIS, Fort Smith, Ark., has been appointed Chief of the Fire Department, succeeding the late Henry Smatt.

COYNE, JOSEPH, was elected President of the Cincinnati Board of Aldermen, succeeding Frank Johnson.

EARL, JOHN R., Lockport, N. Y., has been re-elected President of the Police Board. Commissioner F. J. Reynolds and Alexander Clark were also reappointed.

EMERSON, WM., Newport, Ky., has been elected President of the Board of Aldermen, and Albert Beyer President of the Council.

GREEN, J. B., Arabi, Ga., has been elected Mayor over R. B. Bowen.

GREEN, JAMES A., Youngstown, O., has been elected President of the Park Commission, succeeding Alfred Liebman. Dr. W. H. Hayden was re-elected Secretary and Lionel Evans Park Superintendent.

HARDY, GEO. W., Portland, Me., has resigned his office of City Electrician, to accept a position with the New England Fire Underwriters.

HARTSHORNE, CHARLES F., Waterfield, Mass., Town Clerk for 40 years, the oldest town clerk in point of service in Massachusetts, died January 7.

HOPPER, WALTER C., Paterson, N. J., has been elected President of the Board of Aldermen.

HOPPER, R. L., Winston-Salem, N. C.,

has been elected Chief of the Fire Department, T. Miller Assistant Chief, J. A. McGee Secretary.

KLUEMPER, THEODORE, Covington, Ky., has been re-elected President of the Council.

KRAEMER, MICHAEL, Alexander, Minn., has been elected Mayor, succeeding John J. Anderson, resigned.

LAUBY, CHARLES, Vincennes, Ind., has been appointed Police Commissioner, succeeding Chas. L. Kuhm.

MCGUIRL, HUGH, Geneva, N. Y., has been elected President of the Board of Health, succeeding Prof. H. A. Harding.

MCMAHON, HENRY A., Niagara Falls, N. Y., has been appointed Grade Crossing Commissioner, succeeding former Mayor M. B. Butler, who has been appointed by Mayor Keller to the Industrial Commission.

MERKLE, GEORGE, Hasbrouck Heights, N. J., has been unanimously elected President of Council.

OWENS, THURSTON H., Consulting Engineer, New York City, has been appointed associate editor of the *American Gas Light Journal*, 42 Pine street, New York City. Mr. Owens is a member of the American Gas Institute, National Commercial Gas Association, New York Electrical Society, the U. S. Illuminating Engineering Society, and a corresponding member of the British Illuminating Engineering Society.

REDMOND, SMITH, Ardmore, Okla., has been appointed Chief of Police, succeeding Chief Ganett, resigned.

RICHARDSON, DR. A. L., is Mayor of La Grande, Ore., succeeding F. L. Meyers.

RICHARDSON, FRANK, Jacksonville, Fla., has been elected a member of the Board of Bond Trustees.

RIGHTER, IRVING, Port Jervis, N. Y., has been appointed City Engineer, and Theodore Ludlum, Superintendent of Streets and Sewers.

SEAMAN, J. WESLEY, Long Branch, N. J., has been appointed City Engineer for a term of two years; Ellsworth Jackson, Street Commissioner, and Theodore Howland, Superintendent of Fire Alarms.

SLACK, GEORGE W., Burlington, N. J., has been elected Chief of the Fire Department.

STRYNG, EDWARD, Syracuse, N. Y., has been appointed Engineer of the middle division of the New York State Barge Canal, succeeding Guy Molton, who has held the position for the last two years. Mr. Molton will become Resident Engineer of the Third Division.

TIEDEMAN, GEO. W., Savannah, Ga., has been re-elected Mayor for a term of two years, defeating Capt. R. J. Devant.

WELLS, SEYMOUR, Tonawanda, N. Y., has been re-elected President of the Board of Public Works.

WHEELER, DWIGHT C., has been chosen Chairman of the Board of Fire Commissioners at Bridgeport, Conn.

Mayors Elected—West Virginia

Keyser—R. A. Welch.

Harper's Ferry—George L. Marten.

Bellevue—Joseph Katzner.

Teria Alta—W. Roy Shaw.

Davis—W. E. Weimer, re-elected.

Thomas—Martin.

Elk Garden—W. H. Kight.

South Keyser—J. G. Wolfe.

Kenona—J. H. Lambert.

Matewan—W. R. Hoskins.

Monongah—W. H. Moore.

Fairview—S. T. Barr.

Farmington—Gilbert Musgrave.

Star City—Flay.

Shinnston—Walter Hussey.

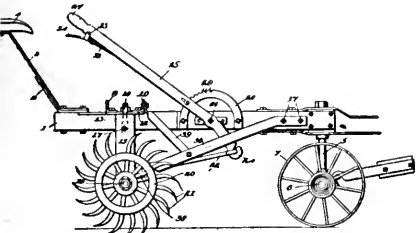
Elk Garden—W. H. Kight.

Fayetteville—R. H. Dickinson.

Montgomery—Benjamin Davis.

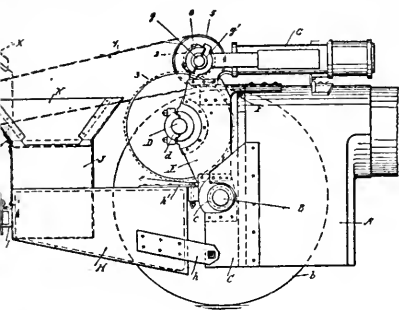
PATENT CLAIMS

980,116. **ROTARY ROAD SCARIFIER.** Walter A. Gillette, Los Angeles, Cal. Serial No. 560,086.
 In a rotary road scarifier, the combination of a right angled supporting frame, a gang of disks provided with curved spikes



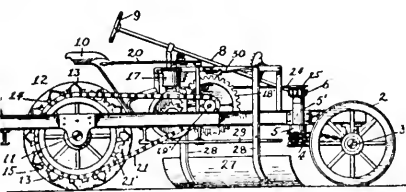
supported on each side of the central portion of said frame, and means for separate adjusting and locking each gang of spike disks, substantially as described.

980,393. **ROAD ENGINE.** Gustaf Arvid Anderson, Waynesboro, Pa., assignor to The Geiser Manufacturing Company, Waynesboro, Pa. Serial No. 534,043.
 In a road engine, the combination, with a boiler, of two lower frame plates secured to the sides of the boiler and projecting forwardly thereof in the same planes as the sides, two upper frame plates arranged



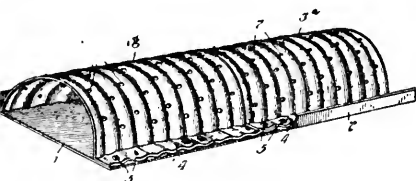
wholly behind the rear end of the boiler parallel to and between the said planes, means for securing the said upper frame plates in position, an axle and road wheels mounted in the lower frame plates, a countershaft mounted in the upper frame plates, and a tooled countershaft wheel secured on the countershaft and arranged wholly behind the rear end of the boiler and not at the side thereof.

980,394. **APPARATUS FOR MAINTAINING CROWNED ROADS.** William C. Anderson, San José, Cal. Serial No. 481,933.
 In an apparatus for the described purpose, the combination of a frame, pressure rolls arranged side by side, ribs on



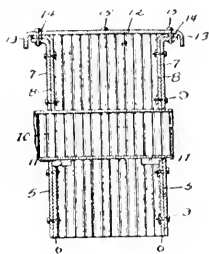
the respective rolls, the ribs on each roll being spirally arranged upon the periphery thereof and the ribs of one roll constituting in effect a continuation of the ribs on the other roll, the said rolls adapted to form and leave in the surface of the road a succession of water draining grooves, a scraper arranged in front of and overlapping the respective rolls, and means carried by the frame for operating said rolls, and means whereby said rolls may be operated there independently or together.

980,442. **DRAINING CULVERT.** Julius H. Schlafly, Canton, Ohio, assignor to The Canton Culvert Company, Canton, Ohio, a Corporation of Ohio. Serial No. 536,395.



A sheet metal culvert section provided with circumferential corrugations and with draining apertures, substantially as and for the purpose specified.

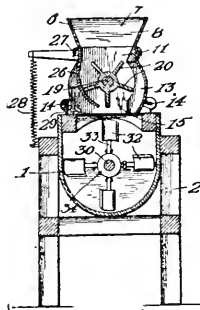
980,754. **ATTACHMENT FOR ROAD CULVERTS.** George S. P. Brannen, Danforth, Me. Serial No. 553,508.
 An end wall for culverts comprising a pair of U-shaped sections having the term-



inals of their opposite limbs connected together and provided with aligning recesses which co-operate to present an opening for the reception of a culvert end, a space flanked by the inner surfaces of the said sections presenting an opening for the reception of a filling material, for the purposes described.

980,834. **FEED REGULATOR FOR CONCRETE MIXERS.** Oliver P. Raber, Kendallville, and Isaac Grogg, Auburn, Ind. Serial No. 441,097. Renewed May 24, 1910. Serial No. 563,154.

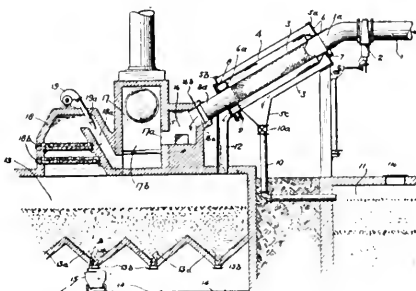
A feed regulator for a concrete mixing machine comprising a supporting frame, a cylindrical casing consisting of oppositely disposed curved side plates, and intermediate and end plates, the last mentioned plates being formed with central bearing openings, and with outwardly projecting apertured lugs arranged at the upper and lower edges of said plates, said plates being adapted to receive the curved side plates between them, and the intermediate plate forming the partition to divide the casing



into two compartments, a rotatable shaft in the bearing openings of said end and intermediate plates, rotary feeding and proportioning wheels arranged on the shaft in said compartments and having blades to form pockets, a longitudinal pivot arranged in certain of the upper ears of said plates, one of said curved side plates being fixed to said pivot and depending therefrom to swing outwardly and upwardly, a horizontal arm projecting radially from said pivot, a coil spring having its lower end fixed to said frame, and its upper end fixed to said arm, whereby the swinging side plate will be yieldably held in contact with said wheels, connecting rods arranged in the remaining apertured ears of said plates to unite the parts of the casing, a hopper above said casing, and means for driving said shaft.

980,463. **SEWAGE DISPOSAL SYSTEM.** Earnest T. Welcme, New York, N. Y. Serial No. 507,936.

In a sewage disposal system, the combination of a conduit, a filter, a reservoir,



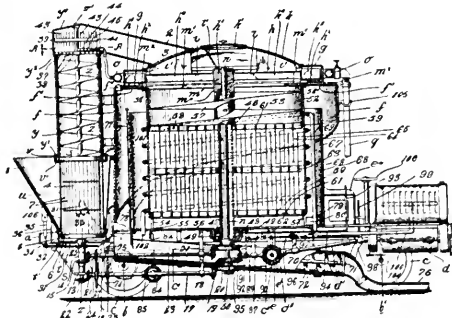
mechanism comprising a plurality of screens in said conduit for separating matter delivered by said conduit, means for carrying liquid separated by said mechanism to said filter, and means for carrying a constituent of said matter to said reservoir.

980,513. **MEANS FOR LAYING DUST AND THE LIKE ON AND MAKING ROADS.** Robert Hacking, West Bridgford, Nottingham, Harry Hill, Ollerton, and Henry Walker Hill, Nottingham, England. Serial No. 526,237.

A composition for surfacing roads, comprising a flux composed of silicate of soda and spirits of turpentine mixed with tar water in the proportions of 30 gallons of water, 120 pounds of silicate of soda and 1/2 gallon of spirits of turpentine, to which is added from 60 to 70 gallons of tar and 100 gallons of water, the whole being mixed and intimately combined with the recited ingredients, as set forth.

980,564. **SNOW DESTROYER.** Patrick D. Piordan, New York, N. Y. Serial No. 581,264.

In an apparatus of the character de-

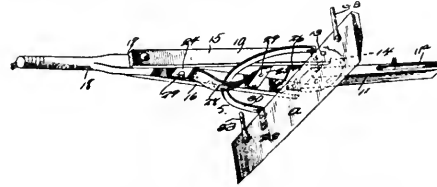


scribed, the combination of triturating mechanism; means for feeding the material to said mechanism; means for supplying water to the latter; and a discharge device for the triturated material.

980,612. **ROAD GRADING MACHINE.**

William H. Dawkins and Tranis G. Dorough, Royston, Ga. Serial No. 532,136.

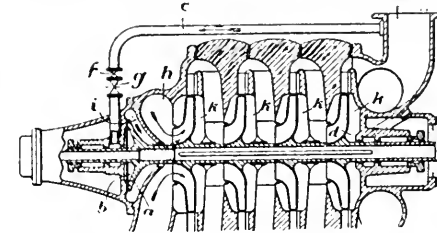
In a road grading machine, a platform frame, a supplemental frame mounted thereon, said supplemental frame comprising two parts, longitudinal yielding means for one of the parts, one of said parts comprising two angularly arranged members converging toward one another at their ends, a curved plate carried by and fixed



to the other part and having pivotal connections with the free ends of said members, one of said parts having a longitudinal slot therein, means for pivoting the slotted end of one of the parts to the platform frame, three U-shaped members arranged between the angularly arranged members, a scraper blade pivoted to one of the U-shaped members and having a semi-annular ring, a bowed guide strip connected to the other two U-shaped members for guiding the semi-annular ring, and means for adjusting and manipulating the blade, as specified.

980,624. **HIGH-PRESSURE CENTRIFUGAL PUMP.** Hans James Schwade, Erfurt, Germany. Serial No. 516,709.

In a high-pressure centrifugal pump, the combination with a spindle and a plurality of wheels mounted thereon; of a casing wherein said wheels are disposed provided with a pair of interiorly-located spaced walls producing a chamber there between,



the rear wall being formed with an opening leading into the suction chamber in front of the first wheel, and the front wall with an opening in communication with the exit side of the pump behind the last wheel; and a relief disk secured to said spindle within the first-named chamber, said disk having its rear face spaced from the rear wall of said chamber to provide a conduit leading to the suction chamber, and its front face spaced from the front wall of said chamber to provide a channel leading to the said conduit.

THE WEEK'S CONTRACT NEWS

Relating to Municipal and Public Work—Street Improvements—Paving, Road Making, Cleaning and Sprinkling—Sewerage
Water Supply and Public Lighting—Fire Equipment and Supplies—Bridges and Concrete Work—Sanitation,
Garbage and Waste Disposal—Police, Parks and Miscellaneous—Proposals and Awards

To be of value this matter must be printed in the number immediately following its receipt, which makes it impossible for us to verify it all. Our sources of information are believed to be reliable, but we cannot guarantee the correctness of all items. Parties in charge of proposed work are requested to send us information concerning it as early as possible; also corrections of any errors discovered.

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREET IMPROVEMENTS				
Ohio	Cincinnati	Jan. 20 noon	Imp. Dayton Pike Sycamore twp., Spec. No. 127; Bond \$1,000.	Fred Dreih, Clk. County Comrs.
Ohio	Cleveland	Jan. 20, noon	Paving portions of 20 streets.	A. B. Lea, Dir. Pub. Serv.
Ohio	Youngstown	Jan. 20	Pave portion South Logan and Millicent aves.	W. H. McMillin, Clk. Bd. Pub. Serv.
Indiana	Frankfort	Jan. 21, 1 p.m.	Constr. various gravel roads.	Chas. F. Cromwell
New Jersey	Alpine	Jan. 21	Bl'g. stone rd. 2,570 ft. long, from Tenafly to Alpine, Sylvan av.	Franklin W. Hopkins, Mayor.
Alabama	Wetumpka	Jan. 23	Road improvements to cost \$170,000.	Solomon Norcross, C.E., Atlanta, Ga.
California	Los Angeles	Jan. 23	Improving Valley Road.	C. G. Keys, Clk. Bd. Superv.
Indiana	Lebanon	Jan. 23, 7:30 p.m.	Constr. gravel roadway, cement curbs and gutters.	Edmund Connor, City Clerk.
New York	New York	Jan. 23, 2 p.m.	Repair, pave approx 270,000 sq. yd. asphalt pave, incl. binder course, 500 cu. yd. Port. cement, concrete, 1,000 sq. yd. old stone pavement.	Geo. McAneny, Boro. President.
Texas	Hillsboro	Jan. 24, 3 p.m.	Lay 31,500 sq. yd. pave 12,711 ft. curb and gutter. Specific cover brick, bitulithic and concrete pavement.	Ed. Woodhall Mayor.
California	Hemet	Jan. 25	Imp. Harvard st. includ. cement curb and gut & conc. culverts	C. G. Hamilton, City Clerk.
Washington	Wenatchee	Jan. 25, 5 p.m.	Grad. and surf with gravel and conc. sidewalks of Okanogan ave. distance of 4,400 ft.	S. R. Sumner, City Clerk.
Ohio	Cleveland	Jan. 27, noon	Paving portions of 20 streets.	A. B. Lea, Dir. Pub. Serv.
Wisconsin	Menomonie	Jan. 31	Pave with vit. brick, asphalt macadam, bitulithic, broken limestone and liquid asphalt bonding solution, or sarcolithic mineral rubber pave. Also cement curb, 7-in. base, 5-in. top and 16-in. depth.	F. W. Rowe, City Clerk.
Indiana	Fowler	Feb. 1, noon	Construction of one mile of gravel road in Benton County.	Lemuel Shipman, County Auditor
Michigan	Hancock	Feb. 1	Constr. 4 mi. of 15 ft. macadam road.	County Clerk.
Indiana	Huntington	Feb. 6, 2 p.m.	Constr. gravel rd. known as P. W. Forest Road.	John W. Weaver, Co. Aud.
West Virginia	Huntington	Feb. 6, 1 p.m.	Grad. and pave 70 streets with vit. brick, bitulithic, sheet asphalt, asphalt block or concrete asphalt.	John Coon, Comr. of Streets.
Georgia	Atlanta	Feb. 6, 3 p.m.	Lay brick, tile and cem. sidew. and furn. mat. for rep. to sts.	W. J. Campbell, City Clerk.
Indiana	Tinton	Feb. 6	Constr. gravel road in several townships.	J. H. Tranbarger, County Auditor.
Indiana	Brazil	Feb. 7, 11:30 a.m.	Improving various highways in Clay County.	E. A. Staggs, Auditor.
Kansas	Manhattan	Feb. 7, 6 p.m.	Pave with brick block, wood block, concr., asph. concr. or sheet asphalt, requiring approx 12,200 yds. pave and 4,000 cu. yd. excav. on Poyntz ave., and 16,200 yds. pave. and 5,450 cu. yd. excav. on Houston and Fourth sts.	C. T. Gist, City Clerk.
Florida	Palatka	Feb. 7, 7:30 p.m.	Constructing approx. 16,500 sq. yd. concrete sidewalks.	A. T. Triay, City Clerk.
Canada	Vancouver, B. C.	Feb. 7	Furnish road roller, weight not less than 15 tons.	Wm. McQueen, City Clerk.
Florida	Tampa	Feb. 7	Paving with shell 1 1/2 mile road.	Hillsboro County Commissioners
Indiana	Crawfordsville	Feb. 7, 2 p.m.	Constr. gravel road known as L. T. Rush Road.	B. B. Engle County Auditor.
Pennsylvania	Erie	Feb. 13, 8 p.m.	Paving part of W. 20th street.	F. Hanlon, City Clerk.
Oregon	Portland	Feb. 23	Constructing pavement on Jersey st.	J. W. Morris, City Engineer.
SEWERAGE				
Washington	Spokane	Jan. 20, 2 p.m.	Furn. 7,000 ft. of 10-in. corrugated drain pipe, perf. bottoms.	John Gifford, City Purch. Agt.
Ohio	Elyria	Jan. 20	Constr. trunk sewer, cost approx. \$26,000.	Rose Moriarty, City Clerk.
Kentucky	Louisville	Jan. 20	Constr. sewer known as 2d St. sewer, incl. 2,430 ft. of 42 and 48-in. concrete sewer.	Comr. of Sew., 605 Equitable Bldg.
New York	Troy	Jan. 20	Constr. salt glaze vit. drain pipe sewer.	J. M. Riley, Secy. B.I. Con. & Sup.
Ohio	Toledo	Jan. 20	Constructing sewer in Huron street.	Fred Shane, Secy. Bd. Pub. Serv.
Ohio	Youngstown	Jan. 20	Constructing sewer in Homewood street.	W. H. McMillin, Clk. Bd. Pub. Serv.
Indiana	Lebanon	Jan. 23, 7:30 p.m.	Constr. sewers in Barrone street.	Edmund Connor, City Clerk
New York	Syracuse	Jan. 26 10 a.m.	Bl'g. Harbor brook intercepting sewer and imp. stream.	G. D. Holmes, Ch. Engr. Inter S. Bd.
Indiana	Richmond	Jan. 26	Constr. sewer system, incl. approx. 4,200 ft. 12 to 42 in. sewer.	Homer Hammond, Pres. Bd. Pub. W.
Ohio	Lorain	Jan. 27, noon	Storm water sewer in Dallas ave.	L. B. Johnston, City Clerk.
Texas	Corpus Christi	Jan. 27	Furn. sewer material, incl. 1,100 sq. ft. of steel sheet piling, 85 c. i. manhole covers, 10 flush tank siphons, 4,000 lin. ft. of c. i. pipe, 2 carloads of lumber, 2,000 ft. of 15-in vitrified sewer pipe, 7,000 ft. of 12-in vitrified sewer pipe, 3,300 ft. of 10-in vitrified sewer pipe, 9,660 ft. of 8-in vitrified sewer pipe, 57 "Ys" 6 on 15, 78 "Ys" 6 on 10, 288 "Ys" 6 on 12, 258 "Ys" 6 on 8.	O. O. Wright, City Clerk.
South Dakota	Alexandria	Jan. 28, 1 p.m.	Constr. approx. 7 1/2 mi. 5 to 24-in. tile drains.	M. Volz Auditor.
Washington	Spokane	Jan. 29	Furn. 7,000 ft. of 10-in. corrug. drain pipe corrug. bottom.	John Gifford, City Purchas. Agt.
Manitoba, Can.	Souris	Feb. 1	Furn. 31,000 ft. vit sewer pipe, etc. spring and summer, 1911.	C. R. Heath, Health Engineer.
Georgia	Atlanta	Feb. 6, 3 p.m.	Constr. sewers and furn. vit. pipe, cem. and castings.	W. J. Campbell, City Clerk.
Ontario, Can.	Toronto	Feb. 7, noon	Constr. several sections low level interceptor.	G. R. Greary, Chin. Bd. Control.
WATER SUPPLY				
Washington	Spokane	Jan. 20, 2 p.m.	Furn. 1,950 lin. ft. 8-in. water pipe and 9,600 ft. 16 in. pipe.	John Gifford, City Purchas. Agt.
Ohio	Newburg	Jan. 21, noon	Constructing water mains.	J. W. Shimek, Clk. B.I. of Control.
Illinois	Chicago	Jan. 21	Furn. 12,500 lbs. packing, also tapping connections, also approx. 15 tons lead pipe.	B. J. Mullaney, Comr. Pub. Wks.
Texas	Georgetown	Jan. 23	Furn. approx. 300 tons class "B" water pipe.	R. E. Ward, Mayor.
Oregon	Astoria	Jan. 23, 2 p.m.	Furn. labor and material for wood stave pipe.	Lars Bergsvik, Engr. Wt. Com.
California	Vallejo	Jan. 23, 7:30 p.m.	Furn. 1,120 pieces of c. i. bell and spigot water pipe 14 in. internal diam., 12 ft. long, 66 in. thick and 340 pieces c. i. bell spigot water pipe 8-in. internal diam., 12 ft. long, 5 1/2 in. thick with fittings.	W. J. Torney, Clk. Bd. Wtr. Comrs.
Kentucky	Louisville	Jan. 24, 2 p.m.	Erect 64 fire hydrants.	Chas. Cronan, City Clerk.
California	Ontario	Jan. 25	Furn. Ontario or upland pipe, pipe and spls. for constr. domestic water system.	R. O. Breckenridge, Town Clerk
Missouri	Kansas City	Jan. 26	Bldg. horizontal shaft centrifugal pump, direct connected to vertical cross com. engine, capacity 30,000,000 gals.	W. Kiersted, Ch. Engr. Water Dept
Illinois	Chicago	Jan. 27	Furn. and install two 20,000,000 cent. pumps and two 1,000 H. P. synchron. elec. motors, piping, switchboard, etc.	B. J. Mullaney, Comr. Pub. Works
Washington	Spokane	Jan. 30, 2 p.m.	Furn. two 14 in. single suction, hor. shaft, two-stage centrifugal pumps, valves, etc.	John Gifford, City Purch. Agt.
California	Los Angeles	Jan. 30, 2 p.m.	Franchise for lay water-pipe in Lankershim; 40 years.	C. G. Keys, County Clerk.
Iowa	State Center	Jan. 31, noon	Drilling well.	J. W. Sparks, City Clerk.
Manitoba, Can.	Sours	Feb. 1	Furn. 425 tons c. i. water pipe, specials, fire hydrants, gate valves and boxes, pig lead, etc., in spring and summer of 1911.	J. W. Breakey, Secy. -Treasurer.
Iowa	Rippey	Feb. 6, 8 p.m.	Construction of water works system.	J. A. Haberer, Town Clerk.
Manitoba, Can.	Winnipeg	Feb. 6	Erect two pump plants; cap 1,000,000 imperial gal. per 24 hrs.	M. Peterson, Secy. B.I. Control

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
BRIDGES				
Oklahoma	Bartlesville	Jan. 21	Build. 50 ft. bridge and 16 ft. roadway. Washington twp.	County Comrs.
W. Va.	Washington	Jan. 23, 2 p.m.	Strengthening Calvert st. bridge; cost approx. \$25,000.	Wm. V. Judson, Engr. Comr.
Illinois	Peoria	Jan. 24	Construction of bridge across Illinois river.	Fred B. Tracy, City Clerk.
Missouri	Kansas City	Jan. 30	Constr. two concr. bridges—one over the Blue river at 15th st., in which will be approx. 3,600 cu. yds. concr., 300,000 lbs. of steel and 1,260 sq. yds. of creosote block pave.; a reinforced conc. arch bridge over Brush Creek at Cleveland ave., contain. 900 cu. yds. of concr., 80,000 lbs. of metal and 360 sq. yds. of creosoted block pavement.	Board Pub. Works.
Michigan	Kalamazoo	Jan. 30	Build. reinforced concr. bridge, 190 ft. span, 3 arches 50 ft. in springing line.	H. A. Johnston, City Engr.
Virginia	Richmond	Feb. 1, 4 p.m.	Plans, designs, detailed drawings, strainsheets, specifications and proposals for \$225,000 rein. con. bridge over James river.	Charles E. Bolling, City Engineer
LIGHTING AND POWER				
Washington	Spokane	Jan. 20, 2 p.m.	Furn. induction motor and switchboard complete; also 3,000-000 gal. two-stage horizontal shaft pump.	John Gifford, City Purch. Agt.
Georgia	Fort Screven	Jan. 30, 11 a.m.	Constructing electric light system.	Constructing Quartermaster.
Washington	Tacoma	Feb. 6	Com. remain. prt. Nisually power plant. tot. cost. \$1,094,000.	Nicholas Lawson, Comr. L. & W.
Pa.	Atlantic	March 1	Imp. Elec. Lt. and Power Plant, probable cost \$40,000.	T. E. Nichols, City Clerk.
MISCELLANEOUS				
Washington	Spokane	Jan. 20, 2 p.m.	Furn. one auto propelled comb. police patrol and ambulance.	John Gifford, City Purchas. Agt.
Pennsylvania	Philadelphia	Jan. 20	Bl'g. superstruc. of Vine st. pier; cost about \$35,000.	J. F. Hassick, Act. D. Dt. W. & D.
North Dakota	La Moure	Jan. 20, 2 p.m.	Furnishing cor. galvanize 1 culverts needed during 1911.	C. J. Alister, County Auditor.
Minnesota	Minneapolis	Jan. 21, noon	Dredging in Lake Calhoun an 1 filling low lands and boulevard adjacent; 500,000 cu. yds. material to be moved; \$1,000 check with bid.	J. A. Ridgway, Secy. B. I. Pk. Comrs W. E. Smyth, City Clerk.
Rhode Island	E. Providence	Jan. 21	Furnishing automobile fire truck.	J. W. Reinhard, Chm. B. I. Supv
Wis. Va.	Ottumwa	Jan. 23, noon	Wrecking and material in old and constr. new jail and sheriff's residence.	M. Peterson, Secy. B. I. Control
Manitoba, Can.	Winnipeg	Jan. 25	Designs for hospital.	J. W. Nelson, Secv. Bd. Pub. Wks
California	Oakland	Feb. 1, 11 a.m.	Excavating for City Hall, grad. ath. field and park lands and around fire alarm building.	Roy Walter, City Clerk.
California	San Jose	Feb. 6	Constructing tuberculosis ward, county hosp. Est. cost \$10,000.	

STREET IMPROVEMENTS

Mobile, Ala.—Laying of sidewalks on St. Francis, Church and Conti sts. between Osborne and Broad sts. is being considered; plans by Engineer Smith; Board of Public Works has asked for bids for paving Water st.; 20 tons of asphalt will be purchased.

Seale, Ala.—Russell County has voted \$9,000 bonds for road improvements.

Tuscaloosa, Ala.—Council has passed resolution authorizing asking for bids for proposed street paving.

Phoenix, Ariz.—City is considering laying about 5 miles of oiled macadam pavement.—O. A. Turney, City Engineer.

Corning, Cal.—City Trustees have passed ordinance ordering mile and a half of concrete sidewalk constructed.

Long Beach, Cal.—Board of Trustees is asking for bids for grading, paving and curbing 3d st., together with construction of a 2-ft. vitrified brick gutter, two concrete and iron culverts and nine catch-basins and conduits.—C. O. Boynton, City Clerk.

Los Angeles, Cal.—County Supervisors have recommended to County Highway Commissioner grading, paving and placement concrete culverts on Valley road from Whittier to Foothill blvd.

Pasadena, Cal.—Council has decided to approve Chester and Michigan aves., Maple Way and Steuben and Chicopee sts.

Sacramento, Cal.—City Trustees have made following appropriations for street work, figures by City Engineer Randle: 5th st., L to Q, with asphaltic macadam, \$10,000; 11th st., C to I, with asphaltic macadam, \$11,304; 16th st., J to M, with asphaltic macadam, \$2,843; 8th st., L to Q, with asphaltic macadam, \$7,413; I, 16th to 9th, with asphalt, \$3,400, and E, 18th to 9th, with oiled macadam, \$3,991.

San Diego, Cal.—Council has authorized grading, paving and curbing of Elm ave.; grading of Hunter st.; paving and curbing of 8th st., and construction of granite block gutters.—J. T. Butler, City Clerk.

Hartford, Conn.—Street Commissioners are considering widening of High st. to make it 36 ft. from one sidewalk to another or its entire length.

Hartford, Conn.—Plans have been received by James H. McDonald, State Highway Commissioner, for proposed state road work, as follows: From A. S. Brainard, Div. Engr., 1,300 lin. ft. survey on the Hartford-Springfield Turnpike, town of South Windsor; from C. H. Nickerson, 23,650 lin. ft. survey on the River road in the town of Sharon; from W. Le Roy Ulrich, 7,300 n. ft. survey on Olcott and West Center sts., town of Manchester.

Brandywine, Del.—Commissioners appointed by the Superior Court have decided that a road should be built in Brandywine hundred from the Faulk road to Boulevard.

Lewes, Del.—Paving of portion of Arnold ave. will be considered by Town Board.

Wilmington, Del.—Mayor Spruce has recommended that Council look into feasibility of building road to river.

Washington, D. C.—District Commissioners have asked for appropriation to establish municipal paving or asphalt plant.

Augusta, Ga.—Commissioner of Public Works Nisbet Wingfield has recommended that as large a sum as possible be set aside for street pavings, streets to be improved to be selected later; also improvement of portion of Ellis and Harper sts.

Cedartown, Ga.—Polk County is considering election on bonds for road construction.

Rock Island, Ill.—City is receiving bids for paving 28th st. from the 7th ave. boulevard to city limits at 18th ave.; width, 36 ft.; estimated cost, \$51,000.—Wallace Friechler, City Engineer.

Springfield, Ill.—City is considering paving of Jackson, E. Edwards and Laurel sts.—F. H. Hamilton, City Engineer.

Evansville, Ind.—Board of Public Works is planning improvement of seven streets.

Fort Wayne, Ind.—Bids will soon be asked for construction of a macadamized road in Maumee Township.—C. H. Brown, County Auditor.

Huntington, Ind.—No bids were received Jan. 2 for construction of the Wisner gravel road.—J. W. Weaver, County Auditor.

Indianapolis, Ind.—Board of Public Works will consider grading of Emerson ave.

Martinsville, Ind.—No bids were received Jan. 3 for highway improvements in Adams Township; new bids will be asked.—J. S. Whitaker, County Auditor.

Muncie, Ind.—Board of Works has adopted resolutions ordering paving of East Adams.

Mt. Vernon, Ind.—County Commissioners have appointed Silas Breece and Alonzo K. Grant as viewers and Thos. J. Johnson as engineer in petition of citizens of Smith Township for gravel roads; roads will be 12 miles in length and cost about \$35,000.

Richmond, Ind.—Plans and specifications are being prepared for macadamizing and curbing west of Fifth street.

Richmond, Ind.—City Engineer Fred. R. Charles has been instructed to write for prices on new road roller, including and without old roller, by Board of Works; also instructed to write in regard to enclosed sweeper, which does not raise dust and requires no sprinkling.

Seymour, Ind.—City is considering improvement of number of streets.—E. B. Lougas, City Engineer.

South Bend, Ind.—Board of Public Works has approved petition for grading of Kankakee avenue.

Vincennes, Ind.—Improvement of Jefferson ave. by grading, gravelling, sidewalk and curbing, is being urged.

Cedar Rapids, Ia.—Paving improvements which will cost \$85,000 and curbing improvements which will cost \$7,000 will be commenced as soon as work will permit.

Red Oak, Ia.—Council has decided to lay 28,723 sq. yds. paving, 7,520 ft. comb. curb and gutter, and 2,378 ft. of curb.—D. B.

Gunn, Mayor. Theo. S. De Lay, Creston. Engineer in Charge.

Topeka, Kan.—Lyman School District residents are urging building of road to connect North Kansas Ave. road with Rochester road.

Louisville, Ky.—Board of Public Works is having plans prepared for building of granite and brick sidewalks on portions of 15 streets.

Annapolis, Md.—Bids will be received February 1 by Board of Public Works for \$1,000,000 state road bonds.

Baltimore, Md.—State Roads Commission has acquired Frederick road; city is expected to pave section between city line at Irvington and Payson sts.

Centerville, Md.—Bids will be received January 31 for \$15,000 road equipment bonds.—Madison B. Bordley, Clerk County Commissioners.

Elkton, Md.—Residents of Third District are urging construction of permanent road from Gilpin's Bridge to Delaware line.

Friendsville, Md.—County road is to be built in Garrett County between Friendsville and Accident.

Boston, Mass.—Building of Highway 109 ft. wide in West Roxbury, extending present road north about one mile is being considered by State Highway Commission.—Harold Parker, Chairman.

New Bedford, Mass.—Superintendent of Streets C. F. Lawton has asked for \$100,000 for paving, \$100,000 for macadam, \$30,000 for curbing, \$2,000 for granolithic sidewalks, \$25,000 for gutters, \$25,000 for grading, \$30,000 for oiling and watering and \$20,000 for miscellaneous purposes.

Bay City, Mich.—City will lay between \$125,000 and \$175,000 worth of paving in residence streets in year; type of paving not been decided upon.—Edward Wilhelm, City Engineer.

Detroit, Mich.—Council has ordered the Department of Public Works, J. J. Haarer, Commissioner, to advertise for bids for paving the following streets: McDougal ave., Guoin to Jefferson aves., with cedar blocks; estimated cost, \$6,740; 3d ave., Baltimore to North blvd., cedar blocks, \$5,083; 2d ave., Boulevard to Calvert ave., cedar blocks, \$54,630; Superior st., Russell to McDougal aves, \$29,440; Colbourn pl., Cass ave. to 4th ave., cedar blocks, \$9,396; Forsyth ave., Stanley to Dewey aves., cedar blocks, \$9,775; Stanley ave., 4th to Greenwood ave., cedar blocks, and Palmer ave., 3d to 4th ave., sheet asphalt, \$5,997; all on concrete foundations with Borea, Medina or other approved curbing.

Manistique, Mich.—County Board of Supervisors has called election to authorize the issuance of bonds for \$90,000 for building of good roads.

Butte, Mont.—Council is considering purchase of rock crusher.

Lincoln, Neb.—Cost of macadamizing West P. st road has been estimated at about \$8,462.—Adna Dobson, City Engineer.

Camden, N. J.—Council has passed ordinance to pave Fourth st. with sheet asphalt.—Wm. D. Brown, Clerk.

Millville, N. J.—Laying of certain streets is being considered.

Verona, N. J.—Mayor J. R. Pratt has recommended improvement of streets.

Wildwood, N. J.—Borough Council has adopted resolution authorizing special election on Feb. 9 on \$20,000 bonds to provide for removal of boardwalk oceanward.

Binghamton, N. Y.—City will repair brick and asphalt pavements at cost of \$2,500; work will begin in May.

Lestershire, N. Y.—Board of Trustees has authorized Village Engineer to prepare estimate on cost of the proposed Main st. pavement.

New York, N. Y.—All bids have been rejected by Park Board. Charles B. Stover, President, for paving with asphalt block transverse road No. 2, crossing Central Park from 79th st. on the east to 81st st. on the west.

Greenborough, N. Y.—Town will issue \$138,000 bonds for improvement of highways.

New York, N. Y.—Bids will be received Jan. 21 by City Controller Prendergast for \$1,500,000 bonds for streets.

Newburgh, N. Y.—Cost of paving Front st. with vitrified brick, from South st. to the Caldwell Lawn Mower Works has been estimated at \$7,000.

Rochester, N. Y.—Asphalt paving for Northview Terrace to cost \$12,000 has been proposed; St. Paul st., \$99,650, and Goodman and Circle st., \$26,000.

Windsor, N. Y.—Village has \$2,500 available for purchase of stone crusher, sorting bins, spreading wagons, etc.

Cincinnati, O.—Council has passed resolution directing City Engineer to prepare plans and specifications for widening Liberty st.

Columbus, O.—City is planning to pave Summit st., 11th ave. to the Mock road.—Henry Matzel, City Engineer.

Massillon, O.—Council has decided to pave five streets this summer.

Montpelier, O.—Plans and specifications for paving Empire and Main sts. have been completed; cost, \$64,702.

Niles, O.—Paving of Vienna ave. is being considered.—J. C. Price, Chairman Street Committee.

Sandusky, O.—Mayor Geo. T. Lehrer has recommended elimination of grade crossings.

Washington, O.—Bids will be received January 24 for \$5,714 street improvement bonds.—Glenn M. Fine, City Auditor.

Youngstown, O.—Bids will be received, Feb. 13, 11 a. m., for \$125,000 bonds for improvement bonds.—Frank Agnew, Secretary, Board County Road Commissioners.

Youngstown, O.—Council is considering paving of portions of Lydia and Hughes sts.

Portland, Ore.—City will improve E. 2d st., between Hawthorne ave. and E. Oak st. by fill; cost, \$48,561.

Bristol, Pa.—Borough Council is considering widening of Beaver Dam road.

Erie, Pa.—City Engineer B. E. Briggs will build asphalt repair plant; work will be done by city; only necessary parts being purchased.

Galeton, Pa.—Paving of borough streets is being considered.

Hazleton, Pa.—County Commissioners will have survey made and ask bids for construction of three miles of roads.

Hazleton, Pa.—Broad st. will be widened to extent of 20 ft.

Chattanooga, Tenn.—Bids will be received Jan. 26, 10 a. m., for \$2,940.36 paving bonds.—T. C. Thompson, Mayor.

Murfreesboro, Tenn.—Mayor G. B. Giltner has recommended that Street Committee take up matter of laying sidewalks.

Dallas, Tex.—Mayor S. J. Hay has recommended that all petitions filed by property owners for street paving be taken up and acted on at once.

El Paso, Tex.—Estimate of improving Franklin st., Kansas to Buchanan st., as made by City Engineer F. H. Todd, is \$15,325, and cost of improving intersecting streets and alleys, \$3,382.89.

Greenville, Tex.—The Council has agreed to pave seven miles of the city's principal streets.

San Antonio, Tex.—Street Committee has recommended improvement of Delgado st. and grading of Hinsache st.

Wichita Falls, Tex.—Citizens have voted additional bonds of \$25,000 for street paving.

Harrisonburg, Va.—Massanetta Springs Co. has appointed committee with G. R. Eastham, Chairman, to supervise construction of road from Harrisonburg to Massanetta Springs; distance four miles.

Lynchburg, Va.—Council is considering proposition for constructing concrete sidewalk from Southern Railway depot about three-quarter mile; cost approximately, \$2,700.

Norfolk, Va.—Council has appropriated \$1,612 for improving May ave. and \$1,500 for paving Woodside Lane.

Norfolk, Va.—City is considering paving of Church st. with asphalt, bitulithic, wood block or Belgian block; cost about \$100,000.—W. T. Brooke, City Engineer.

Seattle, Wash.—Council has decided to pave 31st ave. South, plank Maynard ave. and lay concrete walks on Pike st.; Board of Public Works has adopted specifications for grading and curbing 45th ave. S. W. and W. Oregon sts., paving McClellan st., grading Waters ave. and repaving 6th ave. South.

Seattle, Wash.—Board of Public Works has received following estimates; improving Highland Drive, bridge roadway to be 22 ft., \$1,775; grading and curbing Juneau ave., \$14,800; 6th ave., W., \$85,600, and 9th ave., N. E., \$5,700.

Huntington, W. Va.—Commissioners will soon receive bids for paving streets, which will include eight blocks on 8th ave., Johnson's lane, 2d, 5th and 7th sts.; total cost, \$170,000.—John Coon, Commissioner of Streets.

Watertown, Wis.—Plans are being prepared by City Engineer Arnold Kraeft for proposed paving.

Edmonton, Alta., Can.—Council has voted \$12,000 for concrete subway.

Niagara Falls, Ont.—Plans for a system of experimental roads between Bridgeburg and Niagara-on-the-Lake are being prepared by W. A. McLean, Provincial Good Roads and Highways Engineer.

CONTRACTS AWARDED

Los Angeles, Cal.—Constructing 28,000 sq. ft. of cement sidewalks and 8,000 ft. of cement curbing in Lawdaie Addition No. 2, by the Guy M. Rush Co., Story Building, to Paonessa & Taylor; two miles of shade trees will be set out in parkways.

Los Angeles, Cal.—Improving Bonita Pl., to A. W. Bessemeyer, \$2.21 per lin. ft. for grading and graveling complete; 38c. per lin. ft. for cement curb; 18c. per sq. ft. for cement gutter; 50c. per sq. ft. for vitrified block gutter; improving Ave. 8, to Paul H. Ehlers, 20.7 c. per lin. ft. for cement curb; 9.7c. per sq. ft. for cement sidewalk.

San Francisco, Cal.—Reraving portion of O'Farrell st. with basalt block to City Improvement Co., Mercantile Exchange Bldg., about \$12,050.

Woodland, Cal.—To Jcs. Lawrence for building 6,152 ft. of macadam on Ann st., Washington, \$1 per lin. ft.

Hartford, Conn.—Construction of state road work: Town of Canton, 6,123 lin. ft. gravel-telford road, including one reinforced concrete culvert, 8-ft. span, to Joseph Mascetti, Torrington, \$1.84 per lin. ft. for gravel, \$2.34 per lin. ft. for telford, 60c. per lin. ft. for rubble drain, and 60c. per sq. yd. for cobble gutters; Town of Preston, 7,825 lin. ft. graded telford road, including one reinforced concrete culvert, 8-ft. span, to Eldredge Construction Co., Mystic, \$13,728 for entire grading, with \$2.18 per lin. ft. extra for telford, 90c. per lin. ft. for rubble drain and \$4 per cu. yd. for walling; Town of Brooklyn, 5,030 lin. ft. of macadam-telford road, to Roger Kennedy, Middletown, \$1.79 per lin. ft. for native stone, \$2.48 for all trap rock, 60c. per lin. ft. for telford, \$1 per lin. ft. for rubble drain, 65c. per sq. yd. for cobble gutters; Towns of Litchfield and Harwinton, an aggregate of 3,332 lin. ft. to eliminate two grade crossings at East Litchfield, to Sternberg & Cadwell, West Hartford, \$10,900 for entire grading, 50c. per lin. ft. extra for telford, \$1.25 per lin. ft. for rubble drain; Town of New Fairfield, four sections graded-telford road, aggregating 4,160 lin. ft., to Joseph Mascetti, Torrington, \$6,300 for entire grading, 60c. per lin. ft. each for rubble drain and telford.

Carlyle, Ill.—Grading and keeping in repair township roads during year to S. Cov. Angelo.

East St. Louis, Ill.—Improving 40th st. and Forest Blvd., to Meyer & Thomas, \$20,956.45; Linden ave., to same, \$3,584.50.

Cary, Ind.—Paving Massachusetts st. to S. A. Smith.

Huntington, Ind.—Construction of the Thomas or county line gravel road to Hutsell & Wolfeale, Markle, \$17,997.

Wabash, Ind.—Construction of the M. Kilty road in Chester Township, 2½ miles in length, and Sharp road in Chester Township, 3 miles in length, to George M. Sewell, Jamesville, \$9,200, and to William Refert, Monroe, \$10,434.

Washington, Ind.—Constructing 3 miles of road in Davess County to M. H. Wilson, Montgomery, \$10,201.

Hutchinson, Kan.—To Wheeler & Kelcher Construction Co., Garden City, for rebuilding Haston road, \$3,510.

Baltimore, Md.—Paving Patuxent st. with vit. brick, to Martin T. Beach, Knickerbocker Bldg.

Sedalia, Mo.—To Jos. W. and Geo. T. McNelee, city, for paving Prospect st. with brick block on a 4-in. concrete base, cement fill, 8.20 sq. yds. at \$1.72 per sq. yd. Other bidders: F. W. Keller, \$1.73 per sq. yd.; Johnson & Hyatt, \$1.73½, and Carl P. Werner, \$1.74½—bidders all of city.

Rochester, N. Y.—Furnishing 180,000 ft. of lumber for Street Department, to Wm. B. Morse Lumber Co., \$5,315.50.

Akron, O.—Barges st. paving, to McAllan Bros., \$17,963.73.

Columbus, O.—Contract No. 12, covering paving of Mound st. viaduct, to A. G. Pugh, city, about \$18,000; work includes all paving incident to elimination of grade crossing at Mound st.

Hamilton, O.—To Andrews Asphalt Paving Co. for paving with sheet asphalt, East ave., \$48,938; North 6th st., \$21,065; South B st., \$23,998.

Jenerson, O.—Building North Ridge road, Ashtabula County, to Buckeye Engineering Co., Norwalk, for macadam with Wampum or Bessemer stone, Tarvia X, silica gravel, \$11,720; other bidders: Oatley & Ensign, Cortland, macadam Bessemer stone, Tarvia X, limestone chips, \$11,997; macadam Bessemer stone, Tarvia X, silica gravel, \$11,991; Thomas W. Nicholson, Cleveland, macadam with tar or asphalt, \$12,000; C. J. Chinnock, Warren, macadam, Tarvia X, Cambrian stone, limestone chips, \$11,761; macadam, standard asphalt binder, Cambrian stone, limestone chips, \$11,391; macadam, Tarvia X, Cambrian stone, silica gravel, \$11,933; macadam, standard asphalt, Cambrian stone, silica gravel, \$11,546; Callaghan & Farkinson, Bellevue, macadam, standard asphalt binder, limestone chips, \$11,389; R. P. Burnett, Cleveland, macadam, Bellview stone, standard oil treatment, silica gravel, \$12,412; macadam, Bellview stone, standard oil treatment, limestone chips, \$12,412; Walter F. Clifford, Ashtabula, macadam, Tarvia X, limestone chips, Bessemer or Wampum stone, \$12,238; macadam, Tarvia X, silica gravel, Bessemer or Wampum stone, \$12,416.

Altoona, Pa.—Paving with Clearfield brick, to Bell-Bockel Co.; Lehigh brand of cement will be used; former action rejecting bids rescinded.

Fuyallup, Wash.—Paving in Districts 27 and 28 to Warren Construction Co., 1105 A st., about \$23,448.

Tacoma, Wash.—Paving with brick a portion of Pacific ave., to Kessel Construction Co., \$65,948; other bidders, W. J. Murphy, \$37,667; Wright & Sweeney, \$41,190; N. A. Jones, \$37,293; Lister Construction Co., \$39,820; Anderson Construction Co., \$36,260.

BIDS RECEIVED

Bairdstown, Cal.—Grading and gravelling in Road District No. 1: H. V. Gentry, \$12,516 and A. W. Beesemeyer, \$24,991.

San Diego, Cal.—Street improvements, as follows: Improving J st., Barber Asphalt Paving Co., 19c. per sq. ft. for paving, 35.9c. per sq. ft. for granite block gutters; Fairchild-Gilmore-Wilton Co., 18c. for paving, 35c. for gutters; E. B. Farnhill-Gilmore-Wilton Co., 18c. for paving, 35c. for gutters; Barber Asphalt Paving Co., 19c. for paving, 35.9c. for gutters; for improving F st., Barber Asphalt Paving Co., \$100 for storm drains, 38.4c. for paving, 37.8c. for cement curb, 38.4c. for granite block gutters; Fairchild-Gilmore-Wilton Co., 19.3c. for paving, 37c. for granite block gutters, 35c. for cement curbs, \$60 for cement pipe drain.

East St. Louis, Ill.—Improving Linden ave.: (a) laying 1,090 lin. ft. limestone curb, (b) 56 cu. yds. excavation placed in fill, (c) removing 694 cu. yds. excavation; Myers Construction Co., (a) 70c., (b) 35c., (c) 45c.; Meyer & Thomas, (a) 64c., (b) 35c., (c) 35c.; Gaynard & Sweeney, (a) 75c., (b) 45c.; laying 1620 ft. paving, Myers Construction Co., Egyptian \$1.89, Superior \$1.89; Meyer & Thomas, Albion \$1.64, Alton \$1.64, Egyptian \$1.62, Superior \$1.64; Gaynard & Sweeney, Banner \$1.71, Egyptian \$1.78, Superior \$1.72; improving 40th st., (a) Myers Construction Co., (b) Meyer & Thomas, (c) Gaynard & Sweeney, (d) Walter Coonan, 1,255 cu. yds. excavation placed in fill, (a) 35c., (b) 35c., (c) 45c., (d) 30c.; 350 cu. yds. excavation removed, (a) 45c., (b) 35c., (c) 45c., (d) 30c.; 8880 lin. ft. limestone curb, (a) 70c., (b) 66c., (c) 75c., (d) 79c.; 180 lin. ft. 15-in. vit. clay pipe, (a) 75c., (b) 85c., (c) 75c., (d) 90c.; laying 8,665 sq. yds. paving, (a) Egyptian \$1.89; (b) \$1.66, (c) \$1.78; Superior, (a) \$1.89, (b) \$1.67, (c) \$1.72, (d) \$1.83; Albion, (b) \$1.67, (d) \$1.79; Alton, (b) \$1.67, (c) \$1.72.

Louisville, Ky.—Improving Ramsdell ave. with vit. block gutters and asphalt driveway; American Standard Asphalt Co., lowest bidder, \$1.97 per sq. yd.

Grand Haven, Mich.—Street paving: W. W. Hatch & Son Co., 1005 Hammond Bldg., Detroit, brick paving on 6-in. concrete foundation, \$25,957; on 6-in. concrete, if contract is awarded before Jan. 15, \$35,665; Westrumite, with brick between rails, \$35,-

30; Marble Cement and Coal Co., Muskegon, Tarvia X on 5-in. base course, and 1/2-in. top, \$24,064; Tarvia X on 6-in. base course, and 2 1/2-in. top, \$26,038; Tarvia X on 6-in. base course and 3-in. top, \$29,988; C. H. Kanmeir, 919 6th st., Port Huron, brick paving on 6-in. concrete foundation, \$35,554; C. Marshallman, 226 6th st., Grand Rapids, brick paving on 6-in. concrete foundation, \$32,217; treated macadam, \$24,203; asphalt concrete, \$32,686; Farrell Bros., 701 Main st., W. Lansing, brick paving on 6-in. concrete foundation, \$34,738; Carpenter and Anderson, 310 Shepard Blk., Grand Rapids, brick paving on 6-in. concrete foundation, \$31,050; C. E. Williams, 33 Paddock st., Grand Rapids, brick paving on 6-in. concrete foundation, \$31,828; asphalt macadam on 6-in. concrete foundation, \$23,314; asphalt macadam on 6-in. stone foundation, \$23,051; tar macadam on 6-in. concrete foundation, \$22,835; tar macadam on 6-in. stone foundation, \$22,583; Anson Grune, 47 South Union st., Grand Rapids, brick paving on 6-in. concrete foundation, \$360 to be allowed or use of city roller, \$31,485; Tarvia on crushed stone and 4-in. top course, \$22,161; Tarvia on concrete, and 4-in. top course, \$23,012; John Vander-Wheele & Cornelius Vander-Wheele, 51 Baldwin st., Grand Rapids, brick paving on 6-in. concrete foundation, \$32,695.—Riggs & Sherman Co., Toledo, O., Engineer-in-Charge.

New York, N. Y.—Repairing and maintaining sheet asphalt pavements in Manhattan Borough: (a) 270,000 sq. yds. asphalt pavement, including binder course; (b) 500 cu. yds. Portland cement concrete; (c) 1,000 cu. yds. old stone pavement, to re-lay; (d) total: Uvalde Asphalt Co., 1 Broadway, (a) 90c, (b) \$7.50, (c) 75c, (d) \$47,500; Barber Asphalt Paving Co., (a) 3c, (b) \$7.83, (c) 90c, (d) \$255,900.

Seattle, Wash.—Paving Western ave., Ferguson Coit Co., Arcade Annex, lowest bidders, \$58,996.60; only other bidder, Macadam & Co., \$60,996.

SEWERAGE

Ensley, Ala.—Jefferson County Board of Revenue will construct \$50,000 concrete septic tank to purify drainage of county sanitary sewer.

Clebe, Ariz.—City is considering fund plan for establishment of sewerage system. Address Mayor Coplen.

Pasadena, Cal.—Council is considering construction of sewer on Mountain st. and in portions of Hudson and Belvidere sts.

Washington, D. C.—Improvements for northwest section of city have been ordered which will include laying of a sewer in Mount Pleasant and Irving sts.

Washington, D. C.—Superintendent of Sewers Asa E. Phillips has \$40,000 available for construction of sewer from P st. to Massachusetts ave.

Augusta, Ga.—Commissioner of Public Works Nisbet Wingfield has recommended liberal appropriation for construction of lateral sewers.

Gainesville, Ga.—City will extend sewer system; E. P. Eppes, City Engineer, and Consulting Engineer Barnett, Athens, have been selected to supervise construction.

Macon, Ga.—Alderman Elkin, Chairman of the Sewer Committee, has stated that laying of sewers in South Macon and on Napier Heights would be taken up after present work on Boundary st. is completed.

Murphysboro, Ill.—Council has authorized construction of sewer system to drain north half of city.

Peoria, Ill.—Superintendent of Sewers Sherman Eckley has recommended construction of sewer on south side.

Jefferson, Ia.—Plans will be prepared by Engineers J. S. Worley Co., 206 Reliance Bldg., Kansas City, Mo., for system of sewers.

Keokuk, Ia.—Construction of sewer on 1st st. is being considered.

Topeka, Kan.—City Commissioners are considering construction of drains in First Ward to relieve surface water; cost \$6,000.

Wellington, Kan.—Plans will be prepared by J. S. Worley Co., 206 Reliance Bldg., Kansas City, Mo., for proposed sewage disposal plant.

Paducah, Ky.—E. F. Layman, Cincinnati, O., has been selected to prepare plans for septic tank to be installed for purification of sewage of Colonial Heights.

Cassopolis, Mich.—Citizens have defeated proposition to issue \$30,000 bonds to install sewer system; dredging of Stone Lake and beautification of its shores are being urged.

Laurium, Mich.—Citizens are considering construction of septic tank for purification of sewage; cost \$10,000.

Duluth, Minn.—County Board of Poor Commissioners has decided to wait until spring before beginning work on installation of new sewerage system.

Linden, N. J.—Township has decided to construct lateral sewer in Elizabeth ave.—J. P. Winans, Chairman Township Committee.

Northmouth Beach, N. J.—Establishment of \$50,000 sewer system is being considered.

Sea Island City, N. J.—Plans have been accepted by Councils and bids will soon be asked for construction of a sewer system and sewage disposal plant to be built during coming spring; cost, between \$35,000 and \$40,000.—S. R. Goff, Ocean City, Engineer; T. E. Devow, President Councils.

South Amboy, N. J.—City has sold \$75,000 sewer bonds to R. M. Grant & Co., New York.

Verona, N. J.—Mayor J. R. Pratt has recommended installation of sewage system.

Binghamton, N. Y.—Plans are being prepared for peculiar shaped sewer along Park Creek.

North Pelham, N. Y.—Citizens have voted to enter into contract with Pelham and Pelham Manor to go through villages for construction of outlet sewer to disposal plant; also \$15,000 bonds for construction of outlet sewer; village of Pelham Manor has defeated proposition to enter into contract, while Pelham voted favorably.

Poughkeepsie, N. Y.—Board of Public Works has voted to construct sewer in N. Clinton st. and North st.

Red Springs, N. C.—Citizens have voted bonds for construction of sewer system.—B. Iearshall, Mayor.

Cincinnati, O.—Plans will be prepared for construction of sewer in Riverside and Hillside ayes.

Sandusky, O.—Mayor Geo. T. Lehler has recommended reconstruction of city's sewerage system.

Ligonier, Pa.—Application has been made to State Health Department for permit to build sewerage system and sewage disposal plant according to plans prepared by F. H. Shaw, of Lancaster; work contemplated is 5 miles of 6-in., 8-in., 10-in., 12-in. and 15-in. sewers, disposal plant with sedimentation tanks of "Emscher" type and sprinkling filter beds and pumping station; bond issue will be voted on.—Frank N. Keffer, Chairman Sewerage Committee.

Sharpsville, Pa.—Town is considering construction of sewers during year.

Murfreesboro, Tenn.—Mayor G. B. Giltner has recommended laying of line of sewerage.

Texarkana, Tex.—Council has adopted ordinance creating improvement district No. 10 for purpose of installation of system of sewerage.

Antigo, Wis.—Plans are being prepared by Engineer Wm. G. Kirchoffer, Madison, for sewer and sewage disposal plant; cost \$50,000.

Watertown, Wis.—City Engineer Arnold Kraelt is preparing plans for proposed sewerage system.

CONTRACTS AWARDED

Tucson, Ariz.—Construction of sewer in southwest portion of city; pipe, to Pacific Sewer Pipe Co., of Los Angeles, Cal., \$8,001; to the Tucson Concrete Construction Co., of Tucson, for laying sewers, \$4,856.

Oraville, Cal.—Building sewer system, to Contia Costa Construction Co., \$90,019; bid of J. W. Pierson, Sacramento, rejected.

Washington, D. C.—Building sewer from P st. near Rock Creek to Military road, to E. G. Gummel, 300 Rhode Island ave., N. W.

Jacksonville, Fla.—Laying 1,100 ft. of 15-in. and 200 ft. of 12-in. reinforced concrete pipe to the Reinforced Concrete Culvert Pipe Co., city.

Louisville, Ky.—Contract for Section C of Middlefork sewer, involving \$30,000, has been awarded to the Henry Lickel Co., Louisville.

Houghton, Mich.—To Chester O. Davis, for construction of sanitary sewer.

St. Joseph, Mo.—Construction of sewers, to E. F. Mignery; 59 1/2c. per lin. ft., Dist. No. 53; 54c. for Dist. No. 114, and 55c. for Dist. No. 117.

Plainfield, N. J.—Furnishing and installing sewage pumping machinery, to Blaisdell Machinery Co., New York City, \$3,745; plant is to consist of motors, air compressors, ejectors and operating devices in duplicate, air receiver, pipe connections, gates and valves complete, cap. 175 gal. per minute through 8-in. force, main 1,900 ft. long, actual lift from bottom of ejectors to outlet of force main, 21 ft.

Newburgh, N. Y.—To Pietro Luciano, White Plains, for sewer in Lake st., \$8,912.

Akron, O.—Second ave. sewer, to E. McShaffrey & Son, \$11,234.75; Water st. sewer, to H. O. Toole, \$3,191.65.

Seattle, Wash.—Building sewers on 12th ave. to V. Romaglia and C. Christoforo, 6506 3d ave., N. W., \$21,883.

BIDS RECEIVED

Monrovia, Cal.—Construction of a sewer system: (a) furnishing all labor and material complete; (b) furnishing labor only, exclusive of vitrified pipe, brick and cement; Nukropina & Meletich, Los Angeles, (a) \$18,889; Pekich & Tomich, of Los Angeles, (a) \$83,273, (b) \$41,115; R. C. Lowell, (a) \$85,744, (b) \$43,895; Register & Hendricks, of Los Angeles, (a) \$87,770, (b) \$43,507; Zambica & Nikceirch, (a) \$87,773; Chamberlain & Williamson, Pasadena, (a) \$89,180, (b) \$50,000; E. R. Werdin, Los Angeles, (a) \$83,944; John Balch, Los Angeles, (a) \$90,727, (b) \$45,479; E. R. Davidson, Monrovia, (a) \$91,218; Andrew Holoway, Pasadena, (a) \$95,110, (b) \$43,741; J. D. Kneen, (a) \$95,822; W. A. Frick, (a) \$98,978; Peter Grbovoch, Los Angeles, (a) \$99,031; A. S. Bent, Los Angeles, (a) \$101,000; Thomas H. Shea, (a) \$105,919; Westlake Construction Co., (a) \$113,008; Mesmer & Rice, (a) \$79,672; for material: Vitrified pipe by Pacific Sewer Pipe Co., \$38,271; concrete pipe by Reinforced Concrete Pipe Co., \$11,000; brick by Los Angeles Pressed Brick Co., \$10 per M, and Standard Pressed Brick Co., \$8 per M; cement by Riverside Portland Cement Co., \$3,000. Engineers, Olmstead & Gillett, Wright & Callender Bldg., Los Angeles.

WATER SUPPLY

Benson, Ariz.—Board of Supervisors has granted franchise to J. S. Douglas, Douglas, and W. H. Brophy, Bisbee, to supply town with water works.

Riverside, Cal.—Riverside Artesian Water Co. has issued \$200,000 bonds for installation of larger service pipes and improving system.

Sacramento, Cal.—Board of City Trustees has decided to install a steam pump for city pumping plant.

St. Petersburg, Fla.—F. S. Guthrie desires pipes on water works plant; daily capacity, 400 gals. of water.

Augusta, Ga.—Commissioner of Public Works Nisbet Wingfield has recommended installation of additional filter units.

Gainesville, Ga.—City will extend water works; E. B. Eppes, City Engineer, and Consulting Engineer Barrett, Athens, have been selected to supervise construction.

Chicago Heights, Ill.—City will ask for bids in spring for laying 1,600 ft. of 6-in. c. i. water main.—W. E. Lemertz, Clerk; J. C. Mote, Mayor.

Moline, Ill.—Mayor Olsen has appointed committee, G. A. Stevens, W. L. Velie and others, to investigate water works and report if improvements are necessary.

Stamford, Ill.—Citizens have voted to install \$13,500 water works system with new central plant.

Gas City, Ind.—Municipal water and electric light plant destroyed by fire will be rebuilt.—Thos McKee, Chief Engineer.

South Bend, Ind.—National Board of Fire Underwriters has recommended obtaining of additional well supply, providing of suction storage at pumping station and additional pumping capacity of at least 16,000,000 gals. per day; rebuilding of all frame structures at pumping station with brick; extension of mains and installation of gate valves.

Atlantic, Ia.—The W. K. Palmer Co., Engineers, 717-720 Dwight Bldg., Kansas City, Mo., are preparing plans for pumping and electric light plant for city; bond issue \$50,000.

Englewood, Kan.—Bonds have been sold for construction of water works.—J. S. Worley Co., 206 Reliance Bldg., Kansas City, Mo., Engineers.

Hugoton, Kan.—Stevens County Commissioners have decided to bore for artesian water.

Hugo, Kan.—City is considering installation of water works system.

Mound City, Kan.—Engineers J. S. Worley Co., 206-7 Reliance Bldg., Kansas City, Mo., have been selected to prepare plans for system of water works.

Patterson, La.—City has selected Fred A. Jones Co., Houston, Tex., as Engineer in charge of construction of water works; cost \$30,000; will erect \$1,000 building, construct steel elevated tank and install 1,000-gal. pump.

West Brookfield, Mass.—Town is considering construction of a water system; cost, \$30,000.

Marquette, Mich.—Light and Power Commissioner will erect dam at outlet of Silver Lake.

Argyle, Minn.—Village is considering bond issue for installation of water works system.

Minneapolis, Minn.—Bids will be received Feb. 2, 2 p. m., for \$500,000 water works bonds.—D. C. Brown, City Comptroller.

St. Joseph, Minn.—Village is planning extensions to water works system.

Laurel, Miss.—Mayor Noble has recommended improvement and enlargement of city water works plant.

Moberly, Mo.—City has had plans prepared by Rollins & Westover, Kansas City, for extension of water works; will install pumping plant; cost \$50,000; contracts will be let in early spring.

Helena, Mont.—Citizens have voted \$650,000 bonds to install water plant.

Fairbury, Neb.—Burns & McDonnell, Scarritt Bldg., Kansas City, Mo., are completing plans of water works and electric lighting improvements; cost \$40,000; bonds sold.

Lodge Po'e, Neb.—Geo. Potts is preparing preliminary plans for water works; cost about \$10,000.

Milford, Neb.—City has sold \$18,500 water bonds to Investors' Securities Co., Des Moines, Ia.

Florence, N. J.—Taxpayers have forwarded petition to the Township Committee to ascertain lowest probable cost of installing a municipal water service.

Hillsboro, N. J.—Town is considering construction of water works system.

Hopewell, N. J.—Borough is considering \$3,000 bond issue for repairing reservoir and extending water mains.

Verona, N. J.—Mayor J. R. Pratt has recommended extension of water system and erection of stand pipe.

East Aurora, N. Y.—Engineer Fred. K. Wing, 910 White Bldg., Buffalo, has completed tentative plans for sewage disposal plant and sewer system; citizens will vote on the question soon; estimated cost \$100,000. Address Village President Brotherhood.

New York, N. Y.—Bids will be received Jan. 21 by City Controller Prendergast for \$21,500,000 bonds for developing water supply system.

Red Springs, N. C.—Citizens have voted issuance of bonds for construction of water works and sewerage system; will construct iron tank 190 ft. high, 125,000-gal. capacity; cost \$30,000; engineer not yet selected. —A. B. Fearsall, Mayor.

Thomasville, N. C.—Construction of water works and sewer system is being considered.

Mandan, N. D.—Plans and specifications are being completed by Burns & McDonnell, Scarritt Bldg., Kansas City, Mo., for water works improvements, including new pumping station and settling basins, approximate cost \$65,000.

Barberton, O.—City is considering purchase of 30 more acres of land for purpose of drilling more artesian wells to make water supply of city nearer adequate.

Cincinnati, O.—Bids will be received, Jan. 23, noon, for \$125,000 bonds to improve water works.—E. Von Barg-n, City Auditor.

Sandusky, O.—Mayor Geo. T. Lehler has recommended general overhauling of water filtration plant.

Madras, Ore.—City will install \$10,000 water plant.

Portland, Ore.—National Board of Fire Underwriters has recommended additional storage facilities for the 50,000,000 to 100,000,000 gallons of water for use of the Fire Department; increase by two inches in size of service pipes, prevention of water waste, improvement of western low gravity water system, installation of duplicate main arteries from the reservoirs, laying of twelve new water mains, two fire hydrants at each street intersection in the business section, and the establishment of gate valves in water pipes.

Ligonier, Pa.—Plans have been submitted to State Department of Health for its approval of contemplated enlargement of the municipal water works, which includes a circular, concrete reinforced distributing reservoir of 500,000 gal. capacity, and about 2 miles of 10 in. and 12-in. mains; bonds will be voted on.—F. H. Shaw, Lancaster, Consulting Engineer; Frank M. Keffer, Member Water Committee.

Newton, Pa.—Newton Water Co. has decided to make improvements to its plant and sink another artesian well to supply town.

York, Pa.—Land fronting on the east branch of the Codorus Creek in York and Springfield townships has been purchased by York Water Company for purpose of erecting impounding basin to store surplus water during winter for use in the summer; proposed improvements will begin early next spring, and will require outlay of about \$125,000.

Columbia, S. C.—City has \$6,000 available for new hydrants, service connections, etc.

Gainesville, Tex.—Citizens have voted \$150,000 bonds to purchase water works.

Paris, Tex.—Council has selected F. H. Lancashire, Dallas, to submit report on improvement of water pumping plant.—Edward H. McCusiston, Mayor.

Taylor, Tex.—Council has made agreement with A. T. Zilker, owner of Taylor water works, to increase water supply by

erection of concrete pump house, increasing of storage capacity, installation of additional and larger pumps and boilers and 10-in. instead of 6-in. mains.

Park City, Utah.—Mayor Frank Daley has selected Messrs. Kearns, Thompson & Beggs to secure plans and specifications for proposed water system.

Spokane, Wash.—Plans for 12-in. high-pressure mains on Main and Sprague sts. and 10-in. mains on all cross streets from Division to Monroe have been drawn; installation of 12-in. main on 2d ave. at cost of approximately \$120,000 suggested.

Pembroke, Ont., Can.—Citizens have passed by-law to raise \$65,000 to extend intake pipe of water works system.

Winnipeg, Man., Can.—Specifications will be prepared for pump for two wells which city will sink.

CONTRACTS AWARDED

Fort Wayne, Ind.—To Thrasher & Herman, deep well contractors, Barr st., to drill test wells on east side, where it is proposed erecting pumping station No. 4, \$1.68 per ft. from top to bottom.

Newton, Kan.—Furnishing 2,500,000-gal. pumping engine to Laidlaw-Dunn-Gordon Co.

St. Paul, Minn.—Hydrant and valve supply for coming year to South Park Foundry & Machine Co., St. Paul.

Kansas City, Mo.—To Chapman Valve Co., of St. Louis, for valves, about \$4,690.

Cimarron, N. M.—Construction of water works to the Cook & Gregory Construction Co., Joplin, Mo., about \$32,329.

Fort Worth, Tex.—Furnishing duplicate air compressor for city water works system, to the Ingersoll-Rand Co., St. Louis, \$21,574.

BIDS RECEIVED

Los Angeles, Cal.—Furnishing all fabricated steel and rivets necessary to construct 1,409 ft. of riveted steel siphon 9 ft. 6 in. in diam.; Camden Iron Works, \$9,400 f.o.b. cars or alongside wharf, Camden, N. J.; time of shipment 7 weeks from receipt of order; shipping weight, 505,500 lbs.; East Jersey Pipe Co., \$15,279 f.o.b., Paterson, N. J.; time of shipment 6 weeks from receipt of notice; shipping weight, 265 tons; Springfield Boiler & Mfg. Co., \$13,735 f.o.b., Springfield; time of shipment 4 months; estimated weight, 537,200 lbs.; United Iron Works, \$12,000 f.o.b., Warren, Pa.; time of shipment first carload 30 days from date of order; shipping weight, approximately 506,962 lbs.; Power & Mining Machinery Co., \$14,816 f.o.b., Cudahy, Wis.; time of shipment 90 days; shipping weight, 516,000 lbs.; Llewellyn Iron Works, \$10,681 f.o.b., Alliance, O.; time of shipment, begin in 6 weeks, complete in 90 days; shipping weight, 250 tons; Scully Steel & Iron Co., per drawings, specify 476,462 lbs.; 4 per cent light of 19,078 lbs.; 435,520 lbs. at \$10,150 f.o.b., Chicago, Ill.; start shipping 30 days, complete shipments in 90 days; shipping weight, 489,000 lbs.; Pacific Coast Mfg. Co., \$9,450 f.o.b., Pittsburg, Pa.; complete in 5 weeks; shipping weight, plates 506,000 lbs., rivets 21,000 lbs.; Wm. B. Follock Co., \$10,725 f.o.b., Youngstown, O.; time of shipment, 75 days; shipping weight, 466,000 lbs.; Kennicott Co., \$12,172 f.o.b., Chicago Heights, Ill.; time of commencement of shipment two months after receipt of contract; estimated shipping weight, 490,000 lbs.; Struthers-Weils Co., \$14,610 f.o.b., Warren, Pa.; for steel plate of open-hearth flange quality, made according to Manufacturers' Standard Specifications; estimated weight, 523,687 lbs.; could commence shipping in 4 weeks after order reached shop; Braun, Williams & Russell, Inc., \$10,400 f.o.b., Sharon, Pa.; time of shipment, complete in 70 days; shipping weight, 540,000 lbs.; Wildman Boiler Works, \$9,990 f.o.b., Chicago; time of shipment, 60 days; shipping weight, 492,000 lbs.; Ritter-Conley Mfg. Co., \$9,330 f.o.b., Pittsburg, Pa.; time of shipment 60 days; shipping weight, 523,000 lbs.; Shaw-Patcher Co. Pipe Works, \$13,250 f.o.b., Sacramento, Cal.; time of shipment, begin delivery in 35 days and complete in 30 days thereafter; shipping weight, 505,898 lbs.

Spokane, Wash.—Completion of Lincoln Heights reservoir, S. A. Fish and C. Harnett, lowest bidders, \$162,500.

LIGHTING AND POWER

Mobile, Ala.—Board of Public Works will consider permanent lighting of Bienville Square.

Benson, Ariz.—Board of Supervisors has granted franchise to J. S. Douglas, of Douglas, and W. H. Brophy, of Bisbee, to use streets for installing electric lights and power and for water system, and another for transmission of electric power and light up Sulphur Springs valley from Douglas.

Northside, Cal.—Citizens League has endorsed plan for installation of light plant.

Willows, Cal.—Town Trustees have rejected bid of Northern California Power Co. to furnish arc lights for streets at rate of \$72 a light a year for period of five years, considering price too high.

Carbondale, Colo.—Town Trustees have granted W. M. Dhukel franchise to furnish light and power to town for period of 2 years.

Palisades, Col.—Franchise has been granted to Municipal Light, Power and Telephone Co. to string wires; new company will furnish a 24-hour service.

Stratford, Conn.—Town has voted \$2,500 appropriation to install 100 additional street lights.

Washington, D. C.—An American Consulate in an Asiatic country has reported that certain municipality has decided to erect \$85,000 central electric light plant. Address No. 6107, Bureau of Manufactures.

Washington, D. C.—Report from an American Consul in Latin America containing particulars of organization and plans of company which will establish large hydroelectric plant; American manufacturers of electric machinery and equipment should look after this business directly if they desire to have the first opportunity to sell the materials which will be required to complete plant and transmission system. Address No. 6106, Bureau of Manufactures.

Streator, Ill.—Illinois Valley Gas & Light Co. will erect a large power plant; cost \$250,000.

Fairmount, Ind.—Town Council is planning to award contract for lighting streets.

Gas City, Ind.—Municipal electric light and water plant destroyed recently by fire will be rebuilt.—Thomas McKee, Chief Engineer.

Atlantic, Ia.—W. K. Palmer Co., Engineers, 717 Dwight Bldg., Kansas City, Mo., are preparing plans for electric light and pumping plant; bond issue \$50,000.

Central City, Ia.—Citizens will vote Jan. 30 on granting franchise to F. J. Cross, Monticello, to install \$30,000 light, heat and power plant.

Opelousas, La.—City will make improvements to electric light plant and install additional machinery.—Armas Durio, Superintendent.

New Bedford, Mass.—Street Lighting Committee has asked \$80,000 appropriation for year; about \$3,936 will be used for improvements.

Eveleth, Minn.—Details will be secured by City Clerk McIntyre for proposed white way.

St. Paul, Minn.—Minneapolis General Electric Co. will erect \$750,000 steel and concrete plant.

Marionville, Mo.—Construction of electric light plant is being considered.

Hillsboro, N. J.—Town is considering construction of electric light plant.

Easthampton, L. I., N. Y.—Easthampton Electric Light Co. has petitioned the Public Service Commission for permission to issue \$14,000 bonds, to be used for enlargement of the power house and for improvements to plant.—N. N. Tiffany, Manager.

Oneida, N. Y.—Taxpayers are considering municipal ownership of electric light plant.

Pittstown, N. Y.—Public Service Commission at Albany has authorized Hoosac River Electric Light & Power Co. to exercise franchise granted by town for furnishing of electricity for light, heat and power.

Akron, O.—E. B. Tyler and S. E. Conner, Cleveland, have asked for heat and power franchise for 25 years.

Harrisburg, Pa.—Select Council has passed ordinance providing for placing 11 arc lamps and one incandescent.

Kleppertal, Pa.—Electric plant owned by Metropolitan Electric Light Co., Reading, will be reconstructed at cost of \$60,000.

Steeleton, Pa.—The Steleton Light, Heat and Power Co. is considering erection of generating station.—Fred E. Keeney, city, Superintendent and Chief Electrician.

Irene, S. D.—Jensen Bros. have been granted franchise for installation of electric light plant.

El Paso, Tex.—Col. A. C. Sharpe, Commander of Fort Bliss, has received notice from War Department that his request for appropriation to install electric lights at fort in place of the old-fashioned oil lamps has been allowed; electric light plant will cost about \$17,000.

Paris, Tex.—Council has selected F. H. Lancashire, Dallas, to submit report on construction of street lighting plant.—Edward H. McCusiston, Mayor.

Flainville, Tex.—J. E. Powell, representing capitalists of Springfield, Ill., is making preparations for putting in gas plant. Mayor James R. DeWay and City Secretary James Hamilton have matter in hand.

Camas, Wash.—If franchise is secured E. E. Goff, Portland, Ore., will build a 500-h.p. electric plant on Washougal River.

South Bend, Wash.—Council has passed Jay D. Crary electric street car and power franchise ordinances.

Wausau, Wis.—City will get proposed municipal lighting plant if State Rate Commission will consent to city operating.

Amherst, N. S., Can.—Canada Electric Light Co., Ltd., has decided to expend \$13,000 on extensions and improvements to plant.—Charles Bert, Amherst, Chief Engineer.

Listowel, Ont., Can.—Citizens have voted to expend \$5,000 to complete electric lighting system.

CONTRACTS AWARDED

Bluffton, Ind.—Installing 450 h.p. engine. Fleming & Harrisburg Co., Harrisburg, Pa.; dynamo and other electrical equipment, to Forsythe Electric Works.

Boston, Mass.—Installing electrical apparatus in Curter Hall, Jamaica Plains, to Edwin C. Lewis, \$4,471; other bidders: T. Kelly & Co., \$4,882; A. C. G. Luke Co., \$5,000.

Rome, N. Y.—Lighting streets for five years, to Rome Electric Light and Power Co., \$33 per year for arc lamps.

St. Marys, O.—Installing gas producing plant in electric light plant, to St. Marys Machine Co., \$18,500.

Pottstown, Pa.—By Suburban Gas and Electric Co., to Westinghouse Machine Co., Pottstown, for 625-kw. turbine, and to Westinghouse Electric and Manufacturing Co., for 2,300-volt generator.

Brookston Falls, N. B., Can.—Unit of water wheels to be installed for Main and New Brunswick Electrical Power Co., to Morgan Smith Co., York, Pa.; unit will develop 2,400-h.p. under a head of 72 ft.—R. Gould, Presque Isle, Me., Managing Director.

FIRE EQUIPMENT

Helena, Ala.—City will erect fire station.

San José, Cal.—Board of Fire and Police Commissioners has asked \$48,000 appropriation for fire department, to be used as follows: New fire house on North 8th st., to replace present house, \$5,000; 30 head horses, \$10,000; two combination chemical wagons, \$4,500 each; lot extreme south end lot extreme north end of city, \$500 ch; house for each lot, \$1,500; one fire engine, \$6,000; 2,000 ft. fire hose, \$2,000; 10 fire hydrants, \$3,000; to place wiring underground in business section, \$6,250; hose for fire alarm, \$1,250; 20 new fire alarm boxes, \$2,500.

Chicago, Ill.—Chief Chas. Seyferlich is favorable to better equipment of department with auto apparatus.

Huntington, Ind.—Mayor Milo Feightner has recommended equipment of east end station.

South Bend, Ind.—National Board of Fire Underwriters has recommended installation of 900-gal. steam fire engine at headquarters, equipment of truck with quick-releasing device and ladder pipe, installation of 70-h.p. auto chemical engine with two chemical tanks at headquarters, equipment of each hose wagon in service with one-gal. tank, purchase of 2,000 ft. of hose at headquarters and minor equipment.

Des Moines, Ia.—Fire Chief Wm. Burnett recommended purchase of two fire engines.

Chanute, Kan.—Fire Chief Herod is considering purchase of chemical engine.

Leavenworth, Kan.—Fire Chief Michael Ahler has recommended erection of fire station in southern part of city.

Cnicopee, Mass.—Chief John E. Pomret has recommended purchase of motor-driven apparatus for Grape St. house, also erection of a new station for Falls, to be equipped with motor fire truck.

Haverhill, Mass.—Council has decided to bid for 2,000 ft. of hose.

Saugus, Mass.—Cliftondale residents are giving purchase of auto chemical by this town.

Worcester, Mass.—Fire Chief Geo. S. Sleman has recommended purchase of two double tank automobile chemical engines of 5,000 ft. of new hose, also engine for Burncoat st. station.

Laurel, Miss.—Mayor Noble has recommended purchase of combination auto fire-fighting machine.

St. Louis, Mo.—Architect F. A. Huser has ordered prepared plans for erection of house for auto apparatus.—W. B. Dryden, Secretary Board of Public Improvements.

Logansport, N. J.—Fire Chief H. P. Ross is giving purchase of \$525 chemical engine for New Heights fire company.

Millville, N. J.—Fire Chief P. T. Ludlam has recommended purchase of combination chemical engine and hose wagon and quantity of hose; also erection of fire station on West Main st.

Newark, N. J.—West Side Improvement Association is urging establishment of hook and ladder in western part of city.

Princeton, N. J.—Council has allowed \$10,000 for fire protection, including purchase of auto engine.

Lockport, N. Y.—Fire Chief Cunningham has recommended purchase of 2,000 ft. 2½-in. hose, two shut-off nozzles, two 35-gallon chemical tanks, and one small chemical for chief's rig.

Saranac Lake, N. Y.—Village has voted \$18,000 appropriation for purchase of site on Broadway and erection of fire house to cost \$11,000; apparatus will cost \$4,000.

Brevard, N. C.—City desires prices on fire alarm whistle operated preferably by compressed air.—C. M. Doyle, Chief of Fire Department.

Akron, O.—Bids have been rejected for purchase of auto for Fire Chief.

Gallipolis, O.—Director of Public Safety W. S. Mauring will purchase 1,150 ft. of 2½-in. fire hose.

Sandusky, O.—Director of Public Safety Claude B. De Witt has recommended purchase of aerial truck and costly repairs at various fire stations.

Portland, Ore.—National Board of Fire Underwriters has recommended the establishment of four fire companies and erection of five fire houses; also placing underground of overhead wires and extension of fire alarm system.

Reading, Pa.—C. Mathias, Superintendent of Fire Alarms and Police Telegraph System, has recommended improvements to fire alarm system to cost about \$7,100 and to telegraph system, \$4,000.

Reading, Pa.—Mayor Wm. Rick has recommended furnishing of hook and ladder truck for northern part of city.

Robesonia, Pa.—Pioneer Hose Co. No. 1 will purchase combination wagon and erect fire house.

York, Pa.—Council is considering purchase of aerial truck for Rex Hook & Ladder Co.

Oaklawn, R. I.—Fire Association is considering purchase of site for erection of fire station.

Blunt, S. D.—Volunteer fire department has been organized with John Howard as Chief.

Cheeraw, S. C.—Council is considering need of better fire equipment.

Austin, Tex.—Colorado Hose Co. No. 2 is considering purchase of combination auto engine, hose and chemical engine.

Claremont, Va.—Corporation, C. S. Santmeyer, Recorder, Box 154, desires catalogues, prices, etc., on fire apparatus for town of 1,000 population.

Portsmouth, Va.—Chief of Fire Department asks for purchase of one repeater, one store house, auxiliary tapper system, hose dryers for each house, 3,000 ft. of hose, six additional paid men, five horses, switchboard, relief valves for all three engines, heaters for keeping steam on engines at all times, shut-off nozzles, four additional fire alarm boxes, six high pressure platforms, six dozen rubber coats and six dozen pairs of rubber boots.

Seattle, Wash.—Board of Public Works has rejected all bids for furnishing motor wagon for use of the city electrician and new bids will be asked; bidders were as follows: H. F. Norton Co., \$950; Automobile Exchange, \$750; Hallidie Machinery Co., \$1,150.

Seattle, Wash.—Plans and specifications have been adopted for 3 and 3½-in. hose.

Racine, Wis.—City will rebuild house of company 2 at cost of \$7,000.

Spokane, Wash.—Fire Commissioners have recommended erection of fire station for North Hill district.

CONTRACTS AWARDED

Jersey City, N. J.—Combination engine and hose motor wagon, to the Pope Motor Co., Hartford, Conn., \$5,200; wagon to be delivered within 90 days; 750 ft. of 2½-in. 4-ply cotton jacketed rubber lined hose, to Eureka Fire Hose Co., \$1.20 per ft.; to Voorhees Rubber Mfg. Co., for 1,150 ft. of 2½-in. hose, 95c. per ft.

Seattle, Wash.—Furnishing three auto hose wagons, to Pacific Coast Fire Supply Co., representing Waterous Engine Works Co., \$11,235.

BRIDGES

Denver, Colo.—Eridge is to be constructed over Dry Creek at 12th ave. and Sheridan boulevard.

Rome, Ga.—County Commissioners are planning to build 240 culverts and 60 steel bridges on main county roads during next two years; cost \$100,000.

Indianapolis, Ind.—Board of Public Works will consider erection of concrete bridges across Pleasant Run at State ave. and Minnesota st.

Normal, Ind.—City is considering erection of concrete bridge on Virginia ave.—G. C. Broyhill, City Engineer

Powhatan, La.—Natchitoches County Police Jury, Natchitoches, will construct iron bridge across Three League Bayou.

Baltimore, Md.—State Road Engineers have completed survey for proposed new State bridge over Nanticoke River at Sharptown, between Wicomico and Dorchester Counties.

Pittsfield, Mass.—Construction of a bridge over Housatonic River at Elm st. is being considered, at cost of \$14,000.

Menominee, Mich.—City Engineer Hillis, Marinette, has about prepared plans for erection of proposed bridge over Menominee River.

Port Gibson, Miss.—Claborne County Commissioners will rebuild bridge over Little Bayou Pierre at foot of Farmer st.

Fulton, N. Y.—Council has taken up matter of constructing new bridge across Oswego River at Broadway.

New York, N. Y.—Park Commissioner Stover will ask for \$50,000 appropriation to restore Terrace bridge.

New York, N. Y.—Bids will be received Jan. 24 by City Controller Prendergast for \$2,000,000 bonds for bridges.

Northampton Beach, L. I., N. Y.—Citizens have voted to construct bridge over canal; cost \$8,000.

Warsaw, N. Y.—Town is considering construction of bridge across Oatka Creek.

Cincinnati, O.—City is considering erection of bridge at East Ridgeway ave.—F. H. Shipley, City Engineer.

Zanesville, O.—New bids will be asked by County Commissioners for building substructure of Fifth st. bridge.

Durwood, Okla.—County is planning to erect bridge across Wolf Creek.

Portland, Ore.—Preliminary plans for proposed new bridge across Willamette, from Ellsworth to Meade st., have been prepared by City Engineer Morris.

Harrisburg, Pa.—Select Council recommends advertising for bids for constructing bridge at 13th st. over Reading Railway.

Portsmouth, Va.—Superintendent Bergman, of Southern Railway, will recommend bridging of street crossings and installation of corrugated iron culverts under tracks.

Pasco, Wash.—Representative E. B. Horigan, Franklin County, will recommend construction of bridge across Columbia to connect Pasco with Kennewick.

Seattle, Wash.—Council has passed ordinance authorizing Board of Works to build bridge at 10th ave. South and Kenyon st.

CONTRACTS AWARDED

Edwardsport, Ind.—To Vincennes Bridge Co., for construction of bridge across White River, \$16,548.

Defiance, O.—Making big fill leading to north end of Frances st. bridge, to Jos. Webber, 23c. per cu. yd.

Wagoner, Okla.—By Wagoner County Commissioners, to Canton Bridge Co., Canton, O., for construction of \$14,000 bridge across Verdigris River at Mingo Ferry.

Austin, Tex.—To Ray McDonald, Austin, to construct reinforced concrete bridge or culvert across Shoal Creek at 5th and Nueces sts., \$2,300.

BIDS RECEIVED

Portland, Ore.—Substructure of Broadway bridge: Union Bridge and Construction Co., Kansas City, Mo., \$557,645; Missouri Valley Bridge and Iron Co., \$565,953; Porter Bros., \$683,660; Robert Wakefield, \$707,180; Bates & Rogers Construction Co., \$678,287.

MISCELLANEOUS

Montgomery, Ala.—Erection of city hall is being urged.

Berkeley, Cal.—Council is considering need of auto ambulance.

San Francisco, Cal.—Board of Harbor Commissioners has adopted plans and specifications submitted by Engineer Barker for construction of pier 32 at foot of Main and Brannan sts.; estimated cost \$320,000 with a wooden floor system, and \$377,000 with concrete floor, which has not been decided; Board also directed Engineer to prepare plans and specifications for construction of permanent bulkhead from pier 40 to the south end of the sea wall at Channel st.; also to prepare plans and specifications for the construction of pier 46; for extension of the sea wall from pier 44 to the north side of Channel st., inclusive of bridge across street; also for construction of sea wall to confine land from north side of Channel to 2d st.

San Bernardino, Cal.—County will vote on bonds for purchase of site and erection of hospital buildings.

Washington, D. C.—A Mexican city is preparing to erect a new country and city jail, and the municipal officials wish to be put in touch with manufacturers of steel

cages and prison supplies, etc. Address No. 618 Bureau of Manufactures.

Delmar, Del.—City is receiving bids for erection of two-story city hall.

Jacksonville, Fla.—Council has ordered purchase of site for erection of garbage crematory.

Augusta, Ga.—Chief of Police Elliott has recommended installation of Gamewell signal system and purchase of auto patrol wagon and 80 overcoats.

Chicago, Ill.—West Park Board is considering erection of \$30,000 field house at Holstein Park.

Michigan City, Ind.—Mayor F. C. Miller has recommended liberal appropriation for Washington Park to supply water fountains.

Portland, Me.—Mayor Oakley C. Curtis has recommended bond issue for erection of city hall; cost, about \$1,100,000; also erection of \$50,000 police station.

Baltimore, Md.—Erection of nurses' quarters, cost \$20,000, at Sydenham Hospital for Infectious Diseases is being urged; \$30,000 ward will be erected at once.—Dr. W. P. Morrill, Head of Hospital.

Cumberland, Md.—Bids have been rejected for construction of city hall; cost about \$75,000.—Holmboe & Lafferty, Clarksville, W. Va., Architects.

Frederick, Md.—Delegation of citizens and taxpayers, Joseph D. Baker, Chairman, has urged that county erect at Montevue a building or buildings for care and treatment of colored persons of Frederick City and county who are suffering with tuberculosis.

Abington, Mass.—Town has secured site at Massachusetts ave. and Academy st. for erection of town hall.

Dracut, Mass.—Erection of public hall to cost \$3,000 is being considered. Rev. T. A. Walsh, St. Mary's Church, Collinsville, is interested.

Holyoke, Mass.—Playground Commission has asked for \$18,000 appropriation for its work during year.

Holyoke, Mass.—Park Board is planning to erect recreation and shelter house at Riverside Park this coming summer.

Cheybogan, Mich.—County will vote in spring on \$25,000 bonds to erect jail.

Saginaw, Mich.—Police Commissioners have asked for erection of police station.

Duluth, Minn.—Grand Jury has recommended immediate erection of county jail.

Chaffee, Mo.—City will issue \$26,000 bonds for erecting city hall and water works.—J. M. Massengill, Mayor.

Manchester, N. H.—Purchase of auto ambulance is being considered.

Albany, N. Y.—Mayor Jas. B. McEwan has recommended enlargement of First Precinct station house and complete signal system for police.

Corning, N. Y.—Board of Supervisors has decided to erect tuberculosis hospital.

New York, N. Y.—Bids will be received Jan. 24 by City Controller Prendergast for following bonds: \$2,000,000 for docks and ferries, \$1,000,000 for hospitals, \$15,000,000 for lands, etc., \$3,000,000 for schools, \$5,-

000,000 for finance and \$8,500,000 for construction of rapid transit railroads.

Schenectady, N. Y.—Mayor Chas. C. Durycie has recommended erection of public market and need of garbage and sewage disposal plants.

Cincinnati, O.—City Engineer Shibley has estimated cost of retaining wall on Butler st. at \$9,790.

Cincinnati, O.—Police Department is considering purchase of three more autos.

Defiance, O.—City hall is to be rehabilitated at a cost of \$8,000.

Newport, O.—Police Chief Floeger has recommended purchase of auto patrol and installation of Bertillon system.

Sandusky, O.—Mayor Geo. J. Lehler has recommended establishment of rest and waiting rooms along river front.

Sandusky, O.—Director of Public Safety Claude B. De Witt has recommended purchase of auto patrol.

Arlington, Pa.—Plans have been prepared for enlargement of township building.

Patterson Heights, Pa.—Council has decided to issue \$4,000 bonds to purchase site and erect city building.

Wilkes Barre, Pa.—Erection of public comfort stations will be considered by Park Commission.

York, Pa.—Mayor Jacob E. Weaver has recommended underground conduits for fire alarm and police telegraph systems; also investigation of flashlight patrol system and establishment of street cleaning system.

York, Pa.—Council will purchase site on West Market st. for erection of proposed city hall.

Providence, R. I.—Board of Trustees of State sanatorium has recommended erection of tuberculosis hospital at Wa'lum Lake.

Columbia, S. C.—City is planning erection of jail.—W. H. Gibbs, Mayor.

Chattanooga, Tenn.—Park Commission is planning to improve all city parks during year.

Norfolk, Va.—Council has adopted ordinance providing for renumbering of houses.

Huntington, W. Va.—City Commissioners are considering erection of proposed building for Fire and Police.

Racine, Wis.—Citizens will vote in spring on erection of city hall.

CONTRACTS AWARDED

Grove Hill, Ala.—By County Commissioners of Clarke County, for \$8,000 annex to the court house to be completed by June 1, to Stratton Bros. & Ward, Greensboro, under plans drawn by W. A. Kerridge, of Clarke County.

Randolph, Mo.—To Matt & Bemis, Seward, Neb., for furnishing 40,000 yds. of rock to be used in building 13,000 ft. of standard revetment; work will be commenced at once; bid was as follows: Standard revetment, \$8.60 per ft.; yellow pine piling, driven, 40c. per ft.

Brooklyn, N. Y.—Building municipal bath house at Coney Island to Northeastern Construction Co., 225 Fifth ave., New York City, \$176,000.

Rochester, N. Y.—To Wm. Baker for snow cleaning on Trafalgar st.

Seattle, Wash.—Building chimney for Refuse District No. 4, to Chas. C. Moore & Co., \$3,545.

BIDS RECEIVED

Cumberland, Md.—Bids received Jan. 10 for construction of city hall: C. W. Dowling, Marietta, O., \$107,747; Chas. J. Cassidy Co., Washington, D. C., \$108,864; W. H. Fissell & Co., New York City, \$110,000; Henry S. Rittel, Baltimore, \$111,000; Olin Gerlac, Frostburg, \$133,502.01; all bids rejected.

New York, N. Y.—Furnishing materials and completing abandoned contracts for the removal of snow and ice from the Bronx: (a) 3d district; (b) 4th district; (c) 5th district; (d) 6th district; Chas. De Marco, (a) \$4c, (b) 56c, (c) 47c, (d) 45c; Canavan Bros. (a and b) 64c, (c and d) 62c; F. A. Palidino, (c) 76c, (d) 46c; Wm. J. Fitzgerald, (a) 73c; Thos. Tarpy, (d) 75c.

St. George, S. I., N. Y.—Bids received Jan. 10 for construction of furnaces, steam boilers and appurtenances of Clifton destructor: (a) McDonald Engineering Co., Chicago, Ill.; (b) Destructor Co., New York; lump sum bid price for construction, (a) \$50,350, (b) \$67,867; guaranteed cost of incineration per ton, (a) 70c., (b) 50c.; basis of award, value of plant to city in annual operating basis, investment charges; cost of destructor as per bid, (a) \$50,350, (b) \$67,867; cost of chimney, estimated by city, (a) \$4,000, (b) \$4,100; cost of building estimated by city, (a) 254,006.25 cu. ft., \$50,801.25, (b) 176,764 cu. ft., \$34,152.80; totals, (a) \$105,151.25, (b) \$106,019.80; annual costs, 10 per cent of total investment charges, (a) \$10,515.12, (b) \$10,601.98; incineration of 12,000 tons, estimated annual tonnage, (a) \$8,000, (b) \$6,000; totals, (a) \$18,915.12, (b) \$16,601.98; gross cost per ton, (a) \$1.57, (b) \$1.38; low bidder, annual basis, as per contract; Pauly Jail Co. \$hrdl utmth mth mthmth tract, the Destructor Co. by \$2,313.14.

San Antonio, Tex.—Remodeling the Bexar County jail, general contract: Loessberg & Reinhold, \$57,286; Banspach Bros., \$54,884; J. A. Barry, \$47,885; Gordon Jones Lock Co., \$46,857; H. B. Rheiner & Bro., \$44,925; cell work from Van Don Iron Works, \$39,400; Pauly Jail Co., \$30,999.81; Stewart Iron Works Co., \$43,000, and Southern Structural Steel Co., last named making five propositions.

Seattle, Wash.—Construction of additional stalls at the Pike pl. market, T. H. Ryan, bid on specifications, \$18,500; alternate reductions, \$915, \$2,861, \$1,240, \$2,484.50 and \$35.50; Finne & Gjaide, on specifications, \$19,986; alternate reductions, \$748, \$3,100, \$1,258, \$1,798 and \$22.

TOO LATE FOR CLASSIFICATION

STREET IMPROVEMENTS

Gadsden, Ala.—Council has decided to pave, drain, curb and improve portions of Chestnut and S. Fourth sts.—R. M. Wilbanks, Clerk.

Evansville, Ind.—County Commissioners will estimate cost of improving 1st ave. road with rock from city limits to Camp Ground road.

Pointe a la Hache, La.—Police Jury of Plaquemines has adopted resolution having as its purpose preliminary steps toward construction of a shell road from the St. Bernard line to the Courthouse at Pointe a la Hache; distance of 32 miles; bond issue of \$40,000, with similar amount from the State highway fund, will be necessary to build a thoroughly modern shell road.

Gloucester, Mass.—Council has appropriated \$2,400 for purchase of Reliance stone crusher.

Holyoke, Mass.—Improvement of Railroad st. and repaving of High st. is being considered.

Escanaba, Mich.—Delta Board of County Supervisors has declined to submit to vote of people proposition to bond the county for \$40,000 for construction of roads.

Minneapolis, Minn.—City will spend about \$1,550,000 for street improvements during the next two years.

Rochester, N. Y.—Mayor Edgerton has recommended extension of water system.

Rochester, N. Y.—Council has adopted ordinance of pavement on Goodman and Arch sts. at cost of \$23,000; also is considering ordinance of brick pavement on Shafer st. to cost \$25,000.

Toledo, O.—Repaving and widening of Main st. is being considered.

McMinnville, Ore.—Mayor Leroy Lewis, accompanied by Councilmen Campbell and Hendershott, is making a tour of different valley towns with idea of investigating street paving.

Chester, Pa.—Supervisors of Tinicum township have petitioned Court for permission to construct a grade crossing on Fourth ave. over Reading tracks.

Meadville, Pa.—Mayor F. M. Graff has recommended paving of Liberty st., widening of portion of Plum st., repaving of Chestnut st. and improvement of several other streets.

York, Pa.—Council has decided to pave portion of Hartley and Philadelphia sts. and Richland ave.

Chattanooga, Tenn.—Board of Public Works has decided to pave East Terrace and Tenth st. with brick and West Fourth st. with asphalt; profiles will be prepared for sidewalk grades on Eleventh st.

Fort Worth, Tex.—Citizens have voted \$50,000 bonds to improve streets.

Norfolk, Va.—Finance Committee has recommended paving of Martin's lane with smooth material.

Portsmouth, Va.—Specifications will be prepared for paving with bitulithic, brick, asphalt and fibrelite; streets not yet selected.

SEWERAGE

New Decatur, Ala.—City will build additional storm sewers in west and south part of city.

New Bedford, Mass.—Council has approved petition for expenditure of unnamed sum of money for proposed sewers.

Poughkeepsie, N. Y.—Superintendent Harding recommended that sewer be laid on Main st., Innis ave. to the city line, and at same time to lay water mains, both to be laid under sidewalk.

Tuckahoe, N. Y.—Survey has been made recently of Waverly Square with view of obtaining information as to where it would be best to construct sewer in Waverly Heights, which is greatly needed there.—Robt. J. Bellew, Superintendent of Public Highways.

Toledo, O.—Council will be asked to direct Service Director to have prepared and placed on file plans, specifications, estimates and profiles for proposed drainage of big marsh in North Toledo by artificial means.

Eugene, Ore.—Council has ordered plans and specifications for proposed Fairmount sewer system.

Clairton, Pa.—Council is considering need of sewage disposal plant.—E. O. Knight and Chas. Supplee are interested.

Dallas, Tex.—Bids will be asked for constructing storm sewer on Haskell st., San Jacinto to Live Oak st., \$3,558.48; Victor to Gaston st., \$4,754.98, and for grading of Peak st.

Colonial Beach, Va.—Citizens have voted \$37,500 for sewers and other improvements.

WATER SUPPLY

Santa Ana, Cal.—Citizens will vote on \$20,000 bonds to better water system; well will be dug and reservoir built.

New Bedford, Mass.—Council has approved petition for expenditure of \$150,000 to extend and alter water mains.

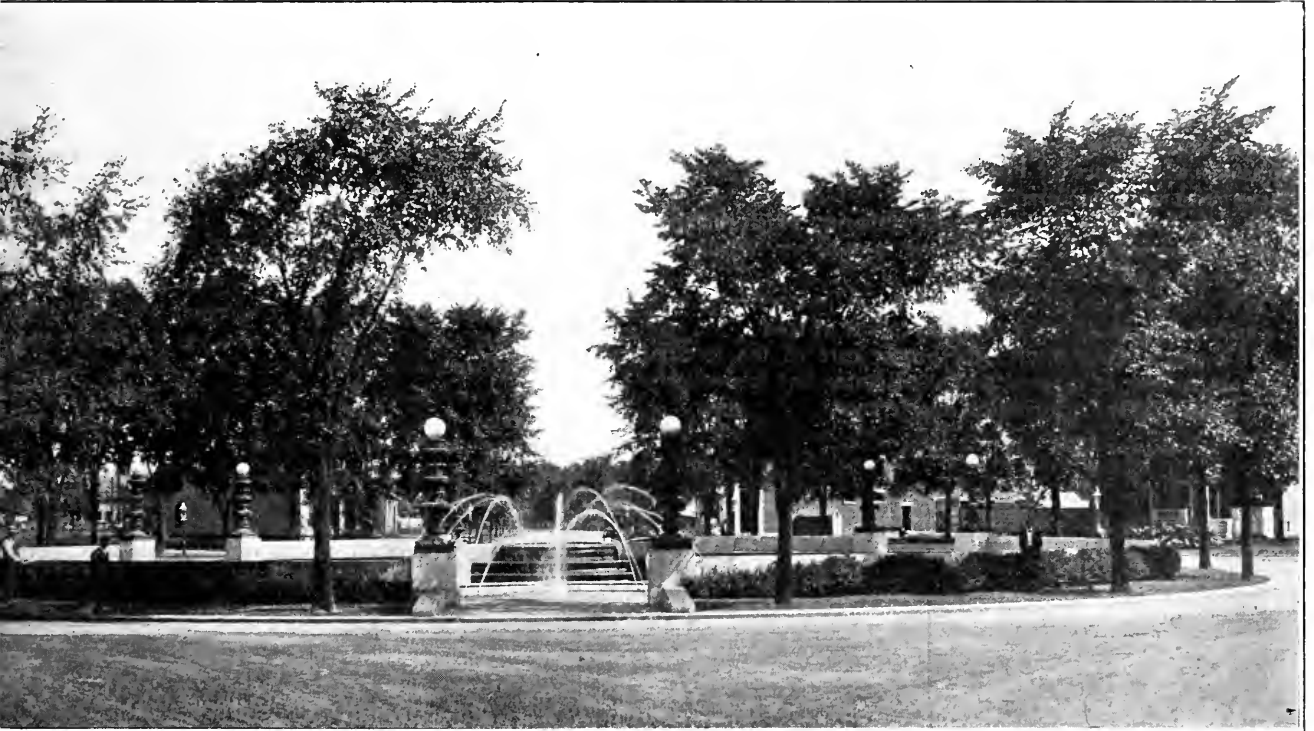
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No. 4



GROUP OF AMERICAN ELMS, BUFFALO'S FINEST SHADE TREE

WORK OF BUFFALO'S FORESTRY DEPARTMENT

Charge of City Forester and Board of Park Commissioners—Has Operated for Three Seasons—Sixty Thousand Quarts of Egg Masses Purchased from Children—Spraying and Pruning

By H. B. FILER, CITY FORESTER OF BUFFALO, N. Y.

For years the shade trees of Buffalo, N. Y., were allowed to grow with little or no attention from the authorities, but a few years ago it became apparent that many of them were suffering from lack of care and were losing their vitality and beauty. About this time there appeared a scourge of tussock caterpillars which destroyed the foliage, and many trees, owing to their low vitality, died completely in consequence.

Scarcely a street in Buffalo is not well provided with shade trees, and this danger of their extinction was felt to be a serious matter. A few public spirited citizens took up the

cause, and later the Society for Beautifying Buffalo became interested and introduced legislation as far back as 1904. The proposed bill was sent to Albany and died a natural death; it was evidently in advance of the times.

Meanwhile conditions were getting worse and the forestry movement was gaining impetus. Finally, in the winter of 1908, an amendment to the city charter passed both houses and was signed by the Governor, which contained the following provisions:

Sec. 323-a. The board of park commissioners shall have full power and authority over all trees planted and to be planted in any of the streets or public places of the city, including the

right to plant new trees and to care for the same, and to remove trees, living or dead, and to trim, spray and otherwise care for all such trees.

Sec. 323-b. The board of park commissioners is authorized to appoint a city forester and such other employes and assistants as may be necessary and to prescribe and define their respective duties and to fix the amount of their compensation. Such forester shall be an expert, trained in the care and culture of trees.

Sec. 323-c. The board of park commissioners shall recommend to the common council from time to time ordinances to be enacted by the said common council for the planting, care and protection of trees in the streets and public places of the city; but no such ordinance not recommended by said board shall be enacted by the common council. Nor shall any ordinance enacted pursuant hereto be altered or repealed without the recommendation of said board.

Sec. 323-d. The common council shall every year grant to the board of park commissioners such sum of money as it shall require and as to the said common council shall appear reasonable and just for planting, maintaining and caring for the trees of the city, for purchasing or raising new trees and for other expenses contemplated by sections 323-a to 323-d of this title.

There are a number of salient features in the foregoing act which are believed to make it the best piece of shade tree legislation ever placed on a statute book.

In the first place it vests the authority in the board of park commissioners, thus doing away with one of those special commissions which have of late been making the government of large cities more cumbersome.

It gives the board full power and authority, which is important if a comprehensive tree campaign is to be successfully carried on for a series of years.

It authorizes the board to appoint a city forester, who must be an expert, trained in the care and culture of trees.

This clause alone insures the proper care of the trees of Buffalo, so long as it remains on the statutes, and it practically removes the office from political interference.

But the creation of a city forestry department is of comparatively small import if it is not provided with funds to carry out systematic work. Of course, one man can do much in an educational way, but most people need to be shown, and it takes a corps of men to work along the streets and demonstrate to the taxpayers what can be done in the way of saving and increasing the beauty of their trees.

It is right and just that the residents at large should provide the funds for such an enterprise, and it is peculiarly just that the board should go to the common council for these funds. The common council represents the rank and file of the taxpayers; and as the councilmanic representative is beholden to his constituents, the people thus become the important factor in the amount of work that can be done in their section.

The department was organized in June, 1908, and active work was started at once. As the budget for the fiscal year had already been passed, the board of park commissioners was authorized by the common council to spend such money as their judgment directed, and at the proper time a deficiency bond would be issued to cover the amount expended. This was believed to be the most satisfactory way, as the department was an innovation and by many considered in the nature of an experiment.

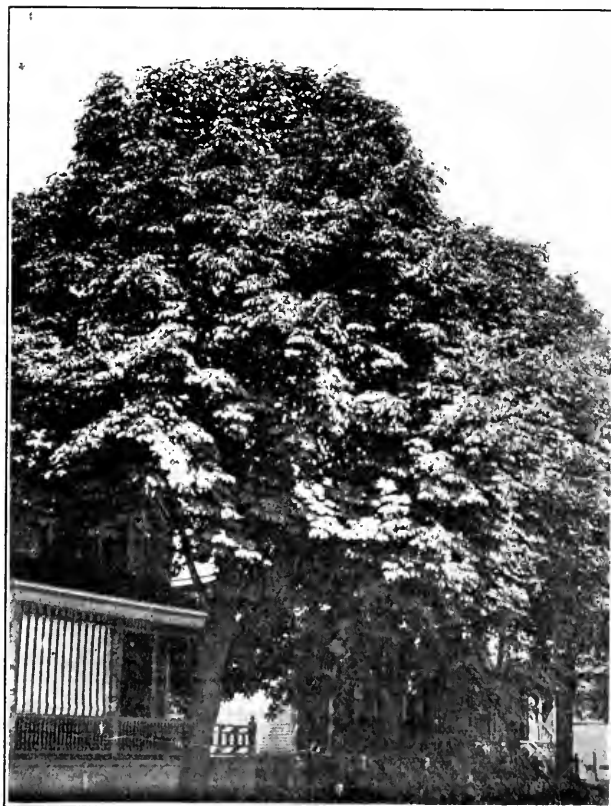
About this time the chamber of commerce adopted the slogan of "Buffalo Means Business," and this slogan was imbedded in the mind of the forester when he took up the duties of caring for the trees.

A vigorous campaign was inaugurated against the insect pests of the city's shade trees. The white-marked tussock moth was present in alarming numbers. To combat this voracious leaf-feeder several large spraying machines were purchased and used constantly during favorable weather, both night and day. The caterpillar season lasts about six weeks, and during that time over 250,000 street trees were sprayed, and the caterpillars were worsted in the first battle of what has since developed into constant warfare for supremacy.

The results of the spraying campaign were a revelation to the public. All trees which had been sprayed retained their foliage throughout the summer, although formerly they had been practically leafless during the month of July, and the caterpillars



AN UNSPRAYED TREE



TREES WHICH WERE SPRAYED



BUYING COCOONS FROM CHILDREN

swarmed everywhere to such an extent that it was unpleasant to walk through the streets. Periodic spraying is carried on yearly, as it is practically impossible to eliminate them entirely.

Immediately upon the successful termination of one year's warfare against the caterpillar plans are laid to lessen the crop of the ensuing year. (Each individual caterpillar increases about 500-fold each generation.) Men are sent over all the streets with long poles which are attached to wire brushes and move the cocoon and egg-masses which are found hidden in all sorts of nooks and crevices, and these are carefully gathered and destroyed. An important feature of this work is the enlistment of the army of children, who often prove to have sharper eyes than the men. These children are paid ten cents per quart for all cocoons and egg-masses which they collect and deliver to certain stations, where they are measured and destroyed. Over 60,000 quarts were turned in by the children in one month. There are about 100 egg-masses to a quart and about 500 eggs to a mass. Three billion caterpillars destroyed by the children yearly is a potential factor in saving the beautiful trees of Buffalo, to say nothing of the benefit to the trees of future years by getting the children interested.

During the late summer and the fall and winter strict attention is given to tree pruning, surgery or tree dentistry, as it is popularly called.

About 20,000 trees are treated annually. All dead branches are removed; decayed portions are gonged out and cemented; wounds are treated antiseptically and covered with paint to preserve the wood; in fact, the tree is treated individually with a view to future health and beauty. This is an immense task, for each year the work of the previous season is gone over so that the tree has every possible chance of recovery and growth. A careful record is kept of trees that are in a sickly condition, and if of sufficient value they are fertilized and stimulated until they show signs of a new lease of life. If, however, they are of a variety poorly suited to the existing conditions or beyond the hope of recovery, they are pulled out, roots and all, and a new tree is planted in their place.

During the winter months some of the streets take on the appearance of a logging camp, for at this season of the year the department is busy removing unsuitable varieties such as the hardy and Carolina poplars. These have long been a nuisance, as they have literally robbed the soil of its fertility, extended their fast growing roots to the sewers and caused a great amount of damage. It might appear that the department is destructive, but it is so only that it may become constructive. In the late autumn and early spring the force turns its attention to tree planting. About six thousand trees are planted yearly, all ranging from 3 to 5 inches in diameter, nursery grown and personally inspected and selected from the nurseries by the city forester.

Only suitable varieties of shade trees are chosen for the streets of Buffalo, such as the American elm, Scotch elm, Norway maple, pin oak and a few others. Only one variety is planted on a street and those at suitable intervals. They are regularly planted, which is perhaps most important.

The only streets selected for tree planting are those which have a tree belt of at least four feet between sidewalk and curb. The young tree is supplied with a liberal amount of good soil and fertilizers in order that it may successfully withstand the shock of transplanting and become adapted to its new condition of soil and climate. Those streets in each ward of the city which are for the most part residential are planted first; vacant streets afterward. These young trees are supplied with stakes and guards to protect them until they become firmly established. They are watered and mulched during each successive summer and very carefully pruned in order that they may grow to become graceful and shapely.

These various lines of effort complete the cycle of the year's work. An annual expense of \$65,000 is incurred, but every penny is expended along useful lines. There is no more maltreatment by public service corporations, careless contractors and indifferent citizens whose wanton destruction has been noticeable in the past.

A tract of land has been secured for a municipal nursery, and 60,000 seedling trees are on the way from Holland, to be grown until they are large enough to be transplanted to the streets and parkways.

A tree census is under way, which will classify and place in the office records an accurate description of every tree on the streets and boulevards of the city. It is believed that Buffalo can proudly boast of having the largest and most active forestry department of any city in the United States.

MONTGOMERY REFUSE DESTRUCTOR

A high-temperature refuse destructor has just about been completed for the City of Montgomery, Ala., along the general lines of those already in use at Staten Island, New York; Westmount, Montreal; Milwaukee, Wis., and one or two other places, the capacity of which is 60 tons per 24 hours. The plant is located near the city water-works pumping plant, and the building containing it shows none of the ordinary architectural features of disposal plants, looking, in fact, more like a pumping station with two living stories above it.

The main floor of the building is about 15 feet below street level, the street being carried through at this point on an embankment. A bridge connects the street with the upper or tipping floor of the plant. The refuse carts, on crossing this bridge, enter directly onto the tipping floor and dump their contents into a storage hopper immediately beneath. On the ground floor, between the storage hopper and the feeding doors of the furnace, is a feeding space sufficiently wide to permit the convenient handling of the rubbish by the stokers. A hot air duct supplying air to the furnace passes under this feeding space.

The plant contains four grates, each with an independent ash pit. Preheated air is supplied by forced draft, and is controlled by a valve at the entrance to each ash pit. This permits the use of a lower, less expensive and less prominent smokestack than is generally used for such plants. As in other recent plants of this nature, the air supplied by the forced draft is drawn from the interior of the building with the idea of thus removing any odors and forcing them through the hot fire where they will be destroyed. The air is heated by being passed through a pre-heater, which is kept hot by the waste gases from the fire. It is calculated that the air required for combustion in one hour is about eight times the total air contents of the building, and that consequently the air in the building will be renewed once every seven or eight minutes. This also assists in keeping the temperature at a lower point and thus making it more comfortable for the operators.

There are four units, each with its grate, and back of each grate is a drying hearth. Over each drying hearth is a container of about one cubic yard capacity, the top of which is flush with the feeding floor and that of the storage hoppers. The bottom of each container swings open so that the contents of the container may be dropped onto the hearth, the

bottom at the same time that it is dropped closing the opening into the drying hearth. The containers are filled and their contents dropped onto the drying hearth, and after having been sufficiently dried the refuse is raked forward onto the grates. After being burned to a clinker, this is drawn out of the furnace and dropped directly into cars running on a track in a tunnel below the clinkering floor; the car being drawn by a cable out of this tunnel and up an incline, when it automatically dumps into a crusher, where the clinker is crushed, after which it is screened and deposited in bins.

The gases from the grates pass first into a large dust-settling chamber, where it is expected that most of the dust in suspension will be deposited. The gases then pass through a 180-h. p. water-tube boiler, in which it is expected that their temperature will be lowered to 500 degrees from about 1600 to 1700 degrees. These boilers are supplied with Foster superheaters. The steam generated in the boilers it is expected to use in the water-works pumping station, which is but 150 feet away. After passing through the boiler, the gases pass through the air heater before referred to and from this directly to the chimney. The chimney is built of radial brick and is 4 feet in diameter in the clear at the top and is 100 feet high. The plans for this plant were prepared by Robt. W. Gibson, of New York, and the plant was constructed by the Destructor Company of New York City.

OPERATING SEWAGE PLANTS

Instructions Issued by Ohio State Board of Health—Screens, Sedimentation Tanks, Sludge Beds, Filters—Form for Records

As we have taken occasion to state a number of time, we believe that much more attention should be paid to the operation of sewage purification plants, and there should be a power of supervision and regulation of these placed in the hands of State Boards of Health, or some other authority, with power to enforce the sanitary and effective operation of them. A sewage disposal plant is really maintained as a safeguard for communities other than the one operating it, in the majority of cases, and it is consequently a matter which some authority representing a combination of cities—either county, state or national—should have supervision over.

In Ohio such supervision has fortunately been placed in the hands of the State Board of Health, and in exercising its authority in this regard it has given or is preparing to give to each community operating a sewage disposal plant a set of instructions for the proper operation of the same. Owing to the varied nature of the several plants it would seem best not to attempt to prepare a set of standard rules to apply to all cases, but rather to adapt to each plant a set of rules fitted to its particular character.

Such a set of rules has recently been prepared for the plant at College Hill, which was described in our issue of Jan. 4. The greater part of this is applicable to a considerable number of plants throughout the country, and we are therefore presenting it, believing that some part of it will offer serviceable suggestions to almost any plant. Some of the suggestions made we believe to be comparatively novel, and not to be found in the text books.

INSTRUCTIONS FOR THE OPERATION OF SEWAGE PURIFICATION WORKS AT COLLEGE HILL

General Remarks.—In connection with the operation of any sewage purification works it must be recognized that they can not be built so as to be entirely automatic in their operation. Even the simplest in form requires regular attention by a competent person. In the case of College Hill the need of intelligent attendants is emphasized by the fact that these works include devices which are the most complex in use, and they are, moreover, liable to frequent derangements which require immediate attention. It is believed that the care-taker should visit the works at least twice a day, and two full days in each week should be devoted to cleaning and placing the plant in general good order. If required, additional labor should be furnished for doing this work.

One phase of the care of sewage purification works which should not be overlooked is the maintenance of the works and their surroundings in a neat and tidy appearance. A prejudice naturally attaches to sewage purifications works, whether they create a nuisance or not, but, as a rule, this prejudice can be entirely overcome if the works always present a neat appearance. These comments are especially applicable to the Colley Hill plant, owing to its proximity to a large sanitarium and a much-traveled electric railroad. As soon as possible the earth work surrounding the plant should be smoothed up and carefully sodded. The judicious laying out of paths and planting of small trees would add very greatly to the appearance and it is suggested that an expert gardener be employed to supervise this work.

In describing the operation of the plant the care of the various devices will be taken up in the order in which the sewage reaches them.

Screen Chamber.—The care of the screen chamber requires no special instructions. It is understood that the design of the screen chamber renders it very difficult to clean the screens. As the screening of the sewage in a sprinkling filter plant is a very important function, it is suggested that the screen chamber be modified, if necessary, to increase the efficiency of the screens and facilitate their cleaning.

Sedimentation Tanks.—One sedimentation tank should be sufficient for the present, at any rate, to give the sewage an adequate period of sedimentation. In order to render less offensive the operation of sludge removal the tanks should be used alternately. When a tank is thrown out of service it should not be emptied immediately, but should be permitted to stand full of sewage until it is desired to again place it in service. Immediately before the sewage is passed through it should be emptied and cleaned. The object of this procedure is to give the foul sludge deposits and scum formations an opportunity to digest. This digestion will be found to assist in rendering the contents of the tank comparatively free from odor so that it can be discharged onto the sludge bed without creating offensive conditions in the neighborhood.

Inasmuch as most effective sedimentation takes place when the sewage passes through the tanks quietly and without agitation, it follows that active fermentation which results in violent ebullition should be taken as a signal for throwing a tank out of service. The length of time which a tank may remain out of service cannot be stated, since this varies greatly with different sewages and with different temperature conditions. With weak sewage it may not be necessary to throw a tank out of service during the entire winter season. On the other hand, with a strong sewage and during the summer time it may be necessary to permit a period of operation of a few weeks only.

It has been observed that great difficulty has been encountered in removing sludge from the tanks owing to the flat slope and roughness of the concrete bottoms. It is believed to be highly desirable to modify the bottoms of the tanks so as to provide a minimum slope of 5 per cent toward the outlets. The surface of the new bottoms should be floated to a smooth finish similar to that of a smooth granolithic pavement. This change should be made as soon as funds will permit.

In connection with any sewage purification plant fairly complete records should be maintained of the volume of the sewage flow, since the flow factor, in almost all cases of difficulty encountered in operation, affords an explanation, or partial explanation, for such difficulty. Inasmuch as there is a good opportunity for the placing of weirs at the outlets of the sedimentation tanks these should be installed. It is recommended that in each of the openings leading to the dosing chamber they be constructed a weir with a 9-inch crest. It would be preferable to construct the edge of the weir of brass, since this metal best withstands the action of the sewage and can be given a sharp edge.

Dosing and Equalizing Chambers.—The dosing and equalizing chambers, as a rule, require but little attention. They should, however, be maintained in a cleanly condition and the attendant should make an effort to understand thoroughly the workings of the syphonic apparatus in order that he may make all ordinary adjustments and repairs. To this end it is suggested that a request be made of the Merritt Company, of Philadelphia (the manufacturers of the automatic device), for a complete description of the principles on which the automatic apparatus is designed.

Filter.—The sprinkling filter will require more labor in its care than any other portion of the plant. The most essential feature to proper operation is to see that all of the sprinkling nozzles are clean and in repair and properly adjusted.

A tendency toward ponding of sewage upon the surface of the beds is an indication that the proper operation is being entirely destroyed, and, therefore, ponding should receive immediate attention. It may be found that the clogging causing the ponding is near the surface and may be remedied by merely disturbing the surface layers of broken stone.

If the filter throughout the entire depth seems to be clogged or saturated with water, in all probability it will be found that

Operation Records of College Hill Sewage Purification Plant for Month of.....19....

Date	Rainfall in Inches.	Sewage Flow at 10 A.M. Expressed in Gallons per 24 Hours	Screenings Removed Cu Ft.	Putrescibility of Final Effluent	Number of Defective Nozzles Repaired or Replaced	REMARKS: To include dates of removal of sludge from tanks and basins, disturbance of filtering material and any other unusual operations. Record any peculiar conditions or phenomena relating to the operation of various devices.
1						
2						

underdrains have become filled with humus matter or organic growth which prevents the effluent from passing to the tanks. When this occurs it becomes necessary to flush the underdrains by applying a jet of water from a hose nozzle at the outlet of the drains into the effluent collecting channels.

Should the removal of the stone from the surface of the filter and the flushing of the underdrains fail to produce satisfactory results it is then apparent that the filtering material has become clogged throughout the mass. This may be due to the rapid formation of humus matter, to disintegration of the stone, or to the original presence of too much fine material in the water. Where this condition obtains the only remedy is to remove the filtering material entirely and replace it after cleaning or provide new material.

Final Sedimentation Basins.—The final sedimentation basins have no special difficulties of operation. After the basins become so filled with sludge that further sedimentation is seriously interfered with the sludge should be removed. Great care must be observed not to remove the sludge excepting during a period when the flow in the stream receiving the effluent is very large. It will, therefore, follow that it is inadvisable to attempt the cleaning of the final sedimentation basins except during or immediately after storms.

Sludge Bed.—The sludge bed will require considerable labor and maintenance. After receiving the contents of the sedimentation tank it should be permitted to thoroughly dry out in the sun. It will be found that the sludge remaining on the surface of the sand will become more or less matted and may be peeled off from the sand without much difficulty. The most convenient and at the same time profitable method of disposal is to break it up finely with shovels and spread it on the ground surrounding the purification works.

In the present condition of the sludge bed it is liable to become clogged at the surface by clayey material washed from the surrounding embankments. To overcome this difficulty the embankments should be carefully sodded and in addition a curb (preferably of concrete, though wooden plank will serve for the purpose) should be placed about the bed at the sand line. The curbing should rise fully a foot and a half above the surface of the sand.

Tests of Operation of the Plant.—The plant when operating successfully should produce a so-called non-putrescible effluent comparatively free from suspended matter. The putrescibility of a poor effluent may ordinarily be readily enough detected by its characteristic odor of hydrogen sulphide, but this test is very delicate enough to maintain proper control over the performance of the plant. A better test is to add to an 8-ounce sample of the effluent a sufficient amount of methylene blue to give it a light, yet decided, blue color. Owing to the great strength of this coloring matter an exceedingly minute quantity is required for the purpose. Methylene blue depends for its color upon the presence of oxygen. If the oxygen supply is drawn, as obtains in the case of a putrescible liquid, the color will disappear. If, therefore, the blue color in a tightly stoppered sample of effluent which has had methylene blue added to it disappears within the course of several days it is an indication that the effluent is not up to standard.

Records.—Records of the operation of the purification works should be maintained on blanks furnished by the State Board of Health. One set of blanks will hold the records for an entire month. At the end of each month a copy of the records should be forwarded to the State Board of Health for review. These blanks, it is believed, are self-explanatory, but for the sake of clearness the following is offered:

The quantity of screenings may be expressed in cubic feet. Measurements may be made by using a receptacle, such as a bucket of known contents. The sewage flow should be expressed in gallons per 24 hours. The height of sewage over the crest of the weirs may be readily converted into gallons per 24 hours by means of tables or diagrams, copies of which should be furnished by the State Board of Health on application. The head on the weir expressed in inches and fractions therefrom, if desired, be given without converting same into gallons per 24 hours. In the column headed "putrescibility" the fact that a sample is putrescible may be recorded with a "plus" and the fact that it is non-putrescible may be recorded with a "zero."

Excessive Sewage Flow.—The objections to excessive sewage

flow have already been hinted at. Such excessive flow may be due to one or both of two causes, the first of which is the admission to the sanitary sewers of roof water, surface drainage, sub-surface drainage and other comparatively clean and inoffensive water. The second cause is the entrance into the sewers of ground water through defective joints and broken pipes or because the sewers are not properly underdrained in very wet soil. In any event, the excessive flow places an unnecessary burden upon the sewage purification works and should, therefore, be eliminated if possible. There is no reason why down-spout connections should be permitted and the proper authorities should be very vigorous in suppressing such connections. If the difficulty is due to the presence of excessive ground water, a careful survey should be made of the sewerage system to locate all points at which this water enters with a view to shutting it out by suitable reconstruction.

Records of House Connections.—It is very essential, especially where the sewage is purified, that careful records be maintained of the exact location and construction of all house connections. It very often happens that the greatest difficulties due to excessive sewage flow or the entrance into the sewers of improper wastes may be traced to house connections. All house connections should be carefully inspected by a village inspector before they are covered up, and conformity with high standards of construction should be insisted upon.

A FLORIDA STRAW ROAD

Just outside of the municipal limits of Lake City, Fla., is a piece of very heavy sandy road, a portion of one of the principal county highways, which it was found necessary to improve at once and at minimum expense about the middle of December last. The method employed was as follows:

The road was cleared of stumps and plowed up, the traveled roadway being straightened at the same time, and was shaped up with a road grader and gone over with a drag to compact the sand. In the meantime, a mowing machine had been cutting broom straw in a neighboring field. A mulch of this broom straw was then laid to a depth of five inches on the 15-foot bed of the roadway, and traffic was encouraged to pass over it, the vehicles being directed to travel in a straight path. The work was completed at the end of the third day at an expense of \$71.60.

While broom straw forms at best but a temporary road covering, it furnishes a noiseless surface of low tractive resistance as compared to the sand, and proves effective for making practicable for teams spots of soft sand in an otherwise naturally good road. A similar method has been employed elsewhere in the same state, pine straw having been used extensively for surfacing sandy roads in Marion County. For this information we are indebted to Mr. A. S. Miller, of Lake City.

CINCINNATI WATER WORKS EFFICIENCY

In his annual report for 1910 the Superintendent of Water-Works, of Cincinnati, Ohio, gives some very satisfactory statements concerning the operation of the water-works plant. The cost for pumping per million gallons during the past year averaged \$14.35, the cost in 1909 having been \$15.74 and in 1908 \$16.09. Previous to this, with the old water-works plant, the average cost was \$33 per million gallons. The ordinary head pumped against is 182 feet for the low service and 450 feet for the high.

A filtration plant was installed in 1908, as described by us at the time. In 1910 only 22 deaths resulted from typhoid, and according to the Health Department reports most of these cases can be traced to importation from outside of the city. In 1906, when the water was not filtered, there were 1,940 cases of typhoid and 239 deaths.

GARBAGE COLLECTION

Only Dry Garbage, Wrapped in Paper Collected in Minneapolis—Can Does Not Become Offensive—Less Frequent Collections Required

By DR. P. M. HALL, COMMISSIONER OF HEALTH, MINNEAPOLIS

Paper before American Public Health Association.

GARBAGE collection and garbage disposal have been treated of in a general way so many times that it would seem that the last word had been said. Instead of handling this great subject in a general way now, probably more can be learned by taking up some phase of the subject in detail. I will, therefore, confine this paper to the discussion of the "garbage receptacle" alone.

As a text for this discussion let us quote the description of the "garbage receptacle" as found in a well-known book on sanitation:

The garbage receptacle, especially when separation of true garbage is made, is usually one of the commonest forms of nuisance to be found. Every garbage can, unless it is emptied daily and thoroughly washed after emptying (which is practically never done) is in hot weather sure to be offensive. The annoyance from it can probably never be entirely done away with, and it is only with great care and at some expense that it can be reduced to a minimum.

When we consider that practically all municipalities collect and dispose of garbage separately from other forms of refuse we have exactly the condition as defined—a separation of true garbage. As a basis for this paper letters of inquiry were sent to all cities of 100,000 population and over in the United States and Canada. Replies were received from practically all of them. In the majority of cities it is specified by ordinance or rule that the garbage receptacles shall be water-tight; shall be covered; shall have handles on the side of the can or on the cover; the size is designated from two gallons to two bushels; the materials from which the receptacle is to be made are specified; that it shall be kept in a place remote from dwellings or placed on walks when the hours of collection are known; that the collector shall neither go upstairs nor down cellar for it, but that the can must be placed on the ground floor, etc.

A very little analysis will show that the sanitary condition of the garbage can has been the principal factor in determining the cost of the collection of garbage. It may be set down as an axiom in the collection of garbage that the cost of collection increases with the frequency of service. The ability of a man and team to collect is not the amount he collects, but the number of stops, the distance of travel and the number of cans he is obliged to handle, so that a daily collection would necessarily cost more than a collection every other day, and a collection twice a week more than a weekly collection.

The demand for frequent collection has arisen from and because of the sanitary condition of the garbage receptacles. Furthermore, undoubtedly, the sanitary condition of the garbage receptacle has had everything to do with making the mere mention of the word "garbage" an offense. Immediately comes to our minds that same noisome garbage can.

Garbage is almost universally described in the rules or ordinances of cities as the animal and vegetable waste from the kitchen, or as resulting from or growing out of the preparation of food. Garbage is subject to rapid decay, and this decay is hastened by three things—heat, moisture and flies, and yet what we call garbage is but an hour removed from our tables—has been served to us as food.

The first step in the disposal of garbage is carrying it from the house and placing it in the can, and the question naturally arises, why should not this step be a sanitary one and be made in the direction of educating the householder? Under existing conditions in almost every city the can is as great if not a greater nuisance than the garbage itself. In the primitive days the Indian, when the offense from the waste products of his housekeeping became too noisome, moved away, but in our day

and generation we remove the garbage and keep the same. Take the first step—the placing of the garbage, the waste food or droppings from our tables, into any kind of receptacles of wood, galvanized iron or what-not, and with the presence of heat, moisture and flies you will very soon have a foul, maggoty, fly-breeding mess of putrefaction. Such a mess is necessarily a nuisance, requires frequent removal and is a nuisance every time it is handled from the can to final disposal. Is it necessary that this condition of things should be? Is there any way to eliminate these breeders of putrefaction—heat, moisture and the fly? Is it not a little bit inconsistent that we legislate and talk about fly infection when we are perpetuating the nuisance in the garbage can by furnishing a most prolific breeding place? It has been said that the annoyance of the can probably never will be done away with. It seems that this condition of things has been accepted everywhere and that nobody has tried. We find, however, exceptions in two cities—one in the United States and the other in Canada, where at least an effort has been made to keep the garbage can from being a constant nuisance, and that is what I have come to tell you about—how these two cities have been trying, and I wish to say with a great measure of success, to make the garbage can no longer a nuisance.

Drain garbage of all moisture, then wrap it in paper before putting it in the can, and it will neither smell badly in hot weather nor freeze and stick to the can in cold weather. Do this and have a clean can at all times.

Heat, moisture and the fly are all eliminated. This rule was put into practice in Minneapolis in February, 1907, and is still in force. The campaign of education was a hard one, but we have won. As one of the garbage collectors said to me within the week, "the garbage cans in my district are clean enough to keep pies in."

It all rests with the collector. He has but to report to the department that the garbage is not properly drained and wrapped in paper, and no further service is rendered until the rule is complied with. If the householder then fails properly to care for his garbage or to have it cleaned up he is brought into court and fined.

The operation of this rule has its economic as well as its sanitary side. The life of the can is very much prolonged. The garbage will roll out of the can in cold weather as well in the summer; if it does not and the garbage is frozen, the can is not emptied, for the householder has failed to drain off the moisture. The collector is forbidden to carry or use a pick or crow-bar to dig out frozen garbage, so the can is not battered up. Garbage kept in this way is not a nuisance; does not invite flies; does not need to be collected more than once a week even in warm weather, thus making a great saving in the cost of collection. It follows naturally that garbage which is not foul in the can will not be so in the wagon or cart. The garbage can should be kept water-tight, and when not used should be discarded and a new one provided. A great deal of trouble has arisen from the tipping over of the cans by dogs. A recent invention in the shape of a small appliance on the cover makes the cover self-locking, and the dog nuisance is a thing of the past.

The size of the can depends so much on the frequency of collection that it need hardly be discussed here. We have found that a 20-gallon can will take care of the garbage of an average sized family for a week and is easily handled by the collector. It is not necessary, even in a cold climate, to have different receptacles in the winter time, for if the rule regarding drainage of moisture and wrapping with paper is followed a metal can is just as easily emptied and kept clean in the winter months as a wooden one.

The question of location of the can is determined largely by the method of collection. In general terms it may be said that cans should be placed where they are most accessible to the driver.

The results of over three years of experience with this method of handling garbage in our city have been entirely satisfactory. At first it was laughed at as a fad of the department. We were asked when we would also require that the packaging

...tied with baby ribbon, but we persisted and now the public in accord with us, for they have seen actual results in the use of clean, sanitary cans which are no longer a nuisance. It is not a pertinent question that in the collection and disposal of garbage the first step should be a system of collection that presents to the citizen a garbage can which is not a nuisance?

IMPROVING POUGHKEEPSIE'S MAIN STREET

As is the case in a great many cities, Main street of Poughkeepsie, N. Y., had gradually come to be considered by the merchants along it as being their own property, and sheds, awnings, signs and stands for the display of goods obstructed and disfigured a large part of its sidewalks. In addition to this, a great number of poles of every description had been allowed to be planted, the resulting condition being that in many places there was space for only a single file of pedestrians.

Fortunately the citizens some years ago awoke to the need for an improvement in these conditions, and the first move was to get rid of about one-third of the poles over about one-third of the length of the street. Then the merchants were required to remove their stands and display their goods only within the store windows; and, following this, swinging signs were ordered removed. With the sidewalks thus uncovered so as to be plainly visible the desirability of improving them was apparent, and concrete sidewalks were constructed for 5,700 feet, or over one-half the length of the street. One improvement followed another, standard cellarways were adopted, all electric wires were placed under the sidewalks and finally the old trolley poles were replaced with combination light and trolley poles.

This last improvement was effected by a combination between the lighting company, which placed the conduits; the property owners, who paid for the sidewalks, and the city, which paid for the poles, fixtures and placing. The poles cost



MAIN STREET AFTER IMPROVEMENTS

\$65 each and \$35 additional for setting them. They are placed 90 feet apart on each side of the street. Each pole has a cluster of four lights suspended 13½ feet above the sidewalk, each light being a 100-watt tungsten of about 80 candle-power. Thirty of these poles have been placed already, and the effect is so generally appreciated that it is proposed to install 100 more in the near future. For this information we are indebted to Robt. J. Harding, Superintendent of Public Works.

NEW YORK FIRE COLLEGE

A GENERAL order was issued by Chief Edward F. Croker, of the New York City Fire Department, on December 28 last establishing a "Fire College," the purpose of which "is to disseminate knowledge of fire fighting, to establish and maintain the highest professional standards, and to afford to men starting in the profession of fire fighting the advantage of the experience of men who have devoted their lives to this profession. Instruction in the various courses will be limited to what must be known to practical firemen in order to efficiently perform their duties. Where possible, courses will be limited to practical work." The college is to be composed of four schools, known as the officers', engineers', probationary firemen's and company schools. Courses of instruction are to be given in general fire fighting, the use of apparatus and tools, engines and boilers, use of high-pressure systems, marine fires, care of horses and of hose, sapping and mining, high-tension electric currents, combustibles and explosives, gasoline motor engineering, fire-alarm telegraphs, auxiliary fire appliances, first aid to the injured, discipline and administration.

The college will be administered by a board, subject to the control of the Fire Commissioner. This board at present consists of eleven instructors and Chief Croker as president *ex officio*. These instructors are deputy and battalion chiefs and foremen, a medical officer, electrical engineer and veterinary surgeon. This board will give instruction in the several subjects and at the conclusion of each course will hold examinations and report upon the same to the Commissioner.

It is the present intention that officers of the department will be divided into sections of 25 members each. Each section will be required to attend the classes three times a week from 10 a. m. to 1 p. m. for a period of six weeks, two sections being under instruction at the same time on alternate days.

The engineers' school must be attended by all engineers, and firemen of the first and second grades may receive permission to do so. All probationary firemen must attend the probationary firemen's school for at least 30 days after their appointment. No probationary fireman will be given a full appointment who has not satisfactorily completed this course; no fireman will be promoted to the grade of engineer who has not successfully completed the course in the engineers' school, and no officers will be promoted unless they have successfully concluded the course of instruction in the officers' school.



STANDARD LAMP AND TROLLEY POLE

The company school is to be attended by companies with their entire complement of officers and men, where instruction will be given in the use of apparatus and tools, and of engines and boilers in the case of engine companies.

A part of the instruction given in the New York fire department college comprises the names and uses of the various tools and appliances used. The mere list of the names of these appliances considerable space and is as follows:

For hook and ladder companies:

Axe, life belt, ladder strap, large maul, small maul, rivet cutter, cotton hook, signal flag, shovel, wire cutter, Hale door forcer, hay fork, ram, Milburn light, gas wrench with T. & S., gun (complete), claw tool, life net (Browder), megaphone, medical bag, junior searchlight, 6-foot hook, 10-foot hook, 15-foot hook, 20-foot hook, 25-foot hook, body bag, Vagen-Bader mask, pyrene extinguisher, pick.

The following are used by engine companies:

4½-inch suction, 10 feet 6 inches long; 4½-inch suction, 4 feet long; 4½-inch suction, swivel; 4½-inch x 2½-inch reducing suction swivel; hydrant connection, portable hydrant nipple, fresh water connection, fresh water hose, thaw hose, hydrant pump, suction basket and rope, play pipes, engine squirt oil can, flat chisel, chipping hammer, monkey wrench, combination wrench, Stillson wrench, socket wrench, hydrant wrenches, double end hydrant wrench, suction wrench, high pressure hydrant wrench, hub cap wrench, hydrant wrenches, alligator wrench, union nut wrenches, open end wrenches, piston rod stuffing box wrench, main pump rod stuffing box wrench, feed pump rod stuffing box wrench, slide valve rod stuffing box wrench, shovel, slice bar, poker, starting bar, seat cushion, driver's safety strap, set of packing tools.

MAGNESIUM CHLORATE FOR REMOVING SNOW

In the city of Berlin, according to an article in the December number of the *Zeitschrift Mitteleuropäischen Motorwagen Vereins*, an oil emulsion has for some time been used for laying the dust on smooth surfaced streets. This was not serviceable, however, for cobblestone streets, and for these a 30 per cent solution of magnesium chlorate in water was tried. This was found to give fairly good results, especially in winter, as it did not freeze or make the streets slippery; and the use of a solution of this material was adopted for cobble pavements and is sprinkled on them every three or four days, as the effect does not last longer than that. When the temperature had fallen to minus 5 degrees centigrade (23 degrees F.) a solution of equal parts of magnesium chlorate and water was used without the streets freezing or being covered with ice. Ice had begun to form on the pavement at a number of places, but several hours after sprinkling this began to crack and was easily removed. This suggested its use on sidewalks and streets generally and was found to reduce the time of removing the ice by two-thirds. If streets are sprinkled with the solution before a snow fall the snow is prevented from clinging to the pavement and its removal is thus facilitated.

CREOSOTING WOOD BLOCKS IN ENGLAND

Mr. John W. Moncur, borough engineer of Sunderland, England, in a discussion before the Institution of Municipal Engineers, gave some information concerning the nature of wood block paving used in that country. According to his statements as quoted by *Surveying and the Civil Engineer*, the wood blocks used are of the best quality of beech, 6 inches in length, 3 inches in width, and 5 inches in depth. The creosote oil is specified to be free from coal tar and other impurities, and to be applied to the blocks at the rate of not less than 10 pounds per cubic foot. These blocks are dipped from one-half to one inch into their depth in pitch and tar and are then bedded on fine sand having a depth of not more than one-fourth inch, with close joints, after which the joints are filled to the surface with pitch and tar. The whole surface is then covered with five pea gravel or crushed granite which is thoroughly rolled into the wood and kept on the surface for seven days after traffic is allowed to use it, and then thoroughly cleaned off.

Apparently we have here the double object aimed at by the committee of the Organization of City Officials for Standardizing Paving Specifications—preservation, secured by the creosote,

and the sealing of the pores against moisture and a leaking out of the creosote, secured by dipping the block in tar. It will be noticed that the amount of creosote is only about one-half of that required in this country. Also that there is an effort to secure a denser and harder pavement surface, and presumably a less slippery one also, by forcing stone screenings or gravel into the top surfaces of the blocks.

PUBLIC COMFORT STATION IN GENOA

A PUBLIC comfort station has recently been opened in Genoa, Italy, which is said to be the only one of its kind in Europe because both of its construction and also of its equipment. The harbor and business sections are a considerable distance from the homes of the working people and the city decided to build a recreation and comfort center there. Here may be found barbers, tub and shower baths, package and parcel room, telephone, reading and writing rooms, promenades and lavatories. The station is located in the heart of the business district where it is easily accessible to all, the ground beneath Ferraro Square being selected for the structure. This, which is the most important and busiest square in Genoa, rests on solid rock, and there was no ground water to interfere with the construction.

The underground building is in the form of a rectangle, 100 feet long and 40 feet wide, with two wings. The entrance is from a side street near the columns of a theatre, and does not interfere with traffic. The stairways leading down to the hall are of solid marble and very broad, and end in the promenade or arcade which leads to all the other parts of the hall. One side of this promenade is occupied by the offices, telephone booths and reading and writing rooms, while on the other side are the shower and tub baths. Each bathroom contains an enameled bathtub and an enameled table on porcelain feet. Over the tubs are cold and hot water shower baths. At the end of the promenade are the barber shops, package and parcel rooms, and in a small extension are the boiler and engine rooms, the fans and ventilators. Still further at the extreme end are the lavatories. The building is well ventilated and lighted.

All the outer walls are built double with an air space between the inner and outer walls, which spaces serve as air chambers and also as conduits for carrying all the piping. The inner walls are painted with an enamel proof against water, soap and all disinfectants. The floors are finished in white tile with a blue pattern.

The main walls of the structure are of reinforced concrete. The roof rests on reinforced concrete columns with bases enlarged to such area that the load upon the foundation is 100 pounds per square inch. The roof is supported by 13 reinforced concrete girders, 9 feet apart in the clear, which in turn are supported by concrete columns 20 feet apart. The girders are 15 by 31 inches outside measurement. The reinforcement consists of twelve rows of 1½-inch round iron rods, two rods being near the inner surface. These are interlaced by numerous cross rods. Spanning these girders are beams which are strongly reinforced with Kahn reinforcements. The open spaces between girders and beams are filled with hollow concrete tile. The supporting columns, which are 12 by 15 inches in cross section, are reinforced by eight round iron rods 1½ inches in diameter, joined by iron hoops.

The hall is heated by the hot water system. The boiler which supplies water for the baths holds 1,300 gallons of water. The hot water from this is conducted in stone-walled conduits to the different bath rooms. The capacity of the plant is 450 tub baths, or 23,400 gallons, in ten hours, at a temperature of 95 degrees F.

The hall is ventilated by electric fans driven by 28-horsepower motors, separate fans being used for supplying the fresh air and for removing the foul. Both the supply of fresh air and the foul air which is removed are led through brick conduits and the air chambers between walls mentioned above. The electric current required is obtained from the central station. For this description we are indebted to *La Revue de l'Édition Technique*.

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239 West Thirty-ninth Street, New York
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Western Office, 929 Manadnock Block, Chicago

A. PRESCOTT FOLWELL, Editor
F. E. PUFFER, Assistant Editor

Business Department
S. W. HUME, President

J. T. MORRIS, Manager. A. PRESCOTT FOLWELL, Secretary

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JANUARY 25, 1911

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Unreliability of City Records

We desire to call attention to an abstract on another page
of this issue of a paper giving a sensible and timely discussion
of city planning. It has seemed to us for some time that the
matter of city planning was being considered too much from
the esthetic and not sufficiently from the engineering stand-
point; too much attention was being paid to civic centers and
boulevards which cut wide swaths through blocks of costly
buildings, and not enough to the designing of street systems
in advance of the opening up of districts, such designing being
made with an eye to maximum utility as well as to pleasing
effect.

An important matter, and one which certainly deserves con-
sideration by city engineers, is referred to as follows: "The
first essential for effectively planning physical changes in any-
thing is a truthful knowledge of the existing physical condi-
tions. The conditions of maps, surveys and records of exist-
ing physical conditions in most American cities and towns, so

far as my observation has gone, is almost incredibly bad.
Where the problem is as large and complex as a whole city,
the value of the right kind of map is incalculable.

"To take a single aspect of the work, for example, the rec-
ords ought to show the exact location of every underground
pipe, sewer or conduit in the streets of the city, corrected up
to date. As it is, in the general absence of such records, new
structures are laid out more or less blindly and involve a huge
amount of needless expense in the alteration of older struc-
tures encountered in the digging."

This arraignment of city records not only asserts the entire
absence of information concerning many underground struc-
tures, but questions the accuracy of many of the records which
exist. The writer has found this to be the case in several
cities. In some where he had been called in to prepare sewer-
age designs he has endeavored to use the level notes and
profiles found in the engineer's office; but after several days
of perplexing efforts to discover some consistency between the
several sets of notes and to eliminate errors, he has found
the shortest and only safe method to be to entirely resurvey
the whole city. The same unreliability of the records has
been found later in excavating for the sewers, when no
amount of care in locating the lines to avoid existing struc-
tures, taking the records as a guide, was successful in accom-
plishing this, as water or gas mains were continually being
found where they were not expected.

We believe that every city should, at the first opportunity,
have all the records in the engineer's office carefully examined,
compared, compiled and indexed, and a series of accurate
lines and profiles run through some of the main streets in all
sections of the town and compared with existing records to
determine their accuracy.

We expect to publish next week a description of the method
employed in one city for locating and mapping all existing
underground structures; and believe that some such system
should be followed by every city, large or small, where ac-
curate records of such structures do not already exist.

Bituminous Concrete and Macadam

Without specifically stating it as their intention to establish
any standard in nomenclature as well as in construction of
bituminous paving, the committee of the Organization of City
Officials for Standardizing Paving Specifications, which de-
voted its attention to that class of pavements, practically pro-
posed such a standard of nomenclature. Bituminous concrete
was defined by the committee as a mixture for paving pur-
poses of broken stone (or gravel?), sand and bituminous
cement, heated and mixed before laying. Any combination
of bitumen and road metal not so mixed they classed as bitu-
minous macadam.

This seems to us a very acceptable definition and distinction,
and to meet the views which have been expressed in this
journal by ourselves and by others. It still remains to dis-
tinguish between combinations of bitumen and broken stone,
made by mixing or by the penetration method. Possi-
bly an agreement as to how far the "penetration" really pen-
etrates must precede such definition. We would suggest
"mixed bituminous macadam" and "bituminous surfaced
macadam," the latter to include all surface applications.

Purifying the Ohio River

We have in previous issues referred to the Ohio River San-
itary Commission, an interstate commission whose object is
to prevent pollution of the Ohio river. This commission held
a meeting on January 5 in the office of the Secretary, Dr. C. O.
Probst of Columbus, O., and drafted a bill which is to be
recommended to the Legislature of West Virginia and Indiana.
This bill, entitled "A bill to prevent contamination of the
Ohio river and to regulate its use as a source of public water
supply," provides that no municipality, corporation or person
shall install any public water supply or sewerage system until
the plans and specifications have been approved by the State

Board of Health; nor make any additions or alterations to a public water supply which involve a change in the source of supply or method of purification, until the plans have been similarly approved. Also that no additions or alterations shall be made in any sewerage system which involves a change in the outlet, an increase in the amount of sewage or a change in the method of disposal until the plans have been approved by the State Board of Health. Also that no corporation, institution or person shall adopt a site for the location of any industry which produces putrescible or other liquid wastes until the site is approved by the State Board of Health or until some method of adequately purifying the waste is adopted satisfactory to the board. By this act the decisions of the board are final and conclusive except for fraud or abuse of discretion; in which case the aggrieved party may appeal to the court of common pleas of the county where the system is located, the appeal not acting as a stay, but the board's decision standing until reversed or modified by the court. The penalties for violating the act are a fine of not exceeding \$500, imprisonment for not more than six months, or both.

CORROSION BY HYPOCHLORITE SOLUTIONS

IN discussing a paper before the New England Water Works Association on the corrosive action of water on metals, Mr. Harold C. Stevens, assistant engineer of the New York Board of Water Supply, gave a brief statement of the experience of that board in the handling of hypochlorite of lime by the department, which looks after the sanitation of the contractors' camps. They found wrought iron pipe to be most readily affected, the inverts of 2-inch pipes through which a one per cent solution trickled being completely rusted through in about four months. Three-inch galvanized iron pipes, conveying at different times one per cent and one-half per cent solutions and flowing full, were replaced after about a year's service because of the accumulation of lime deposit and the formation of tubercles, although the galvanizing was not seriously attacked. Brass pipe was corroded by the hypochlorite solutions, but very much less rapidly than iron; the pipe becoming coated with a smooth layer of lime which protected the metal from further corrosion. Brass valve stems in a tank holding a hypochlorite solution showed general but shallow pitting after three months. Twenty-gauge copper used for floats and tank linings did not meet expectations, the tank lining being eaten through in less than three weeks and an orifice can becoming leaky in about three months. Copper floats also became leaky in about three months through general pitting of the surface.

Tin resisted the action of hypochlorite solution very well. Two ordinary tinned copper ball floats, in solutions of one-half per cent to one per cent strength, lasted for nineteen months. Bronze orifice plates made of "Worthington anti-corrosive metal" have stood well. The edges are not quite so sharp as originally, but the discharge coefficient has increased only about three per cent during nearly two years of service, and part of this may be attributable to wear.

Wood is readily affected by hypochlorite solution. Mixing tanks of white pine began to show serious damage within a month, the end grain at the rabbet being affected most and so softened that it could be crushed or scraped out. Storage tanks containing two per cent solutions were not much affected during the same time. Wooden stilling boxes lasted for nearly two years in solutions of one-half per cent and one per cent strength, but at the end of a year and a half the wood was so softened that edges could be broken off with the hand. Wooden floats boiled in paraffine and coated with a thick layer of paraffine were entirely unaffected after many months' service.

Mr. W. C. Hawley, engineer and water superintendent of Wilkensburg, Pa., stated that they had used galvanized iron pipe for feeding hypochlorite solution to the suction well and found after six or eight months that there had been little action except where the iron was exposed, as at the joints. Ordinary brass was attacked quickly, but a good grade of bronze showed no sign of damage.

Both these gentlemen noticed an unexpected effect on organic matter which had collected in certain pipes. Mr. Stevens stated that when hypochlorite was turned into a large metal supply main a large amount of organic matter was detached and quickly appeared at the reservoir; the next measurement of the capacity of the pipe showing an increase in this of 6 per cent over the previous year, whereas before that there had been an average yearly reduction of 4 per cent. Mr. Hawley stated that they had been compelled to run one of their large engines for some months without an opportunity to clean the condenser, which is located on the suction pipe, and the vacuum had dropped from about 26 inches to 19 inches. Within twenty-four hours after the introduction of hypochlorite in the water, however, the vacuum was found to have increased to about normal. Fear was entertained that there might be a rapid eating away of the metal, but investigation showed that no damage had been done to the tubes, but that they had been thoroughly cleaned of all the organic matter and sediment which had previously collected on them.

CITY PLANNING IN PRACTICE

What It Comprises—The City Plan Never Finished, But Should Grow with the City—Special Department or Official Desirable

IN a recent paper before the American Civic League, Mr. Frederick Law Olmsted discussed the subject of city planning from a point of view somewhat different from that taken by most speakers upon the subject. At the outset he defined city planning as being:

A systematic attempt to do the following three things:

First, to make the best practicable analysis and forecast of such existing and future needs of an urban community as may require its existing natural features or physical equipment to be changed or extended.

Second, to prepare or search out and gather together the most promising tentative plans for the meeting of those several needs; to ascertain the relations of one plan to another and to the interests of the community as a whole; to propose such adaptation of each plan to the others as would minimize any conflicts of purpose or duplication of expense that would be likely to result from their independent execution; and to make apparent any possibilities for increased efficiency through combination or wholesale methods or otherwise.

Third, to keep this combination of plans constantly up to date so as to represent at all times the latest and best judgment as to what physical changes are to be expected, in order that no project for an immediate improvement need be entered upon without a clear understanding of its relation to other changes that are likely to occur.

It is a popular impression that if only a comprehensive general plan can be prepared and then established as the Laws of the Medes and Persians, the job of city planning is done. But in my opinion this "once for all" idea is a most pernicious fallacy. It is associated with the too prevalent American attitude of attending to all public affairs by spasms. It looks to the formation of a Special Temporary Commission on City Plan, to the temporary drafting of the services of a few citizens of conspicuous ability and discretion; to the calling in of noted experts, and to the preparation in the course of a year, or three years, or ten years, of a comprehensive "city plan," followed by the complete transference of the activity of the said conspicuous citizens and noted experts to other fields. Doubtless the educational effect of such a city planning spasm may be very important, but if the regular officers of the city government and of the public service corporations have, for years, been carrying on the administration of the physical equipment of the city in a short-sighted, unco-operative, planless way, it is futile to suppose that the educational effect of seeing somebody else do some constructive planning is going to revolutionize their methods. The best that can be hoped is that some of the features of the plan may be so commendable and receive such strong popular endorsement as to force them permanently upon the consciousness of the community as things that must be provided for. There is always a residue of substantial gain when a wave of spasmodic attention to public duties sinks back into the sea of public indifference.

He then expresses his opinion that a city plan legalized or in any way made compulsory upon future generations or even future administrations is to be avoided, because this would

prevent that improvement in the plan which is almost sure to be rendered possible by the increased knowledge and wisdom of the future or because of unforeseen developments. While the plan must at any given time represent the best practicable forecast of future conditions, it must also be possible for it to grow and improve with the development of the city and with the growth of the science and art of city planning. If either the character of the officials who would have this matter in charge or the organization of any of its departments is such that this continuous development of the city plan is impossible or even improbable, then some change should be sought in either or both of these which will make it possible.

Concerning the real value of experts' reports on city plans, Dr. Olmsted said:

While I cannot over emphasize the fact that city planning must be regarded as a continuous function of some permanent administrative agency in every city, I would not disparage the services which may be rendered by the independent expert. . . . But I do think that the function of the independent expert in such matters has been somewhat misconceived and perhaps exaggerated in importance by enthusiastic laymen. Plans and reports on city planning by temporary commissions, or by experts called in for a flying visit and having but a temporary connection with the problems in hand, may be of great value for educating, for stimulating, for clearing the air, for calling attention to opportunities and indicating effective lines of action. . . . But such a report, or so-called city plan, is not the real thing.

The first essential for effectively planning physical changes in anything is a truthful knowledge of the existing physical conditions. . . . The condition of maps, surveys and records of existing physical conditions in most American cities and towns, so far as my observation has gone, is almost incredibly bad. Where the problem is as large and complex as a whole city, where, on account of the values of land and buildings, a difference of a few inches in location may involve huge sums of money, where comparatively slight differences in level may completely alter the whole plan of a sewer system or bring transportation lines into fatal conflict, where it is necessary to provide sooner or later for such an enormous complex of public utilities in close juxtaposition, the value of the right kind of map is incalculable.

New York, Baltimore, Washington, and some other American cities have awakened to the importance of modern active, comprehensive topographical maps as a basis for the intelligent and economical planning of public improvements, and have provided themselves therewith, at least as to their outer zone; but generally the official surveys consist of incomplete and casual records of streets, properties and public works, gradually accumulated through a long series of years. These records consist for the most part of independent piecemeal surveys of all degrees of accuracy and inaccuracy, made for all sorts of special purposes, and of compilations and transcripts of these piecemeal records patched together in attempts to reconcile irreconcilable data.

This is not the place to enter upon a technical discussion of city surveying as a basis for city planning. I can only emphasize the fact that it is essential, that it pays for itself over and over again, but that it is a big and somewhat costly undertaking in itself when it has been neglected for years. The way to get it is for the citizens to authorize and demand the employment by the city or town of a competent permanent engineering staff, and provide adequate funds for their work.

It is a highly technical matter, and in making a new start or in judging of the efficiency of the local technical staff, the intelligent non-technical citizen or official can very profitably seek advice from independent experts.

But it is not to be assumed because complete and accurate record maps are a necessary basis for a complete and accurate city plan, that all work of planning should wait until the former is complete. In fact, if the city is a live city the topographical map is never complete, any more than the city plan is ever complete and final. The topographical map should be an up-to-date record of existing physical conditions in the city not at one period of its history alone, but always. Like the plans based thereon it is not to be regarded as a picture, but as a kit of working tools, part of it in daily use and the rest kept in good order, ready for instant use when needed.

To take a single aspect of the work, for example, these records ought to show the exact location of every underground pipe, sewer or conduit in the streets of the city, corrected up to date. As it is, in the general absence of such records, new structures are laid out more or less blindly and involve a huge amount of needless expense in the alteration of older structures encountered in the digging. This is but one illustration, but it makes clear that mapping, like planning, must be a continuous function, and that while the mapping must to some degree pre-

cede the planning, they should both advance continually toward a greater degree of accuracy and comprehensiveness.

Mr. Olmsted goes on to state that the same scientific handling and interpretation of statistics which is now common in designing water supply, gas and electric service and the like is seldom used in planning streets, parks, schools and playgrounds or the building accommodations required by the various municipal services, and yet that it is clear that this ought to be done, and that some central authority should be provided to see that the plans which are prepared should co-ordinate and harmonize, and should periodically be revised and brought up to date.

It is rare to find operating officials who are not driven by the pressure of immediate problems to a comparatively nearsighted and narrow view of their field. It is of the greatest importance, therefore, to provide some agency which is sufficiently free from this pressure to take the long look ahead, which can take the initiative in getting the plans made, which will be in a position to force the larger and more distant problems upon the attention of the various responsible officials and command their co-operation in reaching a tentative solution of them, and which finally will compare the various projects and see that they are kept properly correlated.

What the best agency may be for accomplishing these ends I do not pretend to know. There has been so little serious effort to accomplish them that much experiment will yet be needed before any standard method can be evolved. Doubtless the varying forms of existing municipal machinery will call for corresponding local variations in the machinery for city planning. But it is clear that a course should be steered to avoid two opposite dangers. One is that those who are made primarily responsible for the city planning will be too isolated from the regular administrative officers, will fail to be in vital touch with the organization which their work is meant to serve, and will become academic and visionary and therefore subject to arbitrary change of views with changing personnel. The other danger is that they will drift imperceptibly into the temporizing, timid, uncreative attitude which afflicts so many permanent officials.

This last is the disease of bureaucracy. Every official who gets out of the well worn ruts of established routine encounters obstacles and opposition, hurts the feelings of his neighbors and friends and gets little credit and no thanks. After he has suffered this experience a good many times and found that he can accomplish but little good by these individual sallies he is apt to get tired and to settle down into the habitual official attitude of "not looking for trouble."

I am inclined to think that the best organization might include two parts. On the one hand it would have a central bureau of surveys and plans under a permanent able engineer, which would serve all of the administrative departments of the city, record the physical result of all their operations, and keep in close touch with all their projects, thus maintaining the practical contact with current work and the continuity of method which can only come from a permanent technical staff. On the other hand it would have a small supervisory board operating through this bureau and intended to supply greater initiative and breadth of view in dealing with the larger and more distant questions than could be expected of men whose whole time the city could afford to employ. The men of this supervisory board ought to be the very biggest men available. Moreover, the organization ought to be such as to place no routine duties whatever upon them and to make the demands upon their time as infrequent as possible, but the demands upon their concentration of thought and imagination unlimited.

GARBAGE DISPOSAL AT PASADENA

THE city farm of about 500 acres, a considerable part of which is operated by Pasadena, Cal., as a sewage farm, has been described by us in previous issues. One of the more recent features of this farm is the section devoted to the raising of pigs, the garbage of the city being used in connection with this. On one side of the road which passes through this section of the farm are kept the litters while still with the sows; and after weaning they are taken to another section across the road, and as they increase in age and size they are moved from pen to pen until, by the time they reach the last in the series, they are large enough for sale. Alfalfa as well as table refuse is used in feeding them. Great care is taken to collect the garbage regularly and frequently and feed it to the pigs while still fresh. They are not turned loose upon refuse piles, as is sometimes done, but the garbage is sorted over and fed to each individual pen. Clear water from a piped supply is furnished at all times to each of the several pens.

NEWS OF THE MUNICIPALITIES

Current Subjects of General Interest, Under Consideration by City Councils and Department Heads—Streets, Water Works, Lighting and Sanitary Matters—Fire and Police Items—Government and Finance

ROADS AND PAVEMENTS

Highway Committee Approves Paving

York, Pa.—Approval of street paving recently completed here was given last night by the highway committee of the City Council after hearing the reports of chemists upon samples of the material which they had been given for analysis. The Barber Asphalt Company was released from its bonds for the repair of North George street, South Beaver street, West Market street and West York avenue, the five-year term for which the company was bound to make repairs having expired October 10, 1910. Mayor Weaver's effort to show by cutting samples from South Beaver street that the materials had not given the required amount of wear had not been successful, and as the City Engineer said all repairs had been made there was no opposition to the release of the bonds.

Better Sidewalks for Boston

Boston, Mass.—More granolithic sidewalks, particularly in the business district of the city, and the replacing of gravel sidewalks in the outlying districts by some form of permanent walk are among the recommendations of the municipal and metropolitan committee and the directors of the Chamber of Commerce, in a report sent to Mayor Fitzgerald. This report was made by the municipal and metropolitan committee in reply to a request from the Mayor as to the opinion of the chamber. Mayor Fitzgerald in his letter called attention to the prevalence of brick sidewalks, suggesting that "a brick sidewalk in front of a department store or theater is certainly incongruous." These sidewalks are generally of poor quality. The chamber committee points out that this is due to the practice of allowing the abutter to furnish the brick while the city pays for laying it, the result being that the abutter frequently gets brick of poor quality. On the other hand, the city pays for less than one-third of the cost of granolithic walks, which does not encourage the building of this kind of walks.

Reverses Its Paving Decision

York, Pa.—After approving about \$45,000 worth of asphalt paving done here recently by the Filbert Paving Company, the Highway Committee of City Councils has reversed its action and will have a second analysis made of samples of the material used.

Indianapolis Street and Sewer Work in 1910

Indianapolis, Ind.—During 1910, according to City Engineer Klausmann, nine street improvement contracts let the previous year were completed at a cost of \$143,682. Contracts let in 1910 were completed at a cost of \$161,483. In the sewer department 21 contracts let in 1909 were completed, the cost being \$120,692.88, while two 1909 contracts were uncompleted. Eleven contracts let in 1910 were finished and accepted, at a cost of \$37,039.41, and eight contracts were completed but had not been accepted Jan. 1. The city asphalt plant laid 105,594.44 square yards of surface, of which 16,983.66 square yards, for which \$16,841.26 was received, were laid for public service corporations, etc. The gross cost a square yard was 69.5 cents, and the net cost 53.6 cents. In the city engineer's inspection department 3,162 lineal feet of curb, 384,000 paving brick and 4,800 feet of sewers were condemned.

El Paso's Paving Record

El Paso, Tex.—Six miles of paving were laid in El Paso in 1910, and as much more is planned for 1911. Six miles of cement sidewalks were also laid. El Paso now has 60 miles of graded and paved streets, 24 of which are bitulithic or petrolithic. The revolving fund, from which the property owners borrow the money to pay the assessment, is responsible for the progress.

Wills Money for Road Machinery

Binghamton, N. Y.—Out of an estate of \$27,000, the will of T. V. Furman, of Windsor, gives \$2,500 to the village for the purchase of a stone crusher, sorting bins, spreading wagons and necessary tools for handling and crushing stone to be used on the improvement of the village streets. The giver recommends that the crusher be set up near the creek beds which supply stone. "Then," says the will, "it can be readily crushed, screened and sorted in readiness for the streets. In this way the expense of purchasing stone can be cut down and the creek beds lowered at the same time." Should the village fail to use the machine for two consecutive years, the town of Windsor shall come into possession of it, the will declares.

Brick Costs More in Freeport

Freeport, Ill.—On top of the freight rate raise for the transportation of brick, which amounted to 3 cents a square yard for paving brick, comes the announcement that the brick which sold last year for \$12.25 per 1,000 will be furnished this year at \$14.50. The advance of \$2.25 per 1,000 means an additional cost of 10 cents per square yard. A good deal of paving work in Freeport is planned for this year and the high cost of brick will make a big difference in the estimates. As the situation is at present, no brick contractor will take a big contract for fear of some further change in price, and the brick market will not be settled for some time. Last year there was a raise in price of about \$4.

Highway Construction in Santa Clara County

San José, Cal.—The permanent highway improvements made in Santa Clara County during the past year will probably exceed those of any other year. During the past year the county has been getting ready for extensive road improvements. Besides one road roller that was purchased several years ago the county has purchased three new 13-ton road rollers. There have been about 15 miles of good macadam roads built in the county in that period and many miles of the branch roads through the farming districts have been put in excellent shape.

Much Road Building Near St. Joseph

St. Joseph, Mo.—The record for 1910 for the building of permanent county roads in Buchanan County far exceeds the record of any previous year. Ten miles of rock road were constructed during the 12 months ending December 31. During the year the contracts for 10 miles of macadam were awarded at a cost of \$67,565.35. The grading cost \$25,616.39; culverts, 50 in all, \$18,740.15; bridges, 19, \$5,045, and the amount to be paid to the road overseers, which will not be due until the annual settlement which is to be made February 1, 1911, is \$28,000.

Washington Needs Paving Plant

Washington, D. C.—A municipal paving or asphalt plant has been asked for by the Commissioners, according to Major Judson at the hearing, because the two paving concerns in the District have consolidated and the price of paving has gone up from \$1.45 to \$1.77. Asphalt repairs have cost the District about \$400,000 in the last 12 months, and the ownership of a municipal plant is asked for in the interests of economy.

Pavement Construction and Reconstruction

Cincinnati, O.—In his annual report City Engineer Meinert calls attention to the wretched condition of the asphalt streets and recommends that Council adopt ordinances as soon as possible for the resurfacing of them. He recommends the construction of six trunk sewers in various parts of the city. The report shows that 2.22 miles of streets were constructed during the year at a total cost of \$38,452.44, 1.08 miles of sewers costing \$11,827.46 and 2.25 miles of sidewalks, costing \$7,551.57.

Newark's Record for Paving in 1910

Newark, N. J.—Newark paid the sum of \$474,231.89 for paving work in the city streets during the year of 1910, and an additional amount of \$116,174.04 was paid for grading, curbing and flagging. All of which meant a busy year for the Department of Streets and Highways, under the supervision of Engineer William A. Howell, and added materially to the cleanliness and comfort for traffic of the city thoroughfares. In all, the city laid 8.31 miles of new pavement during the year, together with .307 mile under private contracts. This brings the total mileage of paved streets in Newark up to 207.8, a stretch which, if marked out in a continuous line and allowing for the usual width of a street, would extend farther than from Newark to Boston. There are now only about 80 miles of unpaved streets in Newark; this, too, considering the fact that 17 new streets were opened in the city during the last year. Two species of pavement new to the city were introduced here during the year. One of these was the Medina block variety, 4,481 square yards of it, which was laid in Frelinghysen avenue at a cost of \$12,015.56. The other was phalt block, 1,643 square yards or 558 lineal feet, laid in great place at an expenditure of \$6,144.60. In all, the city laid five kinds of pavement by ordinance during the year. One brick paving, of which there was laid 88,791 square yards, amounting to 24,226 lineal feet, cost \$246,903.65, including inspectors' fees, advertising and other expenses. Granite on concrete was laid to the extent of 38,580 square yards, at a cost of \$209,168.08, and bitulithic pavement, 12,711 square yards of it, at a cost of \$37,732.54. The Public Service Corporation, operating under the supervision of the city engineering department, also improved a greater mileage of pavement between the car tracks last year than ever before, the total amounting to 15.7 miles. The greatest part of this work, 9.7 miles, consisted of new standard construction with reclipped granite block. The new specification block was used over a stretch of 4.5 miles. Work was started last year on contracts calling for the grading, curbing and flagging of 29 streets, at an estimated cost of \$91,830. Contracts were also awarded for the flagging of sidewalks on 12 other streets, at a cost of \$22,955.74, bringing the total up to \$116,174.04. Ordinances were passed providing for the opening of 17 new streets at a cost of \$1,130.12.

Mayor Favors Narrow Streets and Wide Parkings

Des Moines, Ia.—That many miles of unpaved streets in the city can be paved at a nominal cost by making the streets narrower, while the traffic can still be taken care of, is the belief of Mayor Hanna, who has investigated paving methods in many large cities. If such a policy is followed Mayor Hanna believes that within a few years the city can pave twice as many miles of pavement as at present. His inquiries show that the narrower streets have been found satisfactory in other cities. Following is his statement, in part:

"Des Moines has nearly 600 miles of streets. Of these only one-seventh are now paved. Our big street question now is how can we get more streets paved without a prohibitive expense. There is no practical reason why pavings from 12 to 22 or 24 feet in width in purely residential districts will not serve all of the purposes of the pavings 30 and 40 feet wide. We can then have parkings of double the present width filled with trees, green grass and flowers.

"Now is the time to prepare paving petitions. The people should get together and discuss the kind of paving and the widths desired and get their petitions in early so as to get ready for next season's work. If we follow out some such policy as this we can pave twice as many miles of streets as we are now paving by using the wider pavements, and can soon have our city presenting a very much cleaner and more beautiful appearance, and that, too, without an outlay so great as to be a burden on the property owners."

New Rock Road Planned for Kansas

Topeka, Kan.—Senator T. A. Milton, of Wyandotte, will make an effort before the legislature to have some action taken upon a proposed rock road to run from Fort Riley to Fort Leavenworth, Kansas City, Topeka and west to Hutchinson, and branching south between Topeka and Kansas City to Olathe and Osawatomie and running to Oklahoma to join the proposed Fort Sill road.

SEWERAGE AND SANITATION

To Investigate Sewage Problem

Boston, Mass.—An investigation of the discharges of sewage and other matter into the Connecticut River within the borders of Massachusetts is called for in a bill filed by Senator Malley of Springfield. The bill provides for the appointment of a board of three experts to conduct the investigation and the board may extend its researches into the entire watershed in this State. If the measure is passed the board will report to the next Legislature.

Municipal Tuberculosis Sanitarium Announces a New Feature

Chicago, Ill.—A free clinic for the care and treatment of members of the colored race suffering from tuberculosis will be the next feature of the constructive campaign in the Municipal Tuberculosis Sanitarium. This plan was announced last week by Frank E. Wing, general superintendent, as the result of a meeting of the board of directors of the sanitarium—Harlow N. Higinbotham, Dr. William A. Evans and Dr. Theodore B. Sachs—at the City Club. The new dispensary will be opened soon at Provident Hospital, West Thirty-sixth and Dearborn streets, and in order to reach the people for whom the dispensary is designed the directors plan to place a colored physician and a colored nurse in attendance.

Erie Plans New Sewerage Plant

Erie, Pa.—The end of one of Erie's greatest problems of recent years—the gathering and destruction of sewage that was formerly emptied into the harbor, polluting the water supply—appears to be in sight. The plans for the large new sewage disposal plant to be built on the bay front at a cost of nearly a quarter of a million dollars, including the necessary main sewer connections, have been approved by the State Health Department and reported to the Mayor and Councils by City Engineer Briggs. In working out the system, the problem of the engineering department has been to make a gravity system, so far as possible, in order to avoid the expense of pumping, which would cost thousands of dollars in future years. City Engineer Briggs drew the plans very carefully and had consultations with Engineer Fuller, of New York, the leading American expert. He decided finally to make use of the system perfected by Dr. Carl Imhoff, in Germany, by which the plant on the harbor front can be developed and converted into a park.

Cost of Operating Sewage Disposal Plant

Pelham, N. Y.—At a joint meeting of the Sewerage Commission and the Town Board Engineer Roberts presented an estimate of the cost of operating the new sewage disposal plant. He showed that the estimated quantity of sewage treated a day would be 400,000 gallons, and that there would be needed from 12 to 15 lights for 12 hours, one centrifugal pump one-half time with 15-minute intervals including the pumping of the sludge. The pump Mr. Roberts thought would consume 150 kilowatts per day of 24 hours, at a minimum rate of 4 cents. Mr. Roberts also said that three men were needed at the plant, a superintendent at \$100 a month, an assistant at \$60 and a night man at \$50; oil packing, waste, fuses, etc., 50 cents a day; repairs, renewals and depreciation, \$2.75 a day; making total expense for the maintenance of the plant \$15.92 a day, or \$5,480 a year. In conclusion the report said: "It has been deemed advisable to have a superintendent at the disposal plant at least for the first year in that every precaution may be taken to properly care for the machinery and the plant under the supervision of a competent man." The members of the commission thought that the plant could be run much cheaper than Mr. Roberts stated. It was the belief that a good engineer could be secured for at least \$80 a month, and an assistant for \$50, and that only two men were needed. It was decided that the plant could be run, including all the expenses, for at least \$3,000 a year. It was finally voted that the supervisor levy against the taxable property that sum for the ensuing year for the maintenance of the plant. Later Supervisor Beecroft discovered that the interest on the bond issue for the year would amount to \$2,642.10, and he was authorized to levy this amount also, making the total cost for the year \$5,642.10.

City Fined for Sewage Nuisance

Henderson, Ky.—The city of Henderson was fined \$50 and costs recently, in the Circuit Court, under an indictment charging the maintenance of a nuisance in running a sewer and emptying sewage into Canoe Creek. The remedying of this alleged nuisance will necessitate, so experts say, an entire change of the sewer system of Henderson, and will cost in the neighborhood of \$150,000.

Sewage Nuisance Disturbs Lynn

Lynn, Mass.—A recent meeting of the Harbor Commission, called for the discussion of harbor improvements, turned instead into a discussion of sewage conditions on the Lynn flats and methods by which the nuisance can be done away with. One speaker declared that a city of 90,000 population should be ashamed to have a front yard such as Lynn has at the present time. Another said that at low tide there was at least two feet of sewage on the Lynn flats, and that in nine cases out of ten the odors would kill a person in less than six months. Another hearing will be held soon to consider the matter further.

Ordinance Regarding Tuberculin Test Sustained

Milwaukee, Wis.—The city of Milwaukee can now demand of shippers milk from tuberculin-tested cows. The celebrated "tuberculin test case" has been decided by the Supreme Court, which affirmed in all points the decision of Judge Turner, Circuit Court, which was that the ordinance is valid and that the tuberculin test is reliable. Of widespread interest is this decision because many other large cities have passed or planned ordinances demanding only tuberculin-tested milk from shippers, and in a number of instances enforcement has been withheld until a decision should be handed down by the Wisconsin Supreme Court. "This decision is one of the most important given in years," said former Health Commissioner G. A. Bading on Tuesday. "It is a great step forward in the fight on tuberculosis. About 20 per cent of tubercular cases in children have been shown to be due to infection by bovine tuberculosis. The city has won on all points and there is now nothing to prevent rigid enforcement of the ordinance." Health Commissioner Kraft says he will give shippers who supply milk to Milwaukee six months to comply with the terms of the ordinance. The case involved the validity of the ordinance prohibiting the sale of milk or cream from cows not tested for tuberculosis and requiring owners of cows to file certificates of test from reputable veterinarians.

Will Fight Sewage Disposal Order

Mount Holly, N. J.—The authorities here have decided to fight the sewage question in the high courts before any steps are taken looking to action in compliance with orders issued by the State Board of Health for the establishment here of a sewage disposal plant, in order that all pollution of the waters of the Rancocas Creek and Delaware River from this point may cease. There are a number of other places along the Delaware that use the river as a receptacle for sewage, and many of the residents of this place feel that it is unjust to compel Mount Holly to erect a sewage disposal plant, while other places are allowed to go on in the same old way.

Investigating Possible River Pollution

St. Paul, Minn.—Residents of the Twin City interested in the high dam project will have to wait until Dr. L. L. Lumsden, of the Government Public Health and Marine Hospital Service, files his report with the Surgeon-General at Washington before learning what the Government officially thinks of the possible pollution of water above the high dam by sewage from Minneapolis. Dr. Lumsden, with Dr. Bass, of the State Board of Health, and Major Shunk, United States Engineer, inspected the sewerage systems of both cities adjacent to the territory which may be affected last week, but none would say what conclusions had been reached. The recommendations will become known through the office of the Surgeon-General at Washington. The investigation follows complaints made to the Federal authorities by members of the Mississippi River Boulevard Association that the sewage of Minneapolis will become offensive and insanitary in the slack water caused by the dam's erection.

WATER SUPPLY

City Would Buy System

Bellefontaine, Ohio.—The city of Urbana will make one more offer of \$100,000 for the water works system in Urbana, now owned by a private company. If the offer is refused, as it has been in the past, the Council expects to build a municipal plant.

Barberton's Water Plant Pays

Barberton, Ohio.—The Board of Public Affairs has submitted the following report showing the operation of the Water Works Department for 1910: Total receipts, \$18,294.86; total expenditures, \$11,970.05; balance on hand to date, \$6,324.81; balance on hand Jan. 1, \$5,160.84.

Numerous improvements were made by the board during the year. Two additional wells of the corkscrew type were added and the other wells were repaired and lined with concrete, thus saving a great quantity of water that was wasted through defective walls. Roofs to cover the wells were also erected. Numerous water mains were extended, five fire hydrants installed, 116 service connections made. Total number of gallons of water pumped, 400,982,000; coal consumed, pounds, 2,677,590; water, daily average gallons, 1,098,580; coal, tons per day, 3.66. The board continues by saying that the available water supply is 1,500,000 gallons every 24 hours. The report says that 6 of the 12 original wells being used produce very little water. More wells are needed to afford adequate fire protection. Two more wells are contemplated being drilled this year and it is thought that these will thoroughly cover the territory.

Not only can the water board show a balance on hand of \$6,324.81, but they produced a statement of expenditures for 1910 showing that they had expended \$8,950 for the benefit of the city. This total, together with the balance on hand Jan. 1, shows a complete saving for the city from this department of \$14,110.81.

Following are expenditures turned over to the city: 165 fire hydrants, at \$40, \$6,600; 33 flush tanks, at \$50, \$1,650; sewer flushing, \$150; fire station, \$50; schools, drinking fountains and watering troughs, \$500; total, \$8,950. And the total receipts were only \$18,294.86.

Poor Foundation Hampers Filtration Plant

Binghamton, N. Y.—Superintendent Moses Stoppard, of the Water Works, has presented to the Water Commission his annual report, in the course of which he reviews the construction and maintenance of the system for the year 1910. In the course of this report Superintendent Stoppard says: "The filtration plant is keeping up the quality of the finished product, as the report of Chemist Nelson will show. Our main troubles with the plant are the result of inferior and careless construction of the substructure originally. This has caused us no end of trouble with leakage. A gradual settling of the bottom, for lack of good foundation, pulls the walls apart and there is no remedy but constant repairing. And this must be done without interfering with the process of filtration. With our limited storage capacity, as at present, we can supply the city with water for only 40 minutes if the filtration plant is shut down."

Expect to Buy Water Plant

Farmville, Va.—The citizens of Farmville are determined to own all utilities of the town. The electric plant has for years been run by the town, the sewer system has recently been bought and negotiations are now pending looking to the purchase of the water company's property. The two last-named systems need to be extended. This will be done as rapidly as possible.

Water Plant Almost Completed

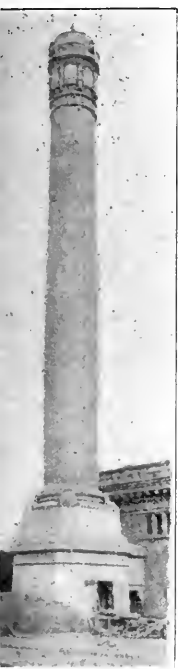
Gadsden, Ala.—The pumping engines for the municipal water works plant have been received here and will be installed in a very short time. The engines are capable of pumping 3,000,000 gallons of water every 24 hours. This amount will more than supply the city for the present and Gadsden will have to grow to be a city of 25,000 or 30,000 before the plant will be inadequate to meet the demand upon it. The cofferdam has been completed.

Recommends Completion of Water Works System

Springfield, Ohio.—In his annual report Superintendent George Cotter, of the Water Works Department, recommends the completion of the water works system, as has been planned for several years; that the city consider the installation of a new 15,000,000-gallon pump, or the use of meters by all consumers as a means of decreasing the amount of water used, and that the new 20-inch main be constructed from the new to the old pumping station. The total receipts from the department for the year were \$81,044, operating expenses \$26,335, balance \$54,708. Bonds and interest to the amount of \$21,000 were paid during the year. The cost of pumping was \$2.58 per million gallons the cheapest in the history of the city, and cheaper than any other city of which a record can be obtained. Attention is called to the fact that only two cases of typhoid fever developed in the city in the last year, and these were both traced to wells outside the city limits.

Handsomest Chimney in America

Philadelphia, Pa.—The chimney of the Queen Lane Filter Plant, Philadelphia, Pa., is reputed to be the handsomest chimney in America. The plant is located in a high-class residential section, and for this reason it was thought justifiable to go to some expense in the matter of ornamentation. The chimney is 125 feet high and 6 feet in diameter inside. It serves six horizontal return-tubular boilers, the total rated capacity of which is 900 horsepower. The lower portion or base of the chimney is of granite and terracotta. The upper portion or shaft is constructed of radial brick, faced with pearl-gray blocks to match the terracotta ornaments of the cap and base. The round column or shaft of the chimney has a double entasis; that is, a double curvature, which is used to overcome the optical illusion which a straight shaft gives of being concaved. This is the design which was applied by the Greeks and Romans to the columns in their temples. The general scheme of ornamentation is Italian Renaissance. The architect employed conventionalized water forms as motives of decoration, both on the chimney and the power house itself, as being indicative of the character and use of the structure. It will be noticed in the view that use is made of shells, cat tails, dolphin heads, star-fish, etc., cleverly placed, as motives of decoration instead of the more commonplace garlands and flowers, etc. The total cost of the chimney was \$15,000.



ly placed, as motives of decoration instead of the more commonplace garlands and flowers, etc. The total cost of the chimney was \$15,000.

Engineers Report on Fort Worth Water

Fort Worth, Tex.—In a preliminary report to Commissioner Powell just made public the three expert engineers employed to find a suitable site for a surface reservoir on the river above the city announced that an adequate supply of surface water can be secured on either fork of the Trinity with a site at a cost of about \$1,000,000. Two suitable sites on the Clear Fork are recommended and one on the West Fork. The Parker County site on the Clear Fork, which now belongs to the city, is not recommended except as an adjunct.

The sites suggested are as follows: Live Oak Ridge on the Clear Fork, containing 2,000 acres, at a cost of \$908,000; Eagle Cliff, 10 miles above the city on the West Fork, comprising 3,000 acres, at a cost of \$995,000; Mound Dam site on West Fork, eight miles from the city, 600 acres, at a cost of \$1,235,000. The Eagle Cliff reservoir would hold 6,000,000,000 gallons of water and the Mound Dam 30,000,000,000 gallons. The Live Oak Ridge reservoir, it is estimated, would contain 6,000,000,000 gallons. The estimates in each include the cost of the overflowed land, earthwork, concrete spillway, slope paving, pipe line, filter beds and engineering design, supervision and contingencies.

United States Moves to Take Jersey Water

Newark, N. J.—United States District Attorney Vreeland has notified the Newark Board of Works that it is the purpose of the Federal Government to take possession by condemnation proceedings under Congressional authority of such rights as Newark may have in the wells of the Hudson Water Company at Belleville, unless Newark comes to an agreement as to the price and the damages to be paid to the United States Government. To bring the matter to the point the Government offered Newark \$10 for the rights which the former desires to acquire and has "determined to take for the provision of a public water supply to said Government at its fortifications and sea coast defences in Staten Island." The notification also sets forth that in the inability of the Government to come to such an agreement the Secretary of War has power to take land or any right pertaining thereto needed for the site, location, construction or prosecution of works for fortification and coast defence. It is believed that the primary purpose of the letter sent to the city authorities of Newark is to establish more firmly the right of the United States to appear in court as a party to the suit of the Hudson Company in its efforts to upset the McCran law of New Jersey, which forbids diversion of water to other States and to place the Government in a position to be able to condemn the water rights if such a course becomes necessary.

May Take Over Water Works

South Omaha, Neb.—The executive committee of the charter revision committee has formulated several amendments to the city charter. One of the amendments suggested bears directly upon the proposition of the West End Improvement Club and favors a municipal water supply system. This amendment would confer upon the city the right of condemning for the purpose of purchase any system of water pipes or mains within the corporate limits, and also empower the city to enter into contracts to control, lease or buy any existing water mains or pipes within the city.

Municipal Ownership Sentiment Prominent

Plainfield, N. J.—Municipal ownership sentiment predominated at the Common Council's public hearing on the water question last week, when more than 2 per cent of the voters gathered, despite the weather, to express their opinions. Councilman Frederic Mygatt, chairman of the Water Committee, presided, and a score of prominent citizens strongly urged the consummation of public control of the water supply.

STREET LIGHTING AND POWER

Start Year Without Electricity

Morgantown, W. Va.—For the first time in many years Morgantown people, on the first day of the new year, had a taste of living without electric lights and without street car service, electric elevators and motors of various kinds. From daylight in the dawn of the new year until 6 o'clock in the evening not even a modest eight-candle incandescent shed its feeble rays through darkened rooms, halls and corridors. Not a street car turned a wheel, and those who desired to reach a floor in any of the taller buildings had to walk. There was neither electric power nor electric light. The shut-down was due to the fact that the Union Utilities Company, the local source of all electric light and power for public use, was connecting its new steam turbine, engines and generators at the power plant, and making necessary changes and repairs.

Passaic Wants Underground Wires

Passaic, N. J.—At the meeting of the Committee of Public Safety last week Passaic, as a municipality, for the first time in its history gave to the public its often intimated desire to have wires put underground. It was decided that bidders for future lighting contracts will have to make provision for the stringing of wires underground. The committee feels that the rates for lighting charged the city by the Public Service Corporation are too high, and unless there is a reduction steps will be taken to build a municipal plant.

Will Test Gas Pressure with Portable Gauges

Baltimore, Md.—Acting on the suggestion of the Public Service Commission the Fire Board has ordered the removal of all the gas-pressure gauges from the engine houses and truckhouses. They were placed in these places some years ago by Superintendent of Lamps and Lighting McCuen for the purpose of keeping tab on the gas pressure in the different sections of the city. By their means, he says, he was able to have a uniform supply of gas. He contends that they are absolutely necessary for the protection of the consumers. Chief Engineer Charles E. Phelps, of the Public Service Commission, explained that the gauges had been ordered removed by the Commission on his recommendation. He said that in place of these gauges, many of which have long been out of commission, and few of which were ever looked at, the Commission proposed to keep one stationary gauge at the City Hall, and to use portable gauges to test the pressure from time to time in other sections of the city.

Repairs to Light Plant Leave Galesburg Dark

Galesburg, Ill.—This city has been in darkness for two weeks because of the inability of the city to operate its electric street lamps, and the prospect is that the same conditions will continue for the next two weeks. On account of the poor condition of the old boilers the city could not maintain both water and light service and, owing to the need of giving fire protection at all hazards, is operating only the water plant. Delay on the part of the contractors in putting in new boilers has added to the complications, and the Mayor and Council are frantically trying to hurry the contractors.

Aside from the inconvenience to which the city is put from lack of light, business is suffering and the difficulty of policing the streets is increased.

Municipal Acetylene Gas Plant Blows Up

Pembina, N. Y.—The town's acetylene gas plant blew up when two men using a gasoline torch for soldering were repairing the gas tank. The tank was supposed to have been emptied of gas. One of the men was killed, the other one escaped uninjured. The damage to the plant amounted to \$1,000.

Springfield Considering Municipal Gas

Springfield, Mass.—Speaking of the possibilities growing out of Mayor Lathrop's recommendation that the city acquire for municipal operation the plants of the two lighting companies, Charles H. Tenney, president of the Springfield Gas Light Company, one of the two concerns involved in the proposition, says:

"Municipal light and power looks attractive, the city seeing an opportunity to take up with a paying business. But there seems to be a misunderstanding among the people as to the status of the Massachusetts law. After the City Council has passed two votes in favor of the project and it has been ratified by vote of the people, then the municipality can go into it. The company in question has from 30 to 60 days in which to make the decision as to whether it will sell. If it votes not to sell, the city's only alternative is to build a plant of its own and go into competition with the private institution. In such event the city would have to build a plant at least as good as that of the Springfield company, which we consider worth from \$2,500,000 to \$3,000,000. It would be necessary to put in duplicate lines for the entire system and no man would want two meters and two services in his house, with his front lawn dug up twice. In Main and Water streets there are as many as four pipe lines, some of them 24 inches in diameter. In Chicago there are both private and municipal lighting plants, also in Berlin. In Philadelphia the city operated a gas plant for a number of years and then leased it to the United Gas and Electric Company at rental. Whether a city would benefit by municipal lighting depends to a great extent on what the private company is charging for its product. Our average price for gas during the five months ending with December was 75 cents per 1,000 feet. Jan. 1 the price was reduced 5 cents, making the present average rate 74 cents. A duplicate system would cost for service and meters for each customer \$40."

FIRE AND POLICE

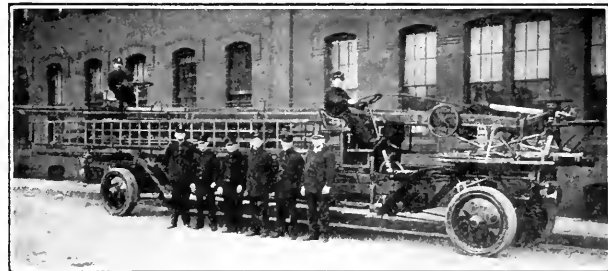
Electric Auto Fire Apparatus in Service

Springfield, Mass.—The Fire Department has received two pieces of apparatus, the motive power of which is supplied by electric storage batteries. One is a chemical apparatus and the other an aerial truck. The propulsion is by the couple-gear system. There is a motor inside of each



CHEMICAL ENGINE AND SQUAD WAGON

wheel, acting directly on a gear which is an integral part of the wheel. So far as known, this is the first application of the system to motor fire apparatus. An advantage in control and decrease in liability of skidding are claimed



AERIAL TRUCK—ELECTRICALLY PROPELLED BY THE COUPLE GEAR SYSTEM

from the fact that power is applied to each of the wheels. The action of this apparatus under service conditions will be watched with interest by fire department officials of other cities.

To Buy No More Horses

New York, N. Y.—Commissioner Waldo has announced that he will buy no more horses for the Fire Department, and will gradually replace the horse-drawn vehicles with motor apparatus.

Philadelphia, Pa.—Chief Baxter, of the Fire Department, hearing of Commissioner Waldo's decision to buy no more horses for the New York Fire Department, expressed his approval of the plan and said that Philadelphia should follow the example and substitute autos for horses as rapidly as practicable.

Fire Report Shows Efficiency

Topeka, Kan.—One of the best years in the history of the Topeka Fire Department, as far as the actual fire loss in the city is concerned, was made by Chief Wilmarth and his men in 1910. In the year 1910 the fire loss in this city was \$34,000, including the damage to buildings and to contents of buildings. The fire damage to buildings was \$20,000 and to contents was \$14,000. The showing made by Chief Wilmarth will compare most favorably with the fire loss in 1909, when Topeka suffered to the extent of \$108,000. And in the year 1908 the loss was \$294,000. Once before the city has gone under the \$34,000 mark, but it was a number of years ago when the population and the fire district were not as large and extensive as at the present time.

Fire Emphasizes Need of Water Works

Tower, Minn.—The most disastrous fire in years burned up a row of houses and threatened to destroy the business district. The fire is said, according to a local paper, to have "emphasized the need of water works."

Motorcycle for Assistant Fire Chief

East Bridgeport, Conn.—A seven or eight horsepower motorcycle will be purchased by the Fire Commission for the Assistant Chief. It will carry a small chemical extinguisher, a searchlight and a siren horn that will be operated by connection with the motor. Commissioner Cogill purposely put off making the purchase until after the motor show at Madison Square Garden, New York, that he might see what it had to offer in the way of powerful motorcycles. Mr. Cogill would prefer that bidders give a competitive test of what their cycles are able to do.

Plans to Have Gasoline Fire Ordinance Passed

El Paso, Tex.—Fire Marshal Henry Reynaud, having succeeded in having an ordinance passed preventing the placing of inflammable materials in wooden boxes, is now planning to have a gasoline ordinance passed by the Council. It is his idea to have the amount of gasoline which may be kept near a building limited to ten gallons, unless it is stored in an underground steel tank.

Year's Work of Fire Department

Indianapolis, Ind.—The Fire Department answered 1,402 alarms, an increase of 79 alarms over 1909. Thirty-six citizens were injured, in five instances the injuries proving fatal. Firemen, including the cellar inspector, made 3,264 inspections. All the fire companies, combined, worked in response to alarms a total of 1,716 hours and 42 minutes. The steam fire engines, combined, worked a total of 72½ hours. Fire apparatus traveled a total of 11,735.8 miles. Ninety-one fire hydrants were installed, making a total of 2,709. The Department cost \$338,475.

Year's Work of Indianapolis Police Department

Indianapolis, Ind.—The report of Superintendent of Police Hyland shows 12,208 arrests were made, an increase of 1,651 arrests over 1909. Of those arrested 10,682 were men and 1,526 were women. There were 271 arrests for violating the liquor laws, an increase of 107; for drunkenness 2,487 were arrested, a gain of 406; there were 50 arrests for keeping gambling houses, an increase of 10, and 461 arrests for visiting gambling houses, an increase of 162. Other arrests included, murder, 27; violating motor speed law, 183; loitering, 2,250; petit larceny, 727; burglary, 93; embezzlement, 29, and grand larceny, 202. The detective department investigated 3,211 cases and recovered stolen goods valued at \$17,991.44. During the year reports were made that a total of 20,970 watches were pawned. The bicycle police made 3,827 arrests. The police emergency automobile made 1,163 runs, covering 7,291 miles and hauling 442 prisoners. The patrol wagons answered 6,501 calls besides hauling prisoners to the workhouse, making a total of 20,647.10 miles, and hauling 8,283 prisoners. The humane officers investigated 2,071 cases, made 259 arrests and the fines aggregated \$25,173.70.

Will Protect Indianapolis

Indianapolis, Ind.—On account of material improvements in the fire protection facilities and water supply, the fire insurance interests will advance this city to a class 2 rating, which means a reduction in premium rates. New water mains are to be installed, the pumping station protected, 50 men will be added to the Fire Department, which is to be put under civil service rules, standard building laws will be adopted and stringent ordinances enforced regarding the use and storage of explosives and inflammables. The City Aldermen, before authorizing the improvements, wanted a signed agreement from the companies that the reductions would be made. It was pointed out, however, that no such agreement was possible under the recent interpretation of the State anti-trust law. It is expected that some kind of agreement as to rating can be obtained from the private inspection bureau.

New Fire Signal Will Call Police Ambulance

Los Angeles, Cal.—The Police Commission has established a new signal in the code of fire alarms. In future, when the signal 1-1-7 is tapped on the gongs, followed by the number of the box, the police ambulance, accompanied by a police surgeon, will respond to the box. Heretofore it has been necessary to use the telephone to get the ambulance when an accident occurred at a fire.

Fire Department Frozen Up

Mason, Mich.—When George Shaw, Chief of the Mason Fire Department, went over to the engine house one morning last week he found the hose carts frozen down in 18 inches of solid ice, the boots standing up were filled with ice, also the hats and coats were coated with ice. The damage was caused by the bursting of water pipes overhead in the Maccabee hall. In case of a fire Mason would have to call on the Lansing or Jackson Fire Departments.

Install Bells in Addition to Flash Light

Moline, Ill.—A new signal system used in summoning an officer on the beat to headquarters will be given a trial by the city. Heretofore when a patrolman has been wanted at the police station an incandescent lamp with a red globe has been lighted. The new system is known as the bell-light, and the gong sounds simultaneously with the lighting of a red electric lamp. The system is not a new one, but it has never been tried out locally. It is manufactured by the Signalphone Alarm Company, which installed the present telephone system now used by the police. E. E. Salisbury, superintendent of the company, has written Chief of Police Bisant that his company will furnish the city one of the bell-light signals free. After conferring with Mayor Olson it was decided to accept the offer. The signal alarm will be placed on the same circuit that controls the telephone system. It will be installed at the northeast corner of Third avenue and Fifteenth street. It will be controlled by a switch in the police station. The gong can be heard for several blocks and when it rings the officer will know that he is wanted at once. The city of Peoria has 80 of the alarms in use at the present time, and they are said to work satisfactorily. It is possible that if the one alarm proves a success here more will be purchased. As soon as the alarm is received it will be installed.

Police Band to Be Officially Recognized

New York, N. Y.—Steps have been taken by Deputy Police Commissioner Driscoll to change the status of the Police Band. As it stands at present the band is of the department, and yet apart from it. The police commissioner may request the band to play at any function, but he cannot command it to do so. The change will be made by making the band an integral part of the department—recognizing it officially and taking over its instruments, music and other property in a manner satisfactory to the members. Then the name will be changed to The Police Band of the City of New York.

Portsmouth's Fire Chief Makes Report

Portsmouth, Va.—Portsmouth's fire loss in 1910 was \$33,358.50 according to statistics compiled by Chief William R. Walker, of the Fire Department. Loss on buildings was \$13,349; on contents, \$20,009.50. He reports that the expenses of the department for the year were \$21,000, including the purchase of horses and harness for Nos. 4 and 5 companies at an outlay of \$900.

Water Lacking, Town Burns

Welch, W. Va.—A fire, January 12, burned the principal business section of the town and caused a loss of \$200,000. The water supply gave out an hour after the fire started.

Wheeling Fire Chief Makes Report

Wheeling, W. Va.—The annual fire report of Chief M. L. Deegan has been submitted to the Council and approved. The report was of the most pleasing nature, showing a total of but thirteen fires for the entire year with a loss of only about \$350. Many of the fires were of such a nature, however, that serious conflagrations would have resulted had it not been for the excellent work of the department. The total value of the property of the department is close to \$50,000.

Will End Shingle Roofs

Boston, Mass.—The result of the two big fires which broke out simultaneously last year and called fire departments from many neighboring towns is found in a bill prepared for passage this year. It provides among other things for the removal of all shingle roofs and their replacement with non-combustible material before 1920. Frame buildings must be no nearer adjoining buildings than 20 feet. They cannot be more than three stories high nor more than 2,000 square feet in area on the ground.

GOVERNMENT AND FINANCE

Municipal Legislation Prepared in Pennsylvania

Harrisburg, Pa.—The law committee of the League of Third Class Cities has prepared drafts of proposed laws for consideration by the Legislature covering the following points:

A tax on the real estate of all public service corporations. Quo warranto proceedings whereby cities may deprive public service corporations of their franchises where violations have occurred.

Placing all telephone and telegraph wires in conduits; the cities may construct their own conduits and compel the companies to install their wires in them or if this is not done, compel the companies to construct their own conduits.

Notification of municipalities within thirty days after an accident on a public highway of the intention of a plaintiff to bring suit against the city for damages. At the present time such a suit may be filed within two years after the accident and it is difficult for the city to get witnesses.

The election of city assessors for four year terms, one to be elected in 1911 for a term of two years and two for four years.

That annexed territory to a city be either added to adjacent wards or ward or be designated as a separate ward, according to the discretion of the court.

That the State contribute one-half the cost of constructing sewage disposal plants.

Referendum on Franchises

Indianapolis, Ind.—A referendum bill has been introduced in the senate by Senator Grube, of Plymouth. This measure provides that no ordinance, granting a franchise, passed by any city council or town board, shall go into effect sooner than thirty days after its passage. If, during the thirty days, any protest, signed by 15 per cent of the voters, casting ballots at the last preceding election, is filed, the ordinance is suspended until an election, at which the ordinance is referred to the voters, is held. This petition, it is provided, need not be only on paper, but may be filed by the "card system," such as is legal in remonstrances. The referendum vote may be taken either at a general election, if such an election is held within sixty days after the filing of the petition, or it may be at a special election. More than one ordinance may be submitted to the voters at one election, and it is provided that special elections shall not be held oftener than once in each six months. No ordinance against which a legal protest has been filed, can go into effect until at an election a majority of voters shall vote in favor of the ordinance. The city clerk is required either to publish the protested ordinance in two newspapers, together with a sample ballot showing the manner of voting, or to mail to every voter a copy of the ordinance and a sample ballot. This must be done at least ten days before the referendum election.

Large Balance is Pleasant Surprise

Indianapolis, Ind.—A pleasant little surprise was sprung on city officials when Howard Kimball, former City Controller, announced that the city's so-called available cash balance on January 1 was \$200,545.19. This is the amount of money the city had on hand at that time, with which to start the year's business, unincumbered by appropriations. The sum is much larger than has been estimated all along by Mayor Shank and members of the city council, and incidentally is larger than Mr. Kimball had expected. On January 1 the controller's balance, after deducting all outstanding warrants, was \$300,617.35, of which \$100,072.16 was held in reserve for specific appropriations, leaving the available cash balance mentioned. On January 1, 1910, the available cash balance was \$268,083.88.

Milton to Ask a New Charter

Milton, Del.—To run a town of more than 1,000 residents on \$1,000 a year is a problem which the Town Board will present to the Legislature, with a request for a new charter. Under the present charter only \$1,000 is allowed to be raised by taxation for town purposes, including street building, payment of town officers and other necessary expenses.

Plan Greater Rehoboth

Rehoboth, Del.—Rehoboth citizens have had a bill of reincorporation drawn up and will ask the Legislature to annex adjoining villages into a greater Rehoboth, under a board of seven commissioners, to be elected every July; three auditors, an assessor and a collector. With the reincorporation and enlarging of the town limits, the population of Rehoboth will be nearly doubled.

Public Improvements Held Up in Spokane

Spokane, Wash.—Corporation Counsel F. B. Morrill has called a halt to the business of the city. Holding that there is a serious doubt about the legality of any acts which the present city government might transact, the corporation counsel, in an opinion to the board of public works, advises that as little business as possible be transacted till the new commissioners take office in March and that no important contracts be entered into. The opinion means that the board will hold up over \$500,000 worth of city contracts which should be awarded at once if the 1911 improvement work is to start in proper season. Acting in conformity with this opinion, the Board of Public Works, the City Council and other city departments are expected to put business other than the merest routine at a standstill.

Mayor Favors Bonds for Small Investors

Toledo, Ohio.—The practicability of a popular municipal bond issue in which bonds of small denominations would be sold to buyers of little means first hand, without a profit to a bond dealer, is being discussed among city officials in whose charge the issue of bonds is placed. It has been suggested that a good opportunity to test the desire of the people to invest their savings in city bonds would be in the issue of \$110,000 for new market purposes, providing the legislation for this issue now in Council passes. Both Mayor Whitlock and Councilman Thomas L. Gifford, who have given the idea some study, have expressed themselves in favor of giving the people a chance to buy city bonds in the denomination of \$100. The Mayor said that the law on its face isn't so bad since it provides that bonds shall be sold to the highest bidder with preference given to the bidder for small amounts. The trouble is that the man with the small amounts cannot watch legislation, nor know the bond business. He would have some means by which any man or woman who had saved up a little money could go to the treasurer and buy the security without giving anybody a premium.

Expenses Increased Under Commission Government

Topeka, Kan.—The commission form of government in Topeka is a success from every viewpoint with the exception of the amount of money paid as salaries to officials. The commission in the nine months of its power in this city has raised the pay rolls from \$177,000 to \$210,000—an increase of more than \$33,000.

Bond Limitation Act Blocking Improvements

Youngstown, Ohio.—The cities of Ohio, particularly the larger ones, find themselves in a predicament with hands tied in the matter of making improvements because of a law passed by the Legislature and effective January 1, 1911, reducing the bond limitation. The bond limitation is reduced by the new law without providing an extension of time when the new tax valuation of 100 per cent. is available. Under the old Longworth act a city could issue bonds up to 1 per cent. on the tax valuation without a vote of the people. Also, the bonds issued at any time must not exceed 4 per cent. of the tax valuation without a vote of the people. With a vote it was possible to issue bonds up to 8 per cent. Under the new law the 1 per cent. issue was not changed, but the 4 per cent. and 8 per cent. were cut to 2½ and 5 per cent., respectively. In the case of Youngstown the net debt is \$1,237,300, and the duplicate valuation is \$34,593,880. Under the new law but 2½ per cent. of the duplicate or \$864,345 can be issued with a vote. This therefore leaves the net debt in excess of the bond limitation of 2½ per cent. by over \$300,000. This leaves the city up to the limit of bond issues under the present tax duplicate. Where the hitch occurs, as explained by City Solicitor Jenkins and City Auditor Davies is in the failure of the Legislature to provide means whereby it was possible to base the new percentages on the new valuation which will amount here to over \$100,000,000, or not to have the law effective until this valuation is available, which will be possible in October. No improvement bonds can be issued for this city under this act except for specials. This law was taken up at length at the solicitor's convention held recently in Columbus, and the Attorney General of the State ruled that there is no way out until relief is afforded either by a special act postponing the limitations until the new valuation is available or some other measure.

TREET CLEANING AND REFUSE DISPOSAL

Park Department Would Clean Walks and Assess Cost

Buffalo, N. Y.—One inducement for living on parkways seems to be in danger of being wiped out on a question of law, and people who have been sitting still and letting the Park Department clean their sidewalks may soon have to get busy, for Corporation Counsel Hammond has sent an opinion to Park Superintendent Seymour informing him that this practice of the department in cleaning sidewalks free of charge (for it has been found practically impossible to collect money for the work) may be stopped by the passage of a bill in the Legislature authorizing the Park Department to assess the cost of such work against the abutting property. Judge Hammond holds that there is no authority under the present charter and ordinances to assess the cost of such work against the property abutting. The Park Department desires to have the privilege of keeping sidewalks along parkways or park approaches clean of snow and ice, so the bill proposed by Judge Hammond will probably soon be on its way to Albany.

Would Substitute Pigs for Incinerator

Milwaukee, Wis.—The city refuse incinerator which was recently completed at a cost of \$210,000 will be abandoned and the piggery system of garbage disposal adopted, if plans under consideration by the city administration are carried out. It is understood that the firm of Barber & Malhoun, which operates a piggery in Grand Rapids, Mich., has opened offices in the Majestic Building with the intention of securing a contract for all garbage of Milwaukee, which is to be consumed on the piggery which it is proposed to establish on a 600-acre tract of land south of the city, on which an option has been secured. Under the proposition the city is to build and maintain delivery stations near proper railroad facilities for the delivery of garbage which is to be collected by the city. The city is to build and equip the necessary tanks to hold the garbage and to deliver it to the piggery in special cars. By this method the city will be compelled to continue to pay the cost of collection, but the disposal of the delivered garbage is to be taken care of by the firm. Only pure garbage is to be taken.

As it requires a proper mixture of garbage and refuse to operate the new incinerator by its own heat, the plant will be abandoned, as it is useless for the incinerating of refuse alone. The Socialists are known to be dissatisfied with it and are said to be looking for an opportunity of getting it out of their hands. Consideration of the piggery system of garbage disposal follows closely on the heels of the attempt to adopt the reduction system which was considered a few weeks ago when a former commissioner of public works of Cleveland attempted to convince the Mayor and his cabinet that the reduction method was superior to the incinerating process. This plan has been temporarily abandoned. Piggeries are in existence in a few cities, but it is said that they have been a failure in large municipalities. St. Louis is said to be the largest city to abandon the system.

Alleged Failure of Garbage Plant to Meet Requirements

Portland, Ore.—During the first eight days of the six months' test of the new garbage crematory, which started December 27, the incinerator has failed to meet the requirements of the contract between the city and the Public Works Engineering Company, which built the plant, according to daily reports of Superintendent Napier filed with City Health Officer Wheeler. Much of the garbage taken to the plant has been burned, but in order to do so immense amounts of extra fuel were required. In fact, the gas furnaces have to be continually fed with extra fuel to keep the heat at such a temperature that the garbage placed in them will be properly reduced. This extra fuel is bringing the total cost a ton for the reduction of garbage to an immense amount. In fact, the cost to the city for reducing the garbage during these first nine days has averaged \$1.26 a ton, when the guarantee is 55 cents a ton. In this cost are not included the salaries of all the men required to operate the plant, as the contracting firm, according to the reports, has several men employed who are not on the pay rolls of the city.

Fire Pipe Line Nearly Down

Baltimore, Md.—While the majority of Baltimoreans have wondered what those boarded-over holes at intervals along Baltimore street have meant, the pipe line on that street, from Gay to Eutaw, its western limit, has been practically completed. It was about the most unostentatious job that was ever carried out by the city. The entire pipe line on Baltimore street has been laid by tunneling. The street has not been torn up except at intervals—three to a block—and traffic has been only slightly impeded. Most people did not know what the holes were for and had no idea that under the bed of the street men were digging all day long and laying the pipes of the city's newest fire-fighting system. Daniel B. Banks, the engineer who designed the pipe line, gets the credit for the tunneling idea. He didn't want the city's main thoroughfare blocked by piles of dirt and paving stones, so he decided to let the way for the pipes be burrowed through the earth below the street bed. In some parts of the street it was necessary to dig down through the sand to a depth of 20 feet to avoid other pipes. At several places it was found necessary to shift sewers and water mains, and all this, was done in the tunnel's depths, away from the public gaze.

Clean Sidewalks at the Capital

Washington, D. C.—The District is one step nearer to having its sidewalks free from snow and slush and ice. The Senate has passed the Dillingham bill requiring residents to clean the sidewalks in front of their homes after a snow storm. There was practically no opposition to the measure, although Senator Heyburn asked several questions regarding its provisions. The bill requires "every person, corporation, joint stock company or syndicate, whether he be owner, tenant, occupant, lessee or other person in charge or control of any building, or lot of land, within the fire limits of the District of Columbia, fronting on a paved sidewalk," to clean the sidewalk in front of his premises within the first four hours of daylight after snow has stopped falling. The condition of many of the streets as well as sidewalks of the capital is commented upon frequently, and not always flatteringly, by visitors.

RAPID TRANSIT

Trolley Franchise Granted and Freight Stations Designated

Hagerstown, Md.—The Mayor and City Council have passed the franchise granting the Hagerstown & Clear Spring Railway Company the right to build its line into this city. The franchise, which had been under consideration for a month, was submitted to the Council in a revised form, the question of hauling freight through the city, objected to by Mayor Scott, being settled by designating two points east of the Western Maryland Railroad for loading and unloading freight. The company is required to give \$5,500 bond to indemnify the city against damaging the streets or failure to complete the road. M. A. Milton, superintendent of the Gas Company, asked to have a clause inserted in the franchise protecting the gas company, but the Council decided it had no authority in the matter.

Complaints of Car Service

South Bend, Ind.—Protests against the service of the South Bend street car system through the press and in indignation meetings have resulted in the appointment of a committee of city officials to conduct a rigorous investigation. The matter a few nights ago reached its climax at a regular meeting of the Common Council when a petition asking municipal action was presented by residents of the southwestern part of the city. In the opening paragraph of the petition the signers report "that the service on the line is inadequate, erratic and thoroughly unsatisfactory, and we hereby petition you to use your authority to require the Indiana Railway Company to give service that is consistent with good business management. The cars are seldom on time," the petition continues, "they are too small for the traffic and are not run often enough for reasonable convenience, and very little attention is paid to having street signs visible and correct, nor is any attempt made to make transfer connections."

English Regulation Regarding Street Car Traffic

Manchester, England.—The Manchester Corporation has adopted a new by-law regulating the passage of tramcars through the city, which reads as follows:

In the central area the distance at which a carriage shall follow a preceding carriage using the same tramway shall be not less than 10 yards, with the following exceptions: When a carriage is stopped at a stopping-place or tramway terminus, or by direction of any police officer, or in case of accident or emergency, each of the carriages following the stationary carriage and using the same tramway may stop within a distance which shall not be less than two yards from the stationary carriage immediately in front of them respectively; when a carriage is restarted after having been stopped as hereinbefore mentioned, it may, for the space of 40 yards from the place where it was stopped, follow a preceding carriage using the same tramway at a distance of not less than two yards. In the portion of Piccadilly, between Portland street and Mosley street, a carriage using the same tramway may follow a preceding carriage at a distance of not less than two yards.

Subway Station Far Underground

New York.—The new station on the Broadway division of the subway at 191st street has been opened. This station is about 170 feet below the surface of the ground, and is farther from the surface than any other station of the Interborough subway. It has cost about \$350,000, the work being done as an extra under the original subway contract. Besides the stairway at 191st street, there are four elevators, all in one shaft, and going down as far as the mezzanine floor of the station. The city authorities are also planning to construct a sort of subterranean street, or promenade, from a point about 900 feet to the west, to connect with the station.

Rapid Transit Subway Plans for Newark

Newark, N. J.—Replying to a letter from President Thomas W. McCarter, of the Public Service Railway Company, which outlined a plan for a rapid transit subway and connections, Mayor Haussling stated the following fundamental consideration from the city's point of view:

1. The subways should be built and owned by the city and leased to the company at a rental to be readjusted at reasonable intervals. If the bonds necessary for the construction of the work should be issued so as to mature in a relatively short period of time, say twenty-five or thirty years, then the rental charge might be based upon interest and amortization charges. If, however, the city should find it convenient to issue bonds running for a longer period of time, say, forty or fifty years, the rental charge should be more than sufficient to pay the interest and establish the sinking fund for the retirement of the securities when they become due.

2. It should be understood and agreed that when the city has constructed a subway in a street, all the lines at present running along that street should be operated through the subway, so that the cars would be entirely removed from the surface. It can be readily appreciated that even one or two lines only, operating on the surface would, with the enormous and inevitable increase of ordinary vehicular traffic, produce within a few years as great a congestion as that from which we now suffer.

3. The city should have the right to extend the subway system from time to time, or to build new subways as it may deem necessary, and to require the company to operate its cars through these extensions or new subways upon terms similar to those governing the use of the original under-surface routes. It need never be anticipated that this power would be unreasonably used. It is certain, however, that new centers of congestion will be created from time to time by the growth of the community. The city should always be in a position to deal with these.

MISCELLANEOUS

Last Voting Machine in South Jersey

North Wildwood, N. J.—The special election held January 10 resulted in a vote of 39 to 6 against the retention of the voting machine. It was the last machine in Cape May County and south of Camden County, and brings the total to 323 out of 336 districts in the State that have voted to discontinue the use of the devices.

Year's Work in Smoke Abatement

Indianapolis, Ind.—Smoke Inspector Jacob P. Brown, in his annual report, says he made 1,820 inspection visits and prosecuted 29 cases, as compared with 5 prosecutions in 1909. There are 710 power plants, using 1,390 boilers, aggregating 128,801 horse-power, as compared with 669 power plants, using 1,305 boilers, aggregating 119,000 horse-power in 1909. New boilers costing \$268,770 were installed last year. January 1 there were 300 plants using smokeless coal, a gain of 50, and 118 smokeless devices were put in in 1910 as compared with 28 in the preceding year. There are now 635 smokeless devices in use. Of the 1,390 boilers in service, 785 are either equipped with smokeless devices or are using smokeless coal, while in 1909 the number similarly equipped was 545.

Purchasing Agent Tests Automobiles

Milwaukee, Wis.—In order to test the efficiency of engines for the automobile ambulance to be purchased for the Police Department and Emergency Hospital, City Purchasing Agent Campbell had a run made to Madison and back a few days ago. The following were entered: Franklin, Stoddard-Dayton, Studebaker, Pope-Hartford, Peerless and C. F. Megow truck car.

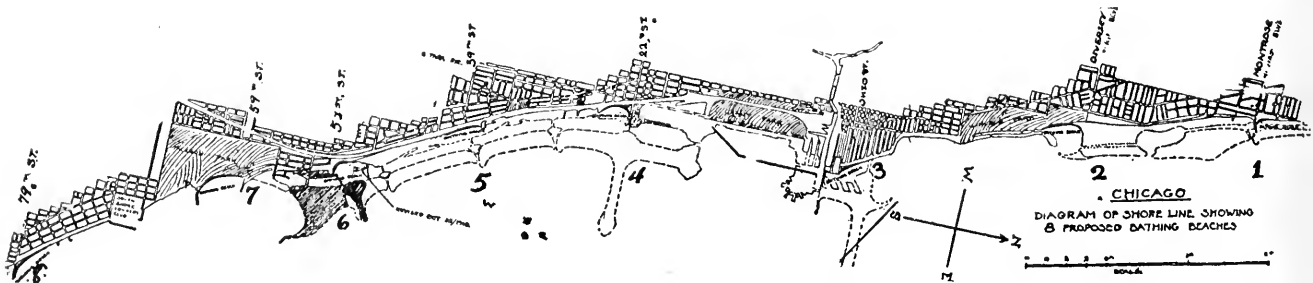
City Plan Commission Recommended

New Britain, Conn.—A proposition to have a "city plan commission" has been made. Speaking of the scope of the commission in Hartford, Judge Roche says that, according to the reading, such a commission would have the authority to say where the schools should be built. The right to take land is given in the proposed provisions and such a commission would have been desirable in the past year. Small plots could have been taken. Judge Roche says that there are several pocket streets in the city which the city has not accepted, but for which the city would probably be liable in case of accident. While such a commission is conceded to be desirable, the city authorities are not prepared to take action on it.

Municipal Bathing Beaches for Chicago

Chicago, Ill.—The diagram indicates the location of the proposed chain of municipally owned bathing beaches on the lake shore. The joint report of the City Council's special committee on bathing beaches and recreation piers and its lake shore reclamation commission recommended the adoption of a consistent program calling for the final construction of eight bathing beaches and two recreation piers. Following is the key to the diagram:

1. New beach and recreation pier—the latter shown by dotted lines—to be built by city at Montrose boulevard.
2. Present beach near foot of Diversey boulevard, to be developed by Lincoln Park Board.
3. Plans for beach at Ohio street, to be considered later.
4. Small beach at Twenty-fifth street, to be extended to Twenty-second street immediately. Recreation pier—shown by dotted lines—to come later.
5. New beach at Thirty-ninth street, to be built by city at once.
6. Recreation island and beach to be built by city at Fifty-first street.
7. New beach to be built by south park commissioner near yacht harbor inlet in Jackson Park.
8. Present beach at Seventy-ninth street, to be extended by city.



LOCATION OF CHICAGO'S PROPOSED BATHING BEACHES

LEGAL NEWS

A Summary and Notes of Recent Decisions—Rulings of Interest to Municipalities

Cities on Ocean—Control of Beach Front

Fishblatt vs. Atlantic City.—The following title of the act found in P. L., 1894: "An act to enable cities in this State, located on or near the ocean and embracing within their limits or jurisdiction any beach or ocean front, to open and lay out a public park or place for public resort or recreation on and along the beach or ocean front of such city and to purchase or condemn lands, property and property rights therefor and to preserve the same from obstruction or encroachment"—fairly expresses an object that includes the establishment of a park lying wholly on the oceanward side of high-water mark, if the limits of the city so far extend.—Court of Errors and Appeals of New Jersey, 78 A. R., 219.

Dangerous Premises—Liability of Municipality

Bisbing vs. Asbury Park.—Where a dangerous condition exists in a public park or way, in a portion thereof not leased, the power to rent portions only of such public lands having been conferred by statute, such condition not arising from or in consequence of the management or control of the municipality over the rented parts of the public lands or connected therewith, the negligence of the public authorities in permitting such condition to exist will not render such municipality liable to respond to the suit of one of the general public injured in consequence thereof.—Court of Errors and Appeals of New Jersey, 78 A. R., 196.

Street Improvements—Appeal

Widener et al. vs. Board of Trustees of Town of Lapel.—Towns and cities act and section 267 authorize the board of town trustees to improve the streets of the town; and section 270 provides the method of exercising the authority so granted. Acts 1909 authorizes abutting property owners to object to a street improvement, provides for the submission of the final order for the improvement and the objections to the circuit court, and declares that the court's order shall be final. Held, that no appeal lies from the order of the circuit court.—Appellate Court of Indiana, 93 N. E. R., 240.

Gas Companies—Competing Franchises

Cumberland Gaslight Company vs. West Virginia & Maryland Gas Company.—Where, as in Maryland, the public policy of the State, as evidenced by years of legislation, is to permit, with the sanction of the municipal authorities, the freest possible competition in the use of the public streets for the laying of gas pipes, a gas company having such a franchise in a particular city is not entitled to recover damages at law against another company which, with the municipal consent, exercised a similar franchise, because the latter had failed to comply with some statutory requirement, especially when such franchise was exercised for several years, during which the State took no action in the matter.—United States Circuit Court, 182 F. R., 667.

Park Commissioners—Corporate Authority

State ex rel. Gerry vs. Edwards, Mayor et al.—The Board of Park Commissioners created by Laws 1901, providing for a board of park commissioners as a department of the city government of cities of the first class, authorizing their appointment by the Governor, and empowering them to levy taxes for carrying out the work of the board, is not a corporate authority of a city within constitution, article 12, prohibiting the Legislature from levying taxes for municipal purposes, but authorizing them to vest by law in the corporate authorities of cities powers to assess and collect taxes, and the Legislature in adopting the law, so far as it bestows on the board the power to levy taxes, violated this constitutional provision and also the theory of local self-government established in the State as a fundamental principle of government.—Supreme Court of Montana, 111 P. R., 734.

Injunction—Usual and Ordinary Business of City

Bowman et al. vs. City of Waverly et al.—Where in answer to injunction proceedings against the officers of a city restraining them from constructing a sidewalk in front

of complainant's premises issued without notice required by Code, defendant in response to a motion to dissolve admitted that they were about to commit acts which were conclusively shown by their own affidavits to be unlawful, they were thereupon estopped to claim that the injunction restrained them from performing the general and ordinary business of the city, and that it had therefore been improperly granted without notice.—Supreme Court of Iowa, 128 N. W. R., 950.

Condemnation of Land—Deed

City of Atlanta vs. Jones et al.—Where a municipal corporation instituted proceedings to condemn a strip of land with a view of opening a street and the owner of the tract of which such land formed a part made a conveyance to the city in fee simple, the inclusion in the deed in connection with the description of the land of the statement that "the land condemned by the assessors duly appointed for that purpose to be used in extending (a named street) from its present terminus westward to (another named) street," did not constitute a condition subsequent authorizing a forfeiture, a cancellation of the deed or a recovery of the land by the grantor upon the ground that the city had abandoned the extension of the street.—Supreme Court of Georgia, 69 S. E. R., 571.

Lands Under Water—Grants

McAndrews & Forbes Company vs. City of Camden.—Conveyances by the State riparian commissioners of tide lands previously leased did not operate to extinguish the public easement in a street already dedicated over such lands, where they expressly provided that the grant was subject to the rights of the public to all easements over the land conveyed, nor did subsequent conveyances by the commissioners do so which merely confirmed the title of their grantees under the prior conveyances.—Court of Errors and Appeals of New Jersey, 78 A. R., 232.

Local Improvements—Statute

Cobe et al. vs. City of Chicago.—Local Improvement Act, June 14, 1897, providing that no special assessment shall be levied for any local improvement until the land necessary therefor has been acquired, except in certain cases, is designed to prevent assessment for improvements on private land not yet acquired by the city, but proposed to be acquired by condemnation.—Supreme Court of Illinois, 93 N. E. R., 46.

Defective Street—Water Box

Powers vs. Village of Mechanicville.—In installing its water system, defendant village set an iron pipe shut-off water box in a brick sidewalk. The cap on top of the box, which was less than a foot from the coping, was 3¼ inches in diameter, and projected ¾ of an inch above the sidewalk. On one side of the box a brick had settled ¾ of an inch, making the cap project on that side 1½ inches above the surface. Held, that the defect was so slight that the village was not liable for injuries caused by catching plaintiff's foot under the cap on the side the brick had settled. That which would not be a defect in a sidewalk, if resulting from an omission of the village, does not become so because it was created by an affirmative act of commission.—Supreme Court of New York, 125 N. Y. S., 801.

Taxation—Assessment—Change by City Council

Gelders et al. vs. City of Fitzgerald et al.—The charter of the city of Fitzgerald as created by the act approved August 22, 1907, authorized the Mayor and Aldermen to elect a board of tax assessors and conferred jurisdiction upon the tax assessors, when so elected, to assess the value of all real estate and personal property within the city, and to make their return to the Mayor and Aldermen. Upon complaint, the Mayor and Aldermen were authorized to raise the assessment so made by the assessors; but the jurisdiction of the Mayor and Aldermen over such matters was purely revisory, dependent upon complaint being filed by the taxpayer, and was in no sense original. A municipal tax on real estate based on values designated by the Mayor and Aldermen of the city of Fitzgerald under color of office in excess of those at which given property was returned by the tax assessors without any complaint having been filed by the taxpayer was ultra vires, and may be enjoined at the instance of a taxpayer, the assessment of whose property has been illegally increased.—Supreme Court of Georgia, 69 S. E. R., 569.

MUNICIPAL APPLIANCES

Vehicles for Municipal Use at National Automobile Show

The exhibit of commercial vehicles at the Eleventh National Automobile Show, Madison Square Garden, New York, January 14-21, interesting and instructive as it was, cannot be considered as representative, at least so far as vehicles for municipal use are concerned, because only those manufacturers who are members of the Automobile Association took part in the show. This circumstance excluded such manufacturers of fire apparatus as the American La France Co., the Seagrave Company, the Webb Motor Fire Apparatus Company, the Luitweiler Pumping Engine Company, and others. In fact, only four pieces of fire apparatus were exhibited—a pumping engine, a chemical and two combination hose and chemical outfits.

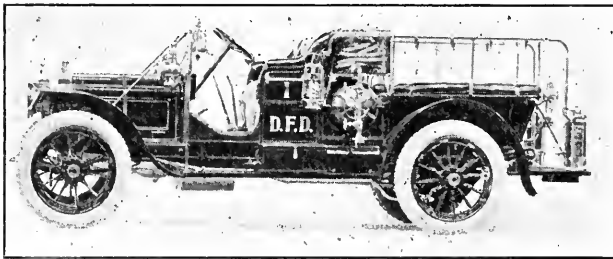
used the advantages of having the hose on the ground ready for the engine when it arrives, in case the chemicals are insufficient, is obvious. The Boyd combination wagon has capacity for 1,000 feet of 2½-inch fire department hose in the wagon body. The motor is 2-cylinder, 4-cycle, horizontal opposed type, 4¾-inch base, 4½-inch stroke, water cooled. The wheel base is 97 inches. The transmission is of the sliding gear type, three speeds forward, one reverse, direct drive on high speed. Two hundred feet of ¾-inch chemical hose with heavy brass couplings is carried in a hose basket mounted over the body wagon. A full complement of accessories, tools and equipment are carried, including a 20-foot extension and 12-foot roof ladder.

The Knox Automobile Company exhibited their new pumping engine. This

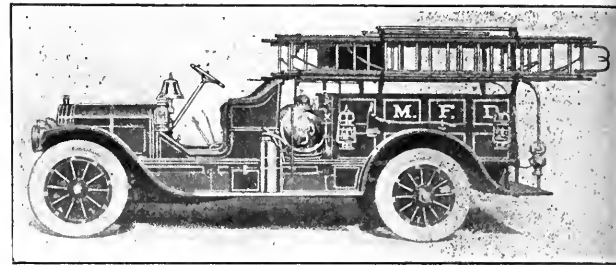
throughout. The pump is driven from the main driving shaft by Hindley worm and gear through a counter shaft mounted on annular ball bearings. The latter is connected with the crank shaft of the pump through a jaw clutch, spur gears and 1½-inch pitch Renold silent chain 4 inches wide.

The Packard Motor Car Company exhibited one of their auto chemicals such as are used in Detroit and Indianapolis. The machine is a squad wagon as well, having a seating capacity for six men inside and two on the seat. One chemical tank is carried and, as is now generally customary, connection is made so that when the chemical tank is emptied water can be quickly turned on and delivered through the tank and hose, thus enabling the firemen to hold the fire in check, if it is not extinguished, until heavier apparatus arrives. The essentials of the fire wagon are as follows:

Chassis—Packard "Thirty" touring car chassis.
Body—Open: front seat, regular Packard



PACKARD CHEMICAL FIRE AUTO



POPE-HARTFORD COMBINATION CHEMICAL

James Boyd & Bro., Inc., showed their combination chemical fire engine and hose motor truck. This is a moderate priced machine, having all the essentials of a chemical engine and a hose wagon with motor equipment. In fact, the capacity for chemicals is unusually large. The Boyd company have been manufacturers of chemical tanks long before they made motor driven apparatus. The machine carries two tanks of 35 gallons capacity each, of the Holloway type, made of the best cold rolled Lake Superior copper. Two extra charges of acid and soda are carried in acid receptacles, with lifters and in bags, respectively. The combination chemical and hose motor is probably the most valuable piece of apparatus made for general purposes. In cities where there is a high water pressure engines are seldom needed. The chemicals hold the fire in check if they do not extinguish it, as they do in about 80 per cent of all cases, until the water hose can be run. Where the water pressure is low and engines must be

is a large machine, weighing 11,000 pounds, with a substantial trussed channel iron frame, made necessary, presumably, from the use of solid rubber tires. The pump is a piston pump, 2-cylinder, double-acting, 4¾ by 8 inches. The body of the wagon carries 1,000 feet of 2½-inch fire department hose. A Hart turret nozzle is mounted on the front of the wagon. This engine has not so far had an actual trial in use by any fire department. Trial tests, however, show that it has thrown from 600 to 700 gallons of water per minute, according to the conditions of the test. In general, it is built to equal in capacity a third size Metropolitan steam fire engine. The gasoline motor which propels both vehicle and pump is of the 6-cylinder, vertical water cooled type. The official rating of the motor is 60-horsepower. The transmission is of the 3-speed selective sliding gear type, and weighs complete 600 pounds. Timken roller bearings and Timken axles are used

open car style; side seats, lengthwise of body.

Seating Capacity—Two men on front seat, six men on side seats.

Finish—Entire car, except radiator, "fire department" red. Radiator and all other metal parts, brass finish. Side and rear running boards black.

Equipment—One 35-gallon chemical tank, two 3-gallon chemical tanks, 250 feet of ¾-inch hose, snaps for helmets on sea rails, fire department bell, hand-lantern on bracket at rear, combination gas and electric headlights, combination oil and electric side and tail lamps.

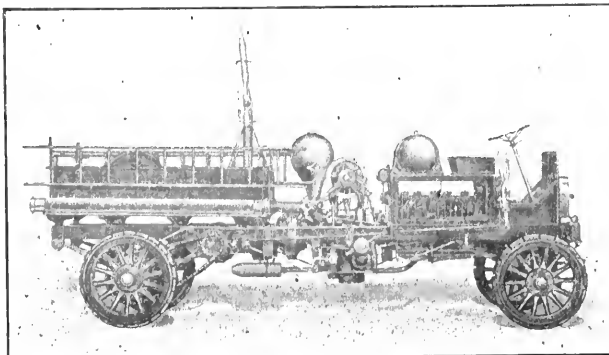
Motor—Four-cylinder vertical; 5-inch bore by 5½-inch stroke; 30 brake horsepower at 650 revolutions.

Wheelbase—123½ inches.

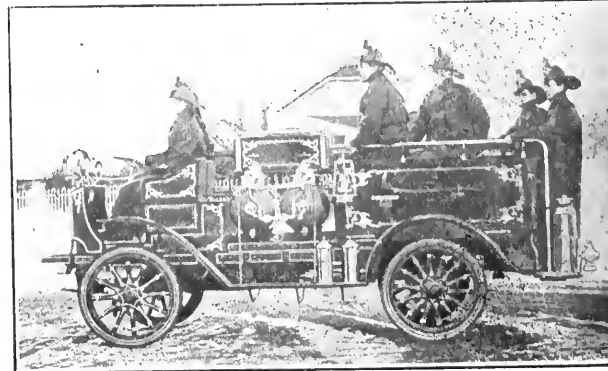
Transmission—Sliding gears, three speed forward and reverse.

Tires—36 by 5 inches; demountable rims.

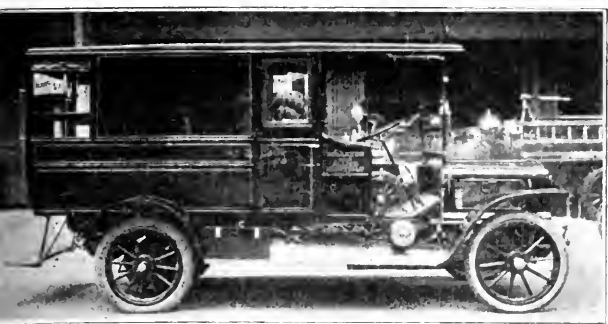
The Pope Manufacturing Company show a Pope-Hartford combination chemical and hose wagon which will be delivered to the Jersey City Fire Department. Similar machines have been used by Hartford, Conn., Meriden and other towns in New England. The fire equipment consists of a 35-gallon Accurate chemical tank with connection



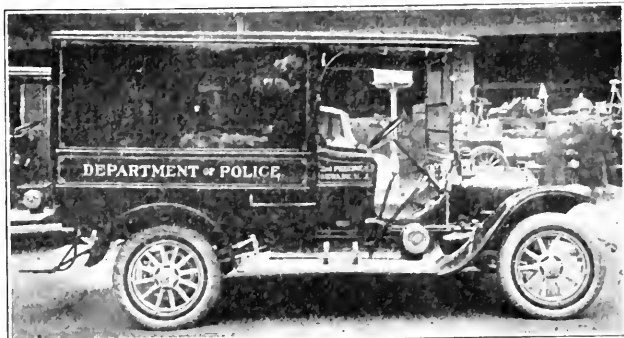
KNOX AUTO PUMPING ENGINE



BOYD COMBINATION CHEMICAL



WHITE STEAM AMBULANCE



WHITE GASOLINE POLICE PATROL

water hose, 250 feet of 3/4-inch chemical hose, two 17-foot extension ladders, 1,000 feet of 2 1/2-inch hose. Four men can be carried, two in front and two on the rear step. The wheel base is 136 inches; tread, 56 inches; wheels, 38 inches in diameter, with 5 1/2-inch tires in front and 39-inch wheels and 6-inch tires in the rear. The engine is 4-cylinder, water cooled, 50-horsepower. The drive is by shaft and gears. The controlling lever for spark and throttle are located on top of steering wheel, engaging with a single sector.

Ambulances and Patrols

Classifying hospital ambulances and police patrol wagons together, for the chassis and wagon body of both are substantially alike, there were more of these vehicles exhibited than of any other kind of municipal autos. There were four patrol wagons, White, Packard, Knox and Pope-Hartford, and three ambulances, White, Lansden and Franklin, at the show. Other manufacturers who perhaps make as many of these autos as any of the other firms did not exhibit specimens of their work. Notable among these were the tube-makers.

The White Company showed a gasoline patrol wagon just completed for the city of Newark, N. J., to be attached to the Second precinct. The wagon is painted black, with gilt lettering, and is of handsome appearance. The specifications are essentially as follows: Four cylinders cast en bloc, 4 1/4 base, 5/8 stroke; horsepower, 30. The throttle and spark advance is controlled by levers mounted on the steering wheel. The throttle is also operated by acceleration. There are four forward speeds with the direct drive to the third gear and a reverse. The transmission is of the selective type; that is, it is possible to shift from one gear to any other without engaging an intermediate gear. The gear shifting mechanism is enclosed within the gear case, which forms an oil well and is free from dirt and grit. The valves are mechanically operated and interchangeable. The water circulation is accomplished by means of a gear-driven centrifugal pump. The ignition is Bosch magneto. The carburetor is water jacketed and has an automatic auxiliary air valve, furnishing correct mixtures at all speeds. The crank case is made in two sections of special aluminum alloy. Crank shaft is of forged nickel steel. Lubrication is a combination of the splash system with positive feed. The steering is the worm and sector type, with ball thrust bearings. The drive is by means of a shaft from gear case to rear axle. The frame is heat treated crucible chrome-nickel steel.

The Packard Motor Car Company showed a police patrol which is built on the Packard "30" chassis, the same as already described in connection with the combination chemical and hose apparatus. In Detroit seven of these patrol wagons have entirely displaced the horse service. The wagon seats nine passengers and a driver. It is equipped with dome lights, rolling storm curtains, police department gong and hand lantern and canvas stretcher. The right seat may be converted into an additional stretcher.

The Knox Automobile Company showed a police ambulance which is for use in police departments where a large part at least of the hospital work is under their control, so far as the transportation of patients is concerned.

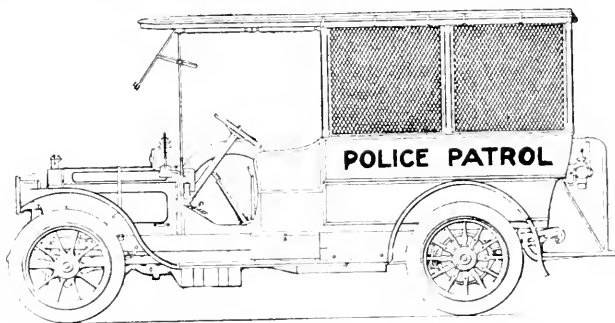
The Pope-Hartford Company showed a patrol wagon such as is used by the city of Hartford. The wagon body is built upon the same chassis as the combination chemical and hose wagon already described.

The White Company exhibited a steam-driven ambulance made for the Bellevue and Allied Hospitals, New York City. The generator or steam maker is the feature which more than any other distinguishes the White from any other type of steam car. The generator consists of nine coils of steam tubing placed one above the other and connected in series. If the whole were to be unwound and straightened out, it would be seen that the generator is made up of a single long piece of tubing. In operation water is pumped into the upper coil and steam issues from the lower coil. There is but a very small quantity of water and steam in the generator at one time, but the process of making steam is so rapid that it is always available in the quantity which the running conditions make necessary. Tubing used in the generator has stood a pressure of 19,000 pounds per square inch without showing any sign of rupture. From the generator the steam is conducted to the engine where it first does its work in the high-pressure cylinder and then passes over the low-pressure cylinder, where its expansion is continued. The steam then exhausts into the condenser located on the front of the car. The power is adapted for a wide range of fuels. Practically all of the 1910 models are run on kerosene, and even lower grades of fuel may be used. The White power plant—generator, engine and all accessories—de-

velops one horsepower for each 14 pounds of weight, and the water consumption per horsepower per hour is equaled only by that of the largest triple expansion condensing engines.

The Lansden Company showed an electric-driven ambulance made for the New York Hospital. The advantages claimed for the electric vehicle for this use are ease and economy in operation, perfect control and smooth running qualities, making the ride comfortable for the patient. The Lansden ambulance is operated by an Edison storage battery, which is lighter than any other in proportion to its capacity. The manufacturers claim that the light weight of these vehicles reduces tire wear to a minimum and entails much less strain on the wearing parts, thereby producing the most economical wagon in maintenance cost.

The H. H. Franklin Manufacturing Company exhibited the handsomest ambulance in the show. The outside was painted lead gray with a red Greek cross on each side. The inside of the body is finished in white enamel, making a very striking appearance and suggesting the extreme of cleanliness. This Franklin has an air-cooled motor, 3 1/4-inch base, 4-inch stroke, individual

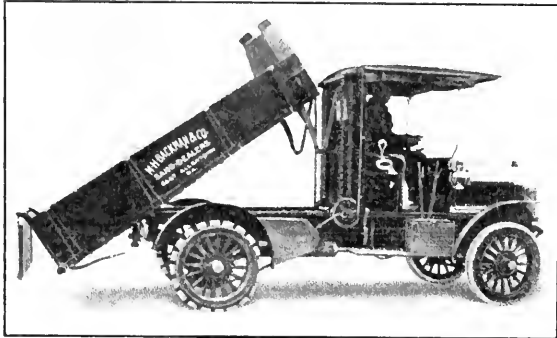


PACKARD POLICE PATROL—DETROIT PATTERN

cylinders and flywheel suction fan. The cylinders are cast singly with vertical steel cooling flanges fitted into outside cylinder walls. The rear axle is tubular of the semi-floating type. The drive is by means of a worm gear, the thrust of which is taken by ball thrust collar bearings. The tubing is of special nickel steel, heat treated. Pall bearings are used in the differential case. Timkin roller bearings are used in the wheels. The front axle is special nickel steel tubing, heat treated, the tubular section giving maximum strength in all directions with minimum weight. All parts are hot-riveted in place. Crank shafts are made of special nickel steel. Oil is fed to each base bearing by a multiple force feed. The carburetor is of special design. The ignition is Bosch magneto. Front springs are 40 inches, full elliptic, with auxiliary light coil.

Trucks

The most interesting part of the show was the display of heavy trucks. During the past year the progress in this branch of automobile construction has perhaps been greater than in any other. This, in fact, is the reason for the exhibit of commercial vehicles as a separate show—the first of its kind ever held. This development has a bearing on municipal affairs, and it does not require any gift of prophecy to see that in the near future automobile trucks will play a large part in the



MACK 7-TON DUMPING TRUCK

construction and maintenance of municipal public works. Two years ago automobile fire apparatus was just beginning to attract attention, and even last summer the International Association of Fire Engineers gave but an indifferent approval to their use. Individually the fire chiefs have been much less conservative than they were collectively and now the chiefs of the largest cities are considering the abandonment of horse-drawn apparatus as fast as is practicable. In two years more it is not unlikely that commissioners of public works and superintendents of streets and street cleaning will be advocating the gradual abandonment of horse-drawn wagons of all sorts and the substitution of commercial trucks.

The argument on which the use of auto trucks for the transportation of construction materials is based can be stated in a general way in very simple terms. The commercial 3-ton truck hauls about 50 per cent more material in a load than the best horse-drawn truck, and it will travel twice as far, consequently will haul three times as much. Figures for the operation of 5-ton trucks, which are a convenient size for municipal work, show that with the liberal allowance of 20 per cent for depreciation, 6 per cent interest on investment, labor, care, storage, and, in fact, everything, the cost is from \$10 to \$12 per day. One truck being equivalent to

three teams, and the cost of teams being assumed at \$6 per day, on the basis assumed there is a saving of one-third in the cost of hauling, an amount that no responsible official can afford to overlook.

For city work, the hauling of sand and stone to points where construction is going on and the removal of ashes and waste, the dumping truck is the vehicle in general use. Three trucks of this kind were shown, the White, Mack and Reliance. Other companies which mount box-shaped bodies on their trucks showed the chassis used, but the bodies were platforms or vans. Among these were the Morgan and the Metzger.

The White Company show a truck that they class as a 3-ton truck, one of which they say is in daily use drawing over five tons to the load. The chassis is claimed to be as strong as trucks classed as 5-ton capacity. The truck is similar to that described in the Municipal Journal and Engineer of January 4, page 39, except that a dumping device has been added. The object of this device is to avoid the shock of allowing the body to strike the ground in dumping. A winch at the forward part of the truck has two spools of different diameters, each figured to accomplish the work for which it is designed. A wire rope from one spool pulls the body backward on rollers running on a track; the wire from the other spool takes the strain after the body is pulled back to the position where it tends to dump. In addition there is a hump in the track like an inverted V which gives the body the initial lift. Beyond the V the wagon tends to dump itself.

The whole arrangement seems simple, effective and convenient. The wheel base of this truck is 144 inches, the tread of rear wheels 65½ inches. The length over all is 19 feet 7½ inches and the platform of the body 13 feet 3 inches by 6 feet 5 inches. In general appearance the wagon seems compact and looks as if it could get in and out of difficult places for loading and unloading.

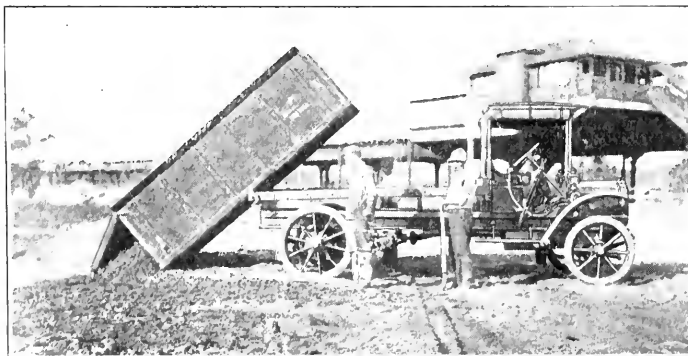
Mack Bros. Motor Car Company, Allentown, Pa., showed a 7-ton dump truck which has been sold to the Goodwin Sand & Gravel Company, New York, and will be used in delivering gravel from the docks to contractors in New York City. The dumping device is shown in the illustration. It consists of a crank, shaft, vertical chain belt and a peculiar link arrangement, one end of which is attached to the wagon body and the other to the

chain belt. In dumping as the crank is turned the chain lifts the body and the link pushes it back until the load is dumped. The motor of the Mack truck is 4-cylinder, 4-cycle, vertical type, 5½-inch bore, 6-inch stroke. The carburetor is float feed and automatic. The double system of ignition is used. The substantial nature of the construction is shown by giving a few of the dimensions. The crank shaft pins are 2 inches in diameter, 3½ inches long. Main bearings are 2½ inches diameter, 4½ inches long. The lubrication is force feed, each bearing receiving its oil through hollow crank shaft from an independent pump. The transmission is the Mack patent, a selective clutch transmission with gears always in mesh. The Mack gears do not slide.

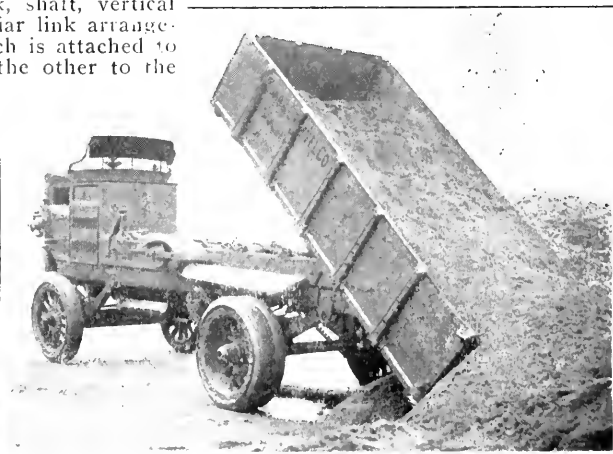
The Rainier Motor Truck Company showed a 5-ton truck made by the Reliance Truck Company. A truck similar to this was used for five months by the Cranford Company, Brooklyn, N. Y., in hauling crushed stone, gravel and sand. A statement of weekly averages of performances of the truck shows about an average of 40 miles a day on this work. The dumping is accomplished by pulling the body truck on roller and track by means of a winch. It has no device for preventing the body from striking the ground. The truck will make 12 miles an hour and has three speeds forward and one reverse. The chassis is 8-inch channel steel. The rear axle is 4-inch nickel steel, front axle is of heavy hand-forged I-beam steel. Wheel base is 130 inches. Tread, 63 and 65 inches. Net weight, 10,000 pounds.

Platform trucks, both large and small, are likely to be of use for city streets, and of these there were many exhibited of capacities ranging from one to ten tons. Small platform wagons are already in use as general purpose and repair wagons in some cities. The Metropolitan Water Works, Boston, Mass., for instance, have operated an emergency wagon for over a year and found it very useful.

R. L. Morgan Company showed their 5-ton platform truck, which they also equip with a dumping body. The platform is 14 feet by 6 feet. Axles, front, are drop-forged steel, single-piece, 5-inch I-beam section; rear axles, 3½-inch solid steel, Timken roller bearings. Cylinders have 5-inch bore, 5-inch stroke. Speed is given at from 6 to 10 miles an hour. One truck at the show was equipped with three-speed sliding gear transmission, another with the regular Morgan planetary type.



WHITE 3-TON DUMPING TRUCK



RAINIER 5-TON DUMPING TRUCK

Rubber Tires

With the adoption of motor vehicles cities the appropriations hitherto made for oats and hay are destined in part to be diverted to the rubber industry. Hence the matter of rubber tires becomes one of increasing interest, although for many years the cities



K PNEUMATIC TIRE AND REMOVABLE RIM

have been good buyers of solid rubber tires to protect vehicles, particularly those of fire departments, from undue wear.

Of the new things in tires shown by the Firestone Company, the most notable is the improved side-wire motor truck tire. The most noticeable of the improvements is the use of flat-faced cross bars and retaining wires. This construction has been found to prevent wear on these parts and make a more



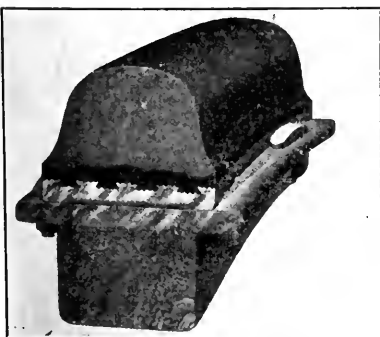
FIRESTONE QUICK REMOVABLE SIDE WIRE

variable fastening, resulting in a service unheard of heretofore for truck tires.

The regular line of pneumatic tires exhibited includes the Firestone non-skid for slippery streets and the smooth tread tire for ordinary service.

Another entirely new feature is the approved motor truck equipment, Firestone quick removable side-wire tires. This combines the standard side-wire tire with a removable rim that permits quick tire changes by the driver anywhere. The principle is similar to their demountable rim for pneumatic tires. The use of this equipment does away with delivery delays and lay-ups on account of the tires.

The Hartford Rubber Works Company showed both solid and pneumatic

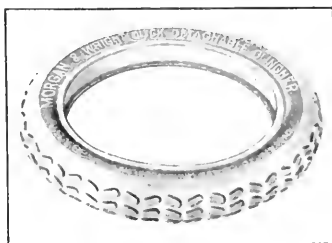


GOODYEAR SOLID—WIRELESS

tires. The solid motor tire is an endless motor tire with longitudinal wires running through its base which is vulcanized. The construction is shown in the illustration.

Among the tires, Morgan & Wright exhibited the Nobby Tread, a non-skidding tire which attracted favorable attention. In making these tires enough extra rubber is used so that when they are finally worn smooth a plain tread tire still remains good for many more miles of service.

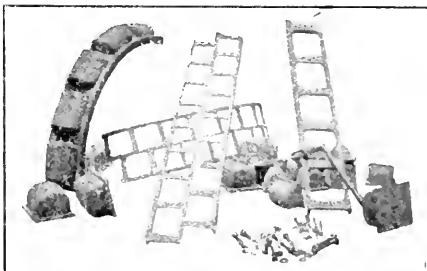
The Republic Rubber Company exhibited their solid motor tires. They are made of one piece of rubber; that



MORGAN & WRIGHT PNEUMATIC NON-SKID

is, the tread and the base portions are one and inseparable. Through the base of the tire cross wires are inserted transversely about 1 1/2 inches apart. Through the center of the base is a strip of vulcanized rubber just deep enough to permit the cross wires to pass through it. About the entire base of the tire and completely covering the ends of the cross wires a multiple of layers of fabric heavily reinforced are placed.

The Consolidated Rubber Tire Company showed the Kelley-Springfield sec-



KELLEY-SPRINGFIELD SOLID SECTIONAL

tional tires. These tires are made up of from 30 to 40 independent blocks, any one of which can be replaced if injured. The blocks are held by the external metal frame. The tires are made in all sizes from 3 to 8 inches.

The Swinehart Tire & Rubber Company exhibited both solid and pneumatic tires. In making the Swinehart pneumatic tires the fabric is laid, not

stretched, smoothly over the core. All treads are wrapped, even in the non-skid type. This is claimed to give a more uniform thickness and secure more perfect adhesion between tread and soft rubber body of the tire.

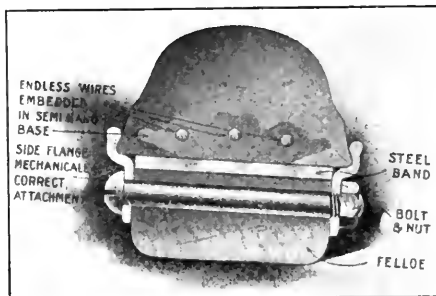
The Fisk Rubber Company exhibited their line of pneumatic tires, including



SWINEHART PNEUMATIC WRAPPED TREADS

bolted-on, clincher, quick detachable clincher and removable rim. In the bolted-on type the tire is absolutely fastened to the rim by a mechanical device.

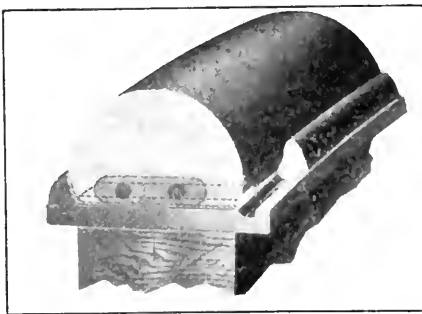
The Goodyear Tire & Rubber Company exhibited their hard rubber base tires. Retaining wires are imbedded in a hard rubber base or core and by a



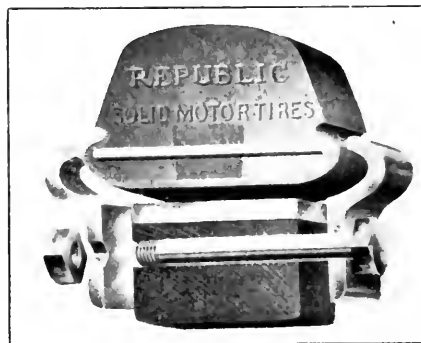
HARTFORD SOLID—LONGITUDINAL WIRES

patented process the hard rubber base is perfectly united to the soft rubber tread, making it practically one piece.

The B. F. Goodrich Company exhibited their wireless tire, which eliminates the factor of friction between the rubber and the wire fastening devices sometimes used. It consists of three integral factors: (1) a special steel base having dovetailed grooves on the top surface; (2) a hard rubber sub-base which is inseparably united with the steel base; and (3) a soft rubber tread, or tire proper, which is inseparably vulcanized upon the hard rubber sub-base. A transverse key on the steel felloe band fits into a key seat in the steel base of the tire, preventing circumferential movement.



GOODYEAR SOLID RUBBER—HARD BASE



REPUBLIC SOLID—CROSS WIRES

NEWS OF THE SOCIETIES

Illinois Society of Engineers and Surveyors.—The society will hold its twenty-sixth annual meeting at East St. Louis, Ill., January 25, 26 and 27. This will be in the nature of a "jubilee" celebrating the completion of 25 years of active work of the society, which is composed of civil engineers engaged in municipal, drainage, water supply, land drainage and other lines of work; it has also a number of county and other surveyors, contractors, professors of engineering colleges, etc. The meetings will be held at the City Hall, and will be opened by the Mayor, Hon. Silas Cook. The President of the society is Mr. A. N. Johnson, State Highway Engineer; the Vice-President is Mr. J. W. Dappert, Drainage Engineer of Taylorville; the Secretary is E. E. R. Tratman, C. E., of Chicago; Mr. W. J. Crocken, City Engineer of East St. Louis, and Mr. W. A. Thompson, Assistant City Engineer, are on the local committee.

A review of land drainage work in Illinois will be presented by the Committee on Drainage. There will be a paper also by E. E. R. Tratman (Chicago) on the different kinds of machines used in the excavation of trenches for sewers and ditches for drainage. The Committee on Water Works will report on the question of preventing the pollution of streams, which is a matter of growing importance. The report of the Committee on Streets and Pavements will deal largely with the use of creosoted wood block paving, which material is growing in favor for the smaller as well as the larger cities. Another subject of special interest is the treatment of macadam and earth roads with tar and bituminous compositions; this will be covered by a paper by T. R. Agg, Assistant Engineer of the State Highway Commission. Mr. A. N. Johnson, State Highway Engineer of Illinois, and Mr. Curtis Hill, State Highway Engineer of Missouri, will talk on the road improvement question.

A series of papers on engineering works in and around East St. Louis will include the city's municipal engineering, its water works and its outlet sewer with pumping station for use during high water in the river. Other papers will deal with the park system, the new "free bridge" now being built over the Mississippi at this point and the drainage works for the relief of the low bottom lands. The papers will be supplemented by a visit to the water works, the sewer outlet, the four bridges over the Mississippi and the Cahokia Creek drainage canal.

Dr. George W. Webster, President of the State Board of Health, will talk on "Vital Statistics in Illinois," showing the sanitary, social and legal, as well as medical, importance of the international system of registration of births, marriages and deaths, which Illinois has not yet adopted. Other sanitary matters will include a report on the sewer system of Illinois towns, a paper on "Sewage Disposal and Purification," by W. S. Shields, Chicago, and the Calumet drainage canal, by L. K. Sherman, Chicago. A topical discussion on garbage disposal and street cleaning methods in Illinois towns is expected also. Mr. A. H. Baer, Belleville, a recognized authority on the Illinois local improvement law, will open a discussion on this subject.

A paper on special surveying and leveling instruments and methods used by the Government departments for precise leveling will be presented by Prof. W. H. Burger, Northwestern University. Mr. H. H. Rankin, County Surveyor of Henderson County, will advocate the abolishment of the office of County Surveyor and the creation of that of County Engineer, with control of road and bridge work, land surveys, etc. The report of the Committee on Surveying will deal with surveys of roads, drainage systems, etc., and the advisability of better monuments for corners and more complete public records of surveys. A paper by E. McCullough (Chicago) will discuss the matter of licensing engineers and surveyors by the State, which has been under consideration by the society for some years. A paper on "The Design of Highway Bridge Abutments" will be read by Mr. H. E. Bilger, Assistant Engineer of the State Highway Commission, and Prof. Dufour, University of Illinois, will lecture on the development of bridge trusses.

Iowa Cement Users' Association.—At the convention, Cedar Rapids, Ia., January 12, Chas. P. Chase, consulting engineer, Clinton, presented a paper reviewing the history of the use of cement in roadway pavements. C. J. Wilson, City Engineer, Waterloo, spoke on "The Use of Cement in Municipal Work"; T. R. Warriner, on "Cement Sidewalks"; W. M. Barr, on "Disintegration of Concrete in Sewage Disposal Plants"; T. H. MacDonald, Engineer, Iowa Highway Commission, on "Concrete Bridges and Culverts." The following officers were elected: President, J. W. Budd, Des Moines; First Vice-President, C. C. Merrillat, Winfield; Second Vice-President, H. H. Dean, Payne; Treasurer, G. E. Tathwell, Waterloo; Secretary, Ira A. Williams, Ames.

American Institute of Architects, San Francisco, Cal.—At a meeting on January 6 a resolution was passed urging the Mayor and Board of Supervisors to create a municipal commission which shall have power to develop a comprehensive plan for all improvements in the city, including those carried on by the United States military authorities, the State Board of Harbor Commissioners, the Park Board, the Board of Works and other departmental bodies. The resolution urges postponement of action with regard to the construction of the new City Hall until such a commission is appointed. The resolution further urges that the various boards, commissions, commercial bodies, improvement clubs and associations request the Mayor to call a convention of representatives of these bodies for the purpose of discussing the question.

Kansas Peace Officers' Association.—A permanent organization was formed at Wichita January 4-5 and the following officers were elected: President, J. H. McPherson, Wichita; first vice-president, J. T. Taylor, Leavenworth; second vice-president, M. Jenkins, Topeka; secretary, W. H. Boston, Wichita; treasurer, G. T. Hern, Hutchinson; board of managers, H. H. Germain, Topeka; Charles Segowser, Wellington, and R. T. Sullivan, Atchison. The convention declared in favor of an amendment to the anti-pass law, allowing railroads transportation for peace officers; a law establishing a bureau of identification; a law making it a criminal offense for a parent to desert a

minor child; a law giving a peace officer the right to make an arrest any place in the State, and a stringent law against any person other than a peace officer carrying any weapon into any public meeting or voting precinct.

The question of making it a felony for parents to desert minor children, and that having to do with the establishment of a bureau of criminal identification, were forthcoming from Chief Taylor, who has expressed the opinion that two-thirds of the instances of desertion reported to the police nowadays result from that cause. The chief's address at the convention was appreciated, and little time was lost in passing a resolution to endeavor to have a law passed which will be the means of eliminating the abandonment nuisance. The bureau of criminal identification is expected to be the means of decreasing to a considerable extent the number of bank and train robberies which annually take place in Kansas.

New Jersey State Association of County Engineers.—The annual meeting will be held at the State House, Trenton, January 24. Officers will be elected and general road matters discussed. The officers who will conduct the meeting are: President, Frank J. Eppele, engineer of Mercer County; vice-president, William P. King, engineer of Morris County; secretary, Edward E. Reed, of Trenton, assistant State road supervisor; treasurer, Joshua Doughty, Jr., engineer of Somerset County; State Road Commissioner, Frederick Gilkyson.

Michigan Engineering Society.—The thirty-second annual meeting was held at the City Hall, Lansing, January 9-12. The following officers were elected: President, Byron E. Sparks, Grand Rapids; vice-president, Prof. John R. Allen, Ann Arbor; secretary, Alba L. Holmes, Grand Rapids; treasurer, Dorr Skeels, Grand Rapids. Directors, Prof. H. K. Vedder, East Lansing; Frank F. Rogers, Lansing; J. J. Hubbell, Manistee. Chairman A. R. Sawyer, of the Legislative Committee, proposed that the Legislature be urged to pass a law providing for the services of a competent engineer connected with the State Highway Department to have charge of the construction of all highway bridges above a certain specified size. Other proposed legislation was to the effect that a drain commissioner should be permitted to keep county and township drains in repair without waiting for the petition of five persons who are subject to taxation for the repairs.

New England Water Works Association.—Allen Hazen, a New York Consulting Engineer, was elected president of the association at the annual meeting January 11 at the Hotel Brunswick. The other officers elected are: Vice-presidents, J. Waldo Smith, of New York; Michael F. Collins, of Lawrence; Leonard Metcalf, of Boston; Irving S. Wood, of Providence; Frank A. McInnes, of Boston, and Morris Knowles, of Pittsburg, Pa.; Willard Kent, of Narragansett Pier, R. I., secretary; Lewis M. Bancroft, of Reading, treasurer; Richard K. Hale, of Boston, editor; William E. Maybury, of Braintree; Edwin A. Fisher, of Rochester, N. Y., and John J. Kirkpatrick, of Holyoke, executive committee. For the first time in many years there was a contest over the election of some of the officers. Not content with the selections of the nominating committee appointed by the president, several members made nominations of their own.

American Society of Civil Engineers.—The fifty-eighth annual meeting of the society was held in the Society House, New York City, January 18-19. A report of the Board of Directors at the business meeting showed a membership, January 1, 1911, of 5,797, divided as follows: Honorary members, 8; corresponding members, 2; members, 2,767; associate members, 1,084; associates, 170; juniors, 745; fellows, 21. The net increase in membership for the year was 305. The total of individual pieces in the library is 8,620, the number of titles 24,906. During the year 29 formal papers were presented at the meetings and 7 other papers were printed in the proceedings. The mortgage debt on the property of the society was reduced \$10,000 to \$35,000. The report of Secretary C. V. Hunt showed that the receipts during the year were \$129,708. The general balance sheet shows a surplus of \$39,792, the total assets amounting to \$27,188.

The special committee on steel columns and streets reported that it cannot at the present time recommend the adoption of any particular formula. A special committee on engineering education reported that it had investigated the courses in civil and mechanical engineering in 20 of the leading technical schools, and after classifying the courses in certain groups and then gain in the individual studies had arrived at the number of semester hours devoted to each subject. It was then discovered that a semester hour is not a uniform unit, but varies considerably with different institutions. While this interposes great difficulties in the examination, the committee hopes that it may result in bringing about the standardization of catalogues in the different institutions. The special committee on uniform tests of cement presented a final report in which a specification is added covering the making of comparison tests. The committee's commendations are now generally accepted except by the Corps of Engineers of the United States Army, and an attempt will be made to harmonize these.

An amendment to the constitution was reported adopted exempting members and associates from the payment of dues after a certain age and number of years' connection with the society.

The report of the Board of Directors on the licensing of engineers was adopted after considerable discussion. The report was to the effect that the licensing of engineers by the State was desirable.

A motion by Charles Hansel to the effect that a special committee be appointed to consider and report on the methods of evaluating public utilities was referred to the Board of Directors with power to act.

The tellers announced the election of the following officers for the ensuing year: President, Rear-Admiral Mordred T. Endicott, civil engineer, U. S. N. (retired); Vice-Presidents, to serve two years, Alfred P. Boller, of New York City, and Charles L. Strobel, of Chicago; for Treasurer, to serve one year, Joseph M. Knap, of New York City; for directors, to serve three years, George C. Clarke, of New York City; Henry G. Stott, of New Rochelle, N. Y.; Jonathan P. Snow, of Boston; Robert Ridgway, of Poughkeepsie; Leonard F. Rundlett, of St. Paul, Minn.; William H. Courtenay, of Louisville.

Three special meetings for topical discussion were held Friday and Sat-

urday on the general subject of Road Construction and Maintenance. The subject was introduced by a paper by L. W. Page, read by A. R. Blanchard, on Preliminary Investigations. The relative value of three methods of carrying on work were discussed: 1. That in which both labor and materials are furnished by the contractors. 2. That in which material is supplied by the party of the first part and the labor by the contractor. 3. That in which both labor and material are supplied by the party of the first part. The bearing of overhead charges on this subject was brought out in the discussion. The fact that depreciation of machinery and general managerial expenses were not always charged up made an apparent difference in favor of services performed by the party of the first part. Good reasons were urged by a number of speakers in favor of the purchase of materials by the party of the first part. The tendency of prices to go up when a number of contractors competed for them was mentioned as an important factor. One speaker urged the purchase of all cement and reinforcing steel by the party of the first part, as is the practice in work done by the Massachusetts Highway Commission. The advantage of the purchase of bituminous cement by the party of the first part was stated to be that the whole subject of the value of bituminous cements was so uncertain that contractors were not in as good a position to decide what to buy as the authorities who had chemists in their employ. Charles W. Ross spoke of the need of a clean surface on the roadway before oil is applied, stating that it was his practice not only to clean the street, but to wash it. The oil is then applied when the surface is slightly moist. Harold Parker described the use of English power spraying machines and expressed the opinion that $\frac{1}{4}$ gallon applied by the machine was more effective than $\frac{1}{2}$ or $\frac{3}{4}$ gallon when poured. Speaking of the use of calcium chloride, he said the results near the coast where the air is moist were good, but the benefits in the dry interior regions less satisfactory. Samuel Whinny introduced the subject of the use of water, calcium chloride, light oils, etc., as dust palliatives and expressed the opinion that there is nothing superior to scientific watering. In order to reduce the cost he would have the watering done by motor vehicles with power spray, if necessary, so that the whole roadway could be sprinkled at one trip of the sprinkler.

Indiana Engineering Society.—The thirty-first annual meeting was held at the Dennison Hotel, Indianapolis, January 12 to 14. The programme consisted of forty papers and reports. Professor W. K. Hatt presented the report of the Committee on Materials of Construction, which dealt with specifications for methods of waterproofing concrete, tests of paving brick and of creosote oils. He also presented a paper describing the new cement and concrete laboratory at Purdue University. C. W. Boynton presented a paper on the manufacture of Portland cement. J. S. Spiker made the report for the Committee on Drainage, which consisted of a summarized report from the surveyors of 31 counties. Prof. R. L. Sackett, Purdue University, presented a paper on Recent Tendencies in English Sewage Purification Plants, as well as the report of the Committee on Stream Pollution. The report showed that sewage bacteria live longer in

water covered by ice than in open water. Mr. Theo. Leisen, Louisville, in the report of the Committee on Water Works, dealt with the subject of standardizing hose attachments. He also referred to the need of action by the Federal Government in preventing stream pollution. In a paper on the evolution of a pumping station Mr. Leisen described the station of the Louisville Water Works. Charles Grossman, Indianapolis, in a paper on wells and well pumping machinery, dealt particularly with the air lift and the impeller pump placed in the well pipe.

Prof. R. L. Sackett, Purdue University, in a paper on road improvements, spoke of macadamizing, tarring and the construction of burnt clay and sand clay roads. The use of crusher run stone in building roads was advocated by Mr. Watts, Princeton. Prof. Albert Smith, Purdue University, presented a paper on bridge specifications. F. A. Kaufman described a concrete girder bridge of 40-foot span, and D. B. Luten maintained that concrete arch bridges were preferable to girder bridges. The Committee on Bridges expressed a preference for creosoted wood block as a paving material. M. W. Blair presented statistics of paving for Indiana cities and described the design of the standard roller for brick tests as adopted by the National Paving Brick Manufacturers' Association.

The following officers were elected: Daniel B. Luten, president, Indianapolis; Prof. Malver A. Howe, vice-president, Terre Haute; Charles Grossman, secretary, Indianapolis.

City Club of Philadelphia.—On Saturday, January 21, Lawson Purdy, President of the Department of Taxes and Assessments of the city of New York, spoke on "Municipal Taxation."

Chamber of Commerce, Pittsburg, Pa.—An educational campaign to explain the new charter plan of the Pittsburg Charter Committee has been decided upon.

Calendar of Meetings

- January 24-26. American Society of Heating and Ventilating Engineers.—Annual Meeting, New York, N. Y.—W. M. Mackay, Secretary. P. O. Box 1818, New York, N. Y.
- January 24-26. Ohio Engineering Society.—Annual Meeting, Columbus, O.—C. J. Knisely, Secretary, New Philadelphia, O.
- January 25-27. Illinois Society of Engineers and Surveyors.—Annual Meeting, East St. Louis, Ill.—E. E. R. Tratman, Secretary, 1636 Monadnock Block, Chicago, Ill.
- February 1-3. Nebraska Cement Association.—Western Cement Exposition, Omaha, Neb.—Peter Palmer, Secretary, Oakland, Neb.
- February 6-11. National Brick Manufacturers Association.—Annual Convention, Louisville, Ky. T. A. Randall, Secretary, Indianapolis, Ind.
- February 14-15. Iowa Drainage Association.—Convention, Mason City, Ia.—W. H. Stevenson, Secretary.
- February 16. Fourth Annual Chicago Cement Show, Coliseum, Chicago, Ill.
- February 28-March 1. Northwestern Cement Products Association, West Hotel, Minneapolis, Minn.—Henry B. Smith, Secretary, 834 Security Bank Building, Minneapolis, Minn.
- May. City Commission Congress.—Meeting, Galveston, Tex.—Mayor Lewis Fisher, Chairman of Committee, Galveston, Tex.
- June 6-10. American Water Works Association.—Thirty-first Annual Convention, Powers Hotel, Rochester, N. Y.—John M. Diven, Secretary, 14 George street, Charleston, S. C.

PERSONALS

ANDERSON, ANDREW, has been appointed Water Superintendent by George C. Jewett, Mayor of Palouse, Wash.

ARNOLD, AMOS, Mechanicsburg, Pa., has been elected Chief Marshal of the Fire Department.

CAMP, D. C., has been elected Mayor of Lumberton, Miss.

CAMPBELL, FRANK, Hackensack, has been reappointed Borough Engineer for Bogota, N. J.

CARTER, J. C., has been elected Mayor of Dade City, Fla.

CAULFIELD, W. V., has been elected Mayor of Gloster, Miss.

CLIFTON, WILLIAM C., Troy, N. Y., has resigned his position as Assistant City Engineer and joined a construction company in New York City.

DUNLAP, MOREY M., former Mayor of Anderson, Ind., is dead, following a surgical operation.

FAUCETTE, J. P., has been elected Mayor of Argenta, Ark.

HALLEN, EDWARD F., has been again chosen president of the Bridgeport Board of Police Commissioners.

JACKSON, D. C., of the firm of D. C. & W. B. Jackson, which has been retained by the Government of Great Britain to advise the Postmaster-General in regard to the plant of the National Telephone Co., which will be taken over this year, sailed for England on Jan. 18.

JOINER, J. M., has been again chosen Chief of the Waycross, Ga., Fire Department.

KASTL, ALBERT E., M. Am. Soc. C. E., of New York City, has been appointed Special Deputy in charge of New York State Barge Canal work by State Engineer Bensel. The salary of this position is \$6,000. Mr. Kastl succeeds William B. Landreth, M. Am. Soc. C. E., as a result of the change in dominant political parties in New York State.

KOON, DR. THOS. W., has been appointed Commissioner of the Police and Fire Department of Cumberland, Md., succeeding Dr. Theodore A. K. Hummelshime.

LATROBE, F. C., who served seven terms as Mayor of Baltimore, is dead.

MAYER, HARVEY, has been elected Mayor of Dover, Del.

MCBEATH, DAN, former Mayor of Washburn, Wis., was murdered in Washington by a Sicilian laborer.

MCDONALD, F. B., Waycross, Ga., has been re-elected Chief of Police.

PARKHURST, FREDERICK S., Niagara Falls, N. Y., has been elected City Engineer.

PERRY, L. E., Jun. Am. Soc. C. E., formerly engaged on the sewage purification works at Philadelphia, has been appointed secretary and engineer for Houston, Perry & Co., Seaford, Del.

PRIOR, HARRY, has been chosen Chief Engineer of the Fire Department at Portsmouth, N. H.

PUTNAM, W. R., has resigned his position as Superintendent of the Marinette, Wis., Electric Light & Power Co.

SHANNON, MAURICE D., has been elected Mayor of Morgan City, La.

SHAY, WILLIAM, has been elected Mayor of Star City, W. Va.

THOMPSON, JAMES T., has been elected Mayor of Lewes, Del., for the tenth consecutive term.

WORRELL, W. L., Rome, Ga., has been made Superintendent and Manager of the water works at Meridian, Miss., to fill vacancy caused by the resignation of W. F. Wilcox.

ZIMMERMAN, W. W., Mayor of Richmond, Ind., has married Mrs. Viola Godkin

TRADE NOTES

Cast Iron Pipe.—Chicago—This is the active season for water pipe and good bookings are expected in the next 30 days. Quotations: 4-inch, \$25; 6 to 12-inch, \$24; 16-inch and up, \$23.50. Birmingham—Production has been decreased by the closing of two plants for repairs. Prices have been advanced. Quotations: 4 to 6-inch, \$20.50; 8 to 12-inch, \$20; over 12-inch, \$18. San Francisco—While figures are being taken on a number of large inquiries, January business has been confined to small lots. New York—Public lettings are few in number, but private companies are making inquiries and placing some orders. Quotations: 6-inch, carload, \$22.

Lead.—Quotations: New York, \$4.50; St. Louis, \$4.35.

Rubber Tires.—The United States Tire Company, with a nominal capital of \$500,000, will be incorporated within a few days, if present plans are carried out, to handle the sales of the Hartford Rubber Works Company, the Morgan & Wright Company, the G & J Tire Company and the Continental Caoutchouc Company, all of which are subsidiaries of the Rubber Goods Manufacturing Company, which in turn is the largest subsidiary of the United States Rubber Company. E. S. Williams, President of the Rubber Goods Manufacturing Company, will be president of the new company, and C. J. N. Butler, President of the Morgan & Wright Company, will be Vice-President. J. M. Gilbert, General Manager of the Continental Caoutchouc Company, will have a similar position with the United States Tire Company, and J. B. Anderson, president of the Hartford Rubber Works Company, will be its General Sales Manager. According to the plans for the new company, the country will be divided into three districts in the handling of sales. New York will be the center of the Eastern district, Chicago of the Central district and San Francisco of the Pacific Coast district. It is understood that the four manufacturing companies will retain their corporate existence. The various branch stores of the different companies, which are now maintained separately, will be consolidated. Each of these consolidated branches will carry tires made by the four companies.

Paving Company Troubles.—W. J. Gilvin, Finance Commissioner, Fort Worth, Tex., has refused to approve the bonds of Roach & Manigan, the Tennessee paving concern that has taken over the contracts of the Metropolitan Construction Company, until the local creditors of the Metropolitan Company have been satisfied. The certificates held by the Metropolitan Company were assigned to one member of the company and the contracts have been assigned to two other members of the same company.

Indian Liquid Asphalt.—Sam E. Finley, manager of the Indian Refining Company, Atlanta, Ga., states that arrangements have just been made by the Commissioners of Mecklenburg County, N. C., to treat six miles of their fine macadam roads with Indian liquid asphalt. The city of Fayetteville has also arranged to treat five and a half miles of macadam streets with it and in both places samples of the material were put down last summer for a test. The company now has down in the State of North Carolina 40 miles of liquid asphalt.

Water Company Reorganization.—The Vancouver (Wash.) Water Works Company has passed into the hands of Isaac Anderson, Tacoma; A. Welch, Portland, and their associates. The two named are President and General Manager, respectively, of the Oregon & Washington corporation, a \$5,000,000 company, formed as a holding company to take over the water works system, the plant of the Independent Light & Water Company, which controls the manufacture and sale of gas, and the operation of the street car system of the Vancouver Traction Company.

Flashlight System.—In his annual report Chief F. W. Krieg, Wilkes-Barre, Pa., speaks as follows regarding the flashlight system: "At the present time when a policeman, patrolling his beat, is wanted it is necessary to wait for him to report. In case of an emergency, if he had the new flashlight signal system and telephones installed in our police alarm boxes, we could get the officer to the telephone on very short notice. This system has proven a great success wherever it has been used. After midnight, under the present system, it is practically impossible for officers on some beats to get to a telephone and they often have to leave their beats and go to a fire engine house to call up headquarters. If the flashlight system and telephones were installed the whole shift could be communicated with in less than 10 minutes from headquarters. This would be a great assistance to the department in case of a burglary, murder or other crime being committed. This also has passed the experimental state, and I most earnestly urge that your honorable body appropriate money for the installation of this much needed system."

City Will Complete Work.—Revoking the contract because the Hudson Terminal Construction Company, now bankrupt, which was constructing the sewage system, abandoned the work, the Bridgeton (N. J.) City Council will complete the work. City officials have been notified by the Fidelity Surety Company, of Baltimore, which held the surety bond of the Hudson Company, that the city could complete the construction of the disposal plant and the laying of the sewer pipes at the expense of their company. The work will be started at once, as several streets for weeks have been impassable owing to the high piles of dirt thrown from the open trenches.

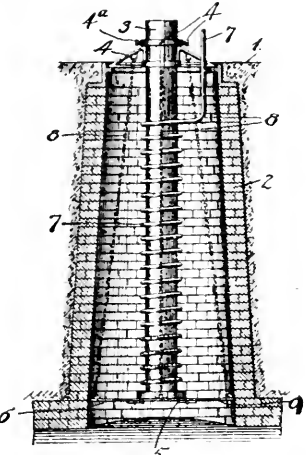
Pacific Power Consolidation.—Deeds transferring the interests of the Suburban Light & Power Company to the Pacific Gas & Electric Company, with headquarters at 445 Sutter street, San Francisco, have been signed by the officers of the absorbed corporation, the final arrangements for the sale of the property having recently been completed. The legal documents have been turned over to the officers of the purchasing concern, which now controls all of the light and power companies in California, with the exception of a few scattering and much smaller corporations.

Cresoted Blocks.—A plant for the manufacture of cresoted paving blocks is to be erected in the vicinity of Little Rock, Ark., by the Ayer & Lord Tie Company, of Chicago and Memphis.

Asphalt Plants.—Hentherington & Berner, iron manufacturers, Indianapolis, have increased their capital stock from \$27,000 to \$81,000.

PATENT CLAIMS

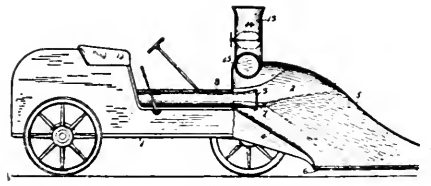
980,314. SNOW MELTER FOR MANHOLES OR SEWER PIPES. Thomas McGill, Brooklyn, N. Y. Serial No. 593,132.
In a snow melting apparatus for use in sewer manholes, a backbone element,



means carried thereby for supporting the same at the manhole opening, snow supporting means at or near the lower end of said backbone, and heating means associated with said parts and carried thereby.

980,332. SNOW REMOVING APPARATUS. Lueder Raschen, San Francisco, Cal. Serial No. 580,346.

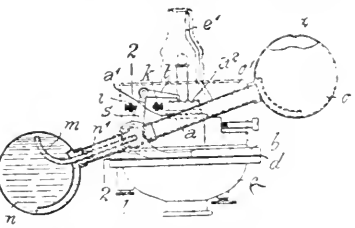
In combination with a vehicle, and means carried by the vehicle for propelling the same, a combustion chamber arranged at the front end of the vehicle and having,



close to the ground, an outlet arranged to direct the products of combustion horizontally and in a partly forward and partly lateral direction, on each side of the vehicle, means carried by the vehicle for producing said products of combustion and means carried thereby for forcing them through said outlet, substantially as described.

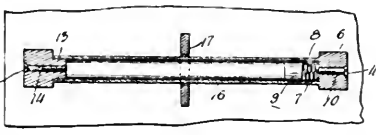
980,334. SYSTEM FOR OPENING AND CLOSING GAS VALVES FROM A DISTANCE. Emil Renkewitz Berlin, Germany, assignor to The Firm of Berlin-Anhaltische Maschinenbau-Actien-Gesellschaft, Berlin, Germany. Serial No. 457,964.

In a system for opening or closing gas valves, the combination with the main valve, and a gas supply thereto, of two receptacles communicating with each other and partly filled with liquid, one of said receptacles being hermetically closed at its top and the other one communicating with



the atmosphere, a rigid connection between said receptacles, a pivot intermediate said receptacles providing a rocking support therefor and having a bore communicating with the closed receptacle at the upper part thereof and with the gas supply, a spring actuated valve adapted to close the communication between the gas supply and the bore of said pivot under the normal pressure of the gas and to open the same upon an increase of the pressure, the bore of said pivot communicating with the atmosphere through a minute aperture, and a connection between the rockable receptacles and the main valve adapted to operate the latter.

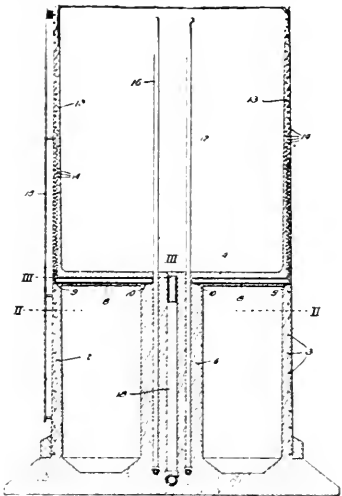
979,856. DEVICE FOR HOLDING KEYS IN FIRE ALARM BOXES. Frank B. Holbrook, Rome, Ga. Serial No. 575,164.



In a guard for a fire alarm box, posts on the exterior of the box, a frangible guard held by the posts, and a key having an aperture to receive the guard.

982,081. CONCRETE WATER-TANK. John Hugh McCoy, Harrisville, Pa. Serial No. 578,678.

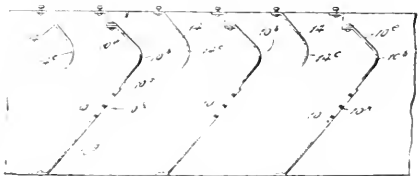
In a concrete water tank, the combination of a circular foundation wall, a central pier, radially arranged floor beams free from each other resting by their free ends over said foundation wall and said pier respectively, separate bearing elements



for the floor beams, reinforcing members free from each other extending radially inward between the outer portions of said floor beams, a floor incorporated with said beams and reinforcing members, and a circular tank wall extending above said floor and circular foundation wall having inclosed within it annular reinforcing members, substantially as set forth.

922,020. CONCRETE-MIXER. Arthur W. Ransome, New York, N. Y. Serial No. 470,028.

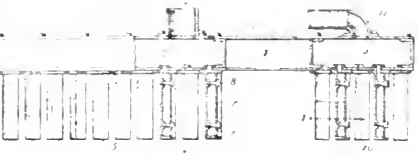
A rotary drum mixer having a mixing



blade with a lifting pocket in one end portion, thereof and its middle portion of less width than either end portions for the purpose specified.

581,635. PROCESS OF MAKING ROADWAYS, RAILROAD BEDS, PAVEMENTS AND THE LIKE. Michael A. Popkess, Kansas City, Mo., assignor to Bituminized Road Company, Phoenix, Ariz., a Corporation of Arizona. Serial No. 484,325.

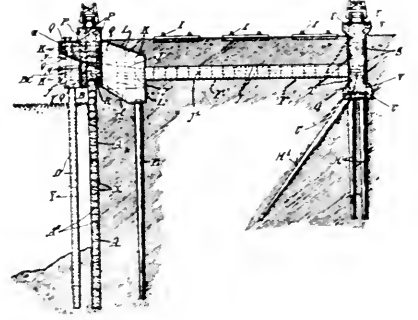
The process of making roadways, railroad beds, sidewalks, etc., the same consisting in pulverizing the earth to a suitable depth



and in injecting into such pulverized earth below the surface of the same, a liquid binder, then in stirring up or loosening the earth thus impregnated with the liquid binder, then in forming substantially V-shaped grooves in such prepared earth, and then in compressing or compacting such prepared earth down upon the underlying or said bed of earth, to form

981,822. CONCRETE-PILING RETAINING WALL STRUCTURE. Maxwell M. Upson, Englewood, N. J. Serial No. 566,591.

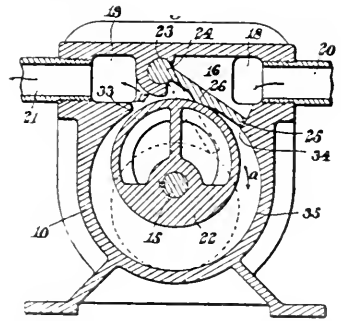
An element of a retaining-wall structure, which comprises a series of substantially solid concrete piling units individually penetrating down into the earth bottom and extending up above the bottom substantially to the surface, and arranged successively adjacent to each other in a row and longitudinally interlocking, to constitute a tight sheet-piling retaining wall of concrete; and a concrete horizontal beam maintained in position transversely along the upper portion of the retaining wall and



co-operating therewith to take the horizontal loads from the respective individual constituent concrete piling units thereof; the concrete of said horizontal beam having embedded in it means disposed horizontally along its length for reinforcing it against the horizontal loads of the retaining wall as a whole; and the concrete masses of the respective piling units having embedded in them vertically disposed means for reinforcing the individual units against the horizontal loads along their lengths intermediate their earth-footings and the horizontal beam, to thereby vertically transmit the horizontal loads downwardly and upwardly.

981,660. WATER METER. Justus Royal Kinney, Boston, Mass. Serial No. 537,344.

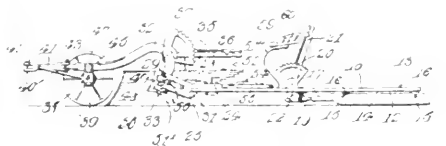
In a device of the class described, the combination of a casing having a cylindrical chamber, an opening in its cylindrical wall, and inlet and outlet passages communicating with said chamber through said opening; a revoluble shaft concentrically disposed in said chamber, and pro-



vided with an extension through an end wall of said casing; a register mechanism operable thereby; a cylindrical piston concentrically mounted upon said shaft and a pivoted blade extending across the inlet passage and adapted to be retained in contact with said piston by the pressure of the fluid passing through said inlet passage; and to close said inlet during portions of the revolution of said piston.

981,710. ROAD-GRADER. John T. Starr, Nowata, Okla. Serial No. 512,051.

In a road grader, a main frame member, a block pivoted to the forward end of said member for movement in a vertical plane, a front frame member swingingly supported in said block, a latch pivoted on one of said frame members to move in



a vertical plane, a scraper blade pivotally mounted in said block on the front frame member, a brace connecting said scraper blade and the main frame member, and means to vary the effective length of the brace and change the angle of the scraper blade relative to said main frame member

Relating to Municipal and Public Work—Street Improvements—Paving, Road Making, Cleaning and Sprinkling—Sewerage,
Water Supply and Public Lighting—Fire Equipment and Supplies—Bridges and Concrete Work—Sanitation,
Garbage and Waste Disposal—Police, Parks and Miscellaneous—Proposals and Awards

To be of value this matter must be printed in the number immediately following its receipt, which makes it impossible for us to verify it all. Our sources of information are believed to be reliable, but we cannot guarantee the correctness of all items. Parties in charge of proposed work are requested to send us information concerning it as early as possible; also corrections of any errors discovered.

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREET IMPROVEMENTS				
Ohio	Cleveland	Jan. 27, noon	Paving portions of 20 streets.	A. B. Lea, Dir. Pub. Serv.
Indiana	South Bend	Jan. 27, 10 a.m.	Paving alley.	A. P. Perley, Clerk. D. P. W.
Tennessee	Newport	Jan. 27, 2 p.m.	Grade 18 mi. and macad. 35 mi. roads in Cocke County.	Geo. W. Gorrell, Secy. Pike Con.
Oklahoma	Tulsa	Jan. 27, 9:30 a.m.	Paving various streets.	E. B. Cline, City Auditor.
Massachusetts	New Bedford	Jan. 27, 2:30 p.m.	Furn. curb., pav. block, brick, sand, shovels, lumber and hay.	C. F. Lawton, Supt. of Streets.
Indiana	Terre Haute	Jan. 28	Constr. gravel road in Sugar Creek twp., cost, \$13,000.	N. G. Wallace, County Auditor.
Wisconsin	Appleton	Jan. 30, 2 p.m.	Constr. concrete sidewalk.	E. L. Williams, City Clerk.
Wisconsin	Menomonie	Jan. 31	Pave. with vit. brick, asphalt macadam, bitulithic, broken limestone and liquid asphalt bonding solution, or sarcolithic mineral rubber pave. Also cement curb, 7-in. base, 5-in. top and 16-in. depth.	F. W. Rowe, City Clerk.
Indiana	Fowler	Feb. 1, noon	Construction of one mile of gravel road in Benton County.	Lemuel Shipman, County Auditor.
Iowa	Cedar Rapids	Feb. 1, 10 a.m.	Constr. curb on various streets.	L. J. Storey, City Clerk.
Michigan	Hancock	Feb. 1	Constr. about 4 miles of 15 ft. macadam road.	County Clerk.
California	Oakland	Feb. 1, 11 a.m.	Grading in various parts of city.	Frank R. Thompson, City Clerk.
Utah	Logan City	Feb. 1, 4 p.m.	Paving 28½ blocks.	Wm. Worley, Comr. on Sidewalks.
Iowa	Monroe	Feb. 1, 2 p.m.	Road work for year commencing April 1.	W. M. Livingston, Town Clerk.
Wisconsin	Appleton	Feb. 2, 10 a.m.	Paving 28,000 yds. street.	E. L. Williams, City Clerk.
Indiana	Fort Wayne	Feb. 2, 10 a.m.	Grade, gravel or macad. various highways.	C. H. Brown, County Auditor.
New York	Buffalo	Feb. 3, 11 a.m.	For repaving various streets.	F. G. Ward, Comr. D. P. W.
Ohio	Youngstown	Feb. 6, 1:30 p.m.	Improving road with slag macadam for 1,040 feet.	Frank Agnew, Secy. Road Comrs.
Indiana	Huntington	Feb. 6, 2 p.m.	Constr. gravel rd. known as P. W. Forest Road.	John W. Weaver, Co. Aud.
West Virginia	Huntington	Feb. 6, 1 p.m.	Grad. and pave. 20 streets with vit. brick, bitulithic, sheet asphalt, asphalt block or concrete asphalt.	John Coon, Comr. of Streets.
Georgia	Atlanta	Feb. 6, 3 p.m.	Lay brick, tile and cem. sidew. and furn. mat. for rep. to sts.	W. J. Campbell, City Clerk.
Indiana	Tipton	Feb. 6	Constr. gravel road in several townships.	J. H. Tranbarger, County Auditor.
Alabama	Montgomery	Feb. 6, noon	Paving with brick, asphalt, bitulithic, Blome granitoid block, mineral rubber, wood block, Hassam granite block or Hassam comp. concr. pave, with necessary grad. curb. and sev. Constr. cement and brick sidewalk for 1911.	C. J. Fay, Acting Treasurer. E. A. Heise, City Clerk. E. A. Staggs, Auditor.
Indiana	Michigan City	Feb. 7, 10 a.m.	Constr. cement and brick sidewalk for 1911.	C. J. Fay, Acting Treasurer.
Indiana	Brazil	Feb. 7, 11:30 a.m.	Improving various highways in Clay County.	E. A. Heise, City Clerk.
Kansas	Manhattan	Feb. 7, 6 p.m.	Pave. with brick block, wood block, concr., asph. concr., or sheet asphalt, requiring approx. 12,200 yds. pave. and 4,000 cu. yd. excav. on Poyntz. ave., and 16,200 yds. pave. and 5,450 cu. yd. excav. on Houston and Fourth sts.	C. T. Gist, City Clerk. A. T. Triay, City Clerk. Wm. McQueen, City Clerk.
Florida	Palatka	Feb. 7, 7:30 p.m.	Constructing approx. 16,500 sq. yd. concrete sidewalks.	Hillsboro County Commissioners.
Canada	Vancouver, B. C.	Feb. 7	Furnish road roller, weight not less than 15 tons.	B. B. Engle, County Auditor.
Florida	Tampa	Feb. 7	Paving with shell 1½ mile road.	J. E. Wallace, County Auditor.
Indiana	Crawfordsville	Feb. 7, 2 p.m.	Constr. gravel road known as L. T. Rush Road.	W. E. Munchenburg, Co. Aud.
Indiana	Logansport	Feb. 7, 10 a.m.	Constr. gravel road in Tipton and Jefferson twps.	J. S. Whitaker, County Auditor.
Indiana	Winamac	Feb. 7, noon	Grading, drain, and gravel. certain highways.	A. Y. Stout, County Auditor.
Indiana	Martinsville	Feb. 7	Constr. road in Adams township.	City Clerk.
Indiana	Marion	Feb. 7, 2 p.m.	Constr. macadam road in Fairmont township.	John T. Goldenbogen, Clk. Co. Comrs.
Virginia	Elizabeth City	Feb. 7, 3 p.m.	Constructing smooth or brick pavement.	Paul Maier, County Auditor.
Ohio	Cleveland	Feb. 8, 11 a.m.	Grading drain, and improve. Fairmont road.	Geo. W. Baxter, County Auditor.
Indiana	Mt. Vernon	Feb. 8, 2 p.m.	Constructing 2 mile road in Robb township.	C. P. Beard, Clk. B. I. of Turnp. Dir.
Indiana	Lafayette	Feb. 8, 10 a.m.	Construct gravel road.	F. Hanlon, City Clerk.
Indiana	Evansville	Feb. 9, 10 a.m.	Broken rock and gravel to repair roads.	Carl A. Anderson, Clerk.
Pennsylvania	Erie	Feb. 13, 8 p.m.	Paving part of W. 20th street.	J. T. Goldenbogen, Clk. Co. Comrs.
Michigan	Menominee	Feb. 14, 2 p.m.	Constr. gravel road on bay shore.	Board of Pub. Works.
Ohio	Cleveland	Feb. 15	Constr. Broad View road.	John Coon, Comr. of Streets.
Alabama	Mobile	Feb. 16, noon	Laying approx. 33,000 sq. yd. wood blk. pave. & 13,426 lin. ft. concrete curb.	County Auditor
West Virginia	Huntington	Feb. 20, 1 p.m.	Paving two alleys.	J. W. Morris, City Engineer.
Ohio	Defiance	Feb. 20	Stoning 1½ mile road, approximate cost, \$5,000.	
Oregon	Portland	Feb. 23	Constructing pavement on Jersey st.	
SEWERAGE				
Ohio	Lorain	Jan. 27, noon	Storm water sewer in Dallas ave.	L. B. Johnston, City Clerk.
Texas	Corpus Christi	Jan. 27	Furn. sewer material, incl. 1,100 sq. ft. of steel sheet piling, 85 c. i. manhole covers, 10 flush tank siphons, 4,000 lin. ft. of c. i. pipe 2 carloads of lumber, 2,000 ft of 15-in vitrified sewer pipe, 7,000 ft. of 12-in vitrified sewer pipe, 3,300 ft. of 10 in. vitrified sewer pipe, 9,660 ft. of 8 in vitrified sewer pipe, 57 "Ys" 6 on 15, 78 "Ys" 6 on 10, 288 "Ys" 6 on 12, 258 "Ys" 6 on 8.	O. O. Wright, City Clerk. County Clk. Urbana, Ill.
Illinois	Champaign	Jan. 27, 2 p.m.	Laying tile in sub. dist. No. 1.	M. Volz, Auditor.
South Dakota	Alexandria	Jan. 28, 1 p.m.	Constr. approx 7½ mi. 5 to 24-in. tile drains.	John Gifford, City Purchas. Agt.
Washington	Spokane	Jan. 29	Furn. 7,000 ft. of 10-in. corrug. drain pipe, corrug. bottom.	M. J. Desmond, City Clerk.
California	Sacramento	Jan. 30	Constr. and reconstr. sewers.	C. R. Heath, Health Engineer.
Manitoba, Can.	Souris	Feb. 1	Furn. 31,000 ft. vit. sewer pipe etc. spring and summer, 1911.	W. J. Campbell, City Clerk.
Georgia	Atlanta	Feb. 6, 3 p.m.	Constr. sewers and furn. vit. pipe, cem. and castings.	F. D. Brooks, City Clerk.
Kansas	Lawrence	Feb. 6	Constr. 8-in. lateral sewer.	G. R. Greary, Chm. Bd. Control.
Ontario, Can.	Toronto	Feb. 7, noon	Constr. several sections low level interceptor.	
Alabama	Mobile	Feb. 16, noon	Constr. approx. 10,350 lin. ft. storm sewer ranging in size from 5x11 ft. canal to 10 in. vit. pipe; also 6,000 ft. 6 in. vit. pipe hose connect.	Board of Pub. Works. John Coon, Comr. of Streets.
West Virginia	Huntington	Feb. 20, 1 p.m.	Laying sewers in various streets.	
WATER SUPPLY				
Illinois	Chicago	Jan. 27	Furn. and install, two 20,000,000 cent. pumps and two 1,000 H. P. synchr. elec. motors, piping, switchboard, etc.	B. J. Mullaney, Comr. Pub. Works.
Washington	Ft. Geo. Wright	Jan. 28, 11 a.m.	Sink 10 in. tubular deep well.	Lieut. A. L. Sneed, Con. Q.M., U.S.A.
California	Los Angeles	Jan. 30	Furn. 1,135 tons of bell and spigot stand. c. i. water pipe.	J. P. Vroman, Secy. Bd. W. Comrs.
Washington	Spokane	Jan. 30, 2 p.m.	Furn. two 14 in single suction, hor. shaft, two-stage centrifugal pumps, valves, etc.	John Gifford, City Purch. Agt.
California	Los Angeles	Jan. 30, 2 p.m.	Franchise for lay. water-pipe in Lankershim; 40 years.	C. G. Keys, County Clerk.
Iowa	State Center	Jan. 31 noon	Drilling well.	J. W. Sparks, City Clerk.
Manitoba, Can.	Souris	Feb. 1	Furn. 425 tons c. i. water pipe, specials, fire hydrants, gate valves and boxes, pig lead, etc., in spring and summer of 1911.	J. W. Breakey, Secy.-Treasurer.

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
WATER SUPPLY (Continued)				
South Dakota	Huron	Feb. 1	Constr. water works to incl. 750,000 gal. concr. reservoir, 200,000 gal. elev. tank, and 1 400 gal. per minute pump. pl.	City Clerk.
Ohio	Troy	Feb. 4	Constr. water mains to infirmary	A. E. Sinks, County Auditor.
Iowa	Rippey	Feb. 6, 8 p.m.	Construction of water works system	J. A. Haberer, Town Clerk.
Manitoba, Can.	Winnipeg	Feb. 6	Erect. two pump. plants; cap. 1,000,000 imperial gal. per 24 hrs.	M. Peterson, Secy. Bd. Control
Kansas	Hanover	Feb. 6	Constructing pumping station	Dugald Spence City Clerk.
New Jersey	South River	Feb. 13	Constr. suction well, brick and concr. 25 ft. diam. and 33 ft. deep	Chas. Anderson Boro. Clerk.
Montana	Townsend	Feb. 14	Constr. water supply system	E. H. Goodman, Town Clerk.
Ohio	Toledo	Feb. 14, noon	Constr. extension water purif. wks. incl. 14 filters, etc., capable purifying 14,000,000 gals. daily	J. R. Cowell, Dir. Pub. Serv.
Georgia	Dalton	Feb. 16	Constr. water works incl. concr. reservoir, 2,000,000 gals. capacity, approximate cost, \$30,000	Paul B. Trammell, Mayor.
Nebraska	North Benl.	Feb. 17, 8 p.m.	Install pumping sta. incl. l. wells, pipes, engines, etc.	Frank D. Howe, City Clerk.
Wyoming	Sheridan	Mar. 6, 3 p.m.	Constr. water supply main with approx. 7,934 ft. of 14-in. and 760 ft. of 10 in. c. i. pipe	Arnold Tschirgi, City Engr.
BRIDGES				
Kansas	Lawrence	Jan. 28, noon	Tear down old and furnish material for new bridge	W R. Green, County Clerk.
Missouri	Kansas City	Jan. 30	Constr. two concr. bridges, one over the Blue river at 15th st., in which will be approx. 3,600 cu. yds. concr. 300,000 lbs. of steel and 1,260 sq. yds. of creosoted block pave; a reinforced conc. arch bridge over Brush Creek at Cleveland ave., contain. 900 cu. yds. of concr., 80,000 lbs. of metal and 360 sq. yds. of creosoted block pavement	Board Pub. Works.
Michigan	Kalamazoo	Jan. 30	Build. reinforced concr. bridge, 190 ft. span, 3 arches 50 ft. in springing line	H. A. Johnston, City Engr.
Ohio	Clinton	Jan. 30, 11 a.m.	Constr. superstructure of Haulk bridge	C. L. Wirth, Co. Clk. Akron.
Ohio	Akron	Jan. 30, 11 a.m.	Constr. concr. floor on bridge over Ohio canal	C. L. Wirth, County Auditor.
Virginia	Richmond	Feb. 1, 4 p.m.	Plans, designs, detailed drawings, strainsheets, specifications and proposals for \$225,000 rein. con. bridge over James river	Charles E. Bolling, City Engineer
California	Oxnard	Feb. 1	Constr. 4 reinforced concr. culvert, install concr. overflow weir regulating box with approx. 50 ft. of concrete conduit	Dessery & West, Engrs. 1117 U. Trust Bldg. Los Angeles.
Ohio	Cincinnati	Feb. 3, noon	Building culverts on Kirby road	Fred Driehs, County Clerk.
Minnesota	Warren	Feb. 4, 10 a.m.	Building culverts of various sizes	County Auditor
Georgia	Ocilla	Feb. 6, noon	Constr. steel bridge over Alapha river	G. T. Young, Clk. Comrs. of Roads.
Kansas	Chanute	Feb. 6, noon	Constr. bridge across Neosho river, also three smaller bridges	W. F. Sams, City Clerk.
Ohio	Zanesville	Feb. 6, noon	Constr. substructure of Fifth st. bridge	H. A. Buerhaus, County Auditor.
Minnesota	Minneapolis	Feb. 6	Repair Bridge No. 4, Hanover Village	A. P. Erickson, County Auditor.
New Jersey	Woodstown	Feb. 8	Constr. concrete floor bridge	Levi S. Prickett, Chm. Bdge. Com. Bridge Committee.
New Jersey	Salem	Feb. 8, 10:30 a.m.	Constr. concrete floor bridge	John W. Summers, County Auditor.
South Dakota	Yankton	Feb. 27, 7:30 p.m.	Constr. steel reinforced concr. bridge over Rhine creek	
LIGHTING AND POWER				
Georgia	Fort Screven	Jan. 30, 11 a.m.	Constructing electric light system	Constructing Quartermaster.
Pennsylvania	Newtown	Jan. 31, noon	Light public highways of borough	Rudolph Hauler, Chm. Com. on Lt.
Saskatchewan	Regina	Jan. 31	Furn. 1,500 kw. steam turb. generat. unit; 500 kw. d.c. generat. unit; two 500-h.p. boilers, economizer, etc.	A. J. McPherson, City Comr.
Washington	Tacoma	Feb. 6	Com. remain. prt. Nisqually power plant, tot. cost, \$1,094,000.	Nicholas Lawson, Comr. L. & W.
Australia	Perth	Feb. 28	Furnish electric pumping machinery	Minister of Pub. Works.
Iowa	Atlantic	March 1	Imp. Elec. Lt. and Power Plant, probable cost \$40,000.	E. T. Nichols, City Clerk.
Mexico	Monterey N. L.	March 1	Erection of gas plant	Lewis Lukes, Apartado 58.
FIRE EQUIPMENT				
Washington	Spokane	Jan. 27, 2 p.m.	Furn. auto. for use of electrician, Fire Dept.	John Gifford, City Purch. Agt.
Washington	Seattle	Jan. 27, 10 a.m.	Furn. one electric chassis for hose wagon	C. B. Bagley, Secy. Bd. Pub. Wks.
Wisconsin	Appleton	Jan. 30, 2 p.m.	Furn. 1,000 ft. cotton hose, 2 1/2 in. coupled	E. L. Williams, City Clerk.
Minnesota	Mankato	Jan. 30, 10 a.m.	1,000 ft. of 2 1/2 in. rubber lined cotton fire hose	A. H. Schere, City Clerk
Texas	Texarkana	Jan. 31	Two auto. chem. and hose wagons, with equipment	A. B. DeLoach, Mayor.
Georgia	Pt. Screven	Feb. 6, 11:45 a.m.	Constr. incl. plumb, wiring and fixture one fire station	Constr. Q.M., U.S.A.
Florida	Jacksonville	Feb. 6, 3 p.m.	Constr. bl. lg. for use fire dept.	W. M. Bostwick, Jr., Chm. W. W. Bd.
Dist. of Col'bia	Washington	Feb. 15, 2 p.m.	Furn. one gasoline motor driven fire eng. and hose wagon comb	Commissioners of the Dist. of Col.
New Jersey	Princeton	July 5	Furn. auto pumping engine	E. M. Updike, Chm. F. & W. Com.
MISCELLANEOUS				
Washington	Spokane	Jan. 27, 2 p.m.	Completion of mill work at isolation hospital	John Gifford, City Purch. Agt.
California	Oakland	Feb. 1, 11 a.m.	Excavating for City Hall, grad. ath. field and park lands and around fire alarm building	J. W. Nelson, Secy. Bd. Pub. Wks
California	San Jose	Feb. 6	Constructing tuberculosis ward, county hosp. Est. cost \$10,000.	Roy Walter, City Clerk.
Indiana	Michigan City	Feb. 7, 10 a.m.	Construction of docks along harbor	E. J. Heise, City Clerk.

STREET IMPROVEMENTS

Cullman, Ala.—Commissioner Max Schmidt has given notice that he will construct one mile of pike road leading from Cullman one mile on Bremen road, west of town.

Cullman, Ala.—City is considering extension of sidewalks. Address Mayor Robertson.

Troy, Ala.—Council has decided to establish paving district; work to begin at once.

Fort Smith, Ark.—Paving of Garrison ave. with creosote wood blocks is being urged.—M. H. Reed, City Engineer.

Modesto, Cal.—City will macadamize all streets leading into country.

Monrovia, Cal.—Board of Trustees has ordered paving, curbing, draining and improvements to various streets.—C. H. Reed, Jr., City Clerk.

Pasadena, Cal.—Paving of Kirkwood st. and extension of Hudson st. is being considered.

Pomona, Cal.—Board of Trustees has decided to ask bids for paving Holt ave.

Redondo, Cal.—Plans have been adopted by City Trustees for improving Vincent and Emerald sts.

Upland, Cal.—Bids will soon be asked for macadamizing A st. and paving entire length of 10th st.

Hartford, Conn.—Street Commissioners are considering paving of Sheldon st. with asphalt.

New Britain, Conn.—Board of Public Works has received following estimates by City Engineer Oldersham for extension of permanent pavement; West Main st., 17-244 yds., cost \$43,110; Arch st., 7,932 yds., \$19,830; Franklin square, 8,355 yds., \$29,875.50, and East Main st., 13,577 yds., \$33,942.50.

Washington, D. C.—Canal road between railroad crossing and chain bridge will soon be improved.

Columbus, Ga.—Construction of pavement on 2d ave. has been recommended.

Gainesville, Ga.—Mayor Mitchell has recommended that city do more street paving.

Thomaston, Ga.—Upson County will vote Feb. 13 on \$100,000 bonds for road improvements.

Freeport, Ill.—Board of Local Improvements has decided to pave and park Washington st.

Joliet, Ill.—City Engineer Stevens has estimated cost of curbing and paving portion of East Washington st. at \$1,030.

La Salle, Ill.—Bids will be received in spring for 7,000 yds. of paving on Canal st.; cost \$16,000.—Edward Byrne, City Engineer.

Granite City, Ill.—Board of Local Improvements has decided to pave and construct sidewalks on number of streets.

Joliet, Ill.—Board of Local Improvements has decided to pave Hickory st. with bituminous macadam.

Peru, Ill.—City is considering macadam

paving on number of streets.—Theo. Webberling, Superintendent of Streets.

Rock Island, Ill.—City is considering paving of 11 blocks on 35th st. with brick.—Wallace Treichler, City Engineer.

Sheldon, Ill.—Township is considering construction of more hard roads.

Bluffton, Ind.—County Commissioners are considering graveling of two roads in Jefferson Township.

Elkhart, Ind.—Board of Works has decided to pave Garfield and Morehouse aves.

Oakland City, Ind.—Township has \$2,000 available for repair of roads.

Terre Haute, Ind.—County Engineer Robt. E. Gibbons is preparing plans for three miles of gravel road improvements in Otter Creek Township; bids will be received about Feb. 1.—N. G. Wallace, County Auditor.

Versailles, Ind.—Bids will soon be received by Commissioners of Ripley County for construction of 14,622 lin. ft. of macadam road in Johnson Township.—Nicholas Voltz, County Auditor.

Vinton, Ia.—Paving of Washington, Jefferson and Concord sts., 35 blocks, is being considered.

Louisville, Ky.—Plans are being prepared for paving with asphalt 20,000 sq. yds. of the Bardstown road, from Duker ave. to Douglass blvd.; cost \$40,000.—D. R. Lyman, Chief Engineer.

Portland, Me.—Council has decided to finish paving of Brighton ave.

Baltimore, Md.—Harbor Board has approved plans by Harbor Engineer O. F. Lackey for water front street and municipal dock to be built in South Baltimore.

Easton, Md.—City has decided to improve streets.

L'Anse, Mich.—L'Anse Township has voted \$25,000 bonds to build new roads.

Seney, Mich.—Schoolcraft County will vote in spring on \$90,000 bonds for construction of good roads.

Jackson, Miss.—Hinds County Board of Supervisors will again ask bids for construction of public roads; former bids rejected.

Tupelo, Miss.—City is considering election on bonds to pave streets.

Joplin, Mo.—Goods Roads Committee, Chris Gruengerich, Chairman, will soon begin construction of macadamized road from 32d and Main sts. west to Tanyard road; J. B. Hodgdon, City Engineer, will make survey.

East Orange, N. J.—Board of Trade is favorable to use of Belgian block for repaving of Main st.

Hammond, N. J.—Council has authorized Town Clerk Seely to advertise for bids for opening of new road from the Camden County line to 3d st.

Metuchen, N. J.—Mayor Washington Wilson has recommended improvement of streets.

Bainbridge, N. Y.—Village has voted to expend \$1,000 in repairing Dugway road.

Binghamton, N. Y.—Improvement of Conklin ave. from eastern end of Pierce Creek bridge to city limits is being considered; cost about \$8,000.

Dolgeville, N. Y.—Citizens will vote in March on additional bitulithic pavement.

Lockport, N. Y.—Superintendent Thomas Brennen has begun survey of Indian Hill road through Tuscarora Reservation in Lewiston; State has appropriated \$5,000 for construction.

Middleport, N. Y.—The County Supervisors have voted to improve Carmon road, leading from the Ridge road to Middleport; cost about \$9,000.—John C. Taylor, Supervisor.

St. Johnsville, N. Y.—City will expend about \$36,000 for brick paving.—H. Van Valkenburg, City Clerk.

Utica, N. Y.—Council has taken preliminary steps for paving 21 additional streets.

Watertown, N. Y.—Mayor Francis M. Hugo has recommended paving of Franklin, State and River sts.; use of bituminous binder in macadam roads and construction of crosswalks over macadam roads with bituminous concrete.

Whitehall, N. Y.—Village is considering election Feb. 6 on \$1,000 bonds for cement sidewalks.

Newbern, N. C.—City will pave Pollock, Craven, Graves, Griffith and East Front sts. and Ave. A.

Reidsville, N. C.—County is considering election on \$500,000 bonds for permanent roads.

Akron, O.—Residents of Bath Township have asked for paving with brick of 3½ miles of road leading from Ghent to north line of township.

Ashtabula, O.—City is considering paving of Prospect, Hulbert and Park sts.; plans and specifications are being made and bids will soon be asked.

Caldwell, O.—Bids will be received Feb. 3 for \$5,304 Cumberland st. improvement bonds.—Hugh Neuhart, Village Clerk.

Defiance, O.—City Engineer Carl Smith has estimated cost of paving as follows: Perry st., \$19,319; 5th st., \$10,623, and East 2d st., \$32,456.

Ironton, O.—Council has passed an ordinance for improvement of 3d st. by paving with vit. brick.—C. W. Golden, Mayor; H. M. Paul, Clerk.

Jefferson, O.—Ashtabula County is considering constructing roads from Colebrook Center to Wayne Township and between Colebrook and New Lyme.

Mt. Gilead, O.—Council has passed ordinance for improvement of portion of Center-Marion st., by paving with brick or blocks.—W. M. Kaufman, Mayor; W. F. Wieland, Clerk.

Springfield, O.—Council is considering paving of East Columbia and other streets.

Strongsville, O.—Bids will be received Feb. 14 for \$1,000 highway improvement bonds.—R. Gibbons, Clerk Board Township Trustees.

Wapakoneta, O.—Council has decided to pave entire length of Mechanic st. this year, about a mile; brick or asphalt will be used; cost about \$40,000.

Wooster, O.—Cost of paving Quimby ave. has been estimated at from \$25,000 to \$30,000.

Hood River, Ore.—City will expend about \$10,000 for macadam paving, curb and sidewalks.—H. B. Langville, City Recorder.

Allentown, Pa.—Borough Engineer A. F. Damon has recommended paving of hills on Baltimore ave. with Belgian blocks and other sections with vit. brick; cost about \$40,000.

Johnstown, Pa.—Retiring Mayor Alex. Wilson has recommended transforming of strip of land along Stony Creek River into boulevard.

Ward, S. C.—Council has passed ordinance for improvement of streets.—C. L. Jones, Mayor.

Chattanooga, Tenn.—Board of Public Works has decided to pave Terrace st., 6th to 9th st., with vit. brick, 4th st. with asphalt and 10th st. with brick.—Robert Hooke, City Engineer.

Chattanooga, Tenn.—Hamilton County Court has appropriated \$500,000 for roads and public highways, \$100,000 for Rossville blvd. and \$65,000 for Wauhatchie pike.

Cookeville, Tenn.—Putnam County will vote Feb. 25 on \$100,000 additional bonds for road improvements.

Dyersburg, Tenn.—City will spend \$10,000 in macadamizing streets during spring and summer of this year; services of a competent engineer who has had experience in road building are desired.—M. W. Ewell, Mayor.

Johnson City, Tenn.—Washington County is considering election on \$500,000 bonds for road purposes.

Aransas Pass, Tex.—Citizens have voted \$20,000 bonds for street improvements.

Beeville, Tex.—City is considering paving Washington st., distance five blocks, with vit. brick.

Ennis, Tex.—Council has agreed to build brick street crossings, to connect all cement sidewalks laid by property owners.

Greenville, Tex.—Council will advertise for bids on work of paving about ten miles of streets.

Lockhart, Tex.—Council has appointed road overseers for the four wards, with instructions to commence work at once in improving streets and alleys; gravel is plentiful in town.

Mexia, Tex.—City will soon begin additional street improvements; \$20,000 bond issue is available.

Orange, Tex.—City will grade and shell Border, Division, 7th and other streets; has purchased shell bank on Sabine River.

Salt Lake City, Utah.—Bill to appropriate \$10,000 to improve State road between Colton and the east line of Wasatch County and to rebuild other roads in the former Utah Indian reservation has been introduced in lower house of the State Legislature.

Amherst, Va.—Amherst County has voted \$135,000 bonds for road improvements.

Lynchburg, Va.—Wood County will vote Feb. 21 on \$175,000 bond issue for paving 10 miles of road leading to Parkersburg.

Newport News, Va.—Chamber of Commerce has proposed construction of boulevard from O'd Point Comfort and the Peninsula section to Richmond.

Norfolk, Va.—Finance and Public Improvement Committee have jointly recommended appropriations for paving Church st., 10th, 11th, 13th, 14th and 15th sts.

Norfolk, Va.—Estimates will be prepared for improvement of Lovitt and Brown aves.

Norfolk, Va.—Board of Control has furnished to Berkeley Ward Improvement Committee following estimates of cost of paving Eighth Ward streets: Paving and guttering Middleton and Walnut sts., \$1,558.20; paving 11th st., \$3,698.40, and building drains on Fauquier st., \$3,422.50.—W. T. Brooke, City Engineer.

Moundsville, W. Va.—Marshall County will expend about \$5,000 in improving Glendale road.

Milwaukee, Wis.—Work of widening main arteries to city will begin at early date. Alderman Hassmann is interested.

Vancouver, B. C., Can.—Ratepayers have authorized issue of \$125,000 street improvement debentures.

CONTRACTS AWARDED

Birmingham, Ala.—Paving South 18th st., to Andrews Asphalt Co., \$28,024 and \$21,618.

Birmingham, Ala.—Laying granitoid pavement on Aves. B and D, to McCartin Construction and Contracting Co., \$25,456.

Chico, Cal.—By Trustees, to the Chico Construction Co. for street improvements totaling \$32,000.

Winnetka, Ill.—Bids received Jan. 3 for brick pavement: (A) Indiana Paving Brick & Block Co., Indianapolis, Ind.; (B) Western Improvement Co., Racine, Wis.; (C) James Cape & Sons, Racine, Wis..

Corona, Cal.—To Enos Bruckman & Kroonen for paving Rimpan st., \$20,283.

Los Angeles, Cal.—By County Board of Supervisors, for improving Road District No. 1, near Bairdston, to H. V. Gentry, grading and graveling \$12,516, cement curb 25c. per lin. ft., cement gutter 13½c. per sq. ft.; other bidders: A. W. Bessemer, grading and graveling \$24,991, cement curb 30c. per lin. ft., cement gutter 19c. per sq. ft., cement sidewalk 11c. per sq. ft.; amount of work to be done is as follows: Grading and excavation, 43,230 cu. yds.; cement curb, 8,896 lin. ft.; cement walks, 45,435 sq. ft.; cement gutters, 22,290 sq. ft.; cross gutters, 1,900 sq. ft.; oil road, 18,052 sq. yds.; cost estimated at \$22,000.—Horace E. Ferris, Clerk.

Palatka, Fla.—Paving certain streets with vit. brick to Southern Paving Construction Co., 5,671 sq. yds., on edge at \$1.34; total \$7,599.14; also bid flat at \$1.23, total \$6,995.33; 3,837 lin. ft. granite curbing, 37c., total \$1,419.69; work to be completed by April 16; other bidder: Graves Mathews Paving Co., on same, on edge \$1.53, total \$8,676.60; flat \$1.35, total \$7,655.85; curbing 43c. per lin. ft., total of \$1,649.91; work to be completed by March 25.

St. Petersburg, Fla.—To Georgia Engineering Co., Augusta, Ga., for grading, paving and curbing streets; work includes removal of 15,000 cu. yds. of earth, 23c., 40,000 sq. yds. of paving, brick laid flat, \$1.40; 5,000 sq. yds. paving, brick laid on edge, \$1.60, and 13,000 lin. ft. granite curbing, 44½c.; to Eureka Stone and Paving Co., city, for cement sidewalk between 2d and 3d sts.—W. F. Divine, City Clerk.

Macon, Ga.—Paving about 10 streets, to W. W. Lasley Co.

Detroit, Mich.—Furnishing County Road Commissioners with cement for year, to Etna Portland Cement Co., \$57,583.

Independence, Mo.—By Jackson County Commissioners, to W. R. Latimer, city, to grade road extending north from Fairmount Church, \$3,034.

Port Chester, N. Y.—To Michael Di Leo for paving lower Purdy ave., \$12,666.25.

Cincinnati, O.—Improving Dick road, to W. S. Nugent, Harrison, \$3,816.

Columbus, O.—Grading and macadamizing one mile of road in Goshen Township, to Harvey B. Stephens, Mechanicsburg, \$7,363.

St. Clairsville, O.—Constructing mile of pike near Woodfield, to W. H. Moore, of Moore & Strahl, \$9,300.

Harrisburg, Pa.—Grading Front st., to Jos. L. Shearer, Jr., \$14,130.52; only other bidder, United Ice and Coal Co., \$14,800.

Wichita Falls, Tex.—Laying 36,000 sq. yds. of wood block, to Creosoting Wood Block Paving Co., Gulfport, Miss., \$2.55 per sq. yd., including 5-in. concrete base and sand filler.

BIDS RECEIVED

Los Angeles, Cal.—By Board of Public Works, for improving Marmion Way: H. H. Curtis, \$1 per lin. ft. grading and graveling, 33c. per lin. ft. cement curb, 14c. per sq. ft. cement gutter, 28c. per sq. ft. vit. block gutter, 3300 storm drains and appurtenances; George R. Curtis, 90c., 30c., 14c., 30c., \$350; Withers & Crites, \$1.15, 33c., 13c., 30c., \$300, storm drain complete at Mt. Washington Drive; \$263, storm drain at Ave. 45th; David Joy, \$1.20, 33c., 14c., 30c., \$302 at Mt. Washington Drive, \$180 storm drain at Ave. 45th; H. O. Richwine, \$1.45, 30c., 14c., 30c., \$350; W. B. McCray, \$1.35, 35c., 15c. per sq. ft. cobble gutter, 15c., 35c., \$2.75 per lin. ft. for culverts and wings complete.

Boston, Mass.—Completing 25,000 sq. yds. binder and surface, furnished and laid; 2,500 sq. yds. surface repaired by heater; 100 cu. yds. extra binder furnished and laid; 500 sq. yds. concrete base, furnished and laid; Warren Bros., 59 Temple pl., \$1.31, 90c., \$9, \$1, total \$37,150; Barber Asphalt Paving Co., Cambridge, \$1,395, 80c., \$10, \$1.29, total, \$39,520; Jones & Meehan, 10 Tremont st., \$1.44, \$1.25, \$7.50, 75c., total \$40,250.

	A	B	C
16,326 sq. yds. brick paving, 5" concrete base, 2" sand cushion, asphalt filler.....	\$1.90	\$2.00	\$2.00
14,970 ft. concrete curb and gutter on cinders.....	.60	.60	.60
10,700 cu. yds. excavation.....	.35	.25	.30
21 catch basins, duplex covers.....	30.00	30.00	30.00
3 inlets, duplex covers.....	10.00	6.00	10.00
404 ft. of 8" sewer, 5 ft. deep.....	.50	.25	.50
313 lin. ft. of 3"x12" pine plank end curb.....	.25	.10	.20
40 old manholes, adjusted.....	2.50	.50	3.00
10 old catch basins adjusted.....	2.50	.50	5.00
10 old inlets adjusted.....	2.50	.50	5.00
Total.....	\$41,302	\$45,119	\$45,980

SEWERAGE

Cullman, Ala.—Installation of sewer system is being considered. Address Mayor Robertson.

Pasadena, Cal.—City Engineer Van num is preparing plans for sewer system take care of land along east bank of Coyote Sece, south of Colorado st.

Pomona, Cal.—Committee, Ira Lee, Chairman, has been selected to work out some comprehensive scheme to take care of storm waters north of Orange Grove ave.

Saratoga, Cal.—Sanitary district has been formed to build sewer in the near future.

Boulder, Col.—Council has passed ordinance for construction of sewer in South University addition.

Colorado Springs, Col.—City Attorney Johnson will draw up ordinance authorizing the construction of storm sewer in business section; cost about \$18,000.

Pocatello, Ida.—Hering & Fuller, 170 Broadway, New York City, Engineers, have prepared plans for installation of sewerage system; cost about \$165,000.—W. A. Same, City Engineer.

Freeport, Ill.—Board of Local Improvements is considering construction of sewer in Harlem ave.

La Grange, Ill.—Village Engineer W. B. Wing has prepared plans for construction of outlet sewer.

Princeton, Ill.—Council has passed an ordinance providing for construction of about 2 miles of sewer in the south, southwest and southeastern parts of city; estimated cost \$24,400.

Rockford, Ill.—Council has authorized construction of combined storm and sanitary sewer in territory north of Harrison ave.; cost \$142,000.

Venice, Ill.—City will receive bids about March on 18,580 ft. vit. pipe, 15 to 16-in., so reconerating 4,800 ft. 8-in. inlet pipe, manholes, 180 catch basins, 1 special manhole with valve, etc.; cost about \$118,300.

Goshen, Ind.—Mayor Spohn has recommended that expert be secured to ascertain the possibility of laying main sewer tunnel along bed of Rock Run ditch.

Fort Leavenworth, Kan.—War Department will ask new bids for building sewer tlet from fort into Missouri River.

Easton, Md.—Citizens will vote Feb. 23 sewer system with disposal plants; plans e being prepared by Clyde Potts, 39 Church st., New York.

Minneapolis, Minn.—Legislature will be asked to allow \$500,000 bond issue for trunk e sewers.

Roundup, Mont.—C. T. Sacket, Livingston, has prepared preliminary plans for nstruction of sewer system.

Omaha, Neb.—Council is considering resolution authorizing plans for storm sewer on Hanscom Park district to Jane st.; cost \$57,000.

Deming, N. M.—Citizens have voted \$35,000 bonds to install sewer system.

Binghamton, N. Y.—City Engineer Giles has estimated cost of constructing trunk er through Park Creek at \$75,000.

Dolgeville, N. Y.—Plans are being prepared by Charles E. Collins, Consulting Engineer, Drexel Bldg., Philadelphia, Pa., for tention of sewerage system; bids for ork will be asked about March 1.

East Aurora, N. Y.—Fred. K. Wing, Buffalo, has completed plans for a system of wers and disposal plant; cost about \$100,000.

North Pelham, N. Y.—Because Village of Pelham Manor failed to pass proposition allowing the villages of North Pelham and Pelham to go through village of Pelham Manor with their sewer system the special ections held by villages of North Pelham and Pelham are void, as far as the issuing e bonds are concerned, and both villages ill have to hold another special election n Jan. 31; property owners in North Pelham will vote upon three propositions; first asks if North Pelham shall enter into a ntract with village of Pelham to build tlet sewer through that village to Pelham Manor; second asks if the villages of North elham and Pelham shall enter into conact with Pelham Manor to build an outlet wwer, while the third asks if North Pelham shall expend \$15,000 for construction e outlet sewer through Pelham.

Port Chester, N. Y.—Board of Trustees as engaged Engineer F. D. Odell to draw ans for a \$100,000 sewage disposal plant.

Yorkville, N. Y.—Bids will be received eb. 6, 4 p. m., for \$22,000 sewer bonds.—m. E. Cooper, Village President.

Barberton, O.—City Engineer Alcorn has epared plans and estimates for sewer ystem to include every street in West arberton; length about 10 miles; cost 5,000.

Ft. Recovery, O.—Specifications and proe have been adopted for the proposed wwer system.

Genoa, O.—Council has decided to con-

struct sewers in subdivision A, District I.—Philip E. Manner, Mayor.

Pleasant Ridge, O.—Village Council has instructed the Riggs-Sherman Construction Co., Toledo, O., to prepare plans and estimates for general sewage system and disposal plant for the village; cost about \$150,000; work will begin about May 1.

Falls City, Ore.—Installation of sewer system at cost of \$2,000 is being considered.

Ontario, Ore.—Council has decided to install drainage system.

Rock Hill, S. C.—T. W. Cothran, Greenwood, with a force of engineers, including N. G. Walker, city, will at once begin survey of city for sewerage.

Dallas, Tex.—City has asked bids for laying storm sewer on Haskell st., San Jacinto to Live Oak st., estimated cost of \$3,558.48, and on Haskell st., Victor to Gaston st., at a cost of \$1,754.98.—William Doran, Street Commissioner.

Skyland, Va.—Frank E. Stover, Luray, is arranging to construct sewer system.

Moundsville, W. Va.—Citizens have voted \$170,000 of bonds for construction of sanitary sewer system; also surface drainage; work will include about 21 miles of sanitary sewers, varying in size from 6-in. to 36-in. diameter; bids will be received for construction about March 1.—Charles E. Collins, Philadelphia, Pa., Engineer; J. M. Williamson, Mayor.

CONTRACTS AWARDED

Birmingham, Ala.—Building four sections of north side storm sewer, to J. W. Gurley & Co., Mobile, \$96,067.80, \$78,613.70, \$11,231.20 and \$13,401.50; two sections to McCartin Contracting Co., \$39,325 and \$14,561.50.

St. Petersburg, Fla.—To E. B. Cooper, city, to construct sewer system No. 15; 660 ft. of 10-in. pipe, 3,100 ft. of 6-in. pipe and 1,200 ft. of 8-in. pipe will be needed.

Albert Lea, Minn.—To Pastore & Lawrence, Duluth, for constructing lateral sewer No. 14, \$1,600.

Lynchburg, Va.—By Council Committee on Streets and Sewers, to Dinguid Bros. for sewer pipe, and for concrete, to Williams & Barnett; contracts are for ensuing year.

North Vancouver, B. C., Can.—To MacDonald, Czouski & Co. for initial sewer installation, \$206,000.

BIDS RECEIVED

St. Louis, Mo.—Constructing the Dale ave. sewer, lowest bidder John B. Turner, 629 Chestnut st., as follows: 200 cu. yds. excavation, solid rock, \$3.50; 15,450 cu. yds. excavation all other material, 50c.; 692 cu. yds. brick masonry, \$8; 54 cu. yds. vit. brick masonry, \$10; 10,770 lin. ft. 12-in. pipe sewers, 27c.; 934 lin. ft. 15-in., 41c.; \$35 lin. ft. 18-in., 57c.; 605 lin. ft. 21-in., 86c.; 544 lin. ft. 24-in., 96c.; 410 6-in. junctions on 12-in. pipe sewers, 80c.; 6-in. slants in brick sewers, 30c.; 583 sq. ft. inlet stones, 50c.; 37,600 lbs. c.-i., 23c.; 6,600 lbs. wrought iron, 4c.; total, \$21,401; totals of other bids: Althaus Construction Co., \$22,039; Wm. F. Riley Construction Co., \$22,833; G. A. Heman, \$23,729; Harry P. Heman, \$27,082; John F. McMahon, \$27,873; Robert Wycoff, \$28,713.

Elizabeth, N. J.—Construction of sewer in Trenton ave., Franz Josef to Laurel ave., Charles Wade, \$2,477.65; Louis Jacques, \$1,729.39; T. Pester Callahan, \$1,827.47; O'Neil & Viscount, \$2,077.65; Joseph Viscount, \$2,690.75, and Alexander C. Martin, \$1,835.75.

WATER SUPPLY

Talladega, Ala.—Council has appropriated \$10,000 for extension of water and gas mains.

Blytheville, Ark.—Council has granted water works franchise to J. E. Thompson, Nashville, Tenn.

Clarksville, Ark.—Installation of municipal water system is being considered.

Anaheim, Cal.—Citizens will vote Jan. 30 on \$8,500 bonds for water works improvements.

Lordsburg, Cal.—City has sold \$26,000 water works bonds to First National Bank of Lordsburg and La Verne.

Sacramento, Cal.—Board of City Trustees has decided to install steam pump in city pumping plant. G. N. Randle, City Engineer.

Meriden, Conn.—Mayor Thos. L. Reilly has recommended that Legislature be petitioned for permission to issue bonds sufficient to proceed this year with development of Bread Brook as an additional water supply.

Norwich, Conn.—Council has appropriated \$30,000 for pumping station.

Washington, D. C.—Board of Trade will urge installation of high pressure water service in business section.

College Park, Ga.—City has sold \$50,000 bonds for water works and sewers.

Dalton, Ga.—City has selected H. S. Jaudon Engineering Co., Savannah, Ga., to prepare plans for water works; capacity 2,000,000 gals.; construct concrete reservoir; cost \$30,000; bids will be opened about Feb. 16.

Chicago Heights, Ill.—All bids for extending water mains in Chicago road have been rejected.

Auburn, Ia.—City is considering \$10,000 bond issue for construction of water works system.

Lost Nation, Ia.—Installation of water works is being considered.

Lincoln, Me.—Town is considering construction of water works system.

Topsham, Me.—Topsham Water District has decided to extend water system to Topsham Heights; mains will be laid in Winter, Bridge, River, Front, Prospect and three unnamed streets; cost \$15,000. William H. Lincoln is interested.

Rockton, Mass.—City will take immediate steps toward construction of new storage reservoir during year.

West Springfield, Mass.—Need of auto pump is being urged; many hydrants do not show 49-lbs. pressure.

Grand Rapids, Mich.—Council has decided to enlarge water mains in Carrier and Lafayette sts.

Holland, Mich.—Board of Public Works has decided to build pumping station; cost about \$12,000.

Arlington, Minn.—Citizens have petitioned Council to look into the question of constructing municipal water works.

Eveleth, Minn.—Cost of installing 16-in. pipe line from St. Mary Lake to Iron Range track has been estimated by City Engineer at \$14,731.48.

Chaffee, Mo.—M. S. Murray, Likeston, has been selected as engineer for extension of water works, including 27,000 ft. of 6-in. c.-i. pipe.—J. M. Massengill, Mayor.

Hopkins, Mo.—City is considering construction of high duty pumping plant and water distribution system.

Webb City, Mo.—Plans have just been completed for 1,500,000-gal. reinforced concrete reservoir for Webb City and Carterville Water Works Co., Webb City; bids will be received about Feb. 14; plans at water company's office.—A. J. McKenzie, City Engineer.

Chadron, Neb.—City will extend water mains at cost of \$38,000; H. D. Mead, city, will supervise work.

Bayonne, N. J.—Board of Water Commissioners has passed resolution for construction of 7,200 ft. of 24-in. main across river at cost of \$65,000; plans by City Engineer Mason.

Spring Lake, N. J.—Council is considering construction of water plant; cost \$7,000.—J. W. Sweigard, Engineer Water Plant.

Endicott, N. Y.—Endicott Water Co. is contemplating erecting large reservoir on Cornell Hill; capacity 1,500,000 gals.

Whitehall, N. Y.—Village is considering election Feb. 6 on \$80,000 bonds to rebuild water works.

Wooster, O.—Council has decided to purchase and install one 100-h.p. boiler, one 500 cu. ft. free air-capacity air compressor, pipe lines, building, and incidental appliances necessary for operation of the municipal pumping station at Bloomington reservoir.—H. H. Franks, Clerk.

Custer City, Okla.—Scott Stine, President Board of Trustees, desires prices on 4-in. and 6-in. c.-i. pipe, pump for flow of 70 gals. per minute, engine boiler and 50,000-gal. tank; population 1,000.

Monmouth, Ore.—Water system will be enlarged.

Redmond, Ore.—Council is considering installation of gravity water system at cost of \$10,000.

Altoona, Pa.—Water Department is planning extensions to water system.

Honey Brook, Pa.—Honey Brook Water Co. is planning to construct large reservoir in spring.

Schuylkill Haven, Pa.—Town will vote Feb. 14 on \$5,000 loan for construction of water works.

Woonsocket, R. I.—Board of Fire Commissioners has recommended erection of standpipe, capacity 1,000,000 gals., and installation of more mains and gate valves.

Manchester, Tenn.—City is considering establishment of water works and electric light plant. W. P. Hickerson, President First National Bank, is interested.

Memphis, Tenn.—Shelby County is considering drilling artesian well to furnish water in court house; cost about \$5,000.—George B. Coleman, Chairman of Committee.

Nashville, Tenn.—Council will consider following appropriations for Water Works Department: \$8,000 to repair machinery at pumping station, \$13,500 for purchase of sulphate of alumina to clarify water at reservoir, \$8,000 to purchase and install water end for Holly engine, and \$10,098.75

for purchase of water pipe and filling and laying of same.

Aransas Pass, Tex.—Citizens have voted \$25,000 of bonds for construction of water works.

Dallas, Tex.—City Commissioners have rejected bids for purchase of carload of pig lead.

Provo, Utah.—Superintendent of Sewers John M. Holdaway has recommended laying of water mains on all streets where there are none and where sewers have been constructed.

Salt Lake City, Utah.—Mayor John S. Bransford has recommended increased water supply.

Rutland, Vt.—Citizens will vote in March on \$25,000 bonds to acquire land along watershed.—H. O. Carpenter, Mayor.

Portsmouth, Va.—Citizens have voted \$600,000 bonds to establish municipal system of water works.

Skyland, Va.—City is considering extension of water works.

Granger, Wash.—Council has instructed the City Engineer to draw plans and specifications for water system.

Redmond, Wash.—City is considering construction of a gravity water system.

Wenatchee, Wash.—Mayor C. H. Holbert has recommended the construction of water system.—F. E. Powell, City Engineer.

Manitowoc, Wis.—Citizens have decided to own water works plant.

New Libson, Wis.—Citizens have voted to install municipal water works system.

Sault Au Recollet, Que., Can.—Council is considering construction of water system and sewerage; cost \$40,000.

Vancouver, B. C., Can.—Ratepayers have authorized issue of \$400,000 water works extension debentures.

Regina, Sask., Can.—City has decided to overhaul present system of water supply.

CONTRACTS AWARDED

Los Angeles, Cal.—Furnishing all fabricated steel and rivets necessary to construct 1,409 ft. of riveted steel siphon 9 ft. 6 in. in diameter, to Camden Iron Works, Camden, \$9,400.

Newton, Kan.—Furnishing 2,500,000-gal. pumping engine, to Laidlaw-Dunn-Gordon Co., Scarritt Bldg., Kansas City, Mo.

Onaga, Kan.—Constructing water works: general contract to W. W. Cook & Son, Junction City; steel tower and tank, hydrants and valves, to Chicago Bridge and Iron Co. and Edw. J. Merkle.—Burns & McDonnell, Scarritt Bldg., Kansas City, Mo., Engineers.

Stafford, Kan.—To J. A. Bortenlanger, Omaha, Neb., for construction of a system of water works.—J. S. Worley & Co., Reliance Bldg., Kansas City, Mo., Engineers.

Lawrence, Mass.—Furnishing 10 tons of pig lead, to Eastern Metal and Refining Co., \$4.65 per cwt.; lead pipe, to Charles Miller & Son Co., Utica, N. Y., \$5.15.

Detroit, Mich.—Furnishing 547 water gate valves and 130 test boxes, to Roe-Stephens Mfg. Co., city; also 200,000 large special castings, to Great Lakes Eng. Works, city, \$60 per ton.

St. Paul, Minn.—Furnishing brass taps and stops for underground work, to Crane & Ordway, city.

Beatrice, Neb.—Construction of water and lighting system, to the Mathews Construction Co., Kansas City, Mo.; work will be started about Feb. 9.—W. K. Palmer Co., 717-720 Dwight Bldg., Kansas City, Mo., Engineers.

Angola, N. Y.—To Mahoney & Swanson, Jamestown, for construction of water works; cost \$55,000; about 900 tons of c.-i. pipe will be required.

Troy, N. Y.—To Charles Miller & Son Co., Utica, to furnish c.-i. water pipe, \$21 a ton f.o.b. Troy, for water mains in Spring and 7th aves.; total about 105 tons.

Yonkers, N. Y.—To John Fox for 245 lengths of 12-in. c.-i. pipe, each length to weigh 100 lbs.; per ton, \$20.70; other bidders: Camden Manufacturing Co., \$20.85; U. S. Cast Iron Co., \$21.25 and Miller & Son, \$26.

Portland, Ore.—Furnishing 5,792 tons of c.-i. pipe of various dimensions, to United States Cast Iron and Foundry Co., Chicago, \$178,872.

Winnipeg, Man., Can.—Laying water mains, to the Engineer of Construction, \$1,675.

BIDS RECEIVED

Chicago, Ill.—Furnishing the city with 9,700 tons of c.-i. water pipe for construction work, U. S. Cast Iron & Foundry Co., only bidder, \$23.75 per ton.

Ft. Smallwood, Md.—Constructing pump house and installing pumping machinery at Ft. Smallwood, L. B. Jacobs, Newark, Del., lowest bidder, \$1,972.

Perth Amboy, N. J.—Furnishing forced draft apparatus and engine and generator for plant at Runyon; forced draft appar-

atus, J. F. Canady Co., \$116; American Power Co., \$87; B. F. Sturtevant Co., \$150; the Engineer Co., \$1,150; the Green Inlet Economizer Co., \$605; engine and generator, General Electric Co., \$1,312; Westinghouse Electric and Manufacturing Co., \$1,179; Allis-Chalmers Co., \$1,325.

LIGHTING AND POWER

Alameda, Cal.—City will consider construction of a reinforced concrete electric power plant building, to cost about \$50,000.

Greenville, Cal.—Indian Valley Light and Power Co. is considering extension of system to Taylorsville, Crescent and Seneca.—C. G. Zschockell, city, Engineer.

Orland, Cal.—C. R. Wickes, Wilows, has purchased light and power franchise.

Putnam, Conn.—Putnam Light and Power Co. will spend large amount in improvement additions.—A. Duprez, city, Chief Engineer.

Washington, D. C.—Nearly \$12,000 is planned by Commissioners to be spent for lighting up several miles of prominent thoroughfares except as 16th st. is now lighted.

La Salle, Ill.—City Engineer Edward Byrne is preparing plans for electric light system for city; cost \$10,000.

Streator, Ill.—City is considering installation of electric light system.—F. W. Herbert, City Engineer.

Fort Wayne, Ind.—Chairman Frank T. Benoy and Member Henry Hilgemann, of Board of Works, together with Mayor Jesse Gice and Lighting Superintendent Frank Dix will visit Chicago with view to gathering new ideas as to underground wiring, ornamental lighting, etc.

Gaston, Ind.—R. A. Brown is arranging to install electric light plant.

Ossian, Ind.—Fort Wayne and Wabash Valley Traction Co. has made a proposition to citizens which, if accepted, will enable them to light their streets and also secure electric current for house lighting and power.

Boston, Mass.—All bids recently received by Superintendent of Streets Rourke for lighting the streets of Boston have been rejected and re-advertising under modified specifications will follow; contract with Rising Sun Co., which expires Jan. 31, will be extended for three months.

Huntington, Mass.—Eugene E. Davis, Northampton, has acquired title to Stowell's Flats with water rights and contemplates erection of power plant.

Marquette, Mich.—City will soon let contract for the construction of a concrete dam at Silver Lake, 24 miles north of the city.—Chas. Retaille, Superintendent Electric Light Commission.

Muskegon, Mich.—F. F. Van Tuye, Detroit, Mich., has been selected by city to prepare plans and specifications for municipal electric plant.

Eveleth, Minn.—Cost of installing white way on Grant ave. has been estimated by City Engineer at \$6,688.22.

Bozeman, Mont.—Dr. Carl Schweter has accepted franchise and will at once erect gas plant; plant will also be erected in Billings.—A. M. Brandenburg, City Clerk.

Chester, Mont.—L. D. Pugsley, President First State Bank, has petitioned for a franchise for electric light plant.

Albany, N. Y.—No bids for furnishing city with electric lights were received Jan. 16 by Board of Contract and Supply; new bids will be asked.

Warrenton, N. C.—Warrenton Electric Light Co. has been incorporated to construct lighting system.—W. L. Rogers and J. W. White, Incorporators.

Barberton, O.—Citizens are urging erection of municipal power plant in connection with water plant.

Cincinnati, O.—Service Director Sundmaker has submitted his new electric light specifications to Mayor Schwab, which, unless changes are made later at instance of civic organizations, will be basis for new 10-year light contract.

Defiance, O.—Defiance Gas and Electric Co. has asked Council for franchise to install \$30,000 heating plant.

Eugene, Ore.—Citizens will vote in April on establishment of street lighting system.

Upper Sandusky, O.—Plant of the Citizens' Light and Power Co. has been sold to American Gas and Electric Co., Providence, R. I., for \$19,900.

Klamath Falls, Ore.—Siskiyou Electric Co. will offer to sell city power for lights and other purposes, and allow city to use it as its own municipal lights and power to furnish to people; there is sentiment in favor of municipal ownership.—E. T. Sanderson, Mayor.

Ebensburg, Pa.—Ebensburg Light, Heat and Power Co. will improve plant, including installation of two dynamos.

Etna, Pa.—Borough Council is considering construction of electric light plant.

Hastings, Pa.—Establishment of municipal lighting plant is being considered.

Philadelphia, Pa.—Council is considering erection of 268 additional arc lights on 5th and Market sts.

Pottstown, Pa.—Philadelphia Suburban Gas and Electric Co. will erect power house; substation will be built at Sanatog.

Ward, S. C.—Council has passed ordinance for better lights.—C. L. Jones, Mayor.

Murfreesboro, Tenn.—John Davis and Tom Elam, owners of Murfreesboro light and gas plant, will install new plant in near future.

Nashville, Tenn.—Light department has asked Council for following appropriations \$15,000 to purchase material and complete underground wire system and \$14,280 for arc lamp equipment, wire, cross arms, insulators, etc.

Newport News, Va.—Establishment of municipal electric light plant is being considered; data has been secured by Alderman H. F. Grimes and Councilman E. C. Cox.

Clarkston, Wash.—Council has granted 50-year franchise to the Pacific Light and Power Co., Portland, permitting company to install and maintain gas mains; company will provide service by extending main from Lewiston.

Spokane, Wash.—Spokane Falls Gas Co. will expend large amount in improvements on its plant at Erie and Bradley sts.—A. Cantril, Manager.

Vancouver, Wash.—Cascades Light and Power Co. has been incorporated to develop water power on the north fork of Lewis River, to furnish electric power.—W. W. Arnold and W. P. Conaway, city Incorporators.

Wheeling, W. Va.—Wheeling Electric Co. has secured permission to erect pumping plant on 42d st.; electricity will be furnished.

Rio, Wis.—Lighting plant will be built by Columbia Electric Light and Power Co., Pardeeville; installation includes 150-h.p. boiler, one 125-h.p. Corliss engine, one 100-kw. 3-phase 60-cycle A.C. generator and necessary accessories.—Myron L. Aldrich, Pardeeville, Superintendent.

Viola, Wis.—C. R. Thompson, Richland Center, is planning establishment of municipal electric light plant; dam across Kickapoo River will be built.

Hamilton, Ont., Can.—The Dominion Power and Transmission Co. is planning for extension and improvements to its plant; cost about \$350,000; new substation will be built in city at a cost of about \$100,000.

Ottawa, Ont., Can.—Mayor Hopewell has recommended purchase in near future of a water power for light and power plant.

CONTRACTS AWARDED

Brooksville, Fla.—Furnishing machinery for municipal electric lighting plant, to Hillsborough Hardware Co., Tampa.

Belvidere, Ill.—To Public Service Operating Co. for lighting streets for 10 years.

Stafford, Kan.—Furnishing necessary equipment for electric light plant, to Joseph Bortenlanger, Omaha, Neb.

Dayton, Ky.—Bid of Union Light, Heat and Power Co., Newport, O., has been accepted by Board of Control for 20-year franchise for lighting city; contract will take effect June 1.

Beatrice, Neb.—Constructing lighting and water system, to Mathews Construction Co., Kansas City, Mo.; work will begin about Feb. 9.—W. K. Palmer Co., 717 Dwight Bldg., Kansas City, Mo., Engineers.

Calgary, Alta., Can.—To Chapman & Walter, Toronto, Ont., for supply of one 1,500-h.p. 2,300 volt, 3-phase, 60-cycle, 400 r.p.m. synchronous motor, to be directly connected to a 1,000-kw. d.c. 550-600 volt generator; also one 200-kw. motor generator exciter set; also complete switchboard apparatus—motor generator and exciter set manufactured by Dick, Kerr & Co., Ltd., switchboard by Cowans, Ltd., Manchester, England.

FIRE EQUIPMENT

Mobile, Ala.—Engine house will be erected at Springhall ave. and Ann st. during coming year.—P. J. Lyons, Mayor.

El Dorado, Ark.—Purchase of motor truck, electric engine and apparatus, 1,000 ft. of hose, 300 ft. of chemical hose, ladders, etc., is being considered.

Tempe, Ariz.—Mac Browning, representing Fire Department, has been instructed to secure latest prices on chemical engine.

Modesto, Cal.—Installation of fire alarm system is being considered and bids are being asked on auto chemical engine and hose wagon.

San Anselmo, Cal.—Plans by W. Garin Mitchell have been accepted for erection of combined fire station and town hall.

Hartford, Conn.—Fire Commissioners have asked for \$240,000 appropriation; improvement proposed includes rebuilding of

engines, improvement of one truck, base of motor car for one deputy chief motor hose wagon.

ampa, Fla.—Council will soon consider for erection of fire station No. 1.

ugusta, Ga.—Council has authorized theirman of the Fire Committee and Chief of the Fire Department to receive proposals for the purchase of a high power mobile for use of the Chief.

illidgeville, Ga.—Purchase of fire apparatus is being considered.

ividre, Ill.—Fire and Water Committees have recommended purchase of hook and ladder.

icago, Ill.—Finance Committee has recommended election in April on \$1,855,000 for erection of fire and police station.

rand, Ill.—Council will issue \$5,000 bids for fire engine.

ishen, Ind.—Mayor Spohn has recommended purchase of site for erection of fire station and city hall.

napolis, Md.—Fire Marshal Phil E. has recommended purchase of automobile.

iftondale, Mass.—Purchase of automobile is being urged.

ill River, Mass.—Fire Commissioner has recommended purchase of autos for chief and Deputy Chief and installation of alarm headquarters in separate building.

alden, Mass.—Purchase of auto for fire Turner and auto chemical for Maple-district has been recommended.

unton, Mass.—Purchase of auto combination chemical and hose wagon has been recommended.

uluth, Minn.—Fire Chief Jos. Randall recommended erection of house at side and at West Duluth, supplying of side district with hall and apparatus, erection of blacksmith and wood shop, purchase of aerial truck and fire tug and installation of 10-circuit repeater with message switchboard.

innneapolis, Minn.—Council will be asked to advertise for bids for high speed emergency hose and chemical auto; cost about \$10,000.—C. W. Ringer, Chief Fire Department.

ayton, Mo.—Purchase of 2,000 ft. of hose and erection of hose-drying tower is being considered.

ayonne, N. J.—Wm. R. Arbuckle, Superintendent Fire and Police Signal Systems, recommended that number of new sign-boxes be erected and that all city wires be placed underground.

rsey City, N. J.—Architect Robert Mor-n, New York, has submitted plans for erection of engine houses No. 6 and No. 7, about \$5,000 will be expended.

morofare, N. J.—Fire company has appointed committee to purchase extinguishers and other necessary apparatus.

msterdam, N. Y.—City desires names of manufacturers handling combination hose chemical auto trucks.—Alderman H. A. ham, 17 E. Main st., Chairman Special Committee on Auto Fire Apparatus.

unkirk, N. Y.—Erection of fire hall is being considered.

artsdale, N. Y.—Village is contemplating purchase of auto chemical engine; village has no water system, therefore does need to provide for carrying hose.

lockport, N. Y.—Council will consider purchase of 1,000 ft. of hose.

t. Vernon, N. Y.—Plans and specifications have been completed for erection of proposed 6th ave. fire house.

tica, N. Y.—Council is considering purchase of site for erection of proposed central fire station.

arren, O.—Council has decided to purchase auto fire truck.

veston, O.—City has sold \$2,000 bonds; learn fire engine and hose wagon with accessories will be purchased.

asbrouck Heights, Pa.—Citizens have petitioned Council to distribute fire alarm bells and alarm bells or whistles at various points throughout borough; also to purchase apparatus in Williams and Euclid tion.

ew Castle, Pa.—Purchase of No. 1 number, two auto combination engines and hose wagons carrying 35-gal. chemical trucks and two 14-ft. ladders, has been recommended.

outh Bethlehem, Pa.—Fire Chief Thomas high has recommended purchase of retractor as auxiliary to fire alarm system.

oodlawn, Pa.—Purchase of 1,000 ft. of hose, 50-gal. chemical tank and wagon is being considered.

oonsrocket, R. I.—Board of Fire Under-takers has recommended erection of brick station at Elm and Social sts. and in market sq. purchase of 75 ft. aerial truck, auto combination hose wagon and 1,000 ft. of hose; also minor equipment, including two turret nozzles.

ashville, Tenn.—Council will consider following appropriations for fire department: \$2,500 to purchase fire hose, \$1,000 to install additional fire alarm boxes and \$1,000 hose wagon.

Sherman, Tex.—Fifth Ward residents are urging purchase of steam fire engine.

Norfolk, Va.—Finance and Public Improvement Committees have jointly recommended erection of fire station at 11th st. and Williams ave.

Pulaski, Va.—Town is considering installation of fire alarm system in connection with town clock; cost about \$600.—A. T. Bones, Chief.

Puyallup, Wash.—Fire and Light Committee is considering petition for more equipment for fire department.

CONTRACTS AWARDED

Washington, D. C.—Erecting stone fire house at 28th and Pennsylvania ave., to Skinner & Garrett, \$22,427.

Mishawaka, Ind.—Furnishing auto fire truck, to American-La France Fire Engine Co., Elmira, N. Y., \$5,250.

BIDS RECEIVED

Long Beach, Cal.—Furnishing new motor-driven fire engine: Nott Fire Engine Co., Minneapolis, Minn., Nott 600-gal. per min. capacity, 90-h.p., \$10,000; Nott 1,000-gal. capacity, 100-h.p., \$11,000; Robinson Fire Apparatus Mfg. Co., St. Louis, Robinson 600-gal. capacity, 120-h.p., \$8,460; Robinson, 700-gal. capacity, 80-h.p., \$7,975; Webb Fire Engine Co., St. Louis, Webb, 600-gal. capacity, 90-h.p., \$8,500; Knox Automobile Co., Springfield, Mass., Knox 600-gal. capacity, 90-h.p., \$8,800.

Washington, D. C.—Construction of chemical engine house: R. J. Jennings, \$24,779; Thomas H. Melton, \$25,765; Boyle-Robertson Construction Co., \$23,923; Allen T. Howison, \$22,600; Burgess & Parsons, \$23,500; George E. Wyne, \$23,600; Hoge & Luebkert Co., \$23,932; McKay & Morris, \$24,846; Skinker & Garrett, \$22,527.

Moline, Ill.—Furnishing fire apparatus: H. W. Neuman Machine Co., Davenport, Ia., \$4,500; Webb Fire Apparatus Co., St. Louis, \$7,500 and \$8,500; Anderson Fire Supply Co., Kansas City, \$4,000 and \$4,500; Robinson Fire Apparatus Co., St. Louis, \$5,500 and \$9,000; Peter Pirsch, Kenosha, Wis., \$3,500, \$4,800 and \$9,500; Nott Fire Engine Co., Minneapolis, \$10,000; Seagrave Co., Columbus, \$4,200, \$4,700, \$4,400 and \$5,100; Knox Automobile Co., Springfield, Mass., Chief's runabout, \$3,057; this was the only bid submitted for chief's wagon; bids on hose trucks and engines, \$8,228, \$4,415, \$665, \$5,068, \$5,268; Pope-Hartford, Hartford, Conn., \$5,000; International Power Co., Providence, R. I., \$4,900; American-La France Fire Engine Co., Elmira, N. Y., \$4,750; E. D. Fisher & Co., Rock Island, \$3,500.—V. E. Brown, Chairman Fire Committee.

BRIDGES

Bridgeport, Conn.—Council is favorable to \$100,000 bond issue for erection of bridge across Pequonock River at East Washington ave.

Denver, Col.—Board of Public Works and Jefferson County Commissioners have decided to erect bridges over Dry Creek at 12th ave.

Chicago, Ill.—Finance Committee has recommended election in April on \$4,145,000 bond issue for erection of bridges.

New Orleans, La.—City will construct bridge across drainage canal near Lake Pontchartrain; City Commissioner Smith has estimated cost of repairing Hagan ave. bridge at \$4,800.—W. J. Hardee, City Engineer.

Bangor, Me.—Penobscot County is considering reconstruction of Bangor-Brewer bridge.—H. Dunn, Brewer, can be addressed.

Lawrence, Mass.—In special report to Legislature, Essex County Commissioners submitted plans for bridge over the Merrimack River; cost approximately \$363,504.

Pittsfield, Mass.—City is considering construction of a bridge across the Housatonic River at Elm st.; cost \$14,000.

Waltham, Mass.—City is considering construction of bridge to Weston across Charles River.—Bertram Brewer, City Engineer.

Kansas City, Mo.—Plans by County Surveyor J. M. Lindsey have been accepted for extension of north approach to 5th st. bridge over Kaw River; cost about \$8,000.

Rahway, N. J.—Council has passed resolution requesting the Board of Freeholders to place drawbridge across Rahway River from South Montgomery st. to Woodbridge road.

Trenton, N. J.—Bridge Committee of Board of Freeholders has decided to instruct County Engineer Epple to prepare plans for steel and concrete bridge over creek at Stockton st.; also plans for widening the bridge on River road, in Titusville.

Fulton, N. Y.—City is planning to erect bridge on Broadway.

Lockport, N. Y.—Council is considering rebuilding of 51st and Transit st. bridges.

Niagara Falls, N. Y.—Work on the 11th st. bridge over New York Central tracks will begin just as soon as \$15,000 bond issue is sold.

Niagara Falls, N. Y.—Superintendent W. E. Harries, of State Reservation, will ask \$8,000 appropriation for bridge from Goat to Luna Island.

Circleville, O.—Board of Commissioners of Pickaway County has approved plans and specifications for repairing bridge over Deer Creek in Deercreek Township.

Portland, Ore.—City Engineer Morris has estimated cost of proposed South Portland bridge at \$1,232,000.

Pittsburg, Pa.—Council has passed ordinance providing for construction of the Point bridge, cost \$850,000 and bridge across Atherton ave. over Pittsburg Junction Railroad; cost \$85,000.

Plymouth, Pa.—State Water Supply Commission has approved application of Scofield Engineering Co., representing the County Commissioners of Luzerne County, for construction of a highway bridge across north branch of the Susquehanna River near Plymouth.

Scranton, Pa.—M. Ward Easby, Philadelphia, is preparing plans for a viaduct to be constructed at Mulberry st.; cost about \$250,000.

York, Pa.—Erection of concrete bridge across Furnace Creek in West Manheim Township is being considered by County Commissioners.

Chattanooga, Tenn.—Hamilton County Court has appropriated \$700,000 for bridges over Tennessee River.

Dallas, Tex.—Commissioners' Court has authorized \$23,000 bond issue for repairing 12 bridges.

Danville, Va.—Council will consider recommendation of Finance Committee for \$15,000 appropriation for construction of bridge at Union st.

Spokane, Wash.—Board of Public Works will ask bids for erection of \$40,000 bridge over Hangman Creek in Stafford's addition.

CONTRACTS AWARDED

Suisun, Cal.—Building bridge over Suisun Creek, to C. N. Gildersleeve, Napa, \$5,450.—C. G. Halliday, County Clerk.

Bridgeport, Conn.—To J. H. Doherty & Bros., by Public Works Director Kenney, for filling in approaches to the new Boston ave. bridge, 43c. per cu. yd. for dirt and \$2.65 per cu. yd. for removal of stone.

Marshalltown, Ia.—Building four bridges, to N. M. Stark Co., Des Moines, and to Wheeler Lumber Co., Des Moines, \$1,500 and \$6,268, respectively.

Kearney, Neb.—Furnishing lumber to Buffalo County during year and for bridge work, to W. T. Gibson, Lamp City.

Durham, N. C.—Erecting reinforced concrete bridge, 70 ft. span, across Eno River, to Carter Construction Co., Burlington, \$10,500.

Lockland, O.—Building concrete bridge on Cooper ave., to G. W. Knight, 3037 Woodbury ave., Cincinnati, \$13,971.

BIDS RECEIVED

New York, N. Y.—Constructing elevators, stairs, drainage, ornamental and electrical work for the anchor piers of Queensboro Bridge over the East River, between Manhattan and Queens Boroughs: Z. Wicks'er, 1135 Broadway, \$70,000; Charles Wille, \$69,724; Snare & Triest Co., 143 Liberty St., \$67,890; Charles Meads Co., 299 Broadway, \$57,300.

MISCELLANEOUS

Berkeley, Cal.—Plans are being considered by Council for erection of municipal incinerator on the site of one which private company has had under construction for past year; P. B. Dundon, Coast agent for the Standard Incinerator, has obtained preliminary data for submission of plans for modern incinerator.

Greeley, Cal.—Plans have been prepared and construction work will soon be begun on erection of jail; the building will be three stories high, of brick and concrete construction; cost about \$40,000.

San Anselmo, Cal.—Plans by W. Garin Mitchell have been accepted for erection of combined town hall and fire station.

Bridgeport, Conn.—Architect Jos. W. Northrop has completed sketches for small addition to city hall.

Jacksonville, Fla.—Board of Health is planning establishment of emergency hospital.

Charleston, Ill.—Coles County is considering election on \$40,000 bonds to erect almshouse.

Chicago, Ill.—Finance Committee has recommended election in April on \$1,855,000 bonds for erection of police and fire station.

Edwardsville, Ill.—Board of Supervisors has approved plans for improving county court house at cost of \$225,000.

Gaston, Ind.—Town Board is preparing to erect town hall and jail.

Goshen, Ind.—Mayor Spohn has recommended purchase of site for erection of city hall and central fire station.

Indianapolis, Ind.—Mayor Shank is urging \$50,000 bond issue for erection of four police substations.

Indianapolis, Ind.—Architect W. H. Gains has submitted to A. W. Butler, Secretary Board of State Charities, plans for county infirmary for Fayette County.

Lexington, Ky.—Park Committee of General Council has recommended appropriation of \$11,000 for Lexington parks and playgrounds.

Lynn, Mass.—Harbor Master P. C. Saunders has submitted plans for new boat, which he asks Council to purchase for his department; cost \$1,200.

New Bedford, Mass.—Park Board has asked for \$5,000 to build pond at Brooklawn Park and \$8,000 to build two shelter houses at Buttonwood and Brooklawn Parks.

Minneapolis, Minn.—Police Committee has been instructed to secure bids for auto ambulance.

Minneapolis, Minn.—Legislature will be asked to allow \$400,000 bond issue for hospital improvements.

Chaffee, Mo.—Lindsay Architectural Co., Sikeston, has prepared plans for erection of \$6,000 city hall.

Kansas City, Mo.—Plans by Fred C. Gunn, 700 Postal Bank Bldg., Kansas City, have been accepted for erection of two-story hospital.

Clifton, N. J.—Acquackanonck Township Committee has authorized Police and Fire Committee to purchase auto for Chief of Police Wm. Coughlan.

Perth Amboy, N. J.—Police Chief P. J. Burke has recommended purchase of fully equipped patrol wagon.

Bronxville, N. Y.—Citizens will soon vote on \$66,000 expenditure for purchase of land on Midland ave. for park purposes.

Buffalo, N. Y.—Board of Aldermen has issued \$200,000 bonds to build hospital for incipient tuberculosis.

Gouverneur, N. Y.—Citizens are considering \$35,000 appropriation for erection of town hall.

Lockport, N. Y.—Council has directed City Clerk Spalding to ask authorities at Washington to appropriate necessary sum for rebuilding piers at Olcott Beach and also for dredging of channel at that place.

New York, N. Y.—Calvin Tomkins, Commissioner of Docks, and Charles B. Stover, Commissioner of Parks, have submitted report to Mayor Gaynor regarding plan and cost of reclaiming land along Hudson River from 81st to 129th st.; plan includes covering tracks of New York Central Railroad with sheds, and constructing rip-rap wall along the water front, about 133 ft. wide at bottom, 76 ft. at top, and set in 10 to 30 ft. of water; also to fill in reclaimed space with about 1,251,515 cu. yds. earth and other material; cost, including rip-rap wall, filling, dredging for foundation, about \$1,007,461.

St. George, S. I., N. Y.—Police Department, New York City, is planning to establish four substations.—J. D. Herlihy, Police Inspector Borough of Richmond.

Akron, O.—Comfort station, cost \$5,000, will be erected at once.—J. W. Gauthier, Director of Public Service.

Cincinnati, O.—Council has appropriated \$6,000 to beautify park at Young and Ringgold sts.

Cincinnati, O.—Park Commissioners L. A. Ault, William Gilbert and George Puchta have decided to adopt the Kessler plan in its entirety for the development of the Cincinnati park system; preliminary work will be commenced at once; this will consist of planning for more playgrounds in congested districts and improvement of those already established.

Toledo, O.—Council has passed ordinance for erection of market house with concrete fronts at Erie and Short sts.; \$110,000 bonds will be issued.

Ontario, Ore.—Council has decided to erect city hall.

Altoona, Pa.—Board of Health has recommended installation of modern garbage crematory.

Washington, Pa.—Committee, Councilman Mevay Chairman, will consider erection of garbage crematory.

Chattanooga, Tenn.—Hamilton County Court has appropriated \$125,000 for erection of court house.

Nashville, Tenn.—Sprinkling department has asked \$1,100 appropriation to purchase additional sprinkling wagons.

Dallas, Tex.—Site at Commerce and Green sts. has been selected for erection of proposed city hall.

Fort Worth, Tex.—Citizens have voted \$120,000 bonds for purchase of sites and erection of police stations; \$20,000 for erection of hospital for poor, and \$15,000 for city warehouse.

Luling, Tex.—Council has passed order granting Civic Club permission to take control of city parks and beautify them as they might see fit.

Salt Lake City, Utah.—Chief of Police S. N. Barlow has recommended establishment of police patrol calling boxes throughout city.

Nottaway, Va.—Nottaway County Commissioners have asked bids for erection of jail.—E. S. Deane, County Clerk.

Milwaukee, Wis.—Erection of emergency and detention hospital is being urged.

Winnipeg, Man., Can.—City is considering construction of a garbage destructor with daily capacity of 100 tons. Alderman A. Wallace is interested.

CONTRACTS AWARDED

Oakland, Cal.—By Board of Public Works, for dredging on Key Route Basin, on the west water front, to the Standard American Dredging Co., \$297,000; contract calls for removing 2,000,000 cu. yds. of dirt and depositing it behind the bulkhead; this will fill in and reclaim 400 acres of land belonging to the city.

Rockford, Ill.—Collecting garbage for next year, to C. Magnusson, \$4,674; other bidders: A. T. Anderson, \$4,944; A. O. Ferguson, \$4,800; Charles Johnson, \$4,775.

Hammond, Ind.—By Water Board, to Great Lakes Dredge and Dock Co., 38 Washington st., Chicago, Ill., for water tunnel under river at Calumet ave., \$9,200.

Louisville, Ky.—By Board of Public Works, for installation of electric City Hall elevator, to American Machine Company, Louisville.

Portland, Me.—Interior work on new city hall, to Norcross Bros. Co., Worcester, Mass., \$210,600 for masonry, plastering, carpentry work and miscellaneous finish work; for vacuum cleaning system, \$3,850; tower, clock and bell, \$2,275, and mail chute, \$690.

Cumberland, Md.—Removal of garbage, to A. L. Elosser, \$6,500; other bidders: C. E.

Danner, \$9,450, and Sylvester Ousborn, present contractor, \$6,938.

East Youngstown, O.—Building city building, to T. J. Skipp, city, \$9,675.

Martin's Ferry, O.—To John and Charles Rindler for removal of garbage.

Pnoenixville, Pa.—Removing garbage during year, to C. Y. Wilson.

BIDS RECEIVED

Mishawaka, Ind.—Furnishing police alarm system: National Police Signal Co., Buffalo, \$140 per box; Star Electric Co., for system, \$3,200; Gamewell Fire Alarm Co., for system, \$3,000; Dean Electric Co. systems, \$1,620 and \$1,375; Signaphone Alarm Co. system, \$1,840.

Boston, Mass.—Furnishing double and single teams for work in various sections of the city; Roxbury South and Jamaica Plain, 13 bidders: John H. Winsloe Contracting Co., lowest bidder for double teams, \$4.44 a day and for single teams, \$2.99 a day; T. J. Shea Co. submitted the highest bid, \$6 a day for double teams and \$4 a day for single teams; South End and Roxbury North District, ten bidders; John W. Collins, lowest bidder, double teams \$4.75 a day and single teams \$3.10; C. Duncan & Son, submitted highest, \$5.50 a day for double and \$3.50 a day for single teams; On West Roxbury specifications, nine bidders; George H. Noone and John E. Noble for \$4.70 for double and \$3 for single teams; T. J. Shea, highest bidder, \$6 for double and \$4 for single; work in Dorchester and Ashmont, five bidders; John H. Winsloe Co. lowest, \$4.39 a day for double and \$2.90 for single teams; for the Brighton district, Joseph McGreevey and M. F. Gaddis lowest for double teams, \$5 a day each, and McGreevey lowest for single teams, \$2.90 a day; work in East Boston, six bidders; John H. Carter lowest bidder, \$4.48 a day for double and \$3 a day for single teams; John H. Winsloe Co. lowest of six bidders in South Boston district; \$4.49 for double and \$2.99 for single teams; B. E. Grant lowest of three bidders for work in Charlestown; double teams \$4.50 a day and single teams for \$3.20.

Boston, Mass.—Removal of ashes: South Dorchester district, John H. Winsloe Contracting Co., \$17,610; John D. Lyons, \$18,700; D. M. Biggs & Co., \$19,500; John J. Loomie, \$19,950. West Roxbury district, John J. Moore, \$8,100; Thomas J. Shea Co., \$8,520. Dorchester district, John J. Bradley, \$21,500; John H. Winsloe Contracting Co., \$21,879; D. M. Biggs & Co., \$24,721; John J. Loomie, \$29,000. Brighton district, J. McGreevey, \$11,280; Joseph Sprissler, \$11,800; B. E. Grant, \$12,000; John H. Carter, \$14,503; John Kelley, \$15,425.

New York, N. Y.—Resurfacing floors at City Hospital, Blackwell's Island, City of New York: Rubin Solomon & Son, \$7,895; Rapid Floor Surfacing Co., \$6,750; M. L. O'Brien, \$7,500; Charles B. Tice, \$5,973; Andrews Floor Planing and Surfacing Co., \$6,485; the Floor Surfacing Co., \$10,562.

Philadelphia, Pa.—By Acting Director Haaskarl, of Department of Wharves, Docks and Ferries, for work of erecting superstructure of the new city pier now in course of construction, between Vine and Calowhill sts.; lowest bidder, the McCintie-Marshall Construction Co., Pottstown, \$314,000; other bidders: Sax & Abbott Construction Co., \$353,710; W. S. P. Shields, \$339,000; Costello & Co., \$343,648.12; James G. Doak & Co., \$344,482; American Paving and Construction Co., \$357,000.

TOO LATE FOR CLASSIFICATION

STREET IMPROVEMENTS

Birmingham, Ala.—Executive Committee of Jefferson County Good Roads Association has decided to urge \$1,000,000 road bond issue in Jefferson County.

Los Angeles, Cal.—Residents of Huntington Park have petitioned Board of Supervisors to build macadam highway on Slauson ave. from Compton ave. to city limits of Huntington Park; distance, less than one mile.

Freeport, Ill.—Board of Local Improvements has decided that all streets south of South Galena ave. to the city limits shall be paved with brick this year; cost about \$46,000.

Rockville, Md.—State Roads Commission is expected to begin soon work of picking the road from Rockville to Norbeck.

Fremont, Neb.—Paving of H st. is being considered.

Stuebenville, O.—Petition has been filed with the County Commissioners by George W. Morrow et al asking for a State Aid road in Island Creek Top, beginning at

Center Chapel church and running to intersect Richmond and Wintersville pike.

Hugo, Okla.—Council is considering building of two miles of pavement.

Oklahoma City, Okla.—Paving Committee is considering paving of Twenty-third st.

Dallas, Tex.—City Commission has ordered preparation of specifications by City Engineer Preston for grading a number of streets of city.

Dallas, Tex.—Council has received petitions for improving Colonial ave., Carroll and Munger sts.

Luling, Tex.—Election on \$50,000 road bonds is being considered.

Sweetwater, Tex.—Citizens have voted \$100,000 bonds for good roads.

Seattle, Wash.—Council has passed resolutions for planking California ave., grading 23d ave., and 26th ave. North and South.

Walla Walla, Wash.—Several miles of good roads are being planned; quantity of straw will be used.—L. V. Loehr, County Engineer.

Marinette, Wis.—Council has decided to pave six blocks with cement this year.

Saltillo, Mex.—Engineer Abbott has com-

pleted plans for paving 100,000 square meters of Saltillo street; plans are now being studied by Committee appointed by Governor del Valle.—Francisco Arizbe Ramos, Chairman.

CONTRACTS AWARDED

Dallas, Tex.—Street paving, to Texas Bitulithic Co. and D. J. Grisby.

Galveston, Tex.—Paving Ave. P with Coffeyville brick, to Kelso & Vautrin.

Seattle, Wash.—Grading 31st st., to Sloan Bros., 1073 E. John st., \$16,561.60; paving Western ave., to Ferguson-Cort Co., Arcade Annex, \$58,996.60; alley M. block 42, D. S. Maynard's Plot, W. J. Ruthe, 418 Highland drive, \$1,733.60.

Spokane, Wash.—Grading Dist. No. 681, to N. A. Jones, \$7,317; paving in Dist. 449, to Anderson & Liljebeck, \$4,185.

SEWERAGE

Nevada, Ia.—Election on construction of sewer system is being considered.

St. Paul, Minn.—Board of Public Works is planning construction of sewerage sys-

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LOCATING SUBSURFACE STRUCTURES

Work Done by Division of Substructures of Brooklyn, N. Y.—Method of Making Field Measurements—Value of Existing Records—Method of Mapping and Filing Records—Value of the Work

About 1905, when the Board of Estimate and Apportionment of New York City was considering the matter of municipal conduits for carrying fire, police and other wires, it was proposed to appropriate \$25,000 for the purpose of surveying and mapping the substructures of those portions of the city where it might be desirable to locate the conduits. This idea met with some opposition, the chief argument against it being that, in conformity with the other powers and duties vested in the Borough Presidents, this work also should be in their charge. This left each president to follow practically his own ideas in obtaining such information.

The president of the Borough of Brooklyn determined upon the organization of a Division of Substructures, and on Sept. 14, 1906, the Board of Estimate and Apportionment approved an appropriation of \$10,000 for this purpose, which fund became available for use about October first. During the remaining three months of that year such a bureau was organized by Assistant Engineer (now Engineer) Morton L. Fouquet, who was placed in immediate charge of the work, and who has continued in charge until the present time. An appropriation of \$16,000 was made in the budget for the year 1907 for this work, and \$23,000 for the year 1908. In 1908 the regularly organized force consisted of six in the field and five in the office.

During the four years since the division began actual work the force, which was selected with particular care, has remained practically unchanged, although somewhat reduced during the past year. This is very fortunate, since the work is in many ways more difficult than ordinary surveying, and the present force has developed an aptitude for it which it would be difficult to duplicate in a new or largely new set of men. With this force and with the work confined to the older and more congested section of the borough, approximately seventy-five miles of streets have been covered and the record maps for this area practically completed. In addition a mass of information has been accumulated covering other sections of the borough for future utilization.

So far the expenses of the division have been met entirely by appropriations. Ever since 1907 the board of aldermen has been requested to authorize the borough president to establish a schedule of fees to be paid by applicants for information, and an ordinance approved by the corporation counsel has been in the hands of the aldermen since early in 1909; but so far permission to make these charges has not been granted. The rates provided for in the ordinance are 8 cents per linear foot where a survey is necessary, and 5 cents where the information can be obtained from the office records alone, where the permit is for a structure 300 ft. in length; the minimum charge being \$5 where there is no field work and

\$10 where field work is required. Where there is a continuous run of substructure of between 300 and 2,500 ft. the fee would be 5 cents a linear foot; and where more than 2500 ft. 3 cents for the first 2500 and 3 cents per foot beyond that length. These charges are believed to be very moderate and very much less than it would cost the corporations to obtain less exact information in any other way. They are based on the charges made for similar information by the corresponding department in the city of Philadelphia, which for 25 years has been accumulating information and performing services similar to those undertaken by the Brooklyn Division of Substructures.

As in the great majority of cities there were, previous to the organization of this division, no complete official records of the location of the various water and gas mains, sewers, wire conduits, steam heating pipes, pneumatic tubes and other continuous structures, nor even of the vaults and tunnels constructed by abutting property owners. Those owned by private corporations were supposed to have been placed under a license issued by the city and to have brought more or less revenue to its treasury; but the city had no record of where such structures were located, or even of what structures might have been placed in any given street. Perhaps the greatest service rendered by this division is the possibility which its records offer of locating in advance the exact position which water mains or other structure can take in a street already crowded with similar structures. The previous practice had been for the city department or private corporation which intended placing a pipe or conduit in a given street to dig test pits at intervals of about a block or two throughout the proposed route in order to learn where it would be possible to locate such structure. Prior to the laying of the new high-pressure water mains in Brooklyn over 300 test pits were dug in the most congested part of the city, where they occasioned the greatest interference with traffic and deterioration of pavements, etc. Moreover, the information thus obtained by one corporation was seldom available for another and a duplicate series of test pits might be dug in the same street a few years later. This was not only very expensive, frequently costing thousands of dollars in connection with a single line of conduit, but was very detrimental to the pavement, which had to be broken in the digging of these test pits.

Not only was it true that the city was not acquainted with the location of private structures, but a great many of those built and operated by itself were but indefinitely or incorrectly located on the official plans. In a great many cases it was found that there was no reliable information as to where was located the pipe connecting a catch basin with the sewer, and the Division of Substructures sent men into the sewers and at the same time discharged water from fire hose into a catch

basin in order to determine where the point of discharge from this might be. With the information now made available, the president of the borough is enabled to regulate intelligently the granting of revocable consents and permits and exercise the authority vested with him of regulating and controlling all street openings in which definite locations for new work about to be undertaken can be so determined as not to conflict with existing substructures; and further space can be reserved in the streets for any contemplated municipal work.

A careful study was made of methods pursued in other cities in accumulating and mapping subsurface data, and the system adopted is in part the Philadelphia system, where a bureau of this character has been in existence for some twenty odd years and the information accumulated has proved of great value to the municipality.

Concisely put, the duties of the division are as follows:

DUTIES OF DIVISION OF SUBSTRUCTURES.

Accumulating all information obtainable by surveys and investigations as to the size, location and character of structures under the streets and avenues in the borough, and recording the same on durable maps.

Assigning definite locations for new substructures.

Reducing pavement mutilations to a minimum.

Conserving, as far as possible, for future utilization, subsurface spaces which are rapidly becoming one of the city's most valuable assets, and from which substantial revenues will be derived through future franchise grants.

Furnishing to applicants seeking subsurface space for tunnels, pipe lines etc., information as to the location and size

of existing substructures. Such information is required by the Board of Estimate and Apportionment when applications are filed for franchises.

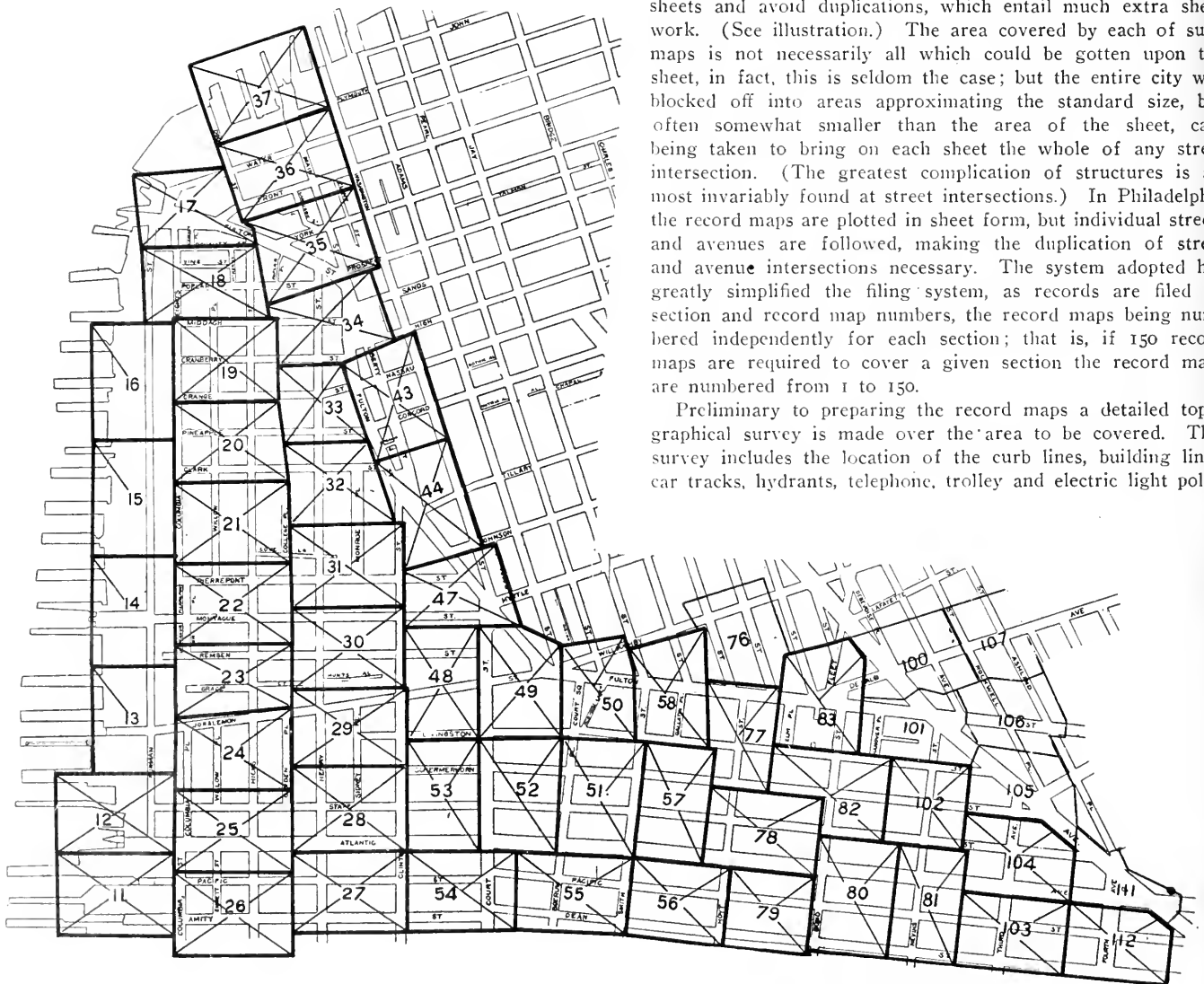
Furnishing other city departments with information to be used in connection with the location and construction of subways, sewers, water mains, etc.

The exaction of a moderate fee for information furnished to private individuals and corporations, the authority for which is to be covered by an amendment to Section 92, Code of Ordinances, now in the hands of the board of aldermen for adoption, thereby placing the division on a revenue earning basis similar to departments of like character in other cities.

METHOD OF PROCEDURE.

Record maps are in sheet form and plotted on durable cloth-mounted paper 32 in. wide by 42 in. long, to a scale of 20 ft. to the inch. To facilitate the carrying on of the work in any part of this large borough, which has an area of over 77 sq. miles, a highway system of over 1200 miles and a sewer system of approximately 900 miles, without confusion and possible repetitions, the borough was divided into twenty sections, and in treatment each section is kept separate and distinct. The sections are again subdivided into smaller sections approximately the size of the record maps. By the use of tracing cloth templates, representing the shape and size of the record maps, but drawn to a scale adaptable to the city atlas (which in this borough is 100 ft. to the inch), a record map layout is determined for any section or any part of a section in which it is desired to carry on subsurface work. By the use of this method most satisfactory results have been obtained, as it has been possible to represent a section on a minimum number of sheets and avoid duplications, which entail much extra sheet work. (See illustration.) The area covered by each of such maps is not necessarily all which could be gotten upon the sheet, in fact, this is seldom the case; but the entire city was blocked off into areas approximating the standard size, but often somewhat smaller than the area of the sheet, care being taken to bring on each sheet the whole of any street intersection. (The greatest complication of structures is almost invariably found at street intersections.) In Philadelphia the record maps are plotted in sheet form, but individual streets and avenues are followed, making the duplication of street and avenue intersections necessary. The system adopted has greatly simplified the filing system, as records are filed by section and record map numbers, the record maps being numbered independently for each section; that is, if 150 record maps are required to cover a given section the record maps are numbered from 1 to 150.

Preliminary to preparing the record maps a detailed topographical survey is made over the area to be covered. This survey includes the location of the curb lines, building lines, car tracks, hydrants, telephone, trolley and electric light poles,



MAP OF PART OF A SECTION, SHOWING RECORD MAP LAYOUT

erated columns, manhole covers, gas drips, and, in fact, any object on the surface of the streets that will in any way serve as a guide in determining the location of substructures. Upon completion of this survey the notes are plotted in the office, and part of the field or outside force is assigned to the work of surveying the manholes or junction boxes.

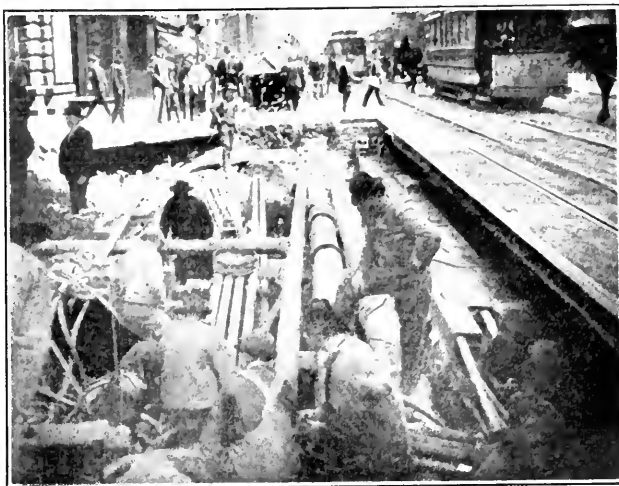
Prior to starting this subsurface work the engineer in charge of the division interviewed the heads of the various public service corporations, explaining the object and work of the division, and was uniformly successful in obtaining their co-operation, and they have responded promptly when requested to open manholes and junction boxes, by removing the heavy iron covers to facilitate the work of surveying the same. These surveys consist of taking full measurements to obtain the size, depth, number of conduits entering and leaving, and the location of the conduits with reference to the surface of the street and the nearest curb; also the location of any foreign pipe line passing through the boxes or manholes. After these surveys have been completed the information is plotted, and a representative is sent to the offices of the different public service corporations for all information obtainable relative to their conduit or pipe lines. Similar information is obtained relative to the location of the sewers, gas mains, water mains, etc. The measurement of the manholes is the most troublesome and time-consuming part of the work, from fifteen minutes to two hours being required to measure each one; but it is the most valuable, giving the exact locations of structures not otherwise obtainable.

One member of the force obtains each morning a list of street opening permits granted for that day and visits the openings within the district under investigation. It would undoubtedly be desirable to visit all the openings made in the borough, but as this frequently runs into the hundreds each day this would require a force out of all proportion to the number available for the work of the division. To partially offset this, however, it is proposed to require all corporations and others receiving permits for opening the streets and highways to deliver to the bureau, upon the completion of the work, a plan showing clearly and definitely the final location of the structure placed in said opening, with all dimensions given thereon, and also of any other structures encountered in making the excavation.

As far as possible the effort has been made to utilize all days when the weather conditions are good by having as large a force in the field as the funds available will permit; then during inclement weather the entire force is put on office work plotting and finishing maps.

In the past it was common practice, prior to the installation of substructures of any extent, to dig test pits to determine in a general way the route to be followed. This method always resulted in serious pavement mutilation, which in the future it is hoped to reduce to a minimum. But the test pits were necessary in the past and the division is ferreting out these old test pit records and through the co-operation of the department of Water Supply, Gas & Electricity alone has compiled over 3000 test pit records. Most of these pits were dug prior to the installation of the hydrants of the high pressure water system recently installed; and these, with test pit records from the other departments, have furnished many valuable data absolutely necessary in determining the location of substructures in the spaces intervening between manholes or junction boxes. In fact, not a stone is left unturned in the effort to obtain accurate information relative to substructures in the streets of the borough.

Upon accumulating such information the record maps are plotted and colored, black being used for the curb and building lines and trolley tracks, and distinctive colors for each one of conduits or pipes; water pipes being shown in blue, electric light and power conduits in red, gas pipes in green, telephone conduits in brown, etc. By using these distinctive colors the record maps are more easily read, and it is not a difficult matter to trace out a run of any particular pipe or



A GROUP OF SUBSTRUCTURES

conduit line. The maps are drawn very accurately to scale, so that all dimensions can be scaled from them. The location of each structure in a vertical plane is designated by the distance in feet and inches from its top surface to the surface of the roadway above. In most cases the dimensions also of the structure are given, thus indicating the depth of its under surface. The accompanying map, which shows a section of one of the standard sheets, gives an idea of the general appearance of the plotted data. The letter *c* following a dimension stands for the word "cover," and indicates the depth of the top surface of the structure below the street surface. Unfortunately, the colors cannot be reproduced here, but these tend to present much more clearly to the eye the relative location of the several structures.

In case more detailed information is required than is shown on the record maps it is readily obtainable through a systematic filing system. All the work of preparing these record maps is carefully checked before they are finally colored. Of course no one of these record maps is ever actually finished, as it is necessary from time to time to make corrections to accord with the installation of new substructures and changes in present substructures, which are constantly taking place; but a scheme of recording these corrections is used so that there is little difficulty in keeping the record maps correct to date.

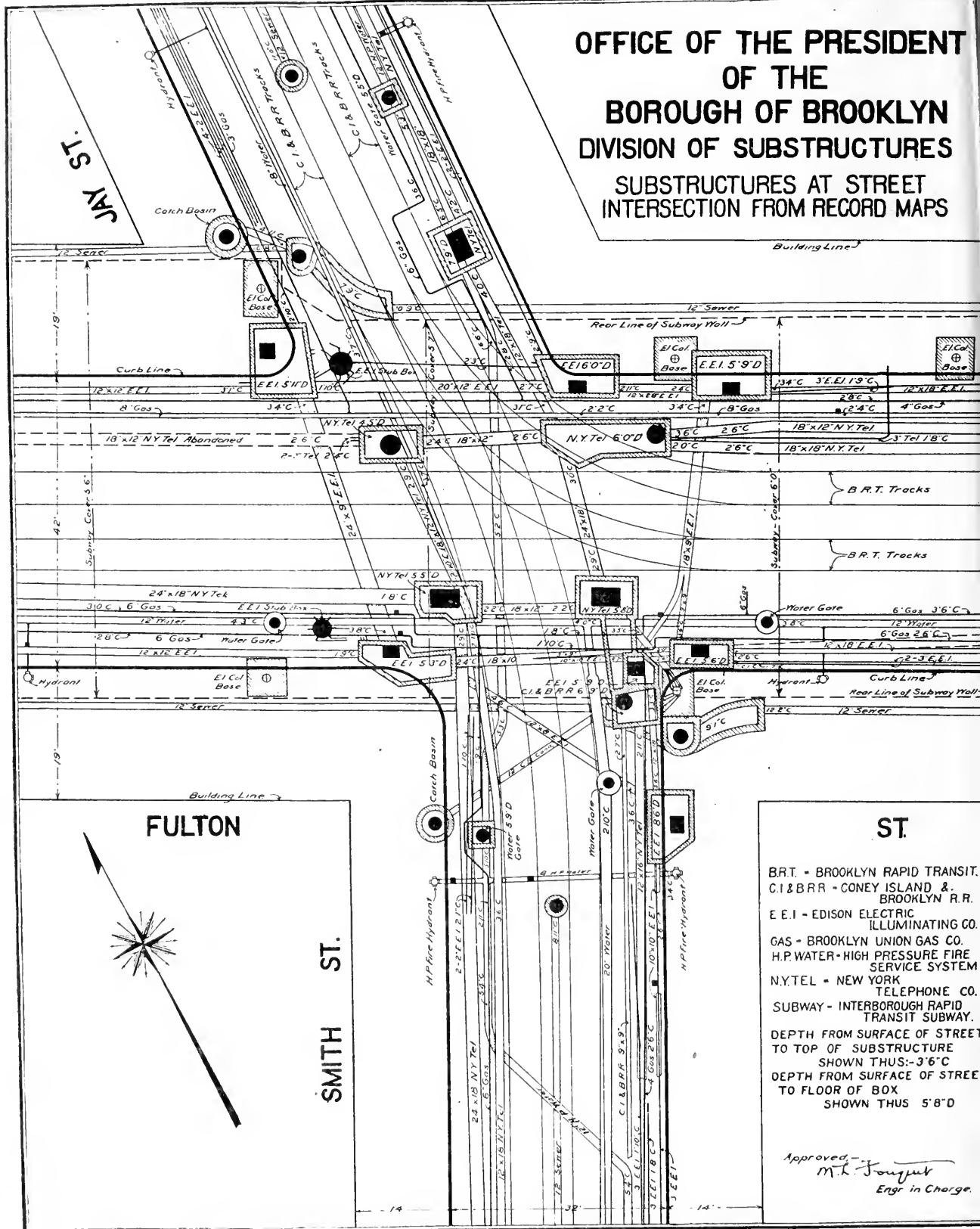
A great element of danger in the streets of New York is the explosions which occasionally occur in conduit manholes or junction boxes covering electric wires and cables, undoubtedly caused by an accumulation of gas being ignited by a spark from a short circuit or blowout. The employees of the division note in detail the condition of such manholes and boxes when they are being surveyed, especially as to the prevalence of gas and the presence in the manholes or in the walls of the same of gas, water and other pipes. In a number of cases gas pipes have been found running through manholes, and as these are, in the majority of cases, by no means tight at the joints, this may account for considerable of the gas which finds its way into the conduits. Information of such conditions is communicated to the corporations concerned as soon as it is obtained.

An idea of the amount of work required in making these surveys may be obtained from a statement of the work done during the year 1908. During this year 95,240 lin. ft. of curbs were located, 52,410 ft. of trolley tracks, and 85,700 ft. of building lines; also 318 hydrants, 174 catch basins, 1215 poles, etc., on sidewalks; 619 sewer manholes, 524 water supply gates and boxes, 10 fire department boxes, 385 boxes of wire conduits, together with a number of miscellaneous boxes, tubes, etc., including 181 gas drips; also 357 street openings and test-pits were visited and data obtained from them. During the year boxes, manholes, etc., were opened and measured, as described above, as follows: 1062 sewer manholes, 484 water-

supply boxes, 16 fire department boxes, 520 wire conduit boxes and 22 miscellaneous. The number of manholes, etc., opened and measured exceeded those located because of the fact that a considerable number of those located the year before had not been surveyed. Up to the present time about 80 miles of streets have been completed.

In making the locations and surveys several appliances especially adapted to this work have been developed or the use of

standard ones found especially applicable. Among the latter is the optical square. This is used for turning right at offsets from a transit line or from a curb in locating manholes, box covers and the like. In running the transit there is so much interference with transit work by the traffic both foot and wheel, that the line is chalked on the sidewalk between transit points and measurements taken from a chalk line to curb, building line, etc. Mr. Fouquet has



PART OF A RECORD MAP, SHOWING METHOD OF REPRESENTING DATA

used for making offset measurements a steel tape, the special features of which are that the graduations, which are similar to those on the ordinary ribbon tape, are placed on the left hand and the tape, passing in front of the body, will have the figures in reading position. For a handle on the reel a leather strap is provided on one side, so that the reel may be held much like a currycomb. When held in this position the notebook can be rested open on top of the reel and the measurements entered. It is the idea that the reel should always be held in the left hand, whether in use or not. Another appliance is a 16-foot pole used for surveying sewer manholes. This pole is hinged at the middle so it can be folded into an eight-foot length, a piece of slotted steel on one half the joint and a thumb nut on the other making it easy to tighten the two halves into a rigid 16-ft. rod. Graduations on the top and the foot numbers are burnt into the rod, as the ordinary usage, including the wash of sewage, would remove painted figures and graduations in a short time. At the bottom of the rod are two pieces of iron, one six inches long in one line of the rod, the other 12 in. long at right angles to the first. The latter is allowed to rest on the invert of any sewer which may be above the bottom of the manhole and the distance from the surface read on the rod; and the rod is then turned until the iron projection is in contact with the top of the sewer and the depth of this also read. This gives the vertical diameter of the sewer. If the horizontal diameter is less than two feet it can be determined approximately by turning the rod until the iron foot is at about the axis of the sewer and then revolving the rod until the foot comes in contact with the sides of the sewer. The 6-in. iron rod at the bottom of the main rod is to enable the depth of the manhole to be determined when there is a deposit in the bottom through which the iron foot might prevent the pushing of the rod proper.

The value of subsurface maps preliminary to the construction of public works of magnitude is well illustrated in the case of the construction of one of the most important substructures in New York, the rapid transit subway system. The engineers, in preparing the contract drawings and estimates for the construction of this vast system of tunnels, found it absolutely necessary to determine the subsurface conditions throughout the entire route, and, in fact, made subsurface maps as part of the contract drawings, giving the prospective contractor much valuable information as to the type and character of the substructure to be cared for during construction. This, without a doubt, resulted in a material saving in the cost of the work.

Another class of information of value to the city is the discovery of the existence of vaults and private tunnels. Several such have been found for which no legal authority has ever been granted, and the city is now able to collect fees for the use of several of whose existence it previously had no knowledge. In one instance there was a disposition on the part of the users of a large tunnel to combat the city's authority. This case is now in the hands of the corporation counsel, and will be fought in the courts.

The value of work of this character is now generally understood and the commendation of this division of the borough president's office by the commissioners of accounts in their recent investigation of the affairs of the borough evidenced the fact. The commissioners stated in part:

The desirability of such a bureau of information, whether the office of the Borough President or elsewhere, would appear to be unquestionable and the plan inaugurated in Brooklyn might well be followed elsewhere to advantage.

A similar department has recently been organized in the Borough of the Bronx. Prior to organizing, representatives of that borough were given every opportunity to study the Brooklyn system and have adopted it throughout. The Borough of Richmond also is about to start a subsurface department, and is profiting by the experience of the Brooklyn division.

LIFE OF WATER WORKS CONSTRUCTION

In a paper on "Depreciation in Water Works Operation and Accounting," which has just been published in the Proceedings of the New England Water Works Association, Mr. Leonard Metcalf, incidental to a discussion of the principles of depreciation, has introduced a number of data and opinions concerning the life of the various structures going to make up the ordinary water works plant. In a table he gives the maximum and minimum limits of the possible life of these several structures as follows:

	General limits of useful life. Years.
Water-works structures.	Years.
Reservoirs	50-100
Steel standpipes.....	25-40
Masonry buildings.....	30-50
Wooden buildings.....	20-40
Filter plants, permanent construction.....	25-50
Pumping machinery, high duty in large units.....	30-50
Ordinary pumping machinery.....	20-30
Steam engines.....	15-25
Boilers	12-20
Electric generators and motors.....	20-30
Masonry conduits.....	50-100
Cast-iron pipe, large diameter:	
In non-tuberculating waters.....	60-100
In tuberculating waters.....	50-75
Cast-iron pipe, small diameter.....	30-50
Steel pipe.....	25-40
Wood stave pipe.....	20-30
Wrought-iron service pipes.....	15-30
Hydrants	35-50
Valves	40-50
Meters	15-25

Considering the plant as a whole he states: "The average length of life of water works plants depends upon many factors. Broadly speaking, from 40 to 60 years probably represents the usual range of life of the structures, except in the case of very rapidly growing towns or cities.

"The Wisconsin Public Service Commission, in a recent opinion upon the value of the Fond du Lac, Wis., water works, gives the average life of the different water works plants examined by it to date as 65¼ years.

"The U. S. Commerce and Labor Bureau, in its special report upon statistics of cities having a population of over 30,000, in which was included some valuable water works statistics, assumes a fifty-year period of life."

The Knoxville Water Company in a period of seventeen years showed an annual average rate of depreciation, exclusive of proper allowance for repairs and renewals, of 2.12 per cent.

Owing to the variation in the amount of gross income in water works, as compared with their cost or value, the depreciation thereon expressed in percentage of the gross income is correspondingly variable. Broadly speaking, however, it may be said that the depreciation is likely to amount to 10 per cent, more or less, of the gross annual income of the works. This is roughly calculated on the basis of a depreciation of one per cent per annum and a gross annual income of 10 per cent of the value of the plant. (One per cent annually contributed to a sinking fund would produce 100 per cent in 41 years, with interest at 4 per cent, or 47 years with interest at 3 per cent.)

In discussing the paper Mr. T. H. MacKenzie called attention to the effect which the nature of the plant would have upon the average life of the same. For instance, in a considerable part of New England the plants are gravity plants, and the reservoir would cost fully 40 per cent as much as the entire plant. The water is impounded by earthen dams, and if these are originally so located as to impound sufficient water no extensions of them are required, and they will remain for a century or possibly several centuries fully as effective as when first constructed. Mr. Metcalf replied that, while this was true in many cases, there would be others in which the functional depreciation—that is, the failure of the reservoir to continue to render adequate service, because of incapacity—may become a very important factor.

Concerning this matter of estimated life of structures Mr. Emil Knuchling stated: "Most of our data are of compara-

tively ancient origin and not based upon apparatus and materials used at the present time. On searching the literature of the subject it will be found that many of the figures are based on mere opinions, expressed many years ago before some commission or tribunal, and have been carried along by a variety of authors without any alterations founded on later experiences." It was considered by several of the speakers as fortunate that a committee of that association was endeavoring to collect accurate data on just this point.

As more or less intimately connected with this matter of depreciation of water works structures is that of depreciation in plants used by the department. In reference to this Mr. Metcalf referred to the allowances made by MacArthur Brothers Company for depreciation upon their plant used in the construction of the Cross River Dam for the Aqueduct Commission of New York City, the stated depreciations being monthly allowances. These allowances were as follows:

Plant items.	Monthly Depreciation Rate allowed by Contractors.
Locomotives, cars, tracks, excavators, machinery, etc....	1.1 %
Scrapers, wagons, etc.; horses, mules, etc.....	2 %
Camp equipment.....	2 %
Small tools.....	5 %
Boats, scows, etc.....	4 %
Office furniture.....	1.1 %
Real estate.....	1/2 %

OVERCROWDING STREET CARS

A recent issue of the U. S. Consular and Trade Reports contains brief statements concerning the prevention of overcrowding street cars in nine European cities from which we abstract the following information: In Liverpool the regulation street car carries passengers on the upper deck, the lower deck seating 22 people and the upper deck 38. No passengers are allowed to stand on the upper deck, and there is an almost entire absence of crowding on the lower. During rush hours the number of cars is increased by 68 per cent. Passengers board the cars at the rear, the doors being wide enough to admit only one person at a time. When the car has been filled an iron gate is closed. The only statement of the number of passengers carried is that of the elevated railroad running the entire length of the city, 6½ miles, which carries an average of 24,000 passengers a day. Several New York lines carry ten times this number.

In Birmingham standing in the cars is prohibited by law, and the police have the authority to regulate the loading and unloading of passengers. This is systematized, the passengers being required to form on the street in two lines, one line for the lower and the other for the upper deck. The forming of these two lines is called the "queue," and is found in most cities in Great Britain. It is stated that the people take naturally to this through the habit of forming similar lines at the entrance to theaters. When all the seats are occupied the motorman draws a chain across the entrance, which is invariably at the front of the car, and the conductor across the exit at the rear. The consul making this report naively remarks that no inconvenience is caused by the enforcement of the law against crowding except to those at the rear of the queue. The quota of 76 cars running at five in the morning is increased to 273 at 7:30, after which the number fluctuates, being 226 from 6 to 8 p. m.

In Manchester four persons are allowed to stand inside a small car and six persons inside a large car. Here also the queue system is employed in the business centers or whenever there is a rush of passengers. The small cars carry 52 persons seated and the large cars 74 persons.

In Leeds the cars have a seating capacity of 58, and eight persons are allowed to stand. During the three rush hour periods the number of cars is increased about 30 per cent. It is estimated that two-thirds of those who use the cars live within two miles of the center of the city.

In Belfast overcrowding is prevented by the conductor closing the gate of the platform as soon as the car is full. Under certain circumstances eight persons are allowed to stand on the lower deck and the same number on the upper deck.

In Marseilles most of the cars accommodate 21 persons inside and 28 standing on a large platform. There are no double-deck cars. During rush hours the service is doubled and tripled on certain lines by means of trailers 25 ft. long.

In Brussels the majority of the workmen walk to their work and there is no trouble from overcrowding. The number of passengers which can ride upon the street cars is strictly limited and overcrowding is prevented by the conductors and the police. This regulation is said to delay passengers in getting about the city to a certain extent, although additional cars are added during the rush hours.

In Berlin police regulations provide that no more than seven shall stand in a car, and the number which may be carried is posted in a conspicuous place in each car. There are exceptional occasions, however, when a greater number may be carried, these being after 11 p. m. on week days, during sudden showers or snow storms, when traffic is interrupted, on occasions of parades, large funerals or public festivities and on Sundays and holidays after 3 p. m.

In Moscow, Russia, the cars seat 26 persons, and eight are allowed to stand on the rear platform of the trailer, but no one is permitted to stand inside the car nor on the front platform. Cars are compelled to stop on the rear side of each street crossing, whether any one desires to enter or leave or not. There are several peculiarities in the cars themselves, one being that no open cars are used in summer and that in all cars the windows on one side are fixed, while those on the other can be opened in warm weather; the object being to avoid cross drafts of air. Instead of bearing the name of the street or district to which it is going, each car bears a large number which indicates its route, small vest pocket books, sold at five cents each, giving a list of all the routes and their numbers.

GOOD ROADS TRAIN IN PENNSYLVANIA

A good roads train is to visit the cities and towns of the State of Pennsylvania, along the line of the Pennsylvania railroad, being operated by that road. The tour of education began Jan. 25, at Harrisburg.

This train will be in charge of the Pennsylvania State College, co-operating with the Roads Department of the National Government and the State Highway Department of Pennsylvania. The train, consisting of four cars, will be used for lecture purposes in villages and small towns along the lines of the Pennsylvania Railroad. One car will be fitted up with a lantern for the illustration of the lectures. Another car will be used for exhibits, showing models of several types of roads, such as earth, sand-clay, gravel, macadam, and telford. This car will also contain a series of photographs and drawings for illustrating the different methods of drainage and kinds of construction required for special conditions. Two flat cars will contain samples of the most important machinery required for service in road building, also a home made roller, drag, and sprinkling wagon. The exact cost and methods of construction of the roller and drag will be shown in detail.

The train will stop in each township along the railroad, where good roads meetings will have been previously advertised. Evening meetings will be held in theaters or court houses of the larger cities, while the exhibits will be open day and evening, with experts in attendance to give explanations and answer questions.

The Pennsylvania State College will have two experts on the train during the entire trip; the United States Government will send at least one of its best trained men, and the State Department of Highways of Pennsylvania will also be represented. Representing the Pennsylvania Railroad Company will be officers of the divisions over which the train will pass.

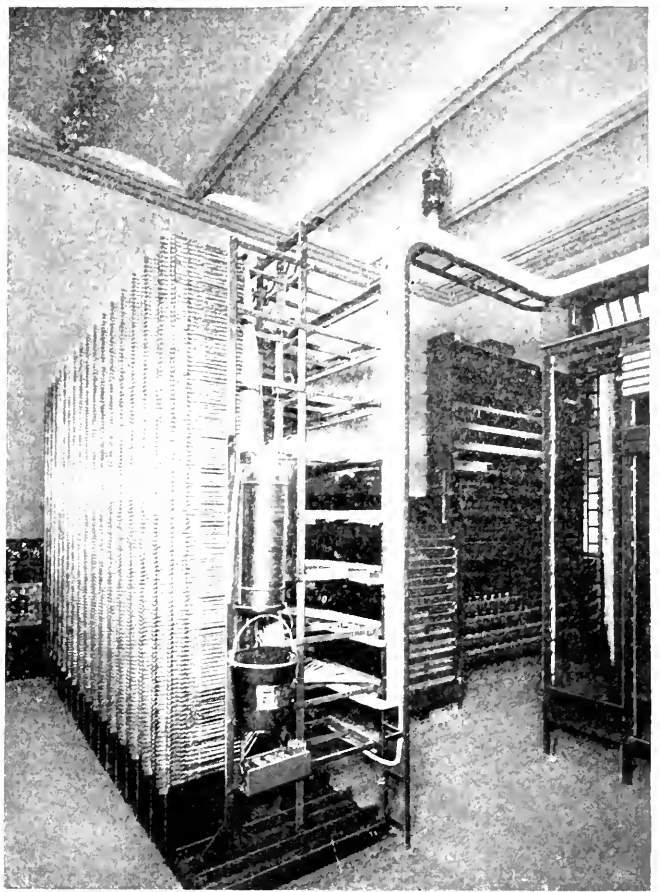
PHILADELPHIA MUNICIPAL TELEPHONES

Operates Six Hundred Local Stations—Special Service for Police Department—All Police Messages Recorded—Patrol Boxes

The city of Philadelphia has had in service since July, 1908, telephone system owned and operated by the city for the use of its several departments. This system is used for all telephone service in connection with hospitals, fire department stations, police stations and the several offices of the departments and bureaus throughout the city. The exchange for this municipal system is located in the city building, and is a thoroughly equipped central exchange, consisting of two four-position standard switchboard sections, accommodating seven regular operators and one testing operator. There is a capacity of 700 local lines and 200 trunk lines, although only about 600 local stations and about 100 trunk lines have yet been connected with the switchboard. All of the trunk lines are equipped with the visual "busy" signal; that is, there is connected with each multiple jack of the trunk line, in front of the operators, a green light which remains lighted while its respective trunk line is in use.

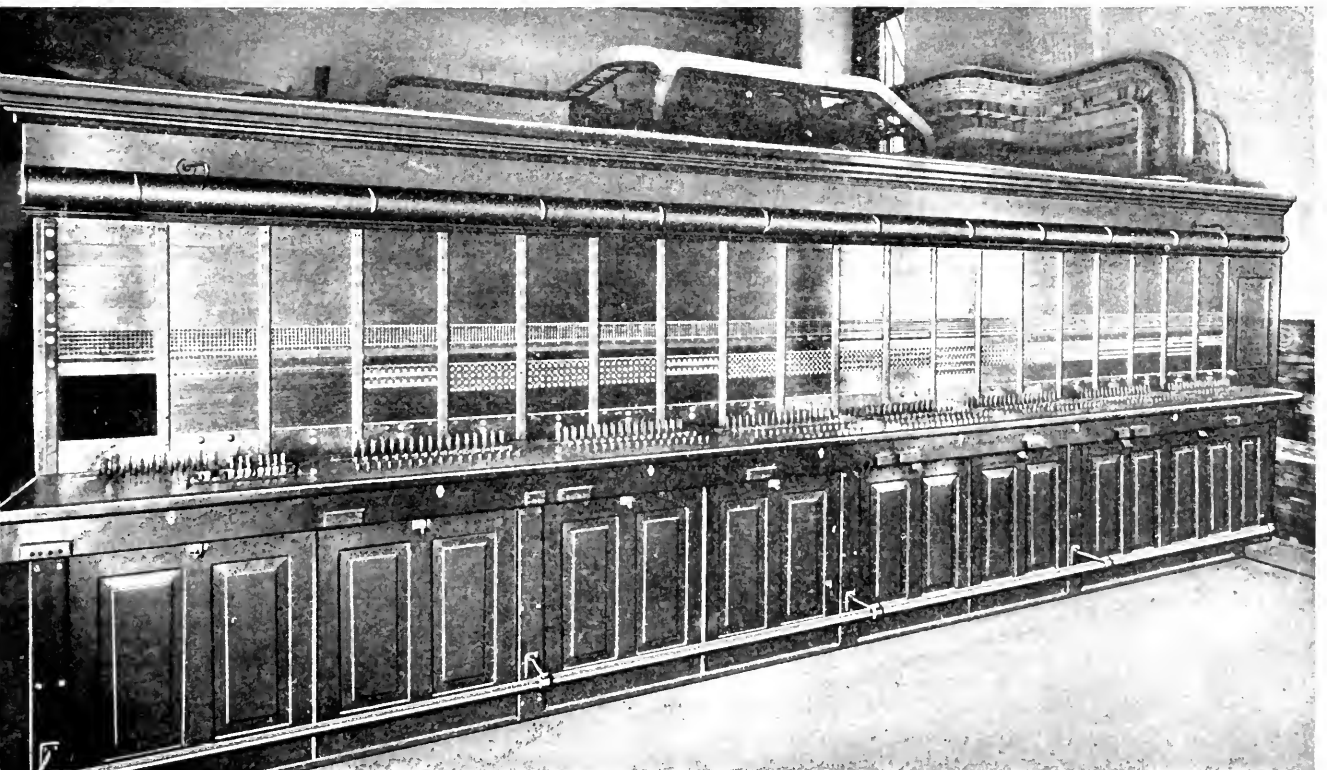
The police department is served by what may be termed a private police telephone system, which has an exchange switchboard located at police headquarters. At present there are something less than 100 local stations connected to this switchboard and 20 trunk lines, 10 of the latter being connected to the main municipal exchange switchboard. All of the police stations throughout the city are connected with this police exchange.

The wires and cables of this system are carried in underground conduits, of which the city owns an extensive system outright, and it also reserves the privilege of using one duct in every street conduit constructed or owned by private corporations. The smallest conductor used is number 18 B and S. The longest continuous connection is from the Holmesburg police station to the Chestnut Hill police station, through the city building, this requiring approximately 40 miles of underground cable.



MAIN DISTRIBUTING FRAME

The cables enter the city building through manholes or vaults and are there spliced, without fuses or other protective devices, to cables which hang in a vertical shaft. At the upper end these cables are connected to a distributing frame similar to the standard equipment found in large commercial telephone exchanges. This frame contains more than 100,000 soldered



SWITCHBOARD IN CITY HALL EXCHANGE

connections. The switchboard and general central office equipment were furnished by the Western Electric Company, and are similar to the type used by them for operating telephone companies generally.

At each of the police stations the terminal equipment consists of a standard telephone set equipped with a chest type transmitter and double-head receiver. The house sergeant is in charge of this and receives and sends all telephone messages. This set is attached to a standard typewriter desk in such a way that the sergeant can operate the typewriter while receiving and transmitting messages. An arrangement of jack, cord and plug is used, similar to that used at small switchboards.

The house sergeant receives all messages, both routine and special, and takes them down at once upon the typewriter, making three copies, one of which is for the lieutenant, captain or officer in charge of the station house; the second copies are turned in at stated intervals to the City Hall for filing, and the third copies are filed at the station house where received.

Patrol boxes are located in all precincts or districts, and each patrolman is required to communicate with his house sergeant at least once each hour, thus making it impossible for any of them to be off the beat for any length of time without detection. Chief J. T. McLaughlin designed a patrol box by which, should the calling patrolman desire, he may connect himself with the main police board at the city hall, "cutting past" the house sergeant. This is especially desirable when a patrolman wishes to give an alarm of fire, as all fire alarms are turned into the city hall before any of the signals in the fire house are struck. This box would also permit an inspector or detective to communicate with headquarters without the knowledge of the officer in a local station. Another feature of this box is that the patrolmen must pull the box, thus indicating its number, before he can telephone, and therefore cannot deceive headquarters as to the point from which he is telephoning.

A RUSSIAN TRICKLING FILTER PLANT

The city of Kharkov, of 250,000 population, has no public sewers, and the various hospitals and public and private institutions have individual purification plants. One of the largest of these is that of the municipal hospital, which takes care of the waste of 3,000 persons. In constructing this plant the amount of sewage was estimated at 10,500 cubic feet of water, or a daily capacity of 26 gallons per capita. At present the sewage varies between 3,900 and 4,025 cubic feet, or an actual amount of water used in the institution of from 13 to 14 gallons per capita.

The plant consists of a septic tank and three filter beds, one primary and two secondary. The primary bed has a filtering surface of 3,000 square feet, composed of several layers of coke; the bottom coke layer consists of pieces from 3 to 8 inches in diameter, the upper layers being each 4 inches deep and consisting of pieces varying from 2.4 inches to 0.3 inch in diameter. As originally designed, two additional layers of very fine sand were provided for, but this idea has been abandoned, as larger sized coke was found to give better aeration. The primary filter is divided by partitions into four beds, to each of which the sewage is discharged by siphon tanks. Each of these tanks holds 200 gallons, fills in 10 or 15 minutes and empties through the siphon in about three-fourths of a minute. The sewage is distributed onto the filter beds by seven iron channels placed 20 inches apart and equipped with 0.3-inch openings spaced 8 inches apart along each side. This primary bed, when filling at the rate of 1.8 cubic feet of sewage for each square foot of area, did not at first give very good results. The effluents showed an efficiency of only 40 to 50 per cent by the oxygen test, whereas it was considered that 60 per cent should be secured. This low efficiency was attributed to lack of uniformity in distributing the sewage on the beds and improper grading of the coke particles. After the bed had been covered with a layer of fine coke of 0.4 to 0.12 inch diameter, the filters gave satisfactory results.

The effluent from the primary bed passes to a septic tank, to pass through which requires from two to three hours, and then to the two secondary filters. These filters are built as percolators, each containing 400 square feet and being 3.3 feet deep. The top layer is of very fine coke 4 inches thick. The bottom layer is of coke in one filter and of slag in the other. To secure the maximum aeration the bottoms of the filters are covered with semi-circular pipes of 16-inch diameter. After two and one-half months operation these secondary beds were giving good results and producing a non-putrescible effluent, the efficiency by oxygen test being from 60 to 70 per cent. These filters were operated at the rate of 10 to 12.5 cubic feet per square foot of area (3,250,000 to 4,000,000 gallons per acre) per 24 hours. At times the water stood two feet above the top of the filter, when the surface became clogged. The surfaces of beds were cleaned once a month.

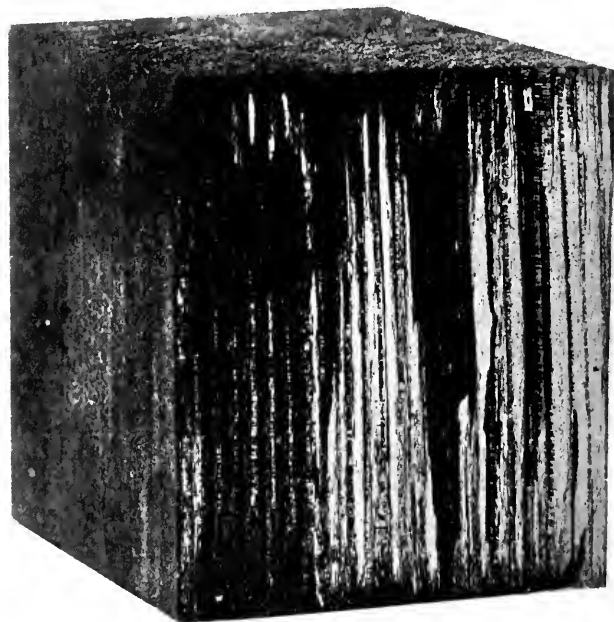
Experiments with this plant appeared to show that the two sets of filters gave better results than could be obtained with one set of filters only. In this particular case the use of three of the four primary filter beds gave as good results as when all four were in use, apparently showing that the capacity of this filter has not been reached. For this information we are indebted to an article in the *Gesundheits Ingenieur* by Mr. N. C. Malischewsky.

WOOD PRESERVING WITH ASPHALT OILS

A paper was presented before the Wood Preservers' Association at its meeting on January 19 of this year by Mr. Frank W. Cherrington, of the Indian Refining Company, in which he described experiments made and results obtained in the treatment of wood with asphaltic oils for the purpose of preserving it. No claim appears to have been made of any antiseptic quality in the asphalt or the oils accompanying the same, but the benefit claimed appeared to be entirely that of exclusion of moisture.

He stated that in 1885 a committee on wood preserving of the American Railway Engineering and Maintenance of Way Association reported that crude petroleum would prove a preservative so long as it continued to saturate the wood by exclusion of water, but that the evaporation of the volatile oils rendered it useless for this purpose. Concerning this, Mr. Cherrington stated that this was based upon experiments with eastern paraffine oils, which are not stable in their composition.

About 1901 the Santa Fe Railroad injected California asphaltic crude oil into pine ties and "laid them in a section of track in Southern Texas, where the climatic condition is one of the most



WOOD BLOCK IMPREGNATED WITH ASPHALT OIL

were for ties to be found in North America. A maximum quantity of oil was forced into these pine ties, the absorption per tie being, of course, dependent upon the amount of heart and sap wood in each tie." Oils from other sections of the country than California or Mexico were reported by the author to be too volatile and highly inflammable for this purpose in their natural state, but they can be refined to a desirable consistency.

Other experiments made on cross-ties were described. It was concluded from these that fairly good penetration could be secured in the various oaks, beech, gum, etc., when injecting all the preservative that the ties would absorb, this maximum amount being found to be about seven pounds per cubic foot. Short leaf pine ties were found to readily absorb straight asphaltic oil in larger quantities and with thorough penetration.

One test was made at Columbus, in which a paving block of standard size was treated with residual asphaltic oil to the amount of 16 pounds per cubic foot. It was then dried in an oven of a temperature of 120 degrees F. for a period of 24 hours, weighed and then immersed in clear water for a period of 24 hours. The gain in weight was found to be 0.02 of one per cent. "The same block, if treated with 20 pounds per cubic foot of creosote, would have been allowed to have absorbed as high as three or four per cent of water, by weight."

Other experiments were made with mixtures of 25 per cent creosote and 75 per cent of asphaltic oil, and these appeared to demonstrate that the two substances remained mixed while penetrating the wood, and that a very satisfactory penetration was secured by the mixture.

"It is readily admitted that the only value of asphaltic oil obtained from the central United States as a wood preservative could be by the injection of a maximum quantity of oil into the wood." It is stated that in the test of ties so treated by the Santa Fe Railroad, nine years' test has indicated that where maximum saturation had been obtained the ties had been well preserved during this time. Nothing is stated by the author to indicate that any actual test has ever been made of the use of this material as a preservative for wood paving blocks, but we believe it is the intention of the asphalt companies to demonstrate its value for this purpose.

CONCRETE WATER TOWER IN HOLLAND

A reinforced concrete water tower has been built in Leyden, Holland, which is described by the *Journal für Gasbeleuchtung*, from which we abstract the following:

In designing a water tank of about 300,000 gallons capacity, elevated on a tower about 65 feet high, it was first intended to make the tower of brick and the tank of iron. On receiving bids on this design and one for reinforced concrete, however, the latter was found to be much cheaper, the bid being \$22,500 against \$28,000 for the brick and iron construction. The reinforced concrete construction was therefore adopted.

The tower consists of 12 reinforced concrete pillars connected by two sets of horizontal braces. The spaces between the columns and the horizontal braces are filled with a brick wall, one brick thick, covered on the inside with a plaster coat. The twelve columns stand on a twelve-sided foundation formed by a complete duodecagon, having a cross-section similar to an inverted T. This foundation is supported by 240 piles 39 feet in length. It is $8\frac{1}{4}$ feet wide and 6 feet high, and was constructed of great strength in order to distribute uniformly along the piles the load contributed by the twelve columns. The columns are 4.95 by 1.98 feet at the bottom, reduced to 2.31 by 1.98 at an elevation of 23 ft., above which they continue at this size to the top.

At the height of about 30 ft. a series of concrete semi-circular arches are sprung from each column to its diametrically opposite one. These are in reality not complete arches, but are rather girders with an arched under surface which do not meet in the center but abut against a ring of concrete under the center of the tank. On the outer side of each column is constructed a bracket 1.3 ft. thick, and these brackets

and the arched girders before mentioned serve to support the tank. The tank is cylindrical, 46 ft. in diameter and 26 ft. high. The bottom of the tank has a thickness of 0.95 ft., and the walls are 0.99 ft. thick near the bottom and 0.33 ft. at the top. Both sides and bottom are reinforced. In order to protect the tank from temperature contraction and expansion it is inclosed by an outer wall or tank which is constructed of 12 reinforced concrete columns, each standing on the outer end of one of the brackets, which columns are connected at top and bottom by concrete beams, the rest of the space between being filled with brick work. The top is covered with a flat roof, in which is placed wire glass which serves to admit light into the tank. The balance of the roof is covered with a waterproof mastic and gravel and a low wall is carried entirely around the outer edge. Three lightning rods are provided on the roof.

A vertical concrete box is carried up in the center of the tower from the ground to the under side of the tank, which contains and protects the supply, drain and overflow pipes. This is rectangular in form and rests on 21 piles. Just outside of this are four columns extending from the ground to the under side of the tank, which serve as supports for a reinforced concrete stairway. These posts are connected at various heights by strong tie-beams. Near the top the stairway ends in a platform and is continued by supplementary stairs leading to the space between the shells of the tank and the enclosing structure. From this point access is had to the top of the tank by means of an iron ladder, which is suspended in this annular space from an iron rail carried around the top of the inner tank, which rail also carries a ladder inside of the tank. These ladders travel on this rail and can be pushed entirely around the tank, thus giving access to any portion of the inner or outer surface. A float with connection from the same to a valve at the top of the inlet pipe automatically shuts off the water when the tank has been filled to the desired level.

The concrete foundation ring is strongly reinforced, both longitudinally and in cross-section. The main columns have vertical reinforcements which are tied together with round iron hoops.

An effort was made to give a pleasing appearance to the tower. The concrete surfaces are finished with a coat imitating sandstone, and the brick work, while flat, is varied in coloring, the bottom being dark, the panels at mid-height being red, and the top brown.

COMMISSION GOVERNMENT IN NEW JERSEY

THE commission government idea has reached New Jersey, and a number of the cities of the State, including Trenton, the capital, are working for the passage of a bill by the present Legislature providing for the adoption of the commission form of government by any cities of the State which may so desire. On January 24 there was a State convention addressed by Mr. John MacVicar, of Des Moines, at which about 20 cities were represented, six of them by their mayors in person, and a State committee, composed of one representative from each city in the State which is interested in the problem, will meet shortly and prepare a draft of a bill which the Legislature will be asked to pass. As Governor Wilson is president of the Short Ballot Association, and the short ballot idea and the commission government idea have many features in common, it is believed that the movement will receive the support of the Governor. The movement, so far as Trenton is concerned at least, is being actively supported by the Chamber of Commerce of that city and the *Trenton Evening Times*.

As was shown by the list of cities which had adopted commission government, which was presented in these columns a short time ago, most of the cities which have adopted it are in the Mississippi Valley, Texas and Oklahoma; but present indications are that the movement will spread more or less rapidly and generally into the other sections of the country.

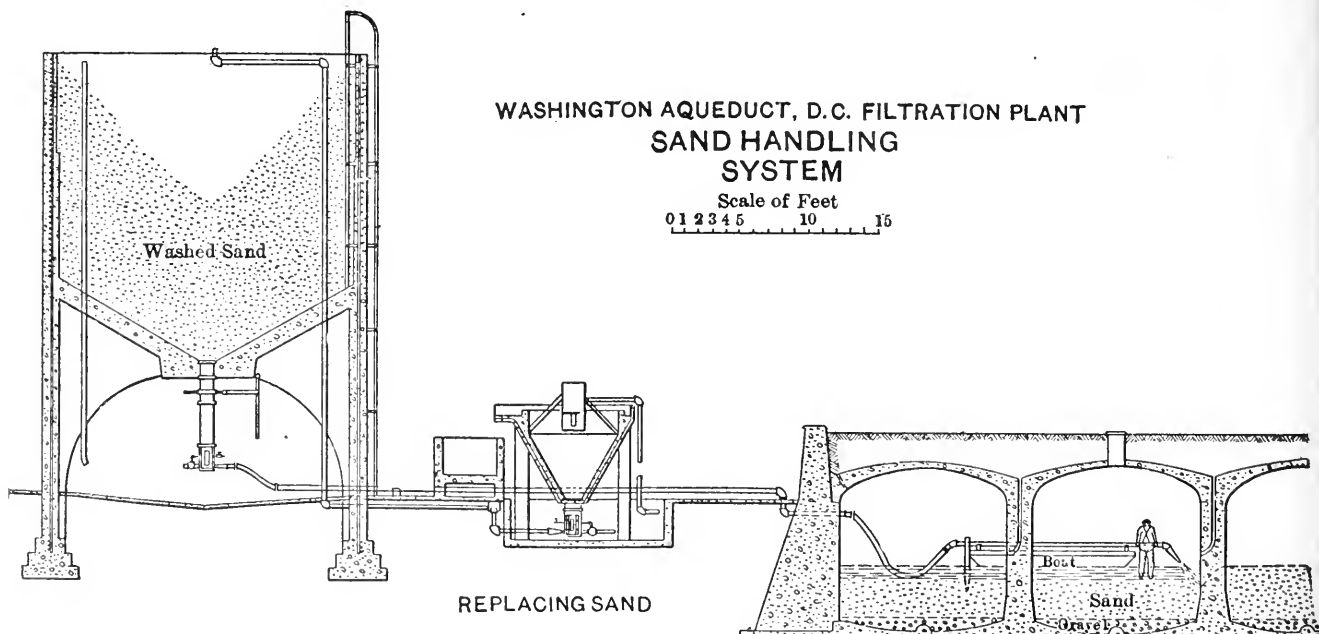
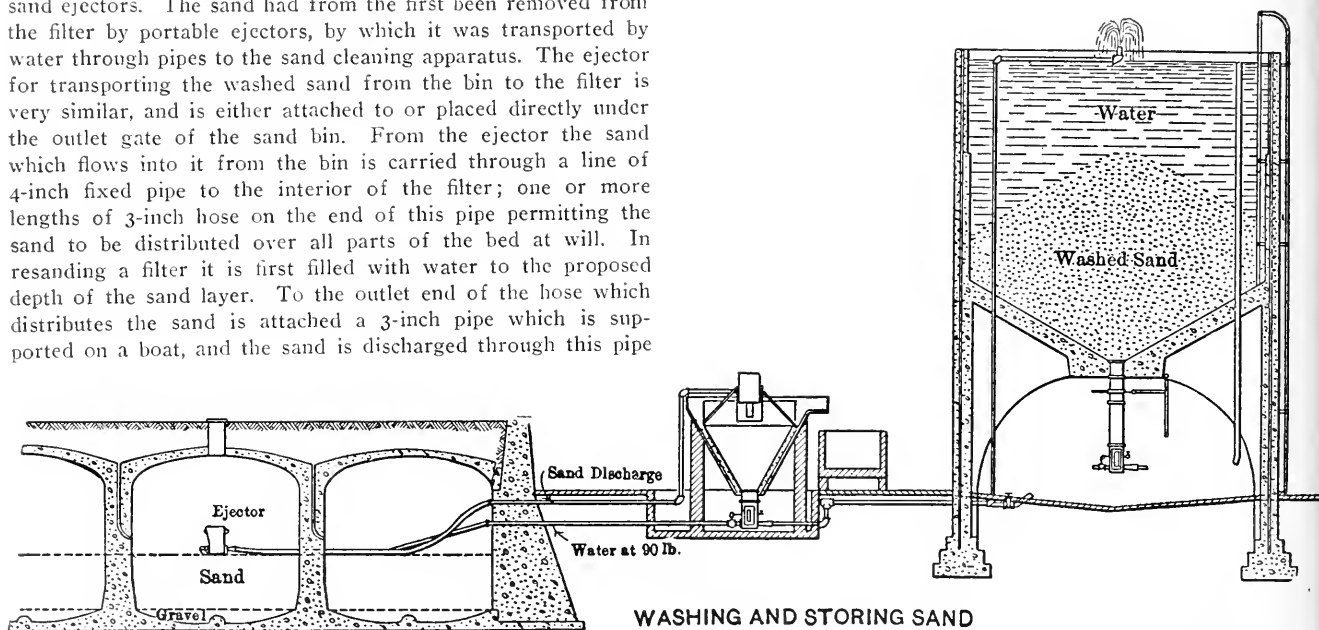
OPERATION OF WASHINGTON FILTRATION PLANT

Replacing Washed Sand by Ejectors—Amount of Sand Removed by Scraping—Cost of All Items of Maintenance—Experiments in Preliminary Filtration, Sedimentation and Rapid Filtration

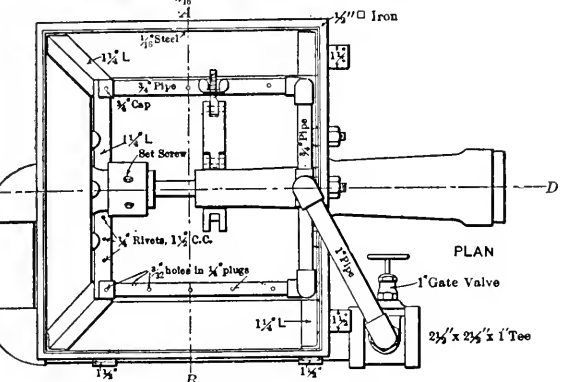
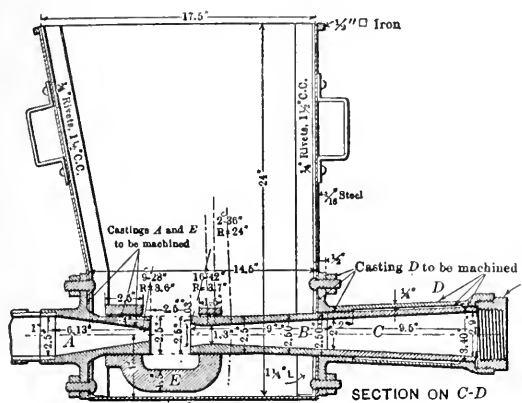
In a paper before the American Society of Civil Engineers, to be presented on February 15, and published in the Proceedings of that Society for December, 1910, Mr. E. D. Hardy, superintendent of the Washington, D. C., water purification plant, gives a description of some of the methods employed and results obtained during five years' operation of the plant. One of the most interesting of these is the manner of handling and washing the sand. His description of this we abstract as follows:

For the first three years of operation the sand was carried from the sand bins in carts and dumped through the numerous manholes of the filters into chutes, the lower ends of which could be pointed in any direction so as to facilitate the spreading of the sand evenly over the surface of the filter. About the middle of 1909 this method was abandoned for the use of sand ejectors. The sand had from the first been removed from the filter by portable ejectors, by which it was transported by water through pipes to the sand cleaning apparatus. The ejector for transporting the washed sand from the bin to the filter is very similar, and is either attached to or placed directly under the outlet gate of the sand bin. From the ejector the sand which flows into it from the bin is carried through a line of 4-inch fixed pipe to the interior of the filter; one or more lengths of 3-inch hose on the end of this pipe permitting the sand to be distributed over all parts of the bed at will. In resanding a filter it is first filled with water to the proposed depth of the sand layer. To the outlet end of the hose which distributes the sand is attached a 3-inch pipe which is supported on a boat, and the sand is discharged through this pipe

to the point required. Work is first begun at the far end of the filter, and the boat is gradually swung from side to side of the filter and at the same time backed toward the front end. At first it was feared that during the filling a small quantity of mud would be deposited on the surface of the old sand, and covered by the new layer, and that this mud would ultimately cause subsurface clogging. For this reason, when the process was first adopted, the sand was raked thoroughly just ahead of the discharge of the fresh sand. Later, however, it was found that by giving the end of the discharge pipe a slope of about 45 degrees from the horizontal the force of the current of sand and water would itself stir up the old sand sufficiently to prevent such a deposit forming. This latter method had been used almost exclusively for fifteen months



DIAGRAMMATIC SECTIONS SHOWING METHODS OF REMOVING, WASHING AND STORING SAND, AND RETURNING AND PLACING THE CLEANED SAND



DETAILS OF SAND EJECTOR

prior to the writing of the paper, during which time eleven filters had been resanded and 24,531 cubic yards of sand replaced without any indication having been observed of a loss of head due to subsurface clogging. The filters resanded in this way have been considered more efficient than those in which sand was replaced with carts.

During the year 1909-'10 the average depth of sand removed per month by scraping was 1.314 inches, there having been three months in which no sand was removed and one month (March, following a month when there had been no scraping) in which 3.64 inches were removed. In removing the sand from the filter the average monthly rates in cubic yards per hour during 1909-'10 varied from 6.2 to 11.8, the mean of the monthly rates being 9.2. In replacing the sand by ejector the average rate per cubic yard per hour varied from 7 to 17.7, the mean being 10.0. The cost of handling the sand, not including any charge for the quantity of water used, during the fiscal year 1909-'10 was as follows, the items being per million gallons pumped to the filter: Scraping averaged 5 cts., ranging from 3 cts. to 10 cts. Ejecting averaged 10 cts., ranging from 3 cts. to 21 cts. Washing averaged 1 ct., ranging from 0 to 4 cts. Smoothing averaged 1 ct., ranging from 0 to 2 cts. Raking averaged 1 ct., ranging from 0 to 2 cts. Resanding averaged 3 cts., ranging from 1 ct. to 27 cts. The total cost averaged 16 cts., ranging from 9 cts. to 57 cts. Stated in cost per cubic yard of sand handled, the monthly averages were as follows: Scraping, average 7 cts., ranging from 6 cts. to 12 cts. Ejecting, 14 cts., ranging from 9 cts. to 25 cts. Washing, average 2 cts., ranging from 0 to 4 cts. Smoothing, 1 ct., ranging from 0 to 2 cts. Resanding, 10 cts., ranging from 5 cts. to 17 cts. Total cost per cubic yard of sand, general average 34 cts., the monthly averages ranging from 25 cts. to 51 cts.

The cost of pumping water for removing and washing sand, including all labor, materials and repairs, was 6 cts. per cubic yard of sand ejected and washed; and 3 cts. per cubic yard was the cost of water for replacing the sand. The latter should be increased by one or two cents on account of the fact that while sand is being replaced a slight upward flow is maintained through the filter. This upward flow is not believed to be absolutely necessary but is always used as an additional safeguard against the formation of a layer of mud on the old sand.

The cost of operating the plant is given by Mr. Hardy in considerable detail, to permit the superintendents in other cities to compare it with figures for their own plants. The statement of expenses accounts for the entire appropriation for the care and maintenance of the filtration plant, including pumping water to the filters, parking and caring for the grounds, buildings, roads, sidewalks, etc. All of this is shown in two tables, one giving the itemized salaries and wages of employees, the other the cost per million gallons filtered for the several subdivisions of the expense account.

List of Employees, Rates of Pay, and Approximate Cost for Supplies

1 Superintendent	\$3,000.00
1 Chief Chemist and Assistant Superintendent	2,100.00
1 First Assistant Chemist	1,500.00
1 Second Assistant Chemist	1,000.00
1 Stenographer and Clerk	1,200.00
1 Surveyor	1,200.00
1 Laboratory Helper	720.00
1 Janitor	600.00
1 Chief Steam Engineer	1,800.00
1 First Assistant Steam Engineer	1,440.00
1 Second Assistant Steam Engineer	1,080.00
3 Oilers, at \$900 each	2,700.00
3 Firemen, at \$900 each	2,700.00
3 Laborers, at \$540 each	1,620.00
1 Filter Foreman	1,200.00
2 Foremen, at \$900 each	1,800.00
1 Timekeeper	900.00
3 Watchmen and Gauge Tenders, at \$900 each	2,700.00
1 Machinist	1,140.00
1 Blacksmith	900.00
1 Storekeeper	900.00
1 Painter	900.00
1 Mechanic	900.00
1 Electrician	900.00
4 Skilled Laborers, at \$600 each	2,400.00
1 Watchman and Special Officer	900.00
1 Recorder	720.00
27 Laborers at \$1.50 per day, for 300 days	12,150.00
3 Teams at \$2.00 per day, for 200 days	1,200.00
Laboratory and office supplies	2,700.00
Filter supplies, tools, hose, repair of roads, parks, shrubs, etc.	8,820.00
Pumping station supplies, oil, waste packing, repairs, etc.	3,570.00
3,600 tons of coal, at \$3.15 per ton	11,340.00
Charges in U. S. Engineer Office, labor	2,900.00
Charges in U. S. Engineer Office, materials	400.00
Total	\$82,000.00

COST PER MILLION GALLONS FILTERED

Month.	Office and laboratory.	Pumping station.	FILTER OPERATIONS:		Parking (care of grounds), etc.	Main office.	Total.
			Sand handling.	Re-pairs, etc.			
1909.							
July	\$0.73	\$0.57	\$0.86		\$0.31	\$0.15	\$2.62
August	0.75	0.61	0.59		0.71	0.14	2.83
September	0.83	0.67	0.80		0.51	0.17	2.98
October	0.72	0.66	0.73		0.34	0.08	2.53
November	0.87	0.76	0.42		0.38	0.18	2.61
December	0.90	0.69	0.27		0.40	0.12	2.38
1910.							
January	0.81	0.63	0.33		0.14	0.10	2.01
February	0.91	0.74	0.35	\$0.07	0.11	0.16	2.37
March	0.92	0.81	0.30	0.07	0.18	0.13	2.41
April	0.93	0.83	0.19	0.03	0.36	0.13	2.77
May	0.86	0.72	0.36	0.03	0.55	0.18	2.70
June	0.88	0.67	0.38		0.38	0.12	2.43
Average	0.84	0.70	0.27	\$0.25	0.36	0.14	2.56
Fiscal years:							
1905-1906	0.45	0.45	0.47	0.02	0.01	0.09	1.49
1906-1907	0.57	0.57	0.58	0.21	0.07	0.04	2.07
1907-1908	0.70	0.59	0.42	0.32	0.15	0.09	2.36
1908-1909	0.72	0.61	0.41	0.34	0.22	0.13	2.44

COST PER MILLION GALLONS FILTERED—CONTINUED

(B) MATERIALS.

Month	Office and laboratory.	Pumping station	FILTER OPERATIONS		Parking (care of grounds, etc.)	Main office.	Total.
			Sand handling	Repairs, etc.			
1909.							
July.....			\$0.01				\$0.01
August.....	\$0.01				\$0.07		\$0.09
September.....	0.05	\$0.31	0.04		0.01	0.03	0.44
October.....	0.08	0.11	0.13		0.46	0.02	0.80
November.....	0.13	0.78	0.10		0.34	0.02	1.37
December.....	0.03	0.17	0.05		0.01	0.05	0.31
1910.							
January.....	0.12	0.74	0.14		0.01		1.01
February.....	0.07	1.88	0.18		0.01	0.01	2.15
March.....	0.26	0.28	0.01				0.55
April.....	0.18	1.22	0.10		0.29	0.02	1.81
May.....	0.06	0.72	0.02		0.11	0.02	0.93
June.....	0.54	2.23		12.16	0.46	0.04	5.43
Average.....	0.13	0.69	0.02	\$0.21	0.17	0.02	1.24
Fiscal years:							
1905-1906.....	0.01	0.59	0.02				0.65
1906-1907.....	0.03	0.67	0.08	0.20	0.02		1.00
1907-1908.....	0.05	0.54	0.04	0.07	0.06	0.01	0.77
1908-1909.....	0.10	0.69	0.05	0.18	0.18	0.02	1.22

(C) TOTALS.

1909.							
July.....	\$0.73	\$0.57	\$0.87		\$0.31	\$0.15	\$2.63
August.....	0.76	0.64	0.59		0.78	0.15	2.92
September.....	0.88	0.98	0.84		0.52	0.20	3.42
October.....	0.80	0.77	0.86		0.80	0.10	3.33
November.....	1.00	1.54	0.52		0.72	0.20	3.98
December.....	0.93	0.86	0.32		0.41	0.17	2.69
1910.							
January.....	0.93	1.37	0.47		0.15	0.10	3.02
February.....	1.01	2.62	0.53	\$0.07	0.12	0.17	4.52
March.....	1.18	1.09	0.31	0.07	0.18	0.13	2.96
April.....	1.11	2.05	0.59	0.03	0.65	0.15	4.58
May.....	0.92	1.44	0.38	0.03	0.66	0.20	3.63
June.....	1.42	2.90	0.38	2.16	0.84	0.16	7.86
Average.....	0.97	1.39	0.29	0.46	0.53	0.16	3.80
Fiscal years:							
1905-1906.....	0.49	1.04	0.49	0.02	0.01	0.09	2.14
1906-1907.....	0.60	1.24	0.66	0.41	0.09	0.04	3.07
1907-1908.....	0.75	1.13	0.46	0.39	0.21	0.10	3.13
1908-1909.....	0.82	1.30	0.46	0.52	0.40	0.15	3.36

* \$0.02 for new sand-handling system.

† \$2.02 " " "

‡ \$0.16 " " "

EXPERIMENTS IN PRELIMINARY TREATMENT.

Another subject to which a considerable part of Mr. Hardy's paper was devoted was a description of the several experiments in preliminary treatment which have been conducted by the department during the past few years. It had been anticipated in designing the present filter plant that preliminary treatment—sedimentation or something similar—would be desirable in connection with slow sand filtration, Messrs. Hering, Fuller and Hazen having suggested sedimentation, assisted by coagulation. There was, however, considerable prejudice against the use of a coagulant, and the bill providing for the construction of the filter plant made no appropriation for any such preliminary treatment. As stated in these columns a week or so ago, experience with the plant has indicated the necessity of some preliminary treatment if acceptable results are to be obtained. Those in charge of the filtration have realized this, and about four years ago began operating an experimental plant to determine the most effective method of preliminary treatment. The experimental plant consisted of three cylindrical concrete filter tanks, each 10 feet in diameter; these tanks being filled with the same gravel and sand which was used in the operating filters in order to duplicate as exactly as possible the large slow sand filters of the existing plant. In addition, appliances were provided for experimenting with various kinds of preliminary treatment. Two

of these consisted of rapid filtration through different media, and a third consisted of sedimentation combined with coagulation. The size of the sedimentation tank bore the same ratio to that of the experimental filter tanks that the Georgetown and McMillan Park reservoirs do the large filters of the plant.

The first preliminary filter was very similar in construction and operation to a mechanical filter, but the sand was the same as that used for the main filters and consequently finer than that generally used in mechanical filters. The second preliminary filter was a Maignen "scrubber," consisting of a cylindrical concrete tank four feet in diameter and eight feet deep, which contained as a bottom layer 12 inches of cobblestones, on which were successive layers of 12 inches of egg-size coke, 12 inches of stove-size coke, 24 inches of nut-size coke, and 24 inches of sponge clippings.

These preliminary filters were operated at the rate of about 50 million gallons per acre per day, and the three slow sand filters treated the effluent from these at rates of from three to four million gallons per day.

These several tanks were connected together in pairs and designated by numbers for convenience in reference; the rapid sand filter with its slow sand filter being designated as No. 1, the Maignen scrubber and its slow sand filter as No. 2, and the coagulating sedimentation basin and its slow sand filter as No. 3.

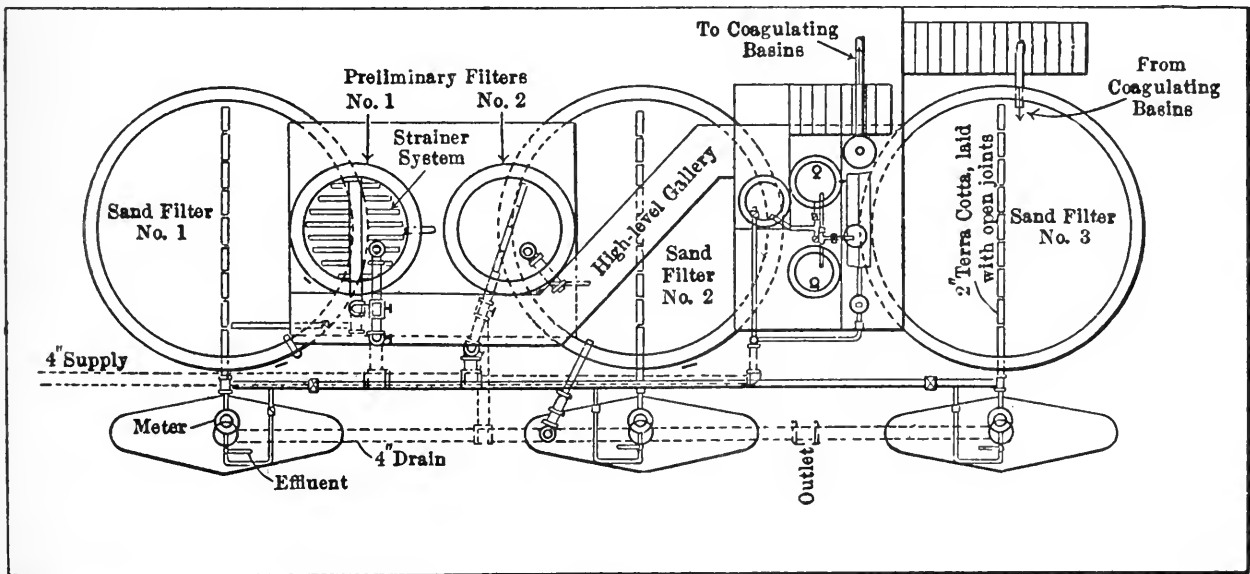
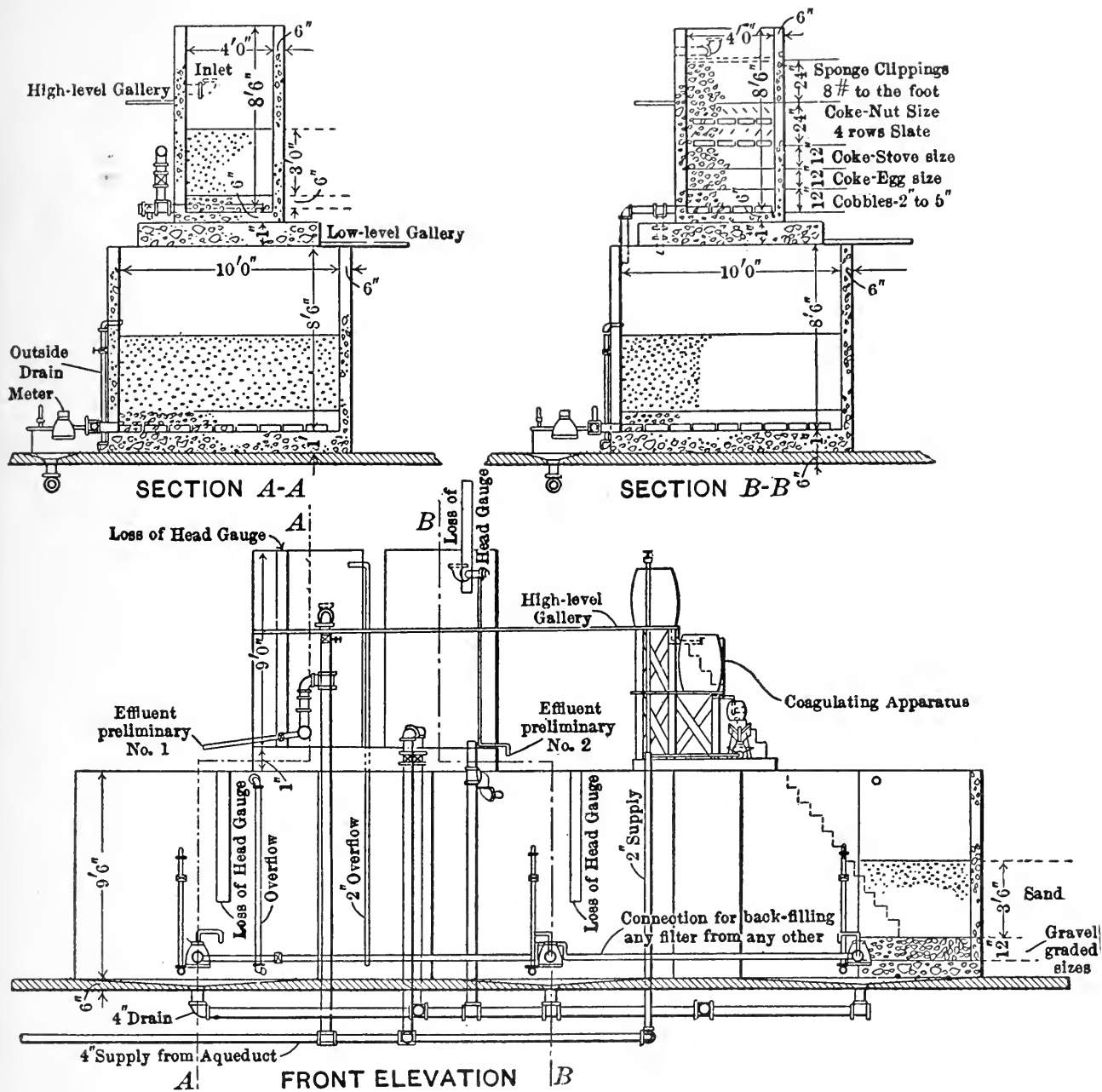
Plant No. 1 ran for from ten days to two weeks between washings at first, but this rapid rate carried the clay to a considerable depth into the preliminary filter, so that the runs gradually decreased in length until they were reduced to about three days. This, together with the necessity for using unfiltered water for washing, made it necessary to at length remove all the filtering materials and clean them. When it was possible to operate this preliminary filter at all it gave excellent results except at times of high turbidity, when the exceedingly fine mud passed through both preliminary and slow sand filters.

Plant No. 2 proved more economical and convenient in operation, but somewhat less efficient than No. 1. In operating this plant sulphate of alumina was used as a coagulant when the applied water contained too much turbidity to be treated satisfactorily by the slow sand filter. Plant No. 3, however, could be depended upon to produce good results under all conditions of turbidity. As an illustration of the operation of these three experimental couples with very turbid water, the figures of Jan. 16 may be given. On this date the turbidity of the raw water was 360, that of the effluent from preliminary filter No. 1 was 210, that from preliminary filter No. 2 was 247, and that of the effluent from the coagulating basin was 5. With these effluents applied to the corresponding slow sand filters final effluents were obtained from plant No. 1 with a turbidity of 37; from plant No. 2 with a turbidity of 42 and from plant No. 3 with zero turbidity.

Plants Nos. 2 and 3 were operated for about 18 months. After being operated about a year plant No. 1 was replaced with a Puech system of five filter units in series, which was no more effective than the simpler preliminary filters.

EXPERIMENTS IN RAPID FILTRATION

Another series of experimental tests was conducted for about 18 months, the object of which was to study relative efficiencies and costs of operating slow sand filters at different rates. For these tests cylindrical galvanized iron tanks four feet in diameter and nine feet high were used. The same sand was used for these as was used in the actual filter plant. These filters were operated at rates of one million, three million, six million, ten million, and, for a short time, thirty million gallons per acre per day; the last being reduced, after running for two months, to about seventeen million gallons. A sixth filter was started at the rate of one hundred million gallons, but it was found practicable to maintain this for only a few days at a time, after which the rate was kept as high as possible for the remainder of the run. The results obtained by this experimental plant were tabulated by Mr. Hardy in his paper, but no synopsis or discussion of the same is given by him: The table is presented herewith.



PLAN, ELEVATION AND SECTIONS OF EXPERIMENTAL FILTERS

Filter number.	1	2	3	4	5	6
Number of runs.	3	6	11	12	25	28
Rate, million gallons per acre per day:						
Maximum	1.35	3.95	7.96	12.60	37.5	118.9
Minimum	0.62	2.30	3.73	5.77	6.68	7.1
Average	1.06	3.26	6.69	10.17	26.1	38.54
Length of run, in days:						
Maximum	233.5	150.5	75.2	90.9	48.71	39.83
Minimum	181.7	42.0	14.5	10.1	0.67	0.62
Average	206.4	109.6	48.89	40.5	14.41	12.61
Million gallons filtered per acre per run:						
Maximum	242.61	484.46	534.67	960.72	1,463.35	1,022.27
Minimum	202.60	135.66	93.79	92.57	19.53	53.32
Average	218.58	302.82	326.76	417.23	374.14	361.92
Cubic yards of sand removed per acre at end of each run:						
Maximum	269	269	672	1,612	2,420	3,360
Minimum	269	134	101	134	134	101
Average	269	213	272	392	583	635
Cubic yards of sand removed per acre per million gallons filtered.	1.23	0.70	0.83	0.94	1.55	1.72
Average initial loss of head.	0.07	0.19	0.51	0.78	3.88	5.38
Turbidity, influent:						
Maximum	120	120	120	120	90	100
Minimum	2	2	2	2	2	2
Average	20	20	21	22	18	19
Turbidity, effluent:						
Maximum	11	13	17	18	30	30
Minimum	0	0	0	0	0	0
Average	1	1	2	2	4	3
Percentage, reduction.	95.0	95.0	90.5	90.9	77.8	84.3
Bacteria, influent:						
Maximum	180,000	180,000	180,000	110,000	180,000	37,500
Minimum	22	20	22	20	25	24
Average	4,800	5,100	4,500	4,200	6,900	5,900
Bacteria, effluent:						
Maximum	4,000	1,300	3,200	5,400	12,800	2,400
Minimum	2	3	1	1	2	2
Average	160	85	110	120	190	180
Percentage, reduction.	96.7	98.3	97.6	97.3	97.3	97.0
Percentage of samples showing <i>bacillus coli</i> in influent:						
10 c.c.	41.2	44.2	42.2	59.2	41.9	45.2
1 c.c.	22.7	25.0	23.9	24.3	24.2	27.2
0.1 c.c.	10.5	12.8	11.9	12.3	13.5	13.2
0.01 c.c.	5.1	7.7	7.5	8.2	8.8	8.2
0.001 c.c.	1.2	1.4	1.2	1.5	1.0	1.0
Percentage of sample showing <i>bacillus coli</i> in effluent:						
10 c.c.	19.5	24.1	29.5	24.2	31.7	34.3
1 c.c.	10.0	13.4	12.0	13.8	15.4	16.1
0.1 c.c.	1.9	3.1	3.8	4.2	1.5	4.5
0.01 c.c.	0	0	0	0	0	0
0.001 c.c.	0	0	0	0	0	0
Cost per million gallons for sand handling.	\$0.43	\$0.25	\$0.29	\$0.33	\$0.54	\$0.60
Interest charges at 3%.	6.85	2.25	1.12	0.73	0.32	0.22
Total.	7.28	2.50	1.41	1.06	0.86	0.82

Coli tests presumptive.

From this table it will be noticed that, though the average rates for filters 5 and 6 were greater than that for 4, the average amount filtered per acre per run was less, filter No. 4 showing the maximum. Comparing the amount of sand used per million gallons filtered, we find that filter No. 2, with a rate of $3\frac{1}{4}$ million gallons per acre per day, showed the minimum amount. It is noticed in the figures for initial loss of head that in the case of the first four filters this loss is roughly proportional to the rate of filtration. In reduction of turbidity it is seen that filter No. 4 was even more efficient than No. 3, although the rate was about fifty per cent higher. In reduction of bacteria there was remarkable similarity between all the filters, those with the highest rates showing even better results than No. 1 with its very low rate. The tests for *B. coli*, how-

ever, showed much more favorable results by the low rates than by the high ones. Finally, the cost for handling sand was the minimum for filter No. 2 with its rate of $3\frac{1}{4}$ million gallons; but if the interest charges on the cost of construction, taken at 3 per cent, be added, the total cost was in favor of the higher rates. Judging from these figures alone it would therefore appear that where turbidity was an important item filter No. 2 with its rate of $3\frac{1}{4}$ million gallons per acre per day would be desirable, and the total cost would be a little more than one-third of that where the rate is only one million gallons. If, however, turbidity is not an important item, rates as high as ten million gallons would seem to be practicable, the total cost at this rate being a little less than one-half that when the rate was $3\frac{1}{4}$ million gallons.

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A. PRESCOTT FOLWELL, Editor
F. E. PUFFER, Assistant Editor

Business Department
S. W. HUME, President

T. MORRIS, Manager. A. PRESCOTT FOLWELL, Secretary

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FEBRUARY 1, 1911.

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Furnishing Data on Request

ATTENTION is called on page 155 of this issue to the paucity of data concerning the length of useful life of water works structures, and the same remarks apply to most other municipal utilities, pavements being possibly the least open to this criticism, although concerning even these the data are not sufficiently numerous or intelligently classified. As is stated in the article referred to, it is fortunate that a committee of the New England Water Works Association is endeavoring to collect accurate data concerning the life of water works structures. This is a matter which no individual of however wide experience can adequately work out from observations made by himself, nor have many individuals the time to collect such data from all available sources and compile them. And yet it is very desirable that this information should be made available; this being illustrated by the fact that, in the absence of definite information on the subject, it has been necessary to estimate it—in some cases to merely guess at it—in order to make calculations required by law or by prudent financing. Even a committee supported by the prestige of a society of

high standing and devoting much valuable time to the research can not, however, secure the data if the necessary figures have not already been recorded by the various water works superintendents and engineers throughout the country. This is one of the many cases where the general good of the profession is dependent upon the efforts of the many individuals in collecting and recording data which may not be of immediate value to the individuals themselves but which require only the slight personal sacrifice necessary to record the information asked for by such committees and furnish it to them when required.

To a large extent the collecting and compiling of data of this kind are in the nature of a labor of love, and we bespeak for all individuals or organizations which are carrying on such investigations for the general benefit of the profession prompt and full replies to questions asked. The probability is that those who are asking for the data are making a much greater sacrifice of time and energy than those who furnish them.

The City Transportation Problem

WE have previously referred to the efforts made by certain cities to limit or entirely prevent by law the crowding of street cars and the difficulty, if not impossibility, of accomplishing much in this way. As stated on another page, crowding is actually prevented in England and on the Continent by simply preventing the entrance of any more passengers after the cars are reasonably well filled. It might at first thought appear that the same methods could be adopted to produce similar results in this country. We believe, however, that a more careful study of the dissimilarity of conditions in the two countries would indicate that this does not necessarily follow. In the first place the crowds to be transported in the larger cities of this country are in most cases much greater than in any of the English or German cities. In the second place in this country a smaller percentage of those who make up the passengers prefer walking to riding for the sake of economy or other reasons. And in the third place the American riding public is not, we believe, as easily constrained to substitute the will of a corporation for their own desires as is that of European countries. There are other obstacles to the success of this plan in the United States, but we believe that those mentioned will be found practically insuperable.

Liability for Water Supply

IN a recent decision of the Supreme Court of New York State (Oakes Manufacturing Company vs. City of New York), it was held that "Where a municipality maintains a public water system it is acting as a governmental agency and is therefore not liable for negligence in maintaining the water supply." Also that the selection of the source of supply is "the exercise of a discretion judicial in its nature and imposed no liability on the consolidated city for damages." We understand this to mean that neither the city nor individual commissioners can be held responsible for an error in judgment in selecting the supply. It has also been held that there is no liability on the part of the city for sickness or death occasioned by impurities in the supply, even though it should have been for many years aware of the existence of such impurity and have made no effort to remedy conditions; although a contrary view was taken by the Minnesota supreme court, according to a news item in our January 11 issue.

It seems to us that in taking this view of the responsibility of municipal officials the courts have been undesirably lenient. Much the same view has been held concerning the responsibilities of a director of a corporation or bank, but there seems to be a tendency at present to hold such officials to a more strict accounting. We believe that there are many arguments in favor of a similar change in opinion concerning the duties and obligations of city officials such as water commissioners, and that the fact that quality is more important than quantity, which has become generally realized during the past decade or so, should be an important consideration in ruling on the duties of commissioners in providing the supply.

HYPOCHLORITE AT HARRISBURG

THE attention of Superintendent George G. Kennedy, of the Harrisburg, Pa., Water and Lighting Department, having been called to the comparatively poor results obtained in the use of hypochlorite in connection with the water supply of Niagara Falls, he has sent us the records of the bacterial reduction effected by the Harrisburg department during 1910 in treating two water supplies obtained from sources near that city. In one case the treatment was continued during March and April and tests taken on an average every two days. In this test .08 grains of hypochlorite per gallon were used. The number of bacteria per c.c. in the raw water averaged 8,833, the minimum being 900 and the maximum 29,750. In the treated water the bacteria ranged from 16 to 760, the average being 73. Tests for *B. coli* resulted as follows: Of 95 tests of raw water, 89 were positive; of a similar number of tests of treated water but four were positive.

A test made of another water between August 8 and December 14, in which the amount of hypochlorite used was .075 grains per gallon, showed the following results: Bacteria in the raw water averaged 1,117, ranging from 600 to 5,740. Those in the treated water averaged 37, ranging from 16 to 95. Of 133 tests for *B. coli* the raw water showed positive results in 132 cases, but the treated water in only four cases. The hypochlorite varied considerably in available chlorine, the average of this being about 26, but ranging from 15.8 to 41.76. These two tests show reduction in bacteria of 99.2 per cent and 96.9 per cent respectively.

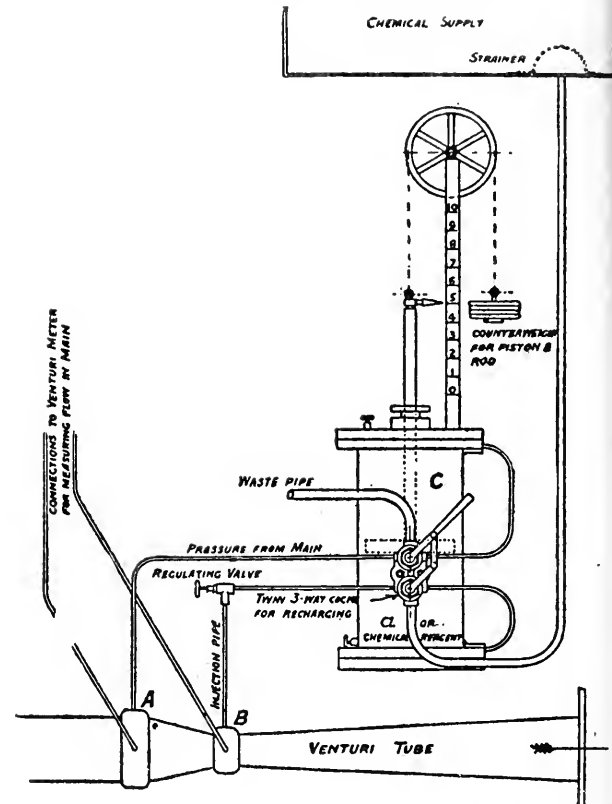
In regular use at the plant, the hypochlorite is passed through an orifice box, where the supply is regulated; and from this through galvanized iron pipes to a grid in front of the 42-inch intake pipe.

PLANT FOR APPLYING HYPOCHLORITE

A new method of applying hypochlorite to water supplies at rates proportional to the flow of water has been introduced in Canada and is described by the *Canadian Engineer*, from which we abstract the following:

As the illustration shows, the principle employed by the Venturi meter is used to regulate the flow, this principle being that, when water is flowing, the pressure at the large section *A* is always greater than that at the smaller section *B*, the latter becoming even a negative pressure under high velocities. The apparatus consists of a cylinder *C*, the top of which is connected to the larger end of the Venturi tube by a small pipe which thus transmits the pressure to the top of the piston which works in the cylinder *C*. Another pipe connects the lower part of the cylinder with the contracted section or throat of the Venturi tube. The piston is provided with a counter weight, and the piston accordingly rises or falls in the cylinder as the relative pressures in *A* and *B* change. The chemical solution is brought from the tank by a pipe which connects by a three-way valve to the pressure pipe from the throat of the Venturi tube; and a similar three-way valve connects a waste pipe with the other pressure pipe. By turning both the three-way valves so that the pressure from the Venturi tube is shut off and the waste pipe and chemical supply pipe are opened, the hypochlorite solution, because of the head due to the elevation of the tank, enters the cylinder below the piston, raising this to its highest point, the water above the piston being discharged through the waste pipe. The three-way valves are then closed to the supply and waste pipes and opened to the pressure pipes, when the greater pressure above the piston forces the chemical solution through the small pipe connecting with the throat. The pressure forcing this out, and as a result the amount of solution applied, are proportional to the excess of pressure at *A* over that at *B*, and consequently to the amount of flow in the main. Theoretically, the amount of solution supplied will vary directly as the amount of flow through the Venturi tube; although the friction in the apparatus will probably introduce a slight variation in this.

When the charge in the cylinder has been exhausted it must be recharged in the manner above described. The apparatus shown in the diagram is intended for a treatment of 1,000 gallons per hour and at this rate will need recharging but once



APPARATUS FOR APPLYING HYPOCHLORITE

in 24 hours. Although apparently not provided for in this diagram, it would be extremely simple to have the indicator automatically ring a bell when the piston is approaching the bottom of the cylinder, thus calling attention to the necessity of recharging.

COAGULATING NON-ALKALINE WATER

THE operation of the mechanical filter plant at Augusta, Ga. was described in the report of Superintendent John H. Ferguson for the year ending November 30, 1910, including the method adopted for overcoming a trouble more or less commonly experienced in several cities, that of the water becoming low in alkalinity and the resulting failure of the alum to properly coagulate. At several times during the past year the water at Augusta became very turbid and low in alkalinity, at times as low as four parts per million. As it requires eight parts to properly decompose one grain of alum, and $1\frac{1}{2}$ grains per gallon were being used at that plant, it was necessary to add about ten parts per million of alkalinity, which was done by the addition of lime.

It had been customary to apply lime at the filter intake from a small and very crude tank, and the lime thus had very little time in which to work on the water and reached the filters in a caustic state. This seemed to prevent the formation of the coagulant cover on the filters for some time after the beds were washed, causing the filters to run muddy water long enough to stain the water in the basin. Mr. Ferguson thereupon determined to introduce the lime into the force main at the point of discharge into the basin, and a preliminary test of this proved so successful that he built a lime house at this point and installed two 700-gal. tanks, properly connected with the mains. This made it possible to control the alkalinity at all times, and the water reached the filter plant in the proper condition to take the alum. The attendant at the filters is furnished with the necessary apparatus for determining, by titration, the proper amount of lime required from time to time.

NEWS OF THE MUNICIPALITIES

Current Subjects of General Interest, Under Consideration by City Councils and Department Heads—Streets, Water Works, Lighting and Sanitary Matters—Fire and Police Items—Government and Finance

ROADS AND PAVEMENTS

Greater Appropriations for Michigan Highways

Lansing, Mich.—State Highway Commissioner T. A. Ely will ask the Legislature for an appropriation of \$250,000 annually for the ensuing two years to conduct the highway department and provide for State rewards on good roads. The last appropriation was for \$150,000 annually, and the work of the department consumed the entire amount and the unexpired balance remaining in the treasury when Commissioner Ely was appointed was but \$57,000. About 300 miles of State award road was built during the last fiscal year, and already applications are on file for 250 miles for the coming year, and it is estimated that the full amount of the appropriation asked for will be necessary to provide for the natural growth of the business of the department for the next two years.

Valuation of Turnpike Made

Milford, O.—A value of \$10,937.50 was placed on the nine miles of the Cincinnati, Columbus and Wooster turnpike, in Clermont County, by a special jury that spent two weeks hearing the condemnation proceedings at Batavia. The section of the pike condemned extends from the Hamilton County line in Milford to Goshen on the northern boundary of Clermont County. A verdict returned in Hamilton County a few days ago fixed a value exceeding \$5,000 per mile for the portion of the pike in the latter county. The Clermont verdict fixes the price at slightly more than \$1,200 per mile. The estimates of the value of the road given by the various witnesses varied from \$1,000 to \$10,000 per mile.

Plan for Paying for Repaving of Thoroughfares

Newark, N. Y.—Chief Engineer Sherrerd has submitted to the Board of Public Works a draft of a bill designed to apply to the method of meeting the city's portion of the expense of repaving main thoroughfares. The commissioners of assessment are given the power to decide what part of the expense shall be assessed against the property owners and what part shall be paid by the city. The idea is that where traffic is greater the property owners' share should be less. The city would, according to the bill, be authorized to issue 20-year bonds to pay for its share of the expense—the idea being that the pavement will last that length of time.

To Resume Paving Repairs

Philadelphia, Pa.—Having recovered from the shock of the admissions of favoring contractors on paving repair measurements made by Highway Commissioner Brooks, in the Bullitt suit to annul the paving repair contract with the Filbert Paving & Construction Company, the officials got together in Mayor Reyburn's office and discussed the future pitfalls and how to avoid them. If there are any more queer contracts executed at a choice of prices either at 20 or 75 cents a yard, the measurements of the contractor's work and the voucher for the same will be computed by a district surveyor and not by anyone connected with the Bureau of Highways. The Mayor conferred with Director Stearns, Chief Benson and Commissioner Brooks. It was decided to have the Filbert Company resume the asphalt repair work under its contract which was halted when the Bullitt suit was begun. The company will be directed to resume operations at once. The Mayor suspects some contracting interests are seeking to discredit his municipal street repair corps and his municipal asphalt "mixer," which is reported to him, would not "mix." The Mayor said the machine is to cost \$2,000, and was being tested, but is not paid for. He told Thomas T. Haines, in charge of the repair corps, that the mixer will have to work properly or it won't be paid for. The Mayor advised Haines to engage an expert to operate the mixer. The Mayor says all small repairs and small jobs on streets will be done by the municipal repair corps during 1911.

Thirty Miles of Cement Walks

Crowley, La.—Contractor de Jersey, who has the contract for laying the cement sidewalks for the city, has completed about 8 miles of cement sidewalks for the city, and will, on the completion of the original contract, immediately begin on the second contract, the completion of which will bring the total amount of sidewalks up to 15 miles. There are about 40 miles of sidewalks in Crowley, and it is probable that 30 miles of cement sidewalks will be laid by the City Council before the work is discontinued. There has been no complaint against the laying of the walks by the city.

To Raise Great Fund for Roads

Denver, Col.—An attempt is being made in Colorado to raise \$1,500,000 for good roads, the Legislature to give one-third of the amount and the counties to give two-thirds, and the proposition seems to have a chance of becoming a reality. In Washington the counties are only asked to duplicate the amount pledged by the State.

Will Ask Lower Rate on Hydrants

Everett, Wash.—The Council Committee on Light and Water proposes to wait upon the Everett Railway, Light & Water Company and ascertain if it will not be possible to secure a reduction in the charge made by the company for supplying water for the street hydrants. This plan was discussed and decided upon by the committee, though no date was set when the conference should be held with Manager W. I. Sturtevant. There are 163 hydrants scattered about the city. The monthly cost for water to serve these hydrants is \$668, or about \$8,000 yearly.

Bridge Stood Test

Federalsburg, Md.—The new reinforced concrete bridge over the Nanticoke River here was tested last week by the State Roads Commission. Two 12-ton rollers passed over it safely, and the structure was pronounced perfect in every way. A lot of residents unfamiliar with concrete gathered to see the bridge fall and, of course, are agreeably disappointed now.

Too Many Duplicate Names

Houston, Tex.—In order to end the confusion resulting from having many duplicated street names, and a few instances of the same name being used for three streets, a committee is now at work selecting new designations for some of the streets of the city.

Cinnamon Trees for New Orleans Streets

New Orleans, La.—At a recent meeting of the Parking Commission, Dr. Joseph Holt showed a specimen of the cinnamon tree of Ceylon, which he discovered in an old nursery uptown. It attracted his attention because after the sharp freezes that have even nipped the leaves of the live oak its foliage remained as bright and fresh as if there hadn't been a frost. It grows 25 to 40 feet high, and the commission is going to try to get stock to begin its planting, as it will make a very important addition to the evergreen foliage of the city.

Tarring Shell Roads

St. Augustine, Fla.—An experiment is being made by Street Commissioner Cray with a tar binder on the shell paving on South St. George street. The results of the test prove to be entirely satisfactory and it may solve the problem of making the shell pavement more lasting at a slight expense. Six hundred square yards was treated at a cost of four and one-half cents a yard. The surface was first scarified and then graded to a crown. While the shell was in this loose condition gas tar was applied and the street was then rolled with the steam roller. There is every indication that the street will now shed the water better in rains and that the gas tar will act as a binder, preventing the shell from grinding up and blowing away.

Chert as a Material for Paving Condemned

Chattanooga, Tenn.—Chert as a material for paving local streets is just now arousing so much condemnation from Chattanooga that an organization has been formed in the hope that certain contracts that have already been let can be changed so that chert may be eliminated and some better material substituted. The new organization was temporarily formed last week at the Manufacturers' Association, where a number of representative citizens gathered to discuss the matter. The name Chattanooga Streets Improvement League was selected, and two committees were appointed. The committee on paving bonds and streets is composed of Samuel Bosworth Smith, Edwin W. Stuart and H. B. Moseley. It will be the duty of these gentlemen to see what can be done about substituting a better material instead of chert for the paving of a number of streets for which legislation has already been initiated, and also to see if additional bonds cannot be issued for the increased cost of a more permanent material.

Aerial Bridge Is Decided Success

Duluth, Minn.—The report of the Board of Public Works for 1910 comments upon the success of the aerial bridge, which cost \$6,338.80 to maintain during the year. The traffic has increased greatly since it was installed, but it has been a decided success, little trouble being experienced.

Erie Paving Record in 1910

Erie, Pa.—The paving done last year reached a total of 50,214.27 square yards of asphalt and 38,147.65 square yards of brick, with 33,771 feet of curbing, the entire cost being \$163,003.97. The city has 51.7 miles of paved streets.

Cost of Oiling Streets in Hartford

Hartford, Conn.—City Engineer Frederic L. Ford, in response to a request from President John E. Moore of the New Britain Board of Public Works, regarding the cost of oiling streets, says that his department has found that the cost for the season for oiling streets with light road oil similar to dustoline or valvoline is approximately 3 cents per square yard. With asphaltic oil containing 65 per cent asphalt it costs from 5 to 6 cents per square yard. No method of assessment for such oiling has as yet been devised for the city of Hartford.

More for Repairs Than New Roads

Rochester, N. Y.—A statement from the State Highway Commission on the amount of work done on good roads in Monroe County in 1910 by the Commission has been received by County Superintendent J. Y. McClintock, and this shows that more than twice as much was spent on repairs and maintenance in this county as was spent on construction of good, new roads. The total amount for maintenance and repair was \$251,524.79, and of this sum \$39,418.21 was expended in the town of Chili, this being the largest sum spent in any town. The smallest amount was spent in Ogdon, \$356.05.

Eisagree Over Apportionment of Fund

Sacramento, Cal.—When the State Highway Commission is appointed and organized, one of its difficult tasks will be the apportionment of the \$18,000,000 road fund to the satisfaction of the north and south, which sections are clearly opposed in their demands for shares of the highway bond issues. Four northern counties seek an allotment of from \$500,000 to \$1,000,000 for the rebuilding of the old El Camino Real, from San Francisco around the bay, nearly 400 miles to Sausalito. The plan received the official approval of the northern California delegation, and when it became known among the southern legislators that the north sought the first fruits of the big fund there was much talk of Los Angeles County making pressing demands for immediate reimbursement for the \$3,000,000 which that county already has spent on its roads.

All Graded Streets Have Sidewalks

Waterloo, Ia.—During 1910 54,026 square yards of asphalt paving were laid, about three miles of thirty-foot roadway. The cost was \$105,806. Of curbing 37,112 feet were laid at a cost of \$22,504. Of cement sidewalks 21,916 linear feet were laid at a cost of \$9,266. Practically every graded street in the city is now provided with a cement walk.

SEWERAGE AND SANITATION

New Bedford's Sewage Problem

Boston, Mass.—In its annual report to the Legislature, the State Board of Health made reference to the sewerage conditions existing at present in New Bedford and of the progress that is being made to remedy them. The board characterizes the present conditions in the river and in Clarks Cove as "serious nuisances." As to the plan proposed for emptying the sewage in the bay southeast of Clarks Point, the board states that there is no doubt that it will be effectually disposed of.

Collingswood Sues Sewerage Company

Collingswood, N. J.—The Collingswood Board of Health has directed the Borough Solicitor, Ralph Kellum, to apply to the Court of Chancery for a rule to show cause why an injunction should not issue restraining the Collingswood Sewerage Company from continuing the operation of its plant, it being contended that as now operated the plant is a public nuisance. It will be alleged in the bill that residents in the immediate vicinity of the plant have been nauseated and made sick by offensive odors and compelled to keep their windows closed.

Pasadena to Have Big Storm Drain

Pasadena, Cal.—This city is now constructing an immense storm drain to carry off flood waters and prevent further washing out of streets. At its largest section the drain is nine feet eight inches wide on the inside and seven feet seven inches high. It is three miles long and will cost, when completed, \$163,000. The initial order of cement called for 10,000 barrels, and this will be but a starter on the work. It is expected that the drain will be completed by next July.

Paterson to Sign Sewer Contract

Paterson, N. J.—Mayor McBride has been authorized to sign, on certain conditions, the contract submitted by the Passaic Valley Sewerage Commission, binding the city to become a party to the trunk sewer. The instructions given the Mayor contain a very important provision, which was inserted to protect the taxpayers of this city from being placed in the position where they will have to go down into their pockets for unlimited amounts of money to pay their proportion of the cost of the big drain. The instructions are embodied in the following resolution: Resolved, That the Mayor be authorized and directed, on behalf of the city, to sign the sewer contract submitted by him at this meeting and as proposed by the Passaic Valley Sewerage Commission, with the addition of the following clause: "And it is further provided that the actual work contemplated in this contract shall not be commenced, nor shall the Commission become obligated to any contractor for any part of the said work until such time as the Commission shall have received actual, bona fide offers from a reputable and responsible contractor or contractors to complete said work within the sum of \$12,250,000, including the costs of rights of way and other necessary property and equipment."

Sanitary Drinking Fountains

Louisville, Ky.—Drinking cups in Louisville's public schools have been unanimously condemned at a joint meeting of the Board of Health and the Board of Education. It is proposed to supplant the cups with hygienic drinking fountains.

City's Largest Sewer Finished

Schenectady, N. Y.—The largest piece of surface sewer work ever undertaken by the city of Schenectady, that of laying the five-foot concrete drain along the Plaza, in the Eleventh Ward, from West alley to Waverly place, crossing Glenwood and Park boulevards, is about completed. The total length is about 1,000 feet. All that Contractor W. D. Goodale has to do now, so far as the city's work is concerned, is to repave the Plaza and trim up the edges of the thoroughfare. The total cost to the city will be about \$26,000. Besides being the largest single surface sewer ever constructed by the city, the big drain also has, as part of it, the largest concrete arch ever built here for sewer purposes. The arch is necessary to carry the sewer over one of the depressions in its course.

WATER SUPPLY

Lake Ashburton Opened

Baltimore, Md.—With a twist of a wheel and the opening of the flood gates, Mayor Mahool January 18 sent the water of Lake Ashburton, the new high-service reservoir at Forest Park, coursing through the pipes into the homes of nearly 150,000 people. The dedication took place in the presence of a crowd of people after the reservoir had been turned over to the city by United States Senator Thomas S. Martin, of Virginia, Vice-President of the Lane Bros. Company & Jones, the contractors who built it. The water reaches the reservoir from Lake Clifton through the Mount Royal Pumping Station, and on January 11 the lake was filled. The neighborhood supplied by the reservoir is known as the western high-service district, and includes a section of the city about a mile and a half wide, running from Dolphin street to Druid Hill Park, diagonally southwest from Jones' falls to the western and southern limits of the city.

Cleveland to Try Free Water System

Cleveland, O.—The free water system is to be tried in Cleveland. It was suggested some time ago by Mayor Baehr, and since then Water Works Superintendent Smith has been working out the details of putting the system to a practical test. Under the free water system expenses of the department will be met with money raised by taxation. It shifts the payment for water from the individual consumer to the taxpayer. Information gathered by Superintendent Smith from many cities which now have free water shows the system to be successful. The charge that the water consumption would be more than doubled by the free water system is not sustained by information Smith has gathered.

Faucets of Free Hydrants Stolen

Louisville, Ky.—The small boy has brought the Louisville Water Company and the Board of Public Works face to face with a serious problem. As quickly as practicable the Health Department is condemning public pumps, the Board of Public Works is ordering them removed and the water company is substituting them with hydrants. The brass faucets of the public hydrants have caught the fancy of the small boy of Louisville, and he has been playfully and gleefully removing them about as fast as they were installed. Each theft of a faucet results in a neighborhood being deprived of free water until a new one can be substituted. The removal of a faucet often makes it necessary for the persons of a neighborhood dependent upon free water to walk several blocks to secure it.

Seeking New Water Supply

Newark, N. J.—That the East Orange Board of Water Commissioners is by no means confident that its present source of supply will in the end be sufficient for the city's needs is demonstrated by the fact that, according to the annual report of that body, application has been made to the State Board of Water Commissioners for a proportionate interest in the Wanake watershed, with Newark, which has made a similar application. The situation is expressed in these significant words: "It is probable that we shall, in the end, be compelled to rely on surface water from the streams of the northern part of the State for any considerable addition to our supply." The report goes into the situation which became acute last summer, when wells in the neighborhood of the pumping plant at White Oak Ridge began to go dry and the suits against the city, which had already begun, rapidly multiplied. The decision of the Supreme Court, which was to the effect that sufferers from the loss of water on the land they occupied might continue to recover for damages by diversion, forced the city to take prompt steps to protect itself, and the proceedings already under way to acquire adjacent lands were the result.

Use of Hypochlorite of Lime Discontinued

Niagara Falls, N. Y.—The Board of Water Commissioners voted to discontinue the use of hypochlorite of lime in the city water. The process met with fair success until cold weather set in, when the taste of chlorine could be discerned in the water and it led to considerable complaint.

Water Company Given Chance to Increase Supply

Schuylkill Haven, Pa.—The quo warranto proceedings brought by the Attorney-General of the State to forfeit the charter of the Schuylkill Haven Gas & Water Company for failure of the company to furnish sufficient water to Schuylkill Haven will probably be discontinued. As a result of consultation of attorneys the case, scheduled for trial in court, will not go on, but instead the water company will be given the opportunity to get the additional water facilities, which the borough was about to buy for \$50,000.

Seattle Water Rate Fight

Delaware, O.—After litigation of nearly two years the City Council and the Delaware Water Company have finally gotten together on a contract, upon which there were compromises by both sides. The contract is for hydrants and a rate of 7 cents per thousand gallons for water for street sprinkling and sewer flushing.

Canal Work May Injure Seneca Falls Water

Seneca Falls, N. Y.—One of the most difficult propositions encountered by barge canal builders when they reach the foot of Cayuga Lake will be to find a way to avoid injuring the water supply of this village. Hermon A. Carmer, Superintendent of the Seneca Falls Water Works Company, says that he has taken the matter up with the barge canal engineers and they have advised him that within a short time they will know what method will be pursued. The Crowell-Sherman-Stalter Company, of Cleveland, will begin work in a few days on its contract to dredge 17 miles from the main canal northwest of Montezuma to deep water in Cayuga Lake. The water company's new intake pipe, recently laid on the lake bottom, extends nearly half way across the lake and ends at just about the point in the lake where the barge canal plans call for dredging. Mr. Carmer thinks that a mechanical filtration plant might be installed to remove any roil from the water while the dredging was in progress.

Health Board Condemns City Water Supply

Shreveport, La.—At a recent open meeting the City Board of Health adopted a resolution condemning as unhealthful and unsanitary the present source of the city water supply, and served notice on the city administration to make efforts within 30 days to remedy the trouble. If the Commissioners fail to act the Board of Health will then call citizens together and urge them to correct the evil.

Los Angeles Aqueduct Construction

Los Angeles, Cal.—Chief Engineer William Mulholland has made a verbal report of the work accomplished in 1910 on the aqueduct. If the work continues in the future at the same rate as that which was maintained during 1910, it will require 18 months more to finish. The construction work for the year amounted to 55 miles, but there was a considerable period during which work was practically at a standstill, and for several months it was retarded by shortage of funds. In spite of this, the progress of 55 miles stands as the record year of the project. The big Elizabeth Lake tunnel, 5 miles long through solid rock, is so nearly completed that the miners who are working toward each other from each end sometimes fancy they can hear the opposing crew through the thin wall of rock. Miles and miles of tunnels, long and short, have been bored and lined in the Jawbone Mountains, and now stand idle, only awaiting the water. Practically all that remains to be done is straight-away ditch digging, which can be accomplished by the battery of steam shovels. It is simply a question of time. A steam shovel can move so many feet a month. There are so many steam shovels and so many miles. The greater part of the work still remaining to be done is at the north end of the aqueduct. The Haiwee dam, which will create the immense Haiwee reservoir, is nearly completed. Work is progressing rapidly on the intake, where the water will be transferred from the Owens River to the huge canal which will carry it into the Haiwee regulating reservoir at the lower end of which the conduit proper begins. The aqueduct, when completed, will be 215 miles long. Of this distance 129 miles has been covered. In building 55 miles last year the aqueduct forces removed 2,500,000 cubic yards of rock and earth, used 300,000 barrels of cement and spent about \$4,000,000.

Impure Water Cause of Typhoid at Niles

Niles, Ohio.—In view of the prevalence of typhoid fever in Niles Dr. H. V. Ormeroid, Health Officer, was asked to make an advisory statement as to the best precautionary measures against the contraction of this dread disease. He said that the simplest and best preventive is the old one—to boil all drinking water and water used in cooking and for similar domestic purposes, unless one is absolutely sure that it is pure. The city water and that from open wells or cisterns into which surface water empties should positively not be used without its first having been sterilized by boiling. Sixty cases of typhoid fever are reported here at the present time, and it would seem that it would pay to use every precaution to avoid an increase of the epidemic.

Wants City to Buy Pumping Plant

Pittsburg, Pa.—The city is to be asked to purchase the pumping station of the Monongahela Water Company, in the West End. The water company expects to show that Councils should appropriate money for this purpose in consequence of an agreement made between them and the city some time ago, when a Councilmanic bond issue of about \$5,000 was voted, the proceeds of which was to be used to buy the lines of the company in Esplen and Elliott. It was made necessary to buy these lines when Elliott and Esplen were annexed. At the time of the agreement the water company expected to sell their pumping station to one of the three railroad lines near which it is situated. For some reason this deal was not consummated. The water company now claims that its pumping station is of no value, since the city has bought its lines and no one else wants to buy the plant. An ordinance will soon be introduced asking that the city purchase this plant.

Majority Favor Municipal Water Plant

Plainfield, N. J.—The question of the advisability of establishing a municipal water plant in this city, or purchasing the plant of the Plainfield-Union Water Company, was fully discussed at a meeting held for the purpose in the Council chambers under the direction of the special Water Committee, of which Councilman F. E. Mygatt is the chairman. The weight of the argument was in favor of a municipal plant, and a majority of those present, either by applause or by word of mouth, indicated that they were in favor of the city controlling the local water supply.

Would Reduce Cost of Pumping Water

Fort Worth, Tex.—A new type of air pump which the inventor declares will reduce the cost of pumping artesian water to one-half of what it is at present was tested last week on one of the big wells in the city artesian system. The pump is the invention of Bryan Obeare, of St. Louis, and the test was made under his direction and in the presence of a number of city officials and officers of several companies owning artesian wells. The pump works on the principle of air expansion, the air being supplied from a compressor. It will operate on low pressure, and this is expected to result in the saving. In the test it lifted water from a depth of 270 feet at the rate of 220 gallons per minute, while the ordinary air compressor pump will raise but 150 gallons per minute from the same depth. It required but 350 cubic feet of free air each minute to raise the water, while an ordinary compressor required 550 cubic feet of free air at a pressure of 90 pounds against a pressure of 61 pounds for the new type. Perry Pennington, a prominent engineer who viewed the test, estimates that the new pump would save the city the sum of \$127,000 annually if attached to the various wells making up the city artesian system.

Helena Will Buy Water Works or Build

Helena, Mont.—The City Council has decided to give the Helena Water Works Company until March 6 to submit a proposition to sell its plant to the city at a reasonable figure. If such offer is not received within that time a resolution adopted provides that thereafter the company is to be considered a nonentity and the Council is to proceed to construct a plant for the city, \$650,000 worth of bonds to be offered on April 1 and contracts to be awarded on April 24.

Meters Decrease Consumption of Water

Elkhart, Ind.—Reports compiled by the Elkhart Water Company indicate that a total of 1,163,215,196 gallons of water were pumped by it for consumption in Elkhart during 1910. The daily average was 3,186,891 gallons, or about 165 gallons per inhabitant. The greatest amount any one month was in July, 142,115,314, or a daily average of 4,584,365. The next highest month was August, 124,457,586. Superintendent Crull stated that there has been a slight decrease in consumption due to a big increase in the number of water meters now in use in the city. There is now a total of about 1,000 meters in operation in Elkhart, 400 of which were installed during the past year. The company provides water for about 4,000 taps in Elkhart.

Purer Water for Des Moines

Des Moines, Iowa.—The new ordinance fixing the standard of the city water supply, drafted by Mayor Hanna and City Bacteriologist W. A. Guild, and which is modeled after the Omaha ordinance of the same nature, seems likely to pass. The water company will be given three months in which to raise its supply to the standard set by the ordinance. The water must be free from gas-producing bacteria, colon bacilli or other pathogenic bacteria. The number of bacilli must never exceed 50 per cubic centimeter. The chemical factors must never exceed the following proportions: Parts per million, total solids, 450.00; free ammonia, .04.

Filter Plant Needs Bacteriologist

Escanaba, Mich.—At a recent meeting of the Common Council Dr. H. W. Long, City Health Officer, read a letter from Dr. F. W. Shumway, Secretary of the State Board of Health, in which the writer stated that he had written W. J. Hatton, Superintendent of the Escanaba Water Company, requesting him to secure a competent bacteriologist to take charge of the filtration plant and retain his services until the plant can be properly operated by a person not versed in bacteriology. With his letter Dr. Shumway enclosed a report made to him by Prof. Thomas S. Ainge, giving the results of the latter's recent inspection of the filtration plant and investigation of general health conditions here.

STREET LIGHTING AND POWER

To Put Lighting Brackets on Trolley Poles

Baltimore, Md.—In keeping with the "City Beautiful" idea, as advocated by the civic center plan, Superintendent of Lamps and Lighting McCuen announces that he has made arrangements with the Gas Company and the United Railways to use their poles for the lamps on Light street, between Pratt and Lee streets. To avoid the duplications of poles when the new tracks are laid down the middle of Light street, Mr. McCuen will place his lamps on the same poles used by the trolley. Artistic fixtures will be used and a new style pole will be necessary.

Fine Showing of Columbus Light Plant

Columbus, O.—Nearly \$10,000 was received from the sale of current from the municipal electric light plant, according to the annual report of Superintendent Gamper to the Mayor. In his report the electric light plant superintendent states that during the year the plant received for expenditures \$81,518, and that the expense of operating the plant and lighting the city was \$52,243, while the expenses of extending the plant were \$24,643. The net expenditures of the plant were \$63,611.42, leaving a balance unexpended of \$7,907. The average number of arc lights in service was 2,340, the number of tungsten lights equal to arc lights, 60, and the number of arches burning equivalent to arc lights, 200, or a total of lamps, 2,600. The net cost of each arc lamp was \$16.28, according to Mr. Gamper.

Buys Lighting Plant

Frederick, Md.—A further step in the direction of municipal ownership has been taken by the purchase by the Town Commissioners of the Citizens' Electric Light & Power Company. The price was \$19,846.72. Already Frederick owns its water works and an electric plant for the city lighting.

Lumber Company Furnishes City Lights Free

Marked Tree, Ark.—By the withdrawal of the \$5,000 license derived from the four saloons which are now allowed to run without license, it was thought by many people that all the necessary adjuncts to run an incorporated town would have to be dispensed with here in Marked Tree, and that the streets would be in utter darkness. While it is true, perhaps, that the town is badly crippled in a financial way, yet the street arc lights will continue to shine as heretofore, as the Chapman & Dewey Lumber Company has sent a letter to the City Council offering to give lights free.

Municipal Electric Plant Wrecked

Nelsonville, O.—One of the engines of the municipal electric lighting plant "ran wild" on January 21, following the breaking of an eccentric rod, and massive pieces of machinery were hurled in every direction, badly wrecking the plant and building and killing the night engineer. The spokes of the two-ton flywheel flew out, and all of the machinery connected with the engine was ruined, but a double engine system enabled the plant to resume partial service.

Bond Election Illegal

Trenton, Tenn.—The city of Trenton some months ago bought from Keenan & Wade the electric light plant and issued bonds for the payment of the same. It turns out that the election at which the question of issuing the bonds was voted on was not legally held, and the bonds have therefore been declared invalid. The city had been running the plant for three months and collecting the money for the lights. When the city found that the bonds were illegal and not binding, it tendered back the plant to Keenan & Wade, who refused to accept it, and so the city is in darkness, with no prospect of a settlement of this question at any future time without long and costly litigation.

Electric Lighting Installed in Place of Gas

Plainville, Conn.—The system of street illumination was changed January 15 from Welsbach gas to Mazda electric lights. Ninety lights were installed at a cost of \$20 a year to the town, the same price, \$1,800, as formerly paid for 67 gas mantle lamps. Lincoln S. Risley, local representative, recently secured a five-year contract for the Housatonic Power Company.

Light Plant Brings Substantial Profit

Tacoma, Wash.—The receipts in the Light Department for 1910 were \$455,944, and the expenditures \$425,496, leaving a margin of \$30,447. The sum of \$122,837 was spent for construction work, all of which was taken from the receipts of the plant.

To Have White Way

Centreville, Ia.—This city is to have a "white way" similar to Des Moines and other cities. Large cluster lights will be placed around the square.

New Use for Electric Power

Schenectady, N. Y.—At a meeting of electrical engineers Henry L. Doherty, New York City, made the prediction that the time is not far distant when electricity will be used during the summer months to produce refrigeration in our homes, places of business and elsewhere, just as coal is now burned to keep them warm in winter, surprising his hearers. While the speaker did not go into details of this plan he said that this cooling process would be accomplished by companies operating a small motor-driven refrigerating apparatus, a small ammonia gas compressor and a brine circulating pump.

City Meter Tester Being Installed

Scranton, Pa.—Under the direction of Meter Inspector Fred Ward, a meter testing apparatus is now being installed on the fourth floor of City Hall. The machine, which is now being connected, will be used for ascertaining the accuracy of water meters. Machines for testing gas and electric meters will be installed later. Since the creation of the office of meter inspector there has been no official testing machine. It has been necessary to use the testing machinery of the Scranton Gas & Water Company. In his last annual message Mayor John Von Bergen urged upon Councils the advisability of having an official testing machine for water meters.

FIRE AND POLICE

Gasoline Fire Engine in Commission

Cohoes, N. Y.—Chief Collin states that the reports that the gasoline fire engine stationed at the McCreey Steamer Company's quarters was out of commission was untrue. He says that the engine has been used 15 times since January 5 and is in good condition. The engine has been run every day for the instruction of the men who are to operate it and has not balked once. The Chief stated that the engine will be run every other day for a week or so and then only when necessary, as the men are becoming well versed in the work of running the engine.

Law Book for Policemen

Chicago, Ill.—LeRoy T. Steward, Superintendent of Police, has had compiled and published a book for circulation among members of the Chicago Police Department, which explains the points which a policeman should know. The book includes definitions of such words as burglary, arson, kidnapping, etc. Legal procedure, rules of evidence and similar matters are also explained.

Marshal Discusses Arson and Carelessness with Matches

Columbus, O.—State Fire Marshal John W. Zuber in his annual report to Governor Harmon says that as a result of investigations by his force there have been 30 convictions during the year for arson and that 38 cases are pending. During the existence of the department the annual loss from incendiarism had been reduced from \$350,000 to \$110,000. Regarding fires originating through carelessness with matches, the Fire Marshal says: "During the year 1909 538 fires in Ohio were caused through carelessness with matches, and 182 of such fires were directly traceable to children playing with matches. The total fire loss from such fires was \$191,543. We believe the General Assembly should enact a law making it unlawful to sell, give away or have in your possession in the State of Ohio the match known as the friction match. We are also impressed with the increase of accidents caused by thoughtless and careless parents locking their children in their home and leaving them alone, and during the absence of the parent the child plays with fire or matches, fires its clothes and the home, and is incinerated and the home destroyed. We believe the General Assembly should make it a felony for any parent or custodian of children to go away from the home leaving their children alone and locked or shut up in the house."

Inspect Police Alarm System

Mishawaka, Ind.—Mayor John A. Herzog and a party of city officials visited Fort Wayne last week to inspect the alarm system installed there by the Signal Phone Police Alarm Company, of Milwaukee, Wis. All were favorably impressed with the system, and enjoyed the trip and the hospitality of the Fort Wayne city officials. They were met by Mayor Grice and members of the administration and taken about the city in automobiles, looking particularly into the workings of the police alarm system, whereby the patrolmen make hourly reports to headquarters. Among the party from Mishawaka were Mayor John A. Herzog, City Clerk James L. Kennedy, City Engineer James Haverly, Street Commissioner Otto Muinch, Councilmen at Large D. J. Campbell and Frank I. Bickel and Councilmen Nelson Christianson, David Burkhardt, Richard Rogeman, Fire Chief Albert J. Buysse and Deputy City Clerk George Raab.

Want Paid Fire Fighters

Wilmington, Del.—A movement is on foot to abolish the volunteer fire department and to present a bill to the present Legislature to authorize a paid department for Wilmington. At least one company has offered to dispose of its buildings and equipment at a nominal figure to the city, and another company has offered to give to the city its buildings and all equipment. The proposed bill provides for eight companies of eight firemen each, to cost for maintenance about \$72,000 annually, whereas the present department represents an expenditure to the city of \$67,000 a year.

Town Wants Police Call System

Westfield, Mass.—A representative of the New England Telephone & Telegraph Company has conferred with Chairman Lewis C. Parker, of the Board of Selectmen, and Chief William A. Flouton relative to the installation of a police system. Cost will be estimated on a proposed plan to install five alarm boxes. These boxes are to be connected with the Central Police Station, and every half hour each officer will report. In addition it is suggested that a light be added to each box so that it may be lighted from the police station and attract the attention of the officer on the beat, who will call up and learn what is wanted. But five boxes would be necessary at first and the annual cost would be a small item. In Peabody, where there are 17 boxes, the annual cost is but \$450. In order to have the new system work successfully, it will be necessary to have a night man in the station and this will be the greatest item of expense. At present the night arrangement is a hit or miss affair, and there is no way that an officer may be summoned except by telephoning to some one in the business section to go out and look one up.

Would Consolidate Police and Fire Alarm Systems

Milwaukee, Wis.—Consolidation of fire and police alarm systems was recommended by the Mayor in a special communication to the Council last week. The consolidation, he suggests, should be quite complete, but the operators will be left in control of each department, although a general superintendent may be appointed. The Mayor stated that after investigation he found it feasible to consolidate the systems for the sake of economy, and that it could be done without crippling either. The cost of installation, repairs, maintenance and extensions he wants paid by one department and larger cables used. Last year 1,172,682 police calls came in, while the Fire Department received 2,000 alarms over its system.

Leggings for Traffic Squad

New York, N. Y.—The regulations of the Police Department have been amended so as to require traffic squad patrolmen and sergeants to wear leggings with winter uniforms. These are to be of black grained oak tanned leather, puttie pattern, to fasten at the bottom with concealed metal catch and at the top with buckle and strap.

Cause of Some False Alarms Explained

Racine, Wis.—Chief Cape appeared before the Fire and Water Committee and submitted a report on the A. D. T. telegraph system. He proved to the committee that during the past two years seven alarms had been sent in over the A. D. T. and that six of them were false alarms. The Chief said that most of the false alarms were caused by watchmen in factories setting the wrong indicator, not having been properly instructed on how to operate the boxes and he would recommend that the company either see that the watchmen are properly instructed or else have the fire alarms cut out altogether. Mr. Baker, a general agent for the A. D. T. system, was in the city recently, and stated that he would see that the system was put in first-class condition, and that there would be no more trouble with false alarms coming in.

High-Pressure Installation to Reduce Insurance

Spokane, Wash.—Lee McKenzie, Chief Surveyor of Washington of the Fire Underwriters, has submitted to the Board of Public Works in writing his proposition to reduce insurance premiums in the business district 10 per cent, providing the proposed high-pressure fire-fighting water system is put in. Mr. McKenzie made the offer to the Board after going over the plans for the improvement, which is to cost about \$150,000. He demands, however, that the high-pressure service be extended to Second avenue, originally left out by Water Engineer Alexander Lindsay's plans. Water Commissioner Armstrong says this will be done. The high-pressure plan involves the laying of 12-inch mains on Main avenue, Sprague avenue and Second avenue, connecting with the high-pressure 30-inch main direct from the pumps on Division street. Cross mains 10 inches in size are to connect the 12-inch mains at every other cross street. Fire Chief Myers says the system will give Spokane the best fire-fighting facilities in the business district of any city in the West. It will make fire engines downtown unnecessary.

Council Votes to Disband Volunteer Department

Jamestown, N. Y.—In response to the vote of the taxpayers of the city the Common Council has voted to disband the local volunteer fire department on March 1 and substitute a paid department of eight companies, with five men each. It is estimated that the cost of maintaining the department for the first year, including salaries and other expenses, will be \$40,000. The volunteer department is one of the oldest in Western New York, having been organized on its present basis about 1838. It consists of eight companies, with an average membership of about 30 men. The companies are already equipped with good apparatus and teams.

Police-Woman Makes Good

Los Angeles, Cal.—So helpful has Mrs. Stebbens Wells, Los Angeles' police-woman, been to the Police Department that Chief of Police Sebastian is to ask the City Council for a squad of five additional women for patrol duty. Sebastian declares that Mrs. Wells has been a potent factor in the administration of police affairs since her appointment four months ago. In his opinion, police-women can do a great deal of good in preventing crime and aiding delinquents to keep out of the meshes of the law. Sebastian will also ask for 100 extra patrolmen.

Fire Chief Reports Work of Department

Elkhart, Ind.—The report of Fire Chief John Ulrich for 1910 shows that the total expenditures for the year were \$29,606.61, divided as follows: Salaries, \$18,295.33; equipment, \$8,500, and miscellaneous expenditures, \$2,811.28. The inventory of the different stations shows the value of the Central station house, lot and contents, \$35,070.30; Station No. 2, \$9,527; No. 3, \$8,512.70; No. 4, \$8,367.60; total \$61,477.60. The total number of gallons of chemicals used was 813 and the number of feet of ladders used, 700. Number of miles traveled by the companies, 534, and number of feet of hose laid, 50,550. The estimated loss on buildings and contents was \$303,034 and the insurance collected was \$86,971.

GOVERNMENT AND FINANCE

Good Financiering by Commission

Columbia, S. C.—For the first time in years the city of Columbia will have a surplus available for permanent improvements under the income estimated by the City Council for the year 1911. Except for its floating bond issue, the city will be free from debt. According to the calculations, a "reserve fund" of \$118,705 can be used for permanent improvements in 1911. When the present City Council took charge of Columbia under the commission form of government, it faced a deficit of approximately \$65,000. At the end of 1911 Columbia will be out of debt, having spent a large sum for permanent improvements. The total income of 1911 is estimated at \$449,455.

New York Bonds Sold on 4.20 Basis

New York, N. Y.—The sale of \$60,000,000 4¼ per cent bonds at an average price of \$100,904 was considered very satisfactory by Controller Prendergast. The total number of bids submitted was 568, and the issue was oversubscribed five times. J. P. Morgan & Co.'s bid of all or none at 100.897 barely failed. The largest successful bid was Kuhn, Loeb & Co., who will get \$11,000,000. At a sale of \$50,000,000 bonds about a year ago the average income yielded at the selling price was 4.14.

Commission Government Elections

Ottawa, Ill.—By a vote of 1,227 to 445 commission government was adopted January 17.

Decatur, Ill.—By a majority of 878 commission government was adopted January 17.

Dixon, Ill.—By a plurality of 159 commission government was adopted January 17. Every precinct but one voted to adopt the plan. The total vote cast was about 60 per cent of the usual municipal vote.

Elgin, Ill.—By a majority of 840 votes commission government was adopted January 21. Two-thirds of the total vote of the city was polled. The change will become effective May 1 and 50 candidates will seek nominations for commissionerships at the primary next month.

Claim Much for Municipal Ownership

Monroe, La.—Friends of municipal ownership who are advocating the re-election of Mayor A. A. Forsythe point to the wonderful growth of the city during the 12 years Mr. Forsythe has served. Twelve years ago there were less than 4,000 inhabitants, and the city was refused credit for a barrel of lime. It owed property valued at less than \$20,000, with no utilities or conveniences. After an experience covering a decade under the municipal ownership plan Monroe to-day, paying 10 mills less taxes than other Louisiana cities, owns property valued at more than \$750,000, has a population exceeding 10,000, a radium-salt water natorium, 9 miles of electric car lines, electric lighting system, water works, park of 100 acres, gas well, artesian well, public school building, \$100,000 City Hall, fire station and jail, traffic bridge across the Ouachita River, 12 miles of sewerage, paved and graveled streets, 80 acres of gravel deposit valued at \$25,000 and a city hospital. The people are the owners of all their public service corporations.

City Adopts New Form of Voucher

Corning, N. Y.—A new form of voucher has been adopted at the direction of Mayor Ellison for the use of the city in the future. The feature of the voucher is that the check which is drawn to pay the bill appears on the reverse side of the bill so that the two cannot become separated. By this arrangement in the future both will be on file with the City Chamberlain instead of having the bill on file with the City Clerk, as had been the case heretofore, and the check as returned from the bank on file with the City Chamberlain. The new voucher was designed by Mayor Ellison personally after he had given the subject much attention. Hereafter all bills against the city will have to be presented on a standard form in order to be audited by the Audit Committee.

Meeting Called for Uniform Municipal Government

Lansing, Mich.—M. F. Gray, of the subcommittee appointed from the Citizens' Council and City Committee some time ago, is busy compiling a list of the principal cities of the State and arranging preliminaries for calling a meeting of delegates from such cities for the purpose of getting some measure through the Legislature relative to uniform municipal government. It is proposed to present a measure to the Legislature that will permit cities to embody in city charters the recall and referendum clauses. The matter of commission form of government and those parts of it in which the State has to deal will also be discussed and taken up with the Legislature by committees to be appointed from the delegates attending the gathering. Considerable detail surrounds the work of getting the delegates together and presenting questions to be discussed.

Mayors May Be Recalled

Seattle, Wash.—A special election will be held February 7 for the recall of Mayor Hiram C. Gill.

Tacoma, Wash.—An application has been made to City Clerk W. H. Cushman for recall petition blanks and charges against Mayor A. V. Faucett have been filed by M. B. Stambaugh, former Councilman under the old form of government. The Mayor is charged with building up a personal political machine and other offenses.

Spokane Adopts Commission Rule

Spokane, Wash.—By a majority of 2,237 out of a total of 10,463 votes, the commission plan charter, drawn by a committee of 15 freeholders, has been accepted. The following will be the immediate effects of the new charter:

"Any official filling an elective office may be recalled. Any new ordinance may be introduced by initiative petition and election. Referendum may be applied to any ordinance except emergency ordinances, ordinances ordering local improvements and those ordering the annual tax levy and appropriations. Any provision of the new charter may be amended by petition and election. Succeeding elections of city officials will be under the new commission system, the next general election to be on March 7."

The other powers of the charter—those which directly affect the administration by the commission—will go into effect when the first commission has been elected and has qualified.

Discuss Commission Form of Government

Trenton, N. J.—Mayors and others, delegates from cities in all parts of the State, assembled January 24 to discuss the commission form of government as a means of relief from partisan abuses and other municipal ills. It was Civic Day of Trenton's "Know Your City Week," and the Trenton Chamber of Commerce and Mayor Madden's non-partisan civics commission were in charge. In the afternoon there was a mass meeting with an address by Commissioner MacVicar, of Des Moines, who has served his city officially under the old and the new form of government. Mr. MacVicar enthusiastically advocated commission rule as carried out in many of the cities of the West. This evening J. Horace MacFarland, president of the American Civics Association, delivered an address on "The City Beautiful."

Lynn City Engineer Makes Report

Lynn, Mass.—Eleven thousand, three hundred and sixty-seven feet of sewer, 17,330 square yards of Hassam paving, 9,202 square yards of granolithic, 6,266 square yards of tar concrete and 18,395 feet of curbstones were laid in this city in 1910, according to the report of City Engineer George I. Leland, which is just issued. The aggregate expenses of the City Engineering Department were \$8,806.81. An unexpended balance of \$664.36 was transferred by the Committee on Finance to other departments at the close of the fiscal year. The salaries of the assistants to the City Engineer amounted to \$5,311.17. His own salary is \$2,500.

STREET CLEANING AND REFUSE DISPOSAL

City Wins Garbage Suit

Syracuse, N. Y.—At his second trial on the charge of violating a city ordinance by collecting garbage, George Checksfield, of Onondaga, was convicted by a jury in the Court of Special Session. Justice B. J. Shove suspended a sentence of \$50 fine, provided an appeal is not taken. The case against Mr. Checksfield is one of about 15 which the city has started to prevent the practice of farmers gathering garbage from boarding houses, hotels and residences. The prosecutions are the result of complaints of the Syracuse Reduction Company for violation of its contract with the city and the commencement of a suit against the municipality for \$20,000 damages. The company claimed that its profits on the contract were partly in the by-products of the reduction plant, and that the most valuable part of the garbage was being taken by the private collectors. The ordinances prohibit the collection of garbage by individuals without a permit. The only authority to grant permits is vested in the Common Council and the Commissioner of Public Safety. It was claimed at the Checksfield trial that he has about 90 hogs to which he feeds the garbage. The same practice is charged against other collectors. It is also claimed that they use the same wagons for drawing garbage and milk which is sold in the city. By living outside the city's jurisdiction, the only method of regulation is by the ordinances prohibiting the collection.

Garbage Problem in Salt Lake City

Salt Lake City, Utah.—Salt Lakers will be forced to pay \$1250 per carload to have their garbage carted out of the city limits by the Salt Lake & Los Angeles Railroad, if a contract measure introduced at the City Council meeting is approved. The document was submitted by the City Health Commissioner, Dr. Samuel G. Paul, and had been prepared at a conference of Councilmen in the Mayor's office. It provides that the city turn all garbage and refuse of any nature over to the railroad at the old city dumping grounds west of the Jordan, on North Temple street. The railroad intends to dump it on a barren tract of land between the city and Saltair. Owing to objections arising over the fact that the contract appears to bind the city to deliver all its garbage, thereby doing away with the need of the city crematory and other present sources of getting rid of it, the matter was referred to the city attorney and the Municipal Laws Committee.

Garbage Collection in Manila

Manila, P. I.—Garbage from houses, markets and shops is deposited in barrels and cleared away by the municipal garbage carts at night to be used, where available, for filling in reclaimed land or burned in the city crematories. On the whole, the natives took kindly to the use of the barrels instead of as formerly throwing their kitchen refuse out into the streets, but the first attempt to introduce metal garbage receptacles of an official pattern was a failure, the material of which the tins were made being so useful for roofing or building purposes that the number of thefts became prohibitive. Experiment is soon to be made with a new type of tin, the material of which will be of a conspicuous and easily identifiable pattern.

RAPID TRANSIT

Subway for Buenos Ayres

Buenos Ayres, Argentine.—After many years of discussion and suggestions by the different authorities in power in the Argentine Republic, permission has just been granted to construct two underground railways within the municipal area of Buenos Ayres, which had become absolutely necessary to relieve the congested traffic conditions in the narrow streets of the city. Platforms at the stations are to be very wide and long, allowing for a train of eight cars to be drawn alongside. The access to the stations is to be by two wide stairs, the entrance and exit being distinct. The depth of the underground railway is to be 22.38 feet from the level of the street, thus necessitating only 30 to 35 steps of the stair to ascend from or descend to the carriages. The tunnel will be made of solid wall of cement and brick, with an arched roof amply high, as the current is to be from above. The way is to be formed of heavy rails to avoid vibration, resting upon sleepers of hardwood, these being laid upon a bed of small stones.

Ask Statute for City Ownership

Des Moines, Iowa.—Mayor Hanna's bill for municipal control of the street car system has been approved by the committee of 25 Polk County delegates in the Legislature and the city legal department, and will be placed on the calendar of the Legislature immediately. The bill provides for the acquiring, leasing and operating of street railway systems by municipalities of over 60,000 population. It legalizes condemnation proceedings and the election of officials to be put in control of the company. Bonds may be issued upon the property without any taxation of general city property or pledging of municipal revenues.

Offer Triborough Bid

New York, N. Y.—The Bradley Contracting Company has written to the Public Service Commission through Frank Bradley, President, offering to build the entire triborough subway route for \$85,437,567. The company also offers to equip the route, together with the Fourth avenue line and loop in Brooklyn, at its own expense, and to operate the lines or turn them over to the city on payment of the cost of equipment plus 10 per cent of such cost. The following statements are made in the formal offer:

"We hereby offer to construct the triborough route, for which bids were submitted October 27, 1910, in accordance with the plans, specifications and terms which accompanied said bills, for the sum of \$85,437,567, or in accordance with such modifications for the triborough route as you may decide upon at a cost proportionate to the above figure.

"We hereby agree to equip at our own expense the said triborough route, the Fourth avenue route and the Brooklyn loop line route and to operate them all in such manner and upon such terms as you in your judgment shall determine to be reasonable to us and to the city of New York, giving proper security for such equipment and operation."

Chairman Willcox, of the Public Service Commission, commenting on the offer, said: "Mr. Bradley has informed me that his offer is made absolutely in good faith, and that his company is willing to construct the road upon the specifications and conditions prepared by the commission."

After the withdrawal of the McAdoo offer in December it seemed for a time probable that there would be no competition for the Interborough.

Will Build Trolley Lines

Charlotte, N. C.—That the Duke interests contemplate a net-work of interurban trolley lines connecting Charlotte and the cities of Piedmont South Carolina, and utilizing the vast water power developed by the properties of the Southern Power Company, in which they are heavily interested, was made known last week, when Messrs. J. B. and B. N. Duke and W. S. Lee unfolded their plans to business men of Greenville, Anderson and Spartanburg, S. C.

Ten-Car Expresses in Subway

New York, N. Y.—Ten-car express trains were run for the first time in the subway January 23. While the work of extending the platforms to accommodate the extra cars will not be completed for a few weeks yet, the subway management decided to begin running 10-car trains at once. Until the new platforms are finished it will be possible to board or leave the last two cars of a train at a few stations only by passing through the other cars.

Street Cleaning Rendered Ineffective

Portland, Ore.—Superintendent A. Donaldson, of the Street Cleaning and Sprinkling Department, in his annual report describes the process of street cleaning and succeeding events as follows: "The principal streets of the city are cleaned and flushed off every night and present a fine appearance in the early morning, but unfortunately for the credit of the department the streets are never allowed to remain clean until the public can see them. Early each morning paper, rubbish and other dirt is swept into the streets by storekeepers and others, spittoons and other receptacles are washed into the gutters, vegetable vendors and others throw refuse into the streets, and soon they look as though they had never been cleaned. All this is in violation of a city ordinance, but it is not enforced by the police, whose duty it is to enforce it."

Wants Enabling Act for Municipal Ownership

Detroit, Mich.—In his inaugural address Mayor William B. Thompson advocated the introduction of a bill into the Legislature to provide for an enabling act in case the people decide for municipal ownership and wish to acquire the street car lines.

MISCELLANEOUS

Teaching Drivers the Law

Beaumont, Tex.—Small pamphlets containing the new traffic ordinance with illustrations how to drive have been freely circulated, and every driver of a vehicle has had an opportunity to get one. Next week there will be a police officer stationed in the middle of intersecting streets in the business section of the city. They will point out to drivers their mistakes and will require obedience to the rules. This will be continued for one week, and the officers will be shifted around to different corners. After that one week of teaching and directing the officers will begin enforcing the law.

Cost of Smokeless City

Minneapolis, Minn.—J. W. Allan, Smoke Inspector, has prepared a statement showing that the elimination of the smoke nuisance in Minneapolis would cost property owners \$7,200,000. This amount would have to be invested in new boilers and smoke consuming devices. Allan says there are 26,000 plants in Minneapolis that should be regularly inspected by the Smoke Inspector. But it is a physical impossibility for one man to do the work, Allan says, and he suggests several assistants be appointed.

May Change Location of City Hall

Pittsburg, Pa.—Frederick L. Olmsted, the city planning expert of Boston, Mass., has made a comprehensive report to the Pittsburg Civic Improvement Commission for a City Hall site, beautiful breathing spots and also outlet to the South Hills, across the Monongahela River, in the now unsightly Hardscrabble district. So impressed with the plans are some of the members of the Commission that they believe the new idea should be given long and serious consideration before the erection of the new City Hall on the market site is started.

Municipal Cold Storage Plant

Cleveland, O.—To reduce the cost of living, the city is planning to rent space to individuals in the municipal cold storage plant being installed in the new West Side market house. Individuals, restaurant keepers and grocery keepers will be encouraged to buy butter, eggs, poultry and other farm products direct from the farmer in summer, when the goods are comparatively cheap, and place them in the cold storage plant for winter use. If the plan succeeds in this case, it is the intention of the city to establish cold storage plants in different parts of Cleveland, in which space will be rented to individuals at a rate which will merely cover the cost of operation. Power to operate the plant is to be supplied by the municipal light and power system. It is thought that by this method high prices which prevail in winter can be broken. Farmers will receive better rates for their products, but the people will not be compelled to pay exorbitant prices now asked for food products by those who store goods in summer to sell in winter. It is believed by Public Service Director Lea that other cities will adopt the plan, if it succeeds here. The city owns a large farm in Warrensville, products from which will be stored for use in the Department of Charities.

Plan to Require Autos to Stop at Near Side

Indianapolis, Ind.—Passage of an ordinance requiring automobiles to make brief stops at the near side of particularly dangerous street crossings as a means of preventing accidents probably will be asked of the City Council by the Board of Public Safety. At a recent meeting the board decided it was time something was done to prevent automobile accidents at certain north side street crossings. With Superintendent of Police Hyland, the Board made a trip to several dangerous crossings and decided to place immediately in the center of the street intersections at Sixteenth and Thirtieth streets, in Meridian street, circles of stone curb $4\frac{1}{2}$ feet in diameter. In the center of these circles ornamental iron poles bearing red electric lights will be placed. This will require automobiles to slow down in order to drive around the obstructions.

Wilmington Park Department Annual Report

Wilmington, Del.—The Board of Park Commissioners in their annual report state that although their work has been hampered by lack of funds, the increased use of the parks by the public shows that the improvements that they have been able to make were much appreciated. The annual expenses were \$23,520. Acknowledgment is made to the J. du Pont de Nemous Powder Company for the gift of two tracts of land, one of 106 acres the other of 18 acres.

Want Food Supply Inspected

Chattanooga, Tenn.—Licensing of the milk dealers, special places for butchering cattle and several other such reforms in the matter of handling the city's food supply are pointed out by Dr. J. C. Brooks, City Food Inspector, as some of things most needed now in Chattanooga. He says that it is now impossible for him to thoroughly inspect the milk which is sold to the consumers on account of the fact that he has no way of distinguishing the dealers. With the license system in vogue, he would have the list of dealers always at command and could more easily keep watch over them. As to the matter of butchering cattle, Dr. Brooks says that there is no way of telling whether the meat which is sold here comes from a good, healthy animal or from one that has died of some sickness. He says that it is sometimes the case that a man who has a cow die on his hands will butcher it and sell the meat in the city. With a regular slaughter house where an inspector could be always on hand this menace to health could be eliminated.

Street Signs and Posts to Go

Evansville, Ind.—A campaign to clear Main street of the hundreds of useless and ugly posts, poles and signs which are to be seen from Eighth to Water streets may be started shortly by the E. B. A. and the Civic Improvement Society. With the appearances on Main street of the ornamental lights, the many posts are more in evidence than ever before.

Ready to Begin Municipal Bathhouse

Brooklyn, N. Y.—Work is to begin at once on the new municipal bathhouse and pavilion at Coney Island. The contract for its construction at a cost of \$176,000 has been signed by the Northeastern Construction Company, of 225 Fifth avenue. The company immediately arranged to start work on the heavy cement foundation for the building. It is the aim of the contractors to have the bathing establishment ready for use early next summer, when thousands of people may daily enjoy a free dip in the surf, regardless of the bathhouse owners, whose monopoly of the ocean front until now has continued unabated for years.

Suggest Municipal Shade Tree Nursery

East Orange, N. J.—A municipal nursery for the rearing of young trees is a novel recommendation contained in the annual report of the East Orange Shade Tree Commission. The difficulty of getting the right kind of trees for planting and the long period required between getting them from the nurseries and setting them out are the reasons for establishing such an institution.

White Way Impossible for Street with Awnings

Forth Worth, Tex.—At a recent meeting of the City Commission Corporation Counsel Slay was instructed to frame an ordinance condemning all permanent awnings along Main and Houston streets. Commissioner Powell, who made the motion to instruct the counsel to take this action, declared that it was useless to construct a Great White Way for these two thoroughfares when awnings on the buildings which line the streets would cut off practically all of the light and mar the beauty of the lights. The motion as adopted provides for a penalty for retaining the permanent awnings along the streets without the permission of the City Commission. Sun shades and awnings that can be raised and lowered will be permitted.

Cities May Operate Coal Mines

Salt Lake City, Utah.—As a result of action taken by the City Council Committee on Municipal Laws at its last regular meeting, it is likely that the resolution introduced by Councilman L. E. Hall several weeks ago authorizing cities to become indebted to the extent of an additional 4 per cent of the value of their taxable property for the purchase and operation of coal lands will be recommended to the State Legislature for enactment into law.

To Abolish Contract Work to Protect Local Labor

Spokane, Wash.—The abolition of all city contract work is urged by Mayor N. S. Pratt as the result of a decision rendered by Superior Judge J. D. Hinkle declaring the city's anti-alien labor ordinance invalid. "Since the anti-alien labor ordinance has been knocked out by the court, the city must find some other way of protecting its resident laborers who have families against the foreign 'floating' element. This means that the city must do its own work in the future, eliminating entirely the contractor and employing its own citizens," said Mayor Pratt. The Mayor believes that the failure of the anti-alien ordinance to hold is the first step toward the sweeping change in the city's policy which he has always more or less persistently urged since he took office—the abolition of all city contract work.

Floor of Concrete Bridge Falls

Youngstown, O.—Part of the concrete flooring of the Spring Common viaduct fell recently and the whole of it will have to be relaid. Several causes are mentioned as contributing to the failure—the concrete was frozen, the sand was loamy, the mixture was 1:2:6, the lay bars were found to be laid on one-foot instead of six-inch centers as required by the specifications.

Pumping Plant Cost \$14,998

Orange, N. J.—Henry H. Berg, Chief Engineer of the Orange Pumping Station, has filed his annual report with City Clerk Willet B. Gano. It shows that during 1910 a total of 1,169,141,287 gallons of water and sewage passed through the municipal pumps. Of this quantity there were 950,580,000 gallons of water and 218,561,287 of sewage. The total cost of maintenance was \$14,998.03.

LEGAL NEWS

A Summary and Notes of Recent Decisions—Rulings of Interest to Municipalities

Water Courses—Adverse Uses

S. O. & C. Company vs. Ansonia Water Company.—In 1884 defendant water supply company obtained from a manufacturing company, a riparian owner below defendant's dam, by a recorded deed, the right to use and divert the water above the dam in consideration of supplying the factory with water required during the working hours during 220 working days in the year. No water was actually taken from the stream under such arrangement, but water was withheld to supply the manufacturing company's wheel, being held substantially two-thirds of the time for the first 15 years, and the effect of withholding it in reducing the waters of the stream was at times serious and perceptible. Held, that other riparian owners could not now claim that defendant was not entitled to so withhold the water for the use of the manufacturing company in view of defendant's open and continued use of the water for that purpose for so long a period.—Supreme Court of Errors of Connecticut, 78 A. R., 432.

Sidewalk Improvement—Lien on Property

Morris et al. vs. City of Gainesville.—Where there is a substantial compliance with lawful requirements in the construction of sidewalks and street improvements in a municipality, and it is not made to appear that the improvements as made are unsuited to the purposes designed, or that such improvements are of no practical value, a lien under the statute on the adjacent property for such improvements may be enforced for the real value thereof under a lawful contract.—Supreme Court of Florida, 53 S. R., 739.

Street Openings—Damages

In re East 172d Street in City of New York.—In proceedings by a city for the opening of a street the damages should have been fixed as of the date when the first street bounding the block was actually opened for public use and not as of the date when the title to such street vested in the city.—Supreme Court of New York, 126 N. Y. S., 284.

Obstructing Street—Rights of Owner

Ogden et al. vs. City of New York et al.—A city constructed docks for use by others for compensation. The contractor doing the work excavated a street so that an abutting owner lost for two years all access to his property and was thereby deprived of its use for that period. A large part of his land fell into the excavation. Held, that the damages inflicted on the abutting owner resulting from depriving him of the use of the street and from his land falling into the excavation were direct and not consequential, and he could recover substantial damages.—Supreme Court of New York, 126 N. Y. S., 189.

Special Legislation—Free Schools

Turner et al. vs. City of Hattiesburg.—Constitution 1890 requiring provision to be made by general laws to prevent the abuse by municipal corporations of the powers of taxation and contracting debts is not self-executing, but requires legislation to put it into effect; and the Legislature may say what is an abuse of such powers by a municipal corporation and provide checks thereon, and it does not invalidate laws 1910, creating the Mississippi Normal College and authorizing municipalities to make donations to secure the location thereof.—Supreme Court of Mississippi, 53 S. R., 682.

Paving Assessment—Bill to Enforce

City of Fairmont vs. Bishop.—A bill by a city, brought under Code 1906, to enforce the lien of a special street paving tax, assessed under section 34 of said chapter, upon the lots abutting on the paved street, is demurrable if it does not allege, in effect, that the owners of the greater amount of the frontage of lots abutting on such street and lying between the same cross streets nearest together, or lying between a cross street and alley, within the same city block, with the lots against which the lien is asserted, signed a written petition asking that the street be paved.—Supreme Court of Appeals of West Virginia, 69 S. E. R., 802.

Water Supply Contract—Cancellation

City of Columbus, Appellant, vs. Mercantile Trust & Deposit Company, of Baltimore, Trustees, and the Columbus Water Works Company and W. S. Greene, as Receiver thereof.—The continuing character of a water works company's contract obligation to furnish an adequate supply of wholesome water is not met by showing that such a supply has been furnished at times, or that, at the time of completion of the works, the company was able to carry out its contract, nor is non-performance excused by the occurrence of conditions which are likely to happen in a climate of long, dry summers. The acceptance by a municipality and its people of improved conditions in a water works system, resulting from complaints, does not estop the municipality to rescind the contract with the water works company for a breach of its contract obligation to furnish an adequate supply of wholesome water, unless such improved conditions result in the continuous maintenance thereafter of such a supply. The maxim that "he who seeks equity must do equity" does not justify a court in denying to a municipality rescission under its cross bill of a contract with a water works company which the latter has broken by failing to maintain a continuous and adequate supply of wholesome water, and in affirmatively restraining the municipality from establishing its own system unless it shall do equity to the bondholders of the water works company by purchasing the usable parts of the water works system. A municipality has the right to treat a contract with a water works company as terminated by the latter's breach of its contract obligation to furnish a continuous adequate supply of wholesome water and to invoke the aid of a court of equity to enforce its rescission, since the remedy at law by an action for damage is wholly inadequate.—United States Supreme Court, 31 S. C. R., 105.

City Attorney's Fees

City of Cartersville vs. Cardwell.—Revised Statute 1900 Section 9339, found in the charter of fourth class cities, provides that, if defendant plead or be found guilty, the Mayor or police judge shall assess the punishment prescribed by ordinance, and render judgment accordingly and for costs of suit. Section 9312, after providing that the Mayor shall have power to remit fines or forfeitures, declares that "this section shall not be so construed as to authorize the Mayor to remit any costs which may be accrued to any officer of said city by reason of any prosecution under the laws or ordinances of such city." Section 9324 provides: "That the Aldermen shall have power to fix the compensation of all officers and employees of the city by ordinance." Held, that an ordinance allowing a fee to the city attorney on appeal from the police court to the circuit court was within the power granted and valid.—Springfield Court of Appeals, 132 S. W. R., 745.

Contracts—Power of Particular Officer

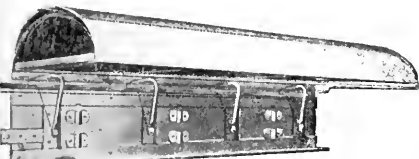
Graff vs. City of Tacoma et al.—Tacoma City charter provides that, subject to the control of the city council etc., the commissioner shall have charge of and superintend the public works, etc., but shall make no purchases in excess of \$500, except upon written contract, and after advertising for bids. Section 130 provides that he shall have special charge and control, subject to the municipal council and ordinances of the city, etc., of the streets, roads and bridges and of improvements and repair thereof, etc. Section 160, which is part of article 12 of the charter, relating to the improvement of streets and kindred improvements, to be made at the expense of the property benefited, provides that the commissioner shall compare bids with the record made by the clerk and award the contract to the lowest legal bidder, etc. Plaintiff in this case made a bid to construct a bridge, which was accepted by the commissioner. Later by ordinance another bid was accepted and the bridge constructed by that contractor. Held, that under the several provisions of the city charter set out above the commissioner could not, by accepting a bid for the construction of the bridge, preclude an award of the contract therefor to another bidder by the city council because Section 160 refers particularly to street improvements, etc., and the others specifically place the matter under the control of the city council.—Supreme Court of Washington, 112 P. R., 251.

MUNICIPAL APPLIANCES

Collapsible Steel Forms

The collapsible steel forms hitherto made by the Collapsible Steel Form Company, Detroit and Carson City, Mich., will hereafter be manufactured by the Concrete Form and Engine Company, Detroit, Mich., who have also taken over the business of the New Belle Isle Motor Company. The new company will make collapsible steel forms, concrete machinery and general utility engines.

The forms are constructed in three pieces, the top (which is semi-circular) and two side-plates. The top and one

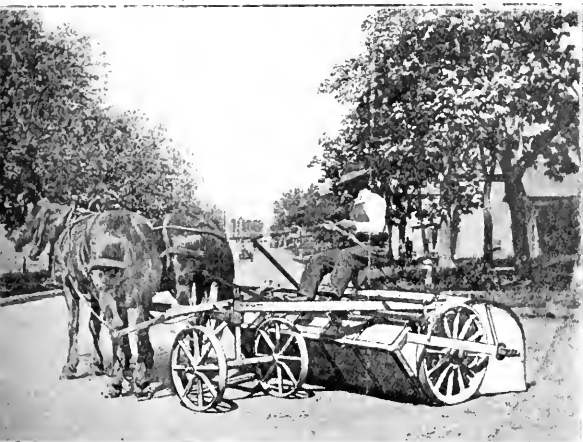


COLLAPSIBLE FORMS FOR SEWERS, CULVERTS AND BRIDGES

The side-plate are shown in the illustration. The working parts of the form are simple and easy to operate. The top, fitting between the two side-plates, is held in position by arms attached to the side-plates by bolts, which allow them to be lowered by pulling the draw-ropes which are attached to the arms. By pulling the draw-rods the arms are lowered and the support of the top is removed, allowing the top to be lowered. The side-plates are held in position by swinging braces so that when locked the sides are immovable. End plates are made which fasten on the top and side-plates by keys so that they may be easily removed. By the use of two side-plates and extra standard size tops it is possible to construct any size culvert ordinarily used.

Sanitary Street Sweeper

The Winters Manufacturing Company, 819 Spring street, Coffeyville, Mo., manufactures a horse-drawn sweeper in which the rotary brush is completely closed in by canvas that very little dust escapes from it. As a result, it is claimed that a street may be swept in the daytime without creating a nuisance. The first illustration gives an idea of the rear construction, showing the brush, also the skeleton steel frame that carries the rear hood.

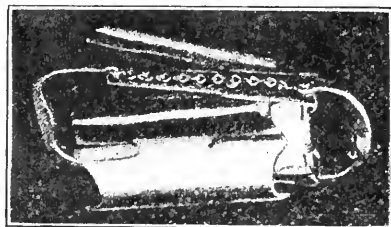


WINTERS SANITARY STREET SWEEPER—EMPTYING DUST BIN

The brush is side-curtained, preventing the dust from leaving the end of the broom. The view also shows the gear drive, which is connected direct with the broom shaft. The construction is simple and there is nothing to give trouble in operating the sweeper. The second illustration shows the dust receptacle lifted, delivering dirt to the pavement. The dust box is strongly reinforced with angle-iron. The box will hold the dirt from about ten blocks of street.

Sewer Cleaning Machine

The Kuhlman sewer cleaning machine, manufactured by the Northern Manufacturing Company, Hammond, Ind., differs from other sewer cleaning machines in that the scoop which does the cleaning is pulled directly against the clogged portion of the sewer. When the scoop is filled, doors provided in the front part of the scoop close and it, with the load, is pulled back easily through the cleaned section and drawn up through the manhole and dumped into a wagon by means of a windlass and cable. This work is accomplished without the necessity of sending men down the manhole. A pulley over which the bucket cable passes is attached at the bottom of the

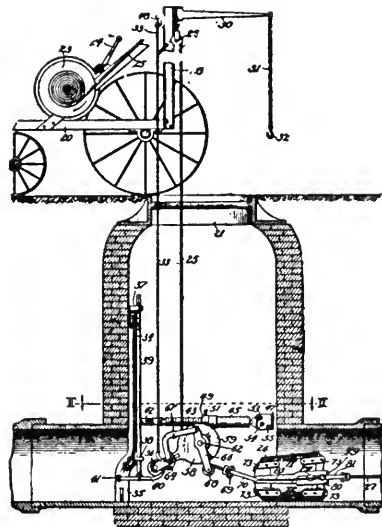


SCOOP OF SEWER CLEANING MACHINE

manhole. This guides the bucket, making the draft direct during the operation of the scoop. When the scoop has been loaded and drawn back to the manhole, a line operated from the surface of the street releases the cable and trolley so that the scoop can be raised.

A light line with a float is first passed from one manhole to another. A windlass and cable is stationed at each manhole. A cable is attached to the line and drawn from one manhole to the other. The scoop or bucket is then

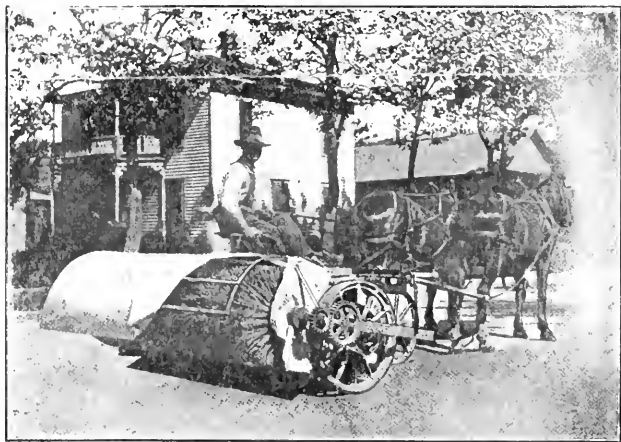
attached and pulled by the cable against the clogged section of the sewer. A lighter cable from the second manhole pulls the bucket with its load back and elevates it through that manhole.



SEWER CLEANING MACHINE

The complete outfit consists of five expansion buckets, one low and one high windlass, two cables and a trolley with pulleys to guide the cables. The trolley system is anchored in the manhole through which the bucket is to be elevated, and keeps the cable from cutting the sewer. After the cable is passed from one manhole to the other the men do all the work from the street. They need not wear rubber boots and oilcloth clothes, hence they can work freely. The bucket allows water to run out so that only comparatively dry sand and mud is drawn out. The company uses a 12-inch bucket for a 16-inch sewer, a 15-inch bucket for an 18-inch sewer, and so on, the bucket being not much less in diameter than the sewer.

Illustrating the efficiency of the machine, the manufacturers state that in operating the machine in Hammond on one occasion the bucket brought out a roll of fine roots. The next pull brought out a root 38 feet long ranging from 5 to 12 inches in diameter. At another time they cleaned a 4-foot sewer in Hammond which had been giving trouble ever since it was built. Complaint of the flooding of cellars during storms had been frequent, although the sewer was large enough theoretically to carry off the rainfall.

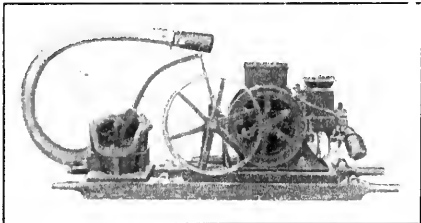


WINTERS SANITARY STREET SWEEPER—REAR VIEW

However, for 12 years no effort was made to clean it except by flushing. In fact, a large centrifugal pump was installed at the mouth of the sewer and operated at every rain with a view to accelerating the flow and removing the sand with which the sewer appeared to be half-filled. Finally the proposition was turned over to the Northern Manufacturing Company to solve. The Kuhlman machine developed the fact that during the construction the contractor had dammed the sewer at intervals with brick walls regularly constructed with mortar joints. These he had never removed. Sand had settled in and filled the sewer to the height of the dams. The Kuhlman machine removed both dams and sand. The sewer, which it was thought would have to be replaced by a larger one, is now doing its work satisfactorily.

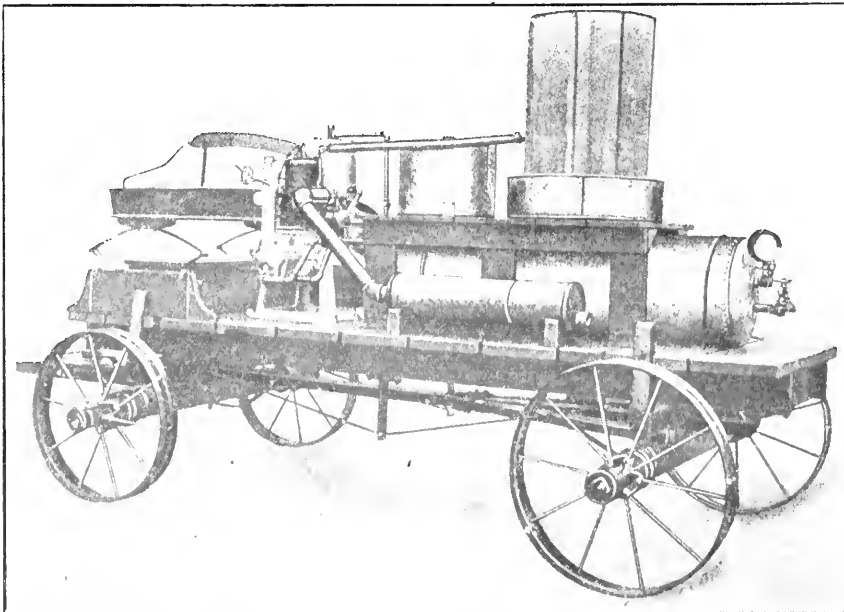
The Douglas Contractors' Diaphragm Pump.

W. & B. DOUGLAS, Middletown, Conn., has designed a self-contained pumping outfit for the use of contractors. It is also used by public service corporations for drainage and sewage work and where pumps of large capacity are operated by unskilled labor. The special

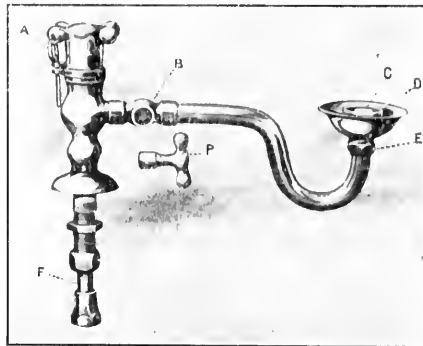


CONTRACTORS' DIAPHRAGM PUMP

feature of the pump is its ability to move large quantities of gritty water at a low price, and to make the unit easily movable from place to place it is mounted on a frame that can be easily handled by four men. The pump is of the diaphragm type and is driven by a gasoline engine. Its capacity is 3000 gallons per hour and it is said to operate on a gallon of fuel per day. All the parts of the engine are inclosed, and the gasoline tank, water jacket, carbureter,



PORTABLE AIR COMPRESSOR WITH GAS ENGINE



UNIVERSAL SANITARY DRINKING FOUNTAIN

muffler, batteries, spark coil and switch are all grouped around the engine. The weight of the pump and engine when crated for shipment is 650 pounds.

Sanitary Drinking Fountain.

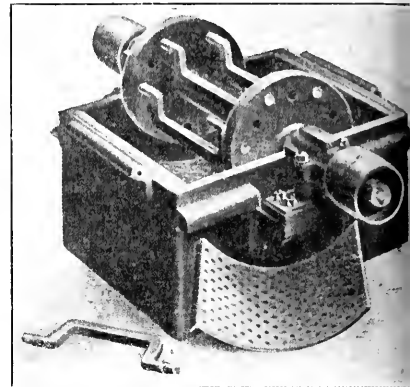
THE Universal Drinking Fountain, shown in the illustration, is made by J. L. Hammett Co., 250 Devonshire street, Boston, Mass. The faucet is ordinarily closed by a spring, except when held open by the hand. By inserting the pin A, however, it is converted into a continuously flowing fountain. The height of the stream is regulated by turning the valve B with a wrench. Drinking water is supplied through the hole C. In the sides of this nozzle are four holes through which the water is forced against the inside of the ring D. Alternating with these four holes are four more holes in the lower edge of the ring D, through which the water is forced against the inside walls of the cup. All the inside parts of the cup are thus being continually flushed. The direction of the stream of water may be changed by turning the regulator E.

Sheet Packing for High Temperatures and Pressures

J-M. Permanite is the trade name of the sheet packing made by the H. W. Johns-Manville Co. for use in connection with superheated steam and high pressures. Permanite packing is made of asbestos and rubber. Hence it will stand a temperature that would destroy ordinary packings.

Fine Crusher

The Gardner Crusher 'Distintegrator and Pulverizer is a suitable machine for obtaining fine crushed rock when needed, as in the construction of bituminous concrete pavements, or for other purposes. It is claimed to give a maximum yield with the lowest possible power and maintenance expense. For example, the No. 1 machine, which weighs 1,700 pounds and has a speed of 1,000 revolutions per minute, requires from 7 to 12 horse-power and will crush 3 tons per hour with 20 per cent of product passing a 20-mesh screen and 50 per cent of it through the 100-mesh screen. The wear is confined to only a single piece of the machine, the hammers, which can be changed without loss of time. The crusher requires no special foundations. The machine is



GARDNER CRUSHER AND PULVERIZER

made by the Gardner Crusher Company, 556 West Thirty-fourth street, New York, N. Y.

Portable Air Compressor

A portable air compressor suitable for contractors' use is made by the Roberts Motor Company, Sandusky, Ohio. The machine illustrated was originally made for contractors laying water pipe. The compressor is capable of supplying two ordinary calking hammers. The heavy galvanized steel tank has a capacity of eight cubic feet and can be filled with air at 100 pound pressure within three minutes from the time the motor is started. A piece of burlap is wrapped around the radiator and kept wet to absorb the heat. The gasoline tank has a capacity of six gallons, sufficient for a run of ten hours. The truck has an open platform with trussed sills. The weight of the outfit is 1,540 pounds.

The special features of the compressor are a gear-driven mechanical oiler, which starts and stops simultaneously with the operation of the motor, a rigid timer which it is said will not get loose, and a noiseless carbureter. The following table gives the principal dimensions and specifications of the compressor:

Diameter of engine cylinder, inches...	4 1/2
Length of engine stroke, inches.....	5
Speed, revolutions per minute.....	600
Horse-power	6
Area low pressure cylinder, square inches	17.5
Area high pressure cylinder, square inches	6.2
Length of stroke, inches.....	5
Air consumption, cubic feet per minute	30
Length, inches	27 1/2
Width, inches	19
Height, inches	34 1/2
Weight with iron base, pounds.....	400
Weight with aluminum base, pounds.	350

NEWS OF THE SOCIETIES

New Jersey Association of County Engineers.—The association met in the office of State Road Commissioner Frederick Gilkyson, January 24, and elected the following officers: President, W. E. King, of Morris county; vice-president, E. D. Rightmire, Atlantic; secretary, Assistant State Surveyor of Roads Edward E. Reed, Mercer, and treasurer, Joshua Doughty, of Somerset. Retiring President Frank J. Epperle expressed regret that the courts in upholding patents for certain paving processes had left to engineers the choice of specifying the high-priced patented materials, laying inferior pavements or infringing patented processes. He hoped that an understanding could be reached with the owners of patents for a uniform specification, under which the various materials could compete. The papers read by the members of the association were as follows: E. D. Rightmire, "Lead Roads"; Earl Thomson, "Some Notes on Mattressing"; J. J. Robertson, "Penetration vs. Mixing Method"; James Owen, "Why I Have Changed My Mind"; William C. Catliff, "Comparison of the Mixing Methods"; Grant Davis, "Extras on Roads"; William E. King, "Repairs"; Joshua Doughty, Jr., "Width of Roads"; Jacob Bauer, "Railroad Grade Crossings"; Frank J. Hubbard, "Reinforced Concrete Bridges."

Maine Society of Civil Engineers.—The society was organized in the rooms of the State Highway Commission, Augusta, with a strong list of charter members, on January 17. The meeting was called by Cyrus C. Babb, engineer of the State Water Storage Commission, who had sent out letters of invitation for the purpose. A temporary organization was effected by the election of Mr. Babb as chairman and Frank Messey, of Bangor, secretary. The association effected its permanent organization with the election of the following officers: President, Cyrus C. Babb, Augusta; vice-president, Walter H. Sawyer, Lewiston; secretary, Frank E. Messey, Bangor; treasurer, H. S. Cardman, Orono; directors, Paul D. Argent, of Michias; E. C. Jordan, of Portland; P. H. Coombs, of Bangor; E. Greenwood, of Skowhegan; Moses Burpee, of Houlton; executive committee, the officers and directors.

Stephenson County Good Roads Association.—The annual meeting was held in Freeport, Ill., on January 14, and opened with an address of welcome by President Jacob Weiss, of the Citizens' Commercial Association of Freeport. President Brickner, of the association, called attention to the need of such a body in every county in the state. Part of a letter from Moses Sawyer, a retiring commissioner, read: "I am tired of the business. The last year I worked hard for better roads and got nothing but rebuffs, the roads were good enough for them. You know we have no money to work with. Our town has about \$1,300 to work 51 miles of road and 51 bridges, and nothing about culverts. We set aside one-half for bridges, that leaves \$12.75 per mile for road work and \$2.75 per bridge, and then they wonder why we do not have better roads and bridges. I wish your road society could explain it so they can see why they do not have better roads." Election of officers will be held on the third Saturday in April.

Ohio State Stone Club.—At the meeting at Toledo January 10 among the papers presented were the following: Present Highway Laws of Ohio and Proposed New Laws, by State Highway Commissioner J. C. Wonders; Roads, Yesterday, To-day and Tomorrow, by H. F. Earl, formerly State Highway Commissioner of Michigan; County Roads in 1920, by J. W. Weldon.

Kansas State Good Roads Convention.—One of the main points urged at the good roads meeting at Wichita on January 17 was that the Kansas constitution should be revised so it will be possible to get State aid for road improvements in the townships and counties. Governor Stubbs' place as speaker was taken by H. J. Waters, head of the Kansas Agricultural College. About five hundred delegates had registered. The creation of an official or board of control, either in State or county, with power arbitrarily to locate more extensive road improvements and the need of a State road engineer were discussed.

Carolina Municipal Association.—The annual convention of the association was held on January 18 and 19 in the rooms of the Chamber of Commerce, Raleigh, N. C. On account of slow arrival of the members, no forenoon session was held. The Mayors present failed to endorse the Battle bill, which is a general measure designed to permit cities of over 5,000 inhabitants to adopt the commission form of government if the voters may so decide. There were many grounds of objection to the bill, and these were urged by those who in many cases favor such government. It was urged that the needs of various cities were different and that separate provision must necessarily be made for each, just as various forms of charters are now found necessary. Among other subjects discussed were the division of the road fund, by which towns and cities might get some returns in work on their streets for their payment toward the support of public highways. "Municipal Taxation" was the subject of a paper by Mayor J. D. McNeill, of Fayetteville, who protested against the discriminatory provision of the laws which prohibit cities from taxing telephone, telegraph and express companies doing business within their limits. The old officers were unanimously re-elected, as follows: President, Fred. N. Tate, High Point; first vice-president, James D. McNeill, Fayetteville; second vice-president, T. W. Hawkins, Charlotte; third vice-president, O. B. Eaton, Winston; fourth vice-president, J. S. Wynne, Raleigh; fifth vice-president, W. D. LaRoque, Jr., Kinston; sixth vice-president, W. G. McRae, Wilmington; secretary and treasurer, Thomas D. Meares, Wilmington.

Indiana Gas Association.—At the convention of the association, which ended at Fort Wayne on January 19, the following officers were elected: President, S. E. Mulholland, Fort Wayne; vice-president, Howard Olds, Newcastle; secretary-treasurer, Philmer Eves, Indianapolis; directors for three years, Samuel T. Murdock, Lafayette; James Moncrie, Bloomington. The growth of the association is the most notable fact brought out in the convention. It now has 150 members. The tenor of the principal addresses has been the question of rates and the relations of gas companies to the public.

Colorado Goods Roads Conference.—More than three hundred delegates attended the conference in Denver, beginning January 13, to devise a plan for the betterment of the highways of the State. Among the speakers were Dr. F. L. Bartlett, president of the Denver Chamber of Commerce, whose topic was "The Commercial Club and its Relation to Good Roads." C. P. Allen, chairman of the Colorado State Highway Commission, followed Dr. Bartlett, discoursing at some length on what the Commission had accomplished since its organization. L. C. Paddock, of Boulder, spoke on "How to Finance Road Building," and State Engineer C. W. Comstock, on the "Internal Revenue Fund." "What State Highways Will Do for Colorado" was the subject of Isaac N. Stevens, of Pueblo. He stated that the good roads in the small country of Switzerland were paying an annual income through the tourist traffic of over \$100,000,000 a year to the hotels alone, and that it is possible that the total income in Switzerland on account of good roads is \$250,000,000 annually. He stated that Paris is receiving \$800,000,000 annually on account of the splendid good roads of France. Mr. Stevens stated that if Colorado had roads equal to those in the Alps or the Pyrenees or the roads of Norway the State would have an annual income of \$250,000,000 greater than it now has. He stated that it was time to quiet the discussion of the matter of a few thousand dollars to be expended in roads and to begin a discussion of a matter of millions. He called attention to the fact that California has just voted \$18,000,000 for good roads, \$9,000,000 of which is to be used in constructing a splendid State road north and south, to be used as an automobile road.

Michigan Engineers' Society.—The session ended at Lansing on January 12, with the election of the following officers: President, Byron E. Parks, Grand Rapids; vice-president, J. R. Allen, Ann Arbor; secretary, A. L. Holmes, Grand Rapids; treasurer, Dorr Skeels, Grand Rapids; directors, Herman K. Vedder, East Lansing; Frank F. Rogers, Lansing, and John J. Hubbell, Manistee. Where the next convention will be held has not yet been decided, the matter being left in the hands of the directors. Because of its central location, it is probable that Lansing will again be selected. One of the principal speakers at the meeting was F. F. Rogers, the State Road Commissioner, who spoke at some length on preserving macadam roads by means of different tar preparations, and in that connection said that the college road could have been kept in far better condition if the center of the road had been covered with one-half inch of coarse sand. This layer of sand would protect it from the auto traffic. He also stated that while some roads were injured by autos traveling over them, that was the case with a very small number. A discussion followed this talk, in which it was brought out that the life of all macadam roads could be prolonged by the use of tar preparations as a binder, different preparations being used for different kinds of material. And contrary to what some have supposed, the harder the stone the better the road. During the last year there have been 790 miles of road built, for which State awards have been paid to the amount of 22 per cent of the total cost of the roads.

Wisconsin Electrical Association.

At the convention of the association, held at the Hotel Foster, Milwaukee, January 19, C. M. Anford, of Chicago, strongly urged the adoption of a better system of street lighting in many American cities because of its value for police protection. He also referred to the value of electric lighting as an advertising medium. Other speakers were: A. D. Goedjen, Milwaukee, on "Electric Meter Testing"; John I. Beggs, of the Milwaukee Electric Railway & Light Company; C. N. Duffy, the Milwaukee Electric Railway & Light Company, who spoke on "Insurance," and W. J. Kelsh, master mechanic and chief engineer of the Eastern Wisconsin Railway and Light Company and the Wisconsin Electric Railway Company, who told of the work in an "Electric Railway Repair Shop." The following officers were elected: G. B. Wheeler, Eau Claire, president; Irving P. Lord, Waupaca, first vice president; W. H. Winslow, Superior, second vice-president; R. M. Kimball, Kenosha, third vice-president; George Allison, Milwaukee, secretary and treasurer.

PERSONALS

BRACKETT, WINSLOW M., Newark, N. J., formerly Superintendent for the Barber Asphalt Co., Trenton, N. J., has been appointed sales agent for the State of New Jersey for the Texas Company.

BREWER, ALEXANDER, former Mayor of Ogden, Utah, has been chosen President of the Weber Club, a civic organization.

BURRELL, FRANK E., Quincy, Mass., has been appointed Chief of Police, and Randolph Bainbridge will be Commissioner of Public Works.

CANON, W. H., was re-elected Mayor of Medford, Ore.

CASSELL, R. L., Morristown, Tenn., has been appointed Chief of Police.

DROWNE, HENRY B., has given up his position as Assistant Engineer in the Rhode Island State Board of Public Roads, and accepted a position as Assistant Engineer with Arthur H. Blanchard, Consulting Highway Engineer, Providence.

EDWARDS, WILLIAM H., New York's Commissioner of Street Cleaning, is one of twenty-six who recently received medals from the Carnegie Hero Fund Commission. This award is made in connection with the shooting of Mayor Gaynor last summer, when Edwards disarmed the assailant.

FROST, HARRY D., for three years connected with the Detroit Water Company, has been engaged by the Akron (Ohio) Waterworks Company.

FULLERTON, T. M., Gadsden, Ala., has been chosen Chief of the Fire Department.

GETZ, ALEXANDER, former Mayor of Hamilton, O., is dead.

GOODRICH, W. FRANCIS, London, England, Consulting Engineer on Refuse Disposal, is making a trip of inspection to a number of American cities having incinerating or other refuse disposal plants.

GRAY, HARVEY, has been appointed Chief of Police for Pasco, Wash., and Alf. Buchanan, of Portland, Ore., Street Commissioner.

HALL, C. T., Malden Mass., has been reappointed Street and Water Commissioner; Henry W. Estay, City Engineer; T. J. Foley, Acting Chief of Police, and T. W. Hough, Fire Commissioner.

HILL, WILBUR, has resigned the position of City Engineer for Gadsden, Ala., and it is expected that H. P. Ford, the Assistant Engineer, will take his place.

LUTSON, WILLIAM, has been re-elected Borough Engineer by the Doylestown, Pa., Council.

INGALLS, FRED, is the new Chief of Police at Centralia, Wash.

JERVAIS, WILLIAM J., has been appointed by Mayor James a member of the Buffalo Board of Health.

JONES, FRED A., Houston, Tex., has been engaged by city of Patterson, La., as Engineer in charge of construction of \$30,000 water works.

KELLER, DR. ARTHUR, Paris, Ky., has been made Health Officer.

MAUPIN, S. T., becomes Superintendent of the water plant at Knoxville, Tenn., succeeding E. N. Chisholm, Jr., who recently resigned.

MEAD, GILES W., Mayor of Glen Ridge, N. J., has been elected President of the joint councils of Bloomfield and Glen Ridge, succeeding William P. Sutphen, resigned.

MILLSPAUGH, W. E., Port Jervis, N. Y., has been elected Chief of the Fire Police.

MORLEY, ALFRED J., is entering upon his third term as Mayor of Victoria, B. C.

MOTT, FRANK K., Mayor of Oakland, has married Mrs. Gertrude Bennett, of Berkeley, Cal.

MUNGLE, WILLIAM, Newark, N. J., has been elected President of the Board of Street and Water Commissioners.

NEUBLOCK, NEWMAN F., has been appointed Chief of Police, Tulsa, Okla., to fill vacancy caused by the resignation of Charles W. Connelly.

PERRY, L. E., Philadelphia, Pa., until recently connected with the design and construction of the Pennypack Creek sewage disposal works of the city of Philadelphia, Pa., has been appointed Secretary and Engineer of Houston, Perry & Co., Seaford, Del.

RAWLS, H. C., the new Mayor of Columbia, Miss., is only twenty-five years of age.

ROURKE, LOUIS, Boston, Mass., has been approved by the Civil Service Commission as Commissioner of the Department of Public Works. Before taking up his work in Boston he was for seven years engaged on the Panama Canal.

SARGENT, PAUL D., has resigned as State Highway Commissioner of Maine to accept the position of Assistant Director of the United States Office of Public Roads.

SKIRM, BENJ. C., Trenton, N. J., has resigned from the Board of Water Commissioners.

STEWART, SAMUEL M., Rochester, N. Y., founder of the firm of A. F. & S. C. Stewart Co., manufacturers of fire apparatus, died January 7.

TAYLOR, L. B., a native of Michigan, has been re-elected Mayor of Vancouver, B. C. He is a naturalized British subject.

THORNBURG, JOHN A., has been elected Mayor of Forest Grove, Ore.

VEDVINE, REMY, has been named for Mayor of the newly organized municipality of Oakdale, La.

WALCOTT, E. L., Chicago, Ill., formerly Secretary of the Modern Iron Works, Quincy, Ill., has been appointed Manager of the Pacific Flush Tank Co., succeeding the late Sidney W. Miller.

WARREN, FRED T., Tampa, Fla., is the new City Engineer.

WEBER, FRANK S., for seven years City Clerk of Watertown, Wis., will leave early in February for three months in the South for his health.

WIDMER, JOHN, Lackawanna, N. Y., has been re-elected President of the Council. John J. Monahan was reappointed City Clerk and Maxwell Briggs given another term as Commissioner of Public Works.

TRADE NOTES

Cast Iron Pipe, Chicago.—It is estimated that the lettings thus far this year are just about equal to the total for the same period of last year. Quotations: 4-inch, \$25; 6 to 12-inch, \$24.10-inch and up, \$23.50. Birmingham The aggregate of small orders placed within the week is quite satisfactory. Prices are believed to be on a firm basis and an advance at an early date probable. Quotations: 4 to 6-inch, \$20 to \$20.50; 8 to 12-inch, \$19.50 to \$20; over 12-inch, average \$18. New York: A number of good orders from private companies have been placed in the last week. Quotations: 6-inch, car loads, \$22.

Lead.—The demand is light, but market is said to be firmer. Quotations: New York, 4.50c; St. Louis, 4.35c.

New Paving.—City Engineer Frank Newton and Councilman George Miller, Carthage, Mo., are said to have invented a pavement which it is expected will be laid in Carthage. The ingredients are said to be Carthage limestone and cement. The cost, it is expected, will not much exceed \$1.

Chicago Cement Show.—The outlook for the success of the fourth annual cement show in Chicago, February 16-23, is very bright. The show will again be held in the big Coliseum. A new and very beautiful scheme of ceiling and wall decorations has been designed and the next cement show will undoubtedly surpass in beauty any that have thus far been held. The same general equipment for booths will be installed as was used at the New York cement show in December last. The corner posts and railings will all be made of cement and the show will be truly a cement show. There will be about two hundred exhibitors. Inquiries from all parts of the United States, particularly from the territory in the Middle West, indicate that the out-of-town attendance will be very heavy. The show comes just at the right time for the contractors who are in the market for machinery for the opening building season. Two important conventions will be held in connection with the Chicago Show. The annual meeting of the National Builders' Supply Association will be held at the Auditorium, February 21-22, and the Sixth Annual Convention of the Interstate Cement Tile Manufacturers' Association will be held at the New Southern Hotel, February 21-23.

Turbo-Generators.—The City Council's Water Committee and the Commissioner of Public Works, Buffalo, N. Y., have approved the purchase by the city of three steam-turbo-electric generators for the equipment of the new water works from the Westinghouse Machine Company, the lowest bidder, at \$248,180. In addition to providing power for pumping service, the new generators will supply current for lighting the streets and public buildings, for which Niagara power is now used.

Corrugated Culverts.—The Ohio Corrugated Culvert Company, Middletown, Ohio, announces the increase of its capital stock from \$65,000 to \$100,000. The capacity of its plant will be greatly increased, and one of the new proposed buildings will be used for manufacturing portable houses made from American ingot iron, rolled by the American Rolling Mill Company, Middletown.

Fire Extinguishers.—The General Fire Extinguisher Company will enlarge its plant at Warren, Ohio, by the erection of a brick and steel factory building, 150 by 350 feet, the contractor which has been placed with the Woods Construction Company, Detroit, Mich. A portion of the building will be used for pipe storage purposes and the remainder for a machine shop. An electric crane will be installed as well as other machinery.

Wood Preserving Plant.—A new and that is regarded by many as an important development in the industrial growth of the Pittsburg district is the erection of the Pittsburg Wood Preserving Company, Pittsburg, which has taken measures for the erection of a lumber-treating plant between Pittsburg and Connellsville, on a site recently secured for the purpose. The resident and general manager is Assistant B. Shipley, who designed the best tie, pile and pole preserving plants in the country. Contracts insuring the success of the enterprise have been made with railroad companies, but the plant will be operated on a general commercial proposition on orders from steam or electric railroads, telegraph and telephone companies, mining companies, municipal boards or companies controlling docks, harbor improvements, etc. With the rapidly increasing use of treated timber, to preserve it from decay, there will be demand in the United States for many such plants, and their equipment of machinery is very considerable. It includes enormous steel pressure cylinders, pressure pumps, vacuum pumps, general service pumps, air compressors, boilers, feed pumps, heaters, engine or other prime mover, electric generator, motors, storage tanks, cranes, yard locomotives, special cars, canalizing reservoirs, underground discharge reservoirs, piping, steam receivers, traps, separators and a mass of auxiliary apparatus such as is commonly used with the above.

Creosoting Plant.—The creosoting plant of the International Creosoting Construction Company, at Beaumont, Tex. was burned January 12. The loss is estimated at \$80,000. The insurance is reported to be ample. The head office of the company is at Galveston.

Voting Machines.—B. A. Myers, Ashen, Ind., is erecting a factory at Middlebury, Ind., for the manufacture of a voting machine. Later on it is the intention of Mr. Myers to establish a factory in either Michigan or Wisconsin. Additional equipment will be purchased later.

Steam Shovels.—The Bucyrus Vulcan Steam Shovel Company, Evansville, Ind., has elected the following officers: President, H. P. Eels, Cleveland, Ohio; vice-president, G. F. Steedman, St. Louis, Mo.; secretary-treasurer, C. L. Schweigart, Milwaukee, Wis.

Crushers.—Plans are reported to be in progress for a further extensive addition to the works of the Power & Mining Machinery Company, Cudahy, Wis., which is now operated as a branch of the International Steam Pump Company.

Somers System of Assessment.—A meeting of the Allied Civic Bodies, Philadelphia, Pa., unanimously recommended that Council appropriate \$12,000 to make a systematic equalization of municipal tax valuations in accordance with the Somers system adopted in Cleveland, O.

Municipal Automobiles.—The large number of automobiles owned by some of the various municipalities is surprising; thus the city of New York owns and operates no less than 130 cars. When the present administration came in there were 110 automobiles, which had cost an average of \$2,328 apiece, or \$277,000 total. Eighteen more have been bought for \$34,000, an average of \$1,900 apiece, while some seven old machines have been sold for \$14,220, a very high average for second-hand cars of \$2,033. There are 16 or 17 departments having machines used solely by them, while other departments divide the use of the cars. Of the departments having more than one car for their exclusive use, the water supply with 16, the health with 11, fire with 9 and charities with 7 lead. Wages and repairs vary widely, thus the water department's 16 cars cost \$17,368.68 in the six months of 1909, from January 1 to June 30. During this same period the health department's 11 cars cost \$3,856 and the fire department's 9 \$17,106.89. The first averages \$1,085.54 per car, the second \$896 and the third \$1,900.76. It thus costs the fire department twice as much per car as it does the health department.

Paving Brick.—A new industry may be started in Binghamton, N. Y., as is expected, some of the State roads in the vicinity will be built with brick. A paving brick plant may be built at East End, Moeller Hill. Most of the property on the hill which contains deposits of material suitable for the manufacture of paving brick, belongs to Charles P. Stevens, Colonel George W. Dunn and a former resident of this city named Stone. The old plant of the Ogden Brick Company, abandoned for a number of years, could be utilized for the new industry.

Lighting Standards.—The Elmer P. Morris Company, Elizabeth, N. J., and the Frederick Iron Works, Frederick, Md., were consolidated January 21 under the name of the Morris Iron Company, which is capitalized at \$175,000. Operations will hereafter be carried on at the Frederick foundry, and work will be commenced at once on an addition there comprising 61,000 feet of floor space. John Mitchell, Jr., is president; E. P. Morris, vice-president and general manager; C. C. Biser, treasurer, and W. T. S. Diven, superintendent.

Road Oiling Machine.—The Good Roads Machinery Company, Kennett Square, Pa., has the road oiling machinery and business of the G. F. W. Company, Saratoga Springs, N. Y. This machinery will hereafter be manufactured at Groton, N. Y., and will be marketed by the Good Roads Machinery Company, through its various branch offices and selling agencies. The machine called the Perfection Oil and Asphalt Distributor handles either light oil or heavy oil that requires heating. The fuel cost per day for heating is claimed not to exceed one dollar.

Asphalt Plant Burned.—The plant of the Barber Asphalt Company, Portland, Ore., was burned January 10. The fire started in a bank of asphalt. The damage is estimated at \$20,000. Officers of the company state that the plant can be rebuilt in time so as not to delay the paving work in the spring.

Meter Boxes.—Manufacturers and dealers in Detroit will figure on the equipment of a new plant for the H. W. Clark Company at Mattoon, Ill., for the manufacture of various appli-

cations used in water distributing systems, including meter boxes. Brass-working tools are among the requirements.

Contractor Fails.—The Elmore and Hamilton Construction Company of Albany, which has construction work under way on the Catskill Water Supply, near Ardsley, Westchester County, and Gardiner, Ulster County, has gone into the hands of receivers, with liabilities of \$270,271 and nominal assets of \$496,206. Judge Holt in the United States Circuit Court appointed the Albany Trust Company and James M. Hamilton receivers, with a bond of \$35,000, on the application of Louis Mizell, a creditor for \$1,224, and authorized them to continue the business for not more than four months without further order of the court. A petition in bankruptcy was subsequently filed here against the company by these creditors: Finger & Lewis, Schenectady, \$630; Frederick W. Schaefer, \$70, and R. U. Dettwill Walsh, \$50, both of Albany. Amos Van Etten, of Kingston, was appointed special master. The principal items in the assets are: Plant, \$260,482; quarries, \$29,071; steel forms, \$43,791, and due from the City of New York, \$84,469. Of the liabilities \$70,000 is due to the Albany Trust Company and \$11,614 is due on payroll. The most valuable assets of the company are two contracts with the City of New York on the Catskill aqueduct, one for \$1,485,000 and the other for \$933,000. About \$587,000 work has been done on the two contracts. The city has retained about \$57,000 until the completion of the work. It is said that one of the causes of the trouble is the company's large investment in plant and quarries, which used up the working capital. The work is now closed down for the winter. The company was incorporated on December 9, 1907 with capital stock of \$250,000.

Buys Lighting Franchise.—It has been announced that the Long Acre Electric Light and Power Company, New York, N. Y., whose plan for starting an opposition to the New York Edison Company has been before the public for several years and which involved it, four or five years ago, in a controversy with the Public Service Commission with regard to the issue of securities, has been bought by a syndicate of New England capitalists identified with electric interests. At a recent meeting of the company, James F. Shaw of Massachusetts was elected President. He declined to state what individuals formed the syndicate or the price that had been paid for the concern. He said, however, that the company intended to proceed immediately with the development of electric light and power under its franchise and that it contemplates the expenditure of at least \$10,000,000 on its initial plant.

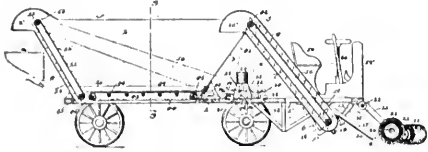
Trinidad Asphalt.—The quantity of asphalt taken from Pitch Lake, Trinidad, B. W. I., which covers an area of 100 acres, during 1910 exceeded that of any previous year. At the present rate of operation, the surface level is lowered about 6 inches a year. The depth of the deposit of asphalt over the center of the lake is unknown, as it cannot be sounded by rods, but the supply is supposed to equal the demand for many years; possibly it is inexhaustible.

Fire Protection for Wagon Works.—Fire has started on a large reservoir at the Studebaker Bros. Manufacturing Company works at South Bend, Ind. The tank, which will have a capacity of 150,000 gallons, will be at the top of a steel tower 206 feet in height.

PATENT CLAIMS

981,652. STREET-CLEANING MACHINE. John B. d'Homergue, Pittsburg, Pa. Serial No. 489,208.

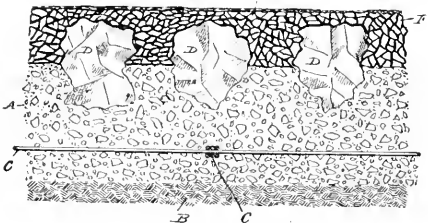
In a street cleaning machine, the combination of a vehicle having a body thereon, means for gathering the material from the street, a power-driven inclined conveyor



for delivering the material to said body, and power-driven means within said body for moving the delivered material along said body.

982,247. CONCRETE ROADWAY. Edward M. Chadbourne, San Francisco, Cal. Serial No. 572,728.

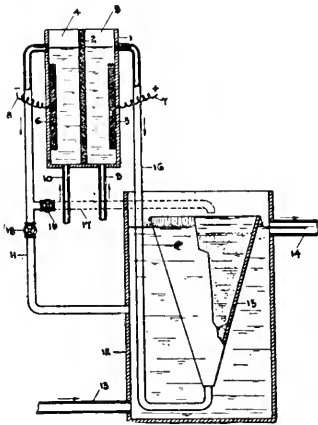
The method of pavement construction which consists in laying a foundation substantially impervious to heavy oils and with oil retaining receptacles on its upper face; in spreading thereon a heated cementitious binder in liquid condition and which is



substantially non-fluid at normal temperatures, and in applying and pressing into the layer of cementitious binder a layer of heated screenings whereby the screenings are forced down and the binder rendered limp and displaced upwardly to fill the voids in and bond the screenings together.

982,704. METHOD OF PURIFYING WATER. William B. Bull, Chicago, Ill., assignor to Chloride Process Company, Chicago, Ill., a Corporation of Illinois. Serial No. 564,245.

The method of purifying water, which consists in producing by electrolysis a solution which is a solvent of iron, subjecting iron in a separate chamber to the action of such solution to form a solution



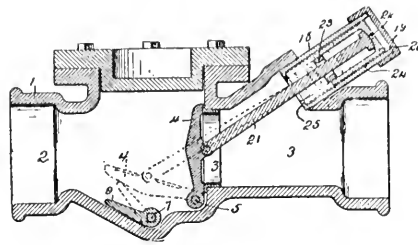
of an iron compound, precipitating the iron solution in the form of an hydroxid coagulant, and coagulating the impurities in the water to be purified with such coagulant.

982,705. APPARATUS FOR PURIFYING WATER. William B. Bull, Chicago, Ill., assignor to Chloride Process Company, Chicago, Ill., a Corporation of Illinois. Serial No. 565,314.

An apparatus for purifying water, comprising electrolytic means, including a chemically inert anode, for producing a reagent adapted to act upon a suitable metal to form a soluble salt thereof capable of being precipitated to form a coagulant, a container separate from the anode chamber adapted to contain such metal, a receptacle for the water to be treated, and means for conducting the reagent to the metal and for introducing the unagglomerated coagulant produced therefrom into the water receptacle.

982,400. AUTOMATIC VALVE. Thomas H. Walker, Kansas City, Mo. Serial No. 448,518.

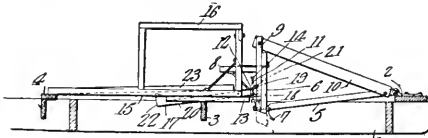
The combination with a valve casing having an inlet and an outlet for fluid, of a valve movable in said casing by incoming fluid to close said outlet when the fluid has reached a certain predetermined pressure, a cylinder closed at its outer end and



having its inner end communicating with said outlet, a hollow piston reciprocative in said cylinder and having openings one at each end for the passage of fluid, a bypass provided for the passage of fluid in said cylinder past said piston, and a rod connected to said valve and adapted to engage and force outwardly said piston when the valve in closing has moved to a certain position.

982,309. ROAD SCRAPER AND GRADER. George K. Smith and Ralph Russell, Albany, and John Anderson, Jr., and Howard Grimes, Newcomb, N. Y. Serial No. 592,107.

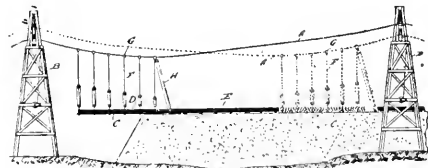
In a machine of the character described, the combination with a traveling frame, of



longitudinally movable beams carried thereby, scrapers supported by said beams and having pivotal connection with the frame and means for moving said beams longitudinally in reverse directions to adjust the angularity of said scrapers.

981,649. CABLEWAY. William Hewitt, Trenton, N. J., assignor to The Trenton Iron Company, Trenton, N. J., a Corporation of New Jersey. Serial No. 560,579.

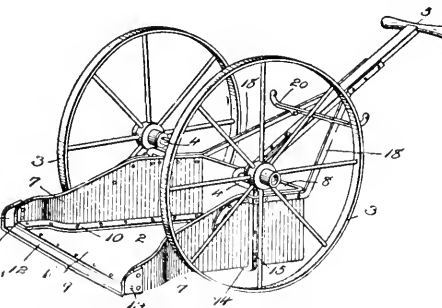
An apparatus of the character described,



including in combination cables, a cradle supported thereby and adjustable along said cables and means for effecting a vertical adjustment of one end of a span relatively to the other.

981,883. STREET-CLEANING PAN. William Henry Roife and Charles Henderson Baker, Wabash, Ind. Serial No. 538,327.

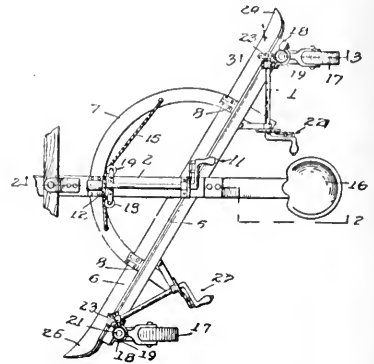
A device of the character described comprising a pan having a flaring mouth, an axle upon which the bottom of said pan rests, the said axle being bent upwardly to



conform to the sides and depth of the pan, the said axle being bent inwardly over the sides of the pan and then outwardly, wheels on said axle, the hub of said wheels extending over the sides of the pan in such manner that the distance between the two wheels is less than the width of the mouth of the pan.

982,427. ROAD-GRADER. David P. Henninger, Redondo Beach, Cal. Serial No. 575,398.

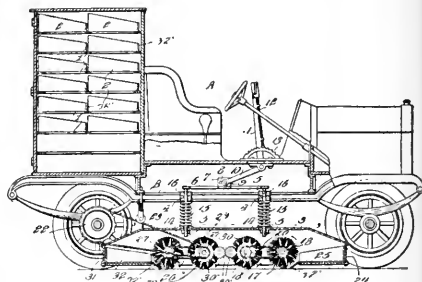
In a dirt road grader, a cross bar, a tongue pivotally connected at its rear end to the center of the cross bar; a semi-circular tongue brace connected at its ends to the cross bar and slidingly connected to



the tongue; a chain connected at its ends to the tongue brace, said ends being upon opposite sides of the tongue; a controller shaft mounted upon the tongue; a sprocket wheel fixed upon the controller shaft and engaging the chain and a controller mechanism for operating the controller shaft; so that by manipulating the controller mechanism the angle of the cross bar relative to the tongue may be adjusted.

982,570. STREET-SWEEPER. Carmen C. Brooks, Haxtum, Col. Serial No. 570,447.

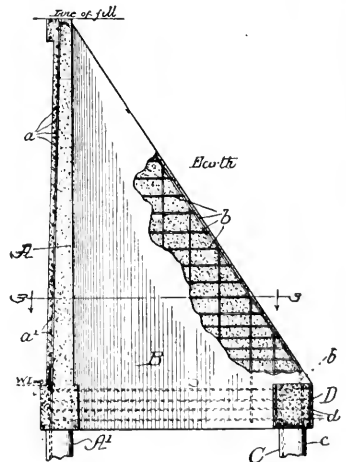
In a street sweeper, a vehicle, a yieldingly supported casing movably mounted between the front and rear axles of the vehicle, pans removably supported by the casing at the ends thereof, a plurality of



pairs of brushes revolubly supported by the casing, driving mechanism for the brushes, the said driving mechanism including means for revolving the respective pairs of brushes in opposite directions and in the direction of the pans at the ends of the casing, and means for moving the casing vertically beneath the vehicle.

982,698. RETAINING WALL. Maxwell M. Upson, New York, N. Y., assignor to Raymond Concrete Pile Company, New York, N. Y., a Corporation of New Jersey. Serial No. 583,124.

A retaining wall comprising a vertical wall, wing walls connected therewith, piles



to which the wing walls are secured, and means associated with said wing walls for resisting the tendency of the vertical wall to overturn or travel horizontally.

THE WEEK'S CONTRACT NEWS

Relating to Municipal and Public Work—Street Improvements—Paving, Road Making, Cleaning and Sprinkling—Sewerage, Water Supply and Public Lighting—Fire Equipment and Supplies—Bridges and Concrete Work—Sanitation, Garbage and Waste Disposal—Police, Parks and Miscellaneous—Proposals and Awards

To be of value this matter must be printed in the number immediately following its receipt, which makes it impossible for us to verify it all. Our sources of information are believed to be reliable, but we cannot guarantee the correctness of all items. Parties in charge of proposed work are requested to send us information concerning it as early as possible; also corrections of any errors discovered.

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREET IMPROVEMENTS				
Ohio	Cleveland	Feb. 3	Grade, drain, curb and pave several streets.	Ira O. Hoffman, Secy. Pub. Serv.
Indiana	Indianapolis	Feb. 3	Grading and curbing street.	C. A. Schraeder, Pres. B. I. Pub. Wks.
Oklahoma	Sapulpa	Feb. 4	Constr. approx. 16,000 sq. yd. asphalt pavement.	I. J. Anderson, City Clerk.
Ohio	Youngstown	Feb. 6	Impr. 4.0+0 ft. of road with slag macadam.	Frank Agnew, Secy. R. I. Comrs.
Indiana	Greensburg	Feb. 6	Macadamizing Main street.	Frank E. Ryan, County Auditor.
California	Fresno	Feb. 6	Constr. grade, curb, culverts and sidewalk approach.	W. H. Ryan, City Clerk.
Minnesota	St. Paul	Feb. 6, 10 a.m.	Furn. steam or gasoline road roller, 10 or 12 ton.	Geo. J. Ries, County Auditor.
Indiana	Fowler	Feb. 6, 1 p.m.	Construct stone road.	Lemuel Shipman, County Auditor.
Ohio	Youngstown	Feb. 6, 1:30 p.m.	Improving road with slag macadam for 1,040 feet.	Frank Agnew, Secy. R. I. Comrs.
Indiana	Huntington	Feb. 6, 2 p.m.	Constr. gravel rd. known as P. W. Forest Road.	John W. Weaver, Co. Aud.
West Virginia	Huntington	Feb. 6, 1 p.m.	Grad. and pave 20 streets with vit. brick, bitulithic, sheet asphalt, asphalt block or concrete asphalt.	John Coon, Comr. of Streets.
Georgia	Atlanta	Feb. 6, 3 p.m.	Lay brick, tile and cem. sidewalk, and turn. mat. for rep. to sts.	W. J. Campbell, City Clerk.
Indiana	Tipton	Feb. 6	Constr. gravel road in several townships.	J. H. Tranbarger, County Auditor.
Alabama	Montgomery	Feb. 6, noon	Paving with brick, asphalt, bitulithic, Blome granitoid block, mineral rubber, wood block, Hassam granite block or Hassam comp. concr. pave, with necessary grad. curb and sew.	C. J. Fay, Acting Treasurer.
Indiana	Indianapolis	Feb. 6	Sprinkling unimp. sts. from May 1 to Oct. 15.	Board of Pub. Works.
New York	Buffalo	Feb. 6	Paving and re-paving streets.	F. G. Ward, Comr. Pub. Wks.
Louisiana	Crowley	Feb. 7, 8 p.m.	Construct approx. 150,000 sq. yd. sidewalk.	R. J. Bourreaux, City Clerk.
Indiana	Michigan City	Feb. 7, 10 a.m.	Constr. cement and brick sidewalk for 1911.	E. J. Heise, City Clerk.
Indiana	Brazil	Feb. 7, 11:30 a.m.	Improving various highways in Clay County.	E. A. Staggs, Auditor.
Kansas	Manhattan	Feb. 7, 6 p.m.	Pave with brick block, wood block, concr. asph. concr. or sheet asphalt, requiring approx. 12,200 yds. pave. and 4,000 cu. yd. excav. on Poyntz ave. and 16,200 yds. pave. and 5,450 cu. yd. excav. on Houston and Fourth sts.	C. T. Gist, City Clerk.
Florida	Palatka	Feb. 7, 7:30 p.m.	Constructing approx. 16,500 sq. yd. concrete sidewalks.	A. T. Triay, City Clerk.
Canada	Vancouver, B. C.	Feb. 7	Furnish road roller, weight not less than 15 tons.	Wm. McQueen, City Clerk.
Florida	Tampa	Feb. 7	Paving with shell 1 1/2 mile road.	Hillsboro County Commissioners.
Indiana	Crawfordsville	Feb. 7, 2 p.m.	Constr. gravel road known as L. T. Rush Road.	B. B. Engle, County Auditor.
Indiana	Logansport	Feb. 7, 10 a.m.	Constr. gravel road in Tipton and Jefferson twps.	J. E. Wallace, County Auditor.
Indiana	Winamac	Feb. 7, noon	Grading, drain and gravel certain highways.	W. E. Munchenburg, Co. Aud.
Indiana	Martinsville	Feb. 7	Constr. road in Adams township.	J. S. Whitaker, County Auditor.
Indiana	Marion	Feb. 7, 2 p.m.	Constr. macadam road in Fairmont township.	A. Y. Stout, County Auditor.
Virginia	Elizabeth City	Feb. 7, 3 p.m.	Constructing smooth or brick pavement.	City Clerk.
Wisconsin	Waterville	Feb. 7	Constructing 8-mile macadam road.	County Commissioners.
Indiana	Michigan City	Feb. 7	Constr. cement and brick sidewalk for 1911.	E. J. Heise, City Clerk.
California	Riverside	Feb. 8	Macadamizing 1 1/4 miles road.	A. B. Pilch, County Clerk.
Ohio	Cleveland	Feb. 8, 11 a.m.	Grading, drain and improve Fairmont road.	John T. Goldenbogen, Clk. Co. Comrs.
Indiana	Mt. Vernon	Feb. 8, 2 p.m.	Constructing 2 mile road in Robb township.	Paul Maier, County Auditor.
Indiana	Lafayette	Feb. 8, 10 a.m.	Construct gravel road.	Geo. W. Baxter, County Auditor.
Indiana	Evansville	Feb. 9, 10 a.m.	Broken gravel and gravel to repair roads.	C. P. Bearl, Clk. B. I. of Turnp. Dir.
Pennsylvania	Erie	Feb. 13, 8 p.m.	Paving part of W. 20th street.	G. F. Hanlon, City Clerk.
Michigan	Menominee	Feb. 14, 2 p.m.	Constr. gravel road on bay shore.	Carl A. Anderson, Clerk.
Ohio	Cleveland	Feb. 15	Constr. Broad View road.	J. T. Goldenbogen, Clk. Co. Comrs.
Alabama	Mobile	Feb. 16, noon	Lay 33,000 sq. yd. wood block pave. incl. grade and concr. foundation with 13,426 ft. cement curb.	Board of Pub. Works.
West Virginia	Huntington	Feb. 20, 1 p.m.	Paving two alleys.	John Coon, Comr. of Streets.
Ohio	Defiance	Feb. 20	Stoning 1 1/2 mile road, approximate cost \$5,000.	County Auditor.
Massachusetts	Boston	Feb. 20, 1 p.m.	Constr. roads, walks, drains, etc. at Ft. Andrews.	Capt. A. M. Miller, Constr. Q.M.
Oregon	Portland	Feb. 23	Constructing pavement on Jersey st.	J. W. Morris, City Engineer.
Oregon	St. Johns	Feb. 23	Constructing several hard service streets.	A. M. Esson, City Representative.
Manitoba	Winnipeg	March 1, 11 a.m.	Supply 1,000 to 1,500 tons asphalt for paving.	M. Peterson, Secy. B. I. of Control.
Georgia	Savannah	March 9, noon	Furn. 5,000 cu. yd. cem. gravel or like material for imp. pub. rds.	County Commissioners.
SEWERAGE				
Missouri	St. Louis	Feb. 3, noon	Constr. Baden pub. sewer.	Maxime Reber, Pres. B. P. Imp. County Auditor.
Minnesota	Warren	Feb. 4, 10 a.m.	Furn. about 2,200 ft. corrugated culverts.	Secy. Richvale Land Co.
California	Nelson	Feb. 5, noon	Construct sewers and septic tanks for Richvale.	W. J. Campbell, City Clerk.
Georgia	Atlanta	Feb. 6, 3 p.m.	Constr. sewers and furn. vit. pipe, cem. and castings.	Chas. Wheeler, Jr., City Clerk.
Oklahoma	Muskogee	Feb. 6, 5 p.m.	Constr. sanitary sewers.	F. D. Brooks, City Clerk.
Kansas	Lawrence	Feb. 6	Constructing 8-in. lateral sewer.	G. R. Geary, Mayor.
Ontario, Can.	Toronto	Feb. 7, noon	Constructing low level intercepting sewer.	Wm. L. Martin, City Clerk.
Georgia	Augusta	Feb. 7	Excavating 3rd level of canal.	T. D. Matheson, City Clerk.
Montana	Billings	Feb. 7	Construct sewer.	J. E. Howe, City Clerk.
New Jersey	Summit	Feb. 7, 8:30 p.m.	Constr. 4,960 ft. 8 and 10-in. vit. pipe sewer.	F. L. Hughes, County Auditor.
North Dakota	Dickinson	Feb. 7, 10 a.m.	Furn. metal culverts, 45 to 48-in. diam. 20 ft. length.	W. Armstrong, Clerk.
New York	Yorkville	Feb. 9, 4 p.m.	Constructing sewers, including disposal plant.	Henry N. Knott, City Clerk.
Minnesota	Minneapolis	Feb. 10, 7:30 p.m.	Furn. sewer brick, spl. castings and vitr. clay pipe.	D. P. Coleman, Mayor.
Alabama	Uniontown	Feb. 13, 8:15 p.m.	Constr. sewerage system and disp. plant, incl. 1,840 lin. ft. 15-in., 3,000 ft. 12-in., 7,500 ft. 10-in., 15,200 ft. 8-in. pipe sewer.	T. A. Hinnant, Clerk.
North Carolina	Wilson	Feb. 15, noon	Constr. from one to two thous. ft. 30 to 49 in. brick storm sewer.	Board of Pub. Works.
Alabama	Mobile	Feb. 16, noon	Constr. approx. 10,350 lin. ft. storm sewer ranging in size from 5x11 ft. canal to 10 in. vit. pipe also 6,000 ft. 6 in. vit. pipe hose connect.	John Coon, Comr. of Streets.
West Virginia	Huntington	Feb. 20, 1 p.m.	Laying sewers in various streets.	John E. Murphy, Clerk B. I. Trust.
New York	Hastings-on-Hud	Feb. 24	Construct sewers in various streets. About 16,000 feet.	
WATER SUPPLY				
Ohio	Troy	Feb. 4	Constr. water mains to infirmary.	A. E. Sinks, County Auditor.
Illinois	Kingston	Feb. 4	Constr. water works system, consisting of 3,000 ft. of 4-in. pipe, 8-in. well, tank and gasoline engine.	Sylvester Witter, Village Clerk.
California	Nelson	Feb. 5, noon	Install water system for Richvale.	Secy. Richvale Land Co.
Iowa	Rippey	Feb. 6, 8 p.m.	Construction of water works system.	J. A. Haberer, Town Clerk.
Manitoba, Can.	Winnipeg	Feb. 6	Erect two pump. plants; cap 1,000,000 imperial gal. per 24 hrs.	M. Peterson, Secy. B. I. Control.
Kansas	Hanover	Feb. 6	Constructing pumping station.	Duval Spence City Clerk.
Georgia	Kirkwood	Feb. 6	Furn. mat. and machy. for constr. water and sewerage system.	Hazelhurst & Anderson Atlanta.

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
WATER SUPPLY (Continued)				
Minnesota	Madison Lake	Feb. 6	Drill 8 in. well, approx. 200 to 300 feet.	F. B. Knoff, Village Clerk.
South Dakota	Huron	Feb. 6	Impr. w. w. system, inclu 1 brick pump house, pump, plant, reinf. concr. reserv. 750,000 gal. cap., steel tower 100 ft. high, and tank 200,000 gal. cap.	S. S. Oviatt, City Auditor.
Missouri	Kansas City	Feb. 9, 2 p.m.	Constr. and deliver two meters of Venturi type, with attach. for install. one on 48 and one on 36-in. pipe.	E. B. Harrington, Secy. Bd. F. and W. Comrs.
Minnesota	Minneapolis	Feb. 10, 7:30 p.m.	Furn. for use in 1911 c.i. pipe, hydrants, valves and special castings, and two 30-in. meter tubes for measuring water pumped by two 20,000,000 gal. centrif. pumps.	Henry N. Knott, City Clerk. Chas. Anderson Boro. Clerk. E. H. Goodman Town Clerk.
New Jersey	South River	Feb. 13	Constr. suction well, brick and concr. 25 ft. diam. and 33 ft. deep	
Montana	Townsend	Feb. 14	Constr. water supply system.	
Ohio	Toledo	Feb. 14, noon	Constr. extension water purif. wks. incl. 11 filters, etc., capable purifying 14,000,000 gals. daily.	J. R. Cowell, Dir. Pub. Serv.
Georgia	Dalton	Feb. 16	Constr. water works incl. concr. reservoir, 2,000,000 gals. capacity, approximate cost \$30,000.	Paul B. Trammell, Mayor. A. M. Brandenburgh, City Clerk. Frank D. Howe, City Clerk.
Montana	Bozeman	Feb. 16, 5 p.m.	Excavating for reser. and laying concr. approx. 4,846 sq. yds.	
Nebraska	North Bend	Feb. 17, 8 p.m.	Install pumping sta. inclu 1 wells, pipes, engines, etc.	S. L. Smith, Dir. Pub. Serv.
Washington	Colville	Feb. 21	Constructing 3,200 ft. of 10 in. wood pipe.	
Ohio	Wooster	Feb. 21, noon	Constr. addition to waterworks system.	
Wyoming	Sheridan	Mar. 6, 3 p.m.	Constr. water supply main with approx. 7,934 ft. of 14-in. and 760 ft. of 10 in. c. i. pipe.	Arnold Tschirgi, City Engr. H. Z. Walpole, Secy. Water Co.
Pennsylvania	West Telford	April 1	Constr. water works; approx. cost \$30,000.	
BRIDGES				
Ohio	Cincinnati	Feb. 3, noon	Building culverts on Kirby road.	Fred Driehs, County Clerk. County Auditor
Minnesota	Warren	Feb. 4, 10 a.m.	Build culverts of various sizes.	J. F. Oaks.
Mississippi	Iuka	Feb. 5	Constr. bridge over McNutt Mill Creek.	W. F. Sams, City Clerk.
Kansas	Chanute	Feb. 6, noon	Constr. bridge across Neosho river, also three smaller bridges.	H. A. Buerhaus, County Auditor. A. P. Erickson County Auditor. County Aud., Circleville.
Ohio	Zanesville	Feb. 6, noon	Constr. substructure of Fifth st. bridge.	W. R. Pistole, County Clerk.
Minnesota	Minneapolis	Feb. 6, 11 a.m.	Repair Bridge No. 4, Hanover Village.	J. D. Laughlin, Chancery Clerk. P. J. Sater, County Auditor.
Ohio	Williamsport	Feb. 6	Repairs to bridge, and superstructure for bridge.	A. K. Breshnar, Clk. B. i. of Supv.
Mississippi	Meridian	Feb. 6, 2 p.m.	Constr. wooden bridge.	D. O. Bachelor, County Auditor.
Mississippi	Vicksburg	Feb. 6	Construct steel bridge over bayou.	Wm. L. Martin, City Clerk.
Indiana	Columbus	Feb. 6	Constr. bridge in Rock Creek township.	
Mississippi	Port Gibson	Feb. 7	Repairing bridge, approx. cost \$4,000.	
Indiana	Elkhart	Feb. 7, 9:30 a.m.	Construct bridge.	
Georgia	Augusta	Feb. 7, 4 p.m.	Constr. masonry culvert over Beaver Dam Ditch.	
Louisiana	Houma	Feb. 7, 2 p.m.	Constr. bridge across Bayou Terrebonne, total length 132 ft. 50 ft. span.	J. C. Dupont. Albert Sahn, County Auditor. Levi S. Prickett, Chm. Bd. Com.
Indiana	Indianapolis	Feb. 8, 10 a.m.	Constr. bridge over Lick Creek.	J. C. Argall, Secy. B. i. Pub. Wks.
New Jersey	Salem	Feb. 8, 10:30 a.m.	Constr. concrete floor bridge.	John W. Summers, County Auditor. County Commissioners.
Washington	Spokane	Feb. 9, 2 p.m.	Constr. concr. bridge over Latah Creek.	
South Dakota	Yankton	Feb. 27, 7:30 p.m.	Constr. steel reinforced concr. bridge over Rhine creek.	
Ohio	Springfield	Feb. 28	Constr. 120 ft. bridge over Mad river.	
LIGHTING AND POWER				
New Jersey	Newark	Feb. 3, 3 p.m.	Furn. and install. ash conveying and auto. stoking system for boiler room of power house.	L. E. Voorhees, Chm. P. B. Com. Nicholas Lawson, Comr. L. & W.
Washington	Tacoma	Feb. 6	Com. remain. prt. Nisqually power plant, tot. cost \$1,094,000.	John Griffiths, Secretary. E. T. Nichols, City Clerk. Lewis Lukes, Apartado 58.
Pennsylvania	Washington	Feb. 20, 7:30 p.m.	Light borough for five and ten years, commencing May 1.	
Iowa	Atlantic	March 1	Imp. Elec. Lt. and Power Plant, probable cost \$40,000.	
Mexico	Monterey, N. L.	March 1	Erection of gas plant.	
FIRE EQUIPMENT				
Georgia	Ft. Screven	Feb. 6, 11:45 a.m.	Constr. incl. plumb, wiring and fixture one fire station.	Constr. O.M., U.S.A.
Florida	Jacksonville	Feb. 6, 3 p.m.	Constr. bl lg. for use fire dept.	W. M. Bostwick, Jr., Chm. N. W. W. B. i.
Texas	Sherman	Feb. 6	Furn. 1,500 ft. rub. lined cotton hose, 2½ in.	B. C. Kreager. City Clerk.
New York	Mt. Vernon	Feb. 7	Construct fire house.	W. C. Seehausen, County Clerk.
Illinois	Carlinville	Feb. 7	Install lighting plant in almshouse.	Wm. B. Ross, Town Clerk.
New Jersey	Kearney	Feb. 8, 9 a.m.	Furn. 2,000 ft. of 2½ in fire hose, fifty ft. lengths.	Edw. P. Dahill, Chief Fire Dept.
Massachusetts	New Bedford	Feb. 8, 7:15 p.m.	Furn. 5,000 ft. of cotton rubber lined hose and 12 steel lockers.	H. W. Carroll, City Clerk.
Washington	Seattle	Feb. 10	Furn. 2,000 ft. of 3½ in. and 3,000 ft. of 3 in. rubber line 1 cot h	John Gifford, City Purchas. Agt. Commissioners of the Dist. of Col.
Washington	Spokane	Feb. 10, 2 p.m.	Furn. 25 fire alarm boxes.	
Dist. of Columbia	Washington	Feb. 15, 2 p.m.	Furn. one gasoline motor driven fire eng. and 1 hose wagon comb	
Montana	Bozeman	March 2, 5 p.m.	Furn. one gasoline motor driven fire eng. and 1 hose wagon comb with spee l of 45 mi., including 1,200 ft. of 2½ hose, 40-gal. chemical tank, etc.	A. M. Brandenburg, City Clerk. E. M. Up like, Chm. F. & W. Com.
New Jersey	Princeton	July 5	Furn. auto pumping engine.	
MISCELLANEOUS				
Pennsylvania	Eldystone	Feb. 6, 8 p.m.	Construct lockup addition to city hall.	Jos. H. Griffith, Clk. of Council. Roy Walter, City Clerk.
California	San Jose	Feb. 6	Constructing tuberculosis ward, county hosp. Est. cost \$10,000.	E. J. Heise, City Clerk. Park Commission.
Indiana	Michigan City	Feb. 7, 10 a.m.	Construction of docks along harbor.	
Pennsylvania	Wilkes Barre	Feb. 10, noon	Furnish 200 shale trees.	
North Dakota	Grand Forks	Feb. 20	Constr. new city hall.	

STREET IMPROVEMENTS

Aliceville, Ala.—Council has passed ordinance providing for laying of 5-ft. concrete sidewalks from 2d st. west to corporate limits along both sides of 3d ave.

Tucson, Ariz.—Territorial Engineer J. B. Girard is planning construction of hundred of miles of Territorial highway.

Chico, Cal.—Fifty-six new concrete crossings are to be laid as preliminary to the new street work which is soon to begin.—C. H. Hintz, Superintendent of Streets.

El Centro, Cal.—City is considering paving of 35,000 sq. yds.—H. B. Pearson, Jr., City Engineer.

Richmond, Cal.—City is planning to pave McDonald ave., distance about 25 blocks.—I. R. Vaughn, City Clerk.

Stockton, Cal.—Citizens have defeated proposition to issue \$507,699 bonds for street work, sewers and fire department purposes.

Denver, Col.—Council will consider extension of 16th ave. through Esplanade entrance to City Park.

Washington, D. C.—An American Consul in the East has reported that several municipalities in his district contemplate purchasing one steam road roller each during coming year. Address No. 6131, Bureau of Manufactures.

Washington, D. C.—A firm of engineers in the Near East has obtained from local government contract to build 1,000 meters of road, and is in the market for road making tools and machinery. Address No. 6123, Bureau of Manufactures.

New Castle, Del.—Citizens will soon vote on \$10,000 bonds for street improvements.

Jacksonville, Fla.—Residents of Third st., Springfield, are urging paving of that thoroughfare.

Pensacola, Fla.—Tentative plans for street paving to be done under new bond issue are now being worked out by Board of Bond Trustees.

Atlanta, Ga.—Council has appropriated \$5,000 for reggrading Spring st. between Walton st. and Carnegie Way.

Kooskia, Ida.—Commercial Club is considering construction of wagon road to Newsome and Elk City.

Bloomington, Ill.—Bids will soon be received by Council for paving N. Oak, Evans and W. Olive sts., 8 blocks; Poston block preferred.—E. Mer Folsom, City Engineer.

Canton, Ill.—Board of Local Improvements is considering paving of East Elm st. from 3d ave. to 7th ave. at estimated cost of \$9,170.14; West Olive st., \$11,310.39.

Freeport, Ill.—Board of Local Improvements is planning to construct 22,000 sq. yds. of brick paving.—J. A. R. Daniels, City Clerk.

Mendota, Ill.—Construction of four-mile hard road from section 16 to township line is being considered.

Sycamore, Ill.—Citizens will vote on construction of hard roads north of town.

Mitchell, Ind.—Council has rejected all bids for four blocks of vit. brick paving on Railroad ave.; new bids will be asked.—W. H. Field, Engineer.

Mishawaka, Ind.—Paving of four avenues with bituminous macadam is under consideration.

Richmond, Ind.—Board of Public Works has adopted resolution for paving of North E street.

CONTRACTS AWARDED

Huntsville, Ala.—To Blome Block Paving Co. for paving two or more streets.
 Azusa, Cal.—Improving Azusa ave. and Center st., to B. K. Davissou Co., Monrovia, \$35,459.
 Fresno, Cal.—Building Sand Creek road, to L. S. Reed, \$21,990.
 Long Beach, Cal.—To Oil Macadam Paving Co. for paving Circle Park, Maine and 10th sts., \$20,558.
 Porterville, Cal.—To Worswick Street Paving Co. to pave Mill st. with class B paving, concrete gutters, 27c.; paving, 5c. per sq. in.; sheet iron culverts, 26c. per lin. ft.
 Augusta, Ga.—Laying curbing, to Wm. F. Bowe, city, 34c. per lin. ft. for straight curb and 45c. for round; cement paving, to A. A. Heit & Co., 9½c. per sq. ft. for sidewalks and 5½c. for cement driveways; both contracts to last during year; laying necessary sewer piping, all sizes, to T. G. Brittingham, city.
 Mattoon, Ill.—To Thornton & Michaels, city, for 6,000 sq. yds. vit. brick paving on concrete foundation, \$13,000.
 Boston, Mass.—Mayor Fitzgerald approved contract made without advertising with Buffalo Steam Roller Co. for furnishing six-ton tandem steam roller for \$2,150.
 Boston, Mass.—Repairing asphalt pavement on streets having no guarantee, as ordered, from Feb. 1, 1911, to Jan. 31, 1912, to Warren Bros. Co., 59 Temple pl., \$37,150.
 Detroit, Mich.—By Department of Public Works, all contracts to run until Jan. 31, 1912: Iron castings, sewer grates, etc., to Co-operative Foundry Co.; furnishing receiving basin stone, to F. C. Ortman, \$28.24 for blue stone; furnishing vit. sewer pipe of following sizes, 33-in., 30-in., 21-in., 12-in., 15-in. and 6-in., to J. Calvert's Sons, 145 Griswold st.; furnishing cinders for the east side of Detroit, to Garner Bros., 499 Chene st.; furnishing cinders for the west side of Detroit, to Wayne County Cinder and Supply Co., both at 55c. per cu. ft.; furnishing No. 1 and 2 cedar block, to W. E. Currie, 20 McGraw Bldg., to furnish No. 1, 40c. per sq. yd. and No. 2, 30c.; Medina stone in circles, to Orleans County Quarry Co., 5-in. stone, 38c. per lin. ft. and 6-in. stone at 41c.; for furnishing paving brick of different kinds to the following, for furnishing 1,000,000 bricks each more or less: Wassall Brick Co., Nelsonville Brick Co., Deckman Duty Brick Co., the Bessemer Limestone Co., the Wooster Shale Brick Co., the Detroit Vitrified Brick Co., the T. B. Townsend Brick and Contracting Co., the Novelty Brick and Coal Co., the Massillon S. & F. B. Co., and the Alliance Clay Product Co.; furnishing gravel, to the A. P. Weideman Co., 73 Home Bank Bldg., 1.035c. per cu. yd. on cars.
 Columbia, Mo.—Paving 6th st., about 10-22½ sq. yds. brick paving, to J. A. Stewart, city, \$20,948.
 Mt. Holly, N. J.—Graveling road from Gardner's Corners through Atison, to Howard Mathis, New Gretna, \$10,430.
 Salem, N. J.—Grading, placing gravel oyster shell surface on the Mannington, Filksgrove and Woodstown road, to Benj. L. Tuft and Frank H. Kelly, city, \$26,442.
 New York, N. Y.—Improving various streets, Bronx: Contract No. 2, to L. J. Moran, 562 Burnside ave., \$5,240; No. 5, to Barber Asphalt Paving Co., 30 Church st., \$4,718; No. 6, to Amanna & Lyons, 8 Van Cortlandt ave., \$3,078; No. 7, to the Alamo Construction Co., 215 W. 125th st., \$12,739.
 Niagara Falls, N. Y.—Cosy Dell section Niagara Falls-Fort Erie road, to Power

Detroit, Mich.—Furnishing all paving brick required for year ending with Jan. 31, 1912; three specifications; for successful bidders, see Contracts Awarded:

Bidder, and trade name of block bid upon.	Delivered	Delivered	Delivered	Guaranteed
	on Sid- ing I. o. b. Cars, per M.	on Street without Guaranty, Per M.	on Street with Three Year Guar- anty, Per M.	Number of Brick Per Sq. Yd.
The Wassall Brick Company, Wassall	\$20.00	\$21.50	\$21.50	39
Metropolitan Paving Brick Co., Canton	19.75	21.70	21.70	40
Metropolitan Paving Brick Co., Century	19.75	21.70	21.70	40
Metropolitan Paving Brick Co., Metropolitan	20.75	22.70	22.70	40
Nelsonville Brick Company, Nelsonville	19.75	21.25	21.25	40
Deckman-Duty Brick Co., Medal	20.00	21.40	21.40	40
Deckman-Duty Brick Co., D. & D.	20.00	21.45	21.25	40
Deckman-Duty Brick Co., Collinwood	20.25	21.75	21.75	40
Bessemer Limestone Company, Bessemer Block	20.25	21.50	21.50	40
Wooster Shale Brick Co., Wooster	19.50	21.25	21.25	39½
Detroit Vitrified Brick Co., Champion	18.50	20.00	20.00	41
S. Zanesville S. P. & Brick Co., Bolen Brown	18.10	19.85	19.85	43
T. B. Townsend Brick & Construction Co., Townsend	19.00	20.75	20.75	40
Massillon Brick Company, Massillon	19.00	20.60	20.60	40
Novelty Brick & Coal Co., Novelty	19.00	20.75	20.75	40
Noble Brick Company, Noble	18.75	20.50	20.50	40
Saginaw Paving Brick Co., Saginaw	19.50	21.00	21.00	42
Massillon S. & F. B. Co., Massillon	19.60	21.35	21.30	40
Alliance Clay P. Co., Speedway	19.10	20.70	20.70	40
Detroit Brick & S. S. Co., Big "4"	19.00	20.75	20.75	40

City Stone Company, to Menzie & Cook, for two sections, from shipyards to Black Creek, to be completed in July, to Champlain & Co., for two sections, extending from Slaters Point to Black Creek, to be completed in July.

Akron, O.—Construction of section 6 of the Akron-Lancaster road, to Leters & Palmer, Mansfield, \$69,650.33.

Lakewood, O.—Laying 2,500 sq. yds. of brick paving, to W. S. Rice, 11,297 Clinton Blvd., 15c per ft.

Urbana, O.—Building one mile of stone road in Champaign County, to H. B. Stevens, Mechanicsburg, \$1,363; other bidders were: E. P. Patrick, Mechanicsburg, \$1,109; T. W. Hill, Bellefontaine, \$1,675; H. T. Wilson, Zena, \$4,617.

Youngstown, O.—Furnishing 50 tons of asphalt cement, to the Texas Co., \$21.90 per ton.

Everett, Wash.—Grading Dist. No. 237, to Atlas Construction Co., \$22,974.

Seattle, Wash.—Grading 15th ave., to Peacock Bros., 855 W. 48th st., \$5,947.75; planing 40,000 ft. of sidewalks on 31th ave., to J. G. Engstrom, \$16.50 per 1,000 ft.

BIDS RECEIVED

Chicago, Ill.—Sectional wood pavement, G. P. Culien, 78 La Salle st., lowest bidder, 2,000 sq. yds. 2 1/2-in. pavement, \$2.35; 2,000 sq. yds., 3 1/2-in., \$2.70.

Ann Arbor, Mich.—Furnishing 15,000 lbs. Portland cement, to Peerless Portland Cement Co., of Union City, Mich., \$1.00 net.

New York, N. Y.—Regrading, grading, setting curb, flagging sidewalks, laying crosswalks, building approaches and placing fences in Bronxwood ave., Gunn Hill road to Burke ave., J. B. Malatesta, lowest bidder; 3,500 cu. yds. earth excavation, 10c.; 9,300 cu. yds. rock excavation, \$1.30; 29,100 cu. yds. filling, 20c.; 2,950 lin. ft. new curbs, 70c.; 11,550 sq. ft. new flag, 24c.; 2,700 sq. ft. new bridgestone for crosswalks, furnished and laid, 18c.; 110 cu. yds. dry rubble masonry, in retaining walls, culverts and gutters, \$1; 50 cu. yds. rubble masonry in mortar, \$2; 160 lin. ft. vit. stoneware pipe, 12 ins. in diameter, \$1; 25 lin. ft. vit. stoneware pipe, 15 ins. diameter, \$1; 1 M ft. lumber, furnished and laid, \$25; 1,900 lin. ft. new guard rail, 20c.; 100 cu. yds. concrete, \$10; 4,200 lbs. steel bars, furnished and in place, 5c.; total, \$26,403; totals of other bids: Perillo & Shiel, \$36,880; F. Pistone, \$34,396; L. C. Rose, \$24,963; J. M. Rogers & Co., \$36,891; C. Romwell ave., Jerome ave. to Macomb's road, M. F. Maher, lowest bidder; 5,200 cu. yds. earth excavation, 39c.; 500 cu. yds. rock excavation, \$1.19; 24,000 cu. yds. fill, 9c.; 4,770 lin. ft. new curb, 72c.; 19,445 sq. ft. new flag, 23c.; 760 sq. ft. new bridgestone for crosswalk, 65c.; 470 cu. yds. dry rubble masonry, in retaining walls, culverts and gutters, \$1.20; 1 M ft. lumber, \$1; 2,450 lin. ft. new guard rail, 19c.; total, \$14,264; totals of other bids: W. McPherson, \$14,816; J. C. Voorhies, \$15,624; A. Cebrelli, \$14,461; Seneca ave., Hunt's Point ave. to Whittier st., L. J. Moran, lowest bidder, \$5,240; paving with asphalt block on a concrete foundation Grant ave., 165th st. to 166th st., Barber Asphalt Paving Co., lowest bidder; 1,604 sq. yds. completed asphalt block pavement, and keeping same in repair for five years, \$1.70; 260 cu. yds. concrete, including mortar bed, \$6; 180 lin. ft. new curbs, 90c.; 750 lin. ft. old curbs reset, 36c.; total, \$4,719; repairing sheet asphalt pavement in Manhattan Borough as follows: (a) 270,000 sq. yds. asphalt pavement, including binder course, (b) 500 cu. yds. Portland cement concrete, (c) 1,000 sq. yds. of old stone pavement relaid, (d) totals; Barber Asphalt Co., (a) 99c., (b) \$7.70, (c) 90c., (d) \$272.050; Uvalde Asphalt Co., (a) 97c., (b) \$7.80, (c) \$1, (d) \$266.800.

SEWERAGE

Attala, Ala.—City will open bids within 30 days for construction of sewer system.

Calixico, Cal.—I. B. Funk, Imperial, has completed plans for the proposed sewer system, consisting of 14,200 ft. 6, 8, 10, 12 and 15-in. pipe sewers, 72 manholes, 10 lamp-holes, 10 flush tanks and 2 concrete settling tanks.

Hanford, Cal.—Town Council has adopted plans for enlargement of the sewer system, including extension of 3 miles of sewers, a settling tank with 2 chambers and extension of 1 mile of water mains for fire purposes.

Los Angeles, Cal.—Council has ordered vit. pipe sewers constructed in portions of Savannah, 1th, Saratoga, 2d, 2d, Evergreen, Fresno, Dacotah, Emmet, New Jersey, Mott, Cincinnati, Eagle and 5th sts. and Pennsylvania, Michigan, Brooklyn and Euclid aves. and East Lake Blvd.

Ft. Morgan, Col.—Bids will be received about March 15 for the construction of pipe sewers, concrete for manholes and flush tanks; cost about \$6,500.—H. R. Oliver, City Engineer.

Easton, Ga.—Plans are being prepared by Clyde Potts, 30 Church st., New York City, for construction of sewerage system and disposal plant.

Waycross, Ga.—Council has adopted plans for extension of sewer and water system throughout Gilchrist Park; cost about \$7,000.

Fairfield, Ill.—Citizens are considering installation of sewer system.—H. D. Daulton, Aurora, Engineer.

Upper Arion, Ill.—Village Engineer B. B. Stakeholder has prepared plans for proposed sewerage system.

Clinton, Ia.—City is considering construction of sanitary and storm water sewers in spring; cost \$200,000.—Reuben Hart, City Engineer.

Clanclala, Ia.—Council has voted to install between four and five miles of sewers at cost of \$10,000.

Dodge City, Kan.—Citizens will vote Feb. 9 on \$1,000 bonds to install sewer system.

Covington, Ky.—City Engineer Weimers has recommended construction of 6 trunk sewers in various parts of city.

Cicquet, Minn.—Plans are being prepared by City Engineer E. S. Spencer for sewers to be built this season.

Meirose, Minn.—S. S. Clute, St. Cloud, is preparing plans for a sewer system to cost about \$9,000; contract will be let about Feb. 15.—F. J. Weisser, City Clerk.

Gordon, Neb.—Citizens have voted bonds for construction of sewers.

Hastings, Neb.—Council has decided to construct sewerage extension in Deitz addition; length one-half mile.

Omaha, Neb.—Plans have been prepared by J. E. Bruce, Acting City Engineer, for construction of sewer system; cost about \$1,051,000.

Bound Brook, N. J.—Plans are being prepared by Consulting Engineer Clyde Potts, 30 Church St., New York City, for sewage disposal works for borough.

Collingswood, N. J.—Sewerage Co. has applied to courts to have piece of land in West Collingswood condemned for site for a pumping station and electric lift, which is required to force the sewerage from low section of Collingswood to disposal plant.

Hasbrouck Heights, N. J.—Preliminary survey has been made with approximate estimate of cost for the proposed sewer system.

Trenton, N. J.—Council has decided to install sewer on Homan ave.—H. B. Salter, City Clerk.

Frankfort, N. Y.—Village has voted to issue bonds for establishment of system of sewers.

Niagara Falls, N. Y.—Residents of Ontario ave. are urging extension of sewer at cost of about \$1,500.—F. S. Parkhurst, Jr., City Engineer.

Charlotte, N. C.—City is considering election on \$250,000 of sewer bonds.—W. Hawkins, Mayor.

Durham, N. C.—City has asked for authority to issue \$300,000 bonds for sewer construction, erection of disposal plant and improvements to streets and sidewalks.

Columbus, O.—Council has passed ordinance authorizing Service Department to make contract with Grandview Heights for furnishing of sewerage and water service to that village.

Millersburg, O.—Council has decided to construct sewers in three streets.

New Concord, O.—City is considering construction of sewer system and disposal plant in Lincoln addition.—Jas. E. Campbell, Mayor.

Pleasant Ridge, O.—Riggs-Sherman Co., The Nasby, Toledo, has been selected to prepare plans for complete sanitary sewer system, with sewage disposal plant.

Ravenna, O.—Council has passed resolutions for construction of sewers in Chestnut and Diamond sts.

Ripley, O.—Surveys have been made by City Engineer for sewer to be constructed at cost of about \$5,300.—L. V. Williams, Mayor.

Sebring, O.—City is considering construction of 12 miles of sewers during year.

Struthers, O.—Council is considering advisability of constructing sewers to be one-half mile in length in Poland, Stewart and Hawthorne sts.

West Lafayette, O.—Council has decided to construct sewers to cost about \$20,000.

Brownsville, Ore.—Sewer system will be constructed this year.

Portland, Ore.—Plans for installation of the Killingsworth ave. and Union ave. sewer have been completed; cost about \$250,000.—J. W. Morris, City Engineer.

Portland, Ore.—Residents of Vernon District have asked Council for installation of sewer system.

Springfield, Ore.—Council has passed ordinances for construction of four sewers.

Connellsville, Pa.—Plans have been prepared by J. B. Hogg, city, for comprehensive sewerage system to cost \$150,000.

Danville, Pa.—Dr. Samuel Dixon, State Board of Health, has refused to approve proposed sewerage plans; Council will take action soon.

Tarentum, Pa.—Complying with order State Board of Health that all borough along Allegheny River erect sewerage disposal plants, Tarentum, Brackenridge, Harrison and East Deer Townships are preparing to build joint plant near Tarentum Health and Sewer Committees of Council represent Tarentum and W. R. Almes, A. Kern and T. J. Crawford compose Brackenridge committee in charge of plans; committees representing the two townships will be chosen by Supervisors; similar joint plant is being planned by Ramassus, New Kensington and Arnold, across river from Tarentum; Springdale and Cheswick will join in building tunnel.

Houston, Tex.—Consulting Engineer Frank L. Dormant has prepared plans and bids will soon be asked for construction of three sewers.

Seattle, Wash.—Cost of building sewer on W. 65th st. has been estimated at \$14,000.

Wausau, Wis.—Bids will soon be received for construction of 60 and 72-in. pipe sewers in Sixth Ward.—B. C. Gowan, City Clerk.

New Westminster, B. C., Can.—Plans have been prepared for proposed 8th sewer system consisting of over 14 miles of vit. sewer pipe.

CONTRACTS AWARDED

Brawley, Cal.—To California Ornament Brick Co., Los Angeles, for construction system of sewers, \$13,616.—A. L. Sonderegger, Central Bldg., Los Angeles, Consulting Engineer.

Monrovia, Cal.—By Board of Trustees, R. C. Lowell, 613 South Grand ave., Los Angeles, for construction of municipal sewer system, \$85,741 for sewer complete; vit. pipe will be used for all, except 24-in. which will be of reinforced concrete; quantities required, 118,600 ft. 6-in., 3,250 yds. 10,000 ft. 8-in., 160 yds.; 65,000 ft. 10-in., 186 yds.; 3,160 ft. 12-in., 50 yds.; 1,200 ft. 14-in., 16 yds.; 4,000 ft. 16-in., 60 yds.; 9,7 ft. 24-in., 22 brick manholes; 67 flush tanks.—Olmstead & Gillilan, Wright & Callender Bldg., Los Angeles, Engineers.

Aledo, Ill.—Building sewer, to Lany Clifford, 235 North Genessee st., Waukegan, Ill., \$9,806.

Syracuse, N. Y.—Building Harbor Branch intercepting sewer; northern section John Young Contracting Co., \$88,121; southern section to Chas. T. Hookway, \$101,014.

Cnecotah, Okla.—Construction of sewer to C. R. Nichols, Caney, Kan., \$29,601; work includes 56,150 ft. 12, 10 and 8-in. vit. pipe sewers laid with cement joints, 1,320 branches, 90 manholes, 50 lampholes, 8 flush tanks, 40,180 cu. yds. excavation; other bidders: Midland Construction Co., Ft. Scott, Kan., \$31,814; Bash & Grey, Joplin, Mo., \$32,637; F. R. Stone, Oklahoma City, \$32,663; Hinson Bros. & Price, Cnecotah, \$33,333; Healy Construction Co., McAlester, \$33,277; Heman Construction Co., St. Louis, Mo., \$34,722; W. W. Williams, Joplin, Mo., \$34,130; E. M. Eby, Wichita, Kan., \$34,344; General Construction Co., Bartlesville, Okla., \$34,956; C. E. Philpot, Pine Bluff, Ark., \$35,267; and H. W. Cardwell, Memphis, Ark., \$35,404.

BIDS RECEIVED

Syracuse, N. Y.—Building intercepting sewer, three alternatives, that is, the work is to be done in two divisions; one is north of Erie Canal and other on the south side thereof, the third alternative being for both divisions in one bid; Alternative No. 1, John Young Contracting Co., city, \$88,121; C. T. Hookway, city, \$92,216.50; Gaffey & Byrnes, city, \$99,594; Ryan & Reilly, Philadelphia, Pa., \$112,928.15; alternative No. 2, C. T. Hookway, \$101,014; John Young Contracting Co., \$103,238.25; Samuel Bonn, city, \$109,147; Ryan & Reilly, \$141,282; alternative No. 3, John Young Contracting Co., \$189,487.75.

Toledo, O.—Building sewer No. 1104, sidewalk bed of Huron st., Albert Gorzybowski, lowest bidder, 630 ft. 8-in. pipe, \$9c. earth excavation; work also includes 2 manholes 1 flush hole, 500 extra brick, etc.; total, \$541.93; estimated cost, \$880; only other bidder, Wm. Mahon, \$761.59 1/2.

Oklahoma City, Okla.—Sanitary laterals sewers, job, Engineer's estimate, lowest bidder and low estimate: Blocks 23, sub 14 Dittmer Heights, \$1,706.72; Swazer-McCreedy, \$956.81; block 7-14 Shillings' add, \$5,251.25; Reinhardt Donovan, \$3,910.44; blocks 6-14-7-15, original plat Capitol Hill, \$3,633.60; Reinhardt-Donovan, \$2,501.55; part College Hill add., and St. Mary's Academy ground, \$1,707.01; Reinhardt-Donovan, \$3,553.75; block 8 original plat Capitol Hill, \$944.59; Swazer-McCreedy, \$644.88.

WATER SUPPLY

Lytleville, Ark.—J. E. Thompson, 241 1/2th ave., Nashville, Tenn., will construct water works, 500,000 gals. capacity, to include pumping station to cost \$2,900; also steel towers 125 ft., with 75,000-gal. tanks, and one 40 ft., with 40,000-gal. tank; all electric and coal oil engine; whole \$60,000.—Rollan & Westover, Kansas City, Mo., Engineers.

Merced, Cal.—Citizens have voted \$35,000 for the construction of water works.

San Diego, Cal.—City Trustees have decided to build fire cisterns in warehouse district.

Corris, Cal.—Citizens will vote Feb. 14 on installation of municipal water system.

Yreka, Cal.—Mutual Water Co. has appropriated \$15,000 to develop a new water supply; number of wells will be sunk.

Huntington Beach, Cal.—Huntington Beach Water Co. has decided to construct reservoir.—A. L. Reed, Manager.

Long Beach, Cal.—Purchase of municipal water plant is being urged.

Redlands, Cal.—Bear Valley Mutual Water Co. has decided to construct a pipe to cost about \$25,000.

Redlands, Cal.—City Trustees have asked Municipal Water Co. to submit to the city proposition for the building of a high-pressure water system for business section of city.

Redondo Beach, Cal.—Redondo Water Works will expend about \$25,000 during present year in extension of mains within city.

San Jose, Cal.—Citizens will soon vote on plan to extend salt water mains.

Washington, D. C.—An engineer in city of Western Europe advises an American official that in case a loan which the local government has under consideration is effected a large part of the money will be devoted to public improvements; part of program of improvements will be the sinking of artesian wells; gentleman desires to be placed in communication with manufacturers of well boring machinery with view securing agency for such lines. Address 6178, Bureau of Manufactures.

Warnerburn, Ga.—Citizens have voted \$20,000 to be used for construction of water works.—W. B. Green, City Clerk.

Salmon City, Ida.—Citizens will vote Feb. 21 on \$50,000 bonds for purpose of purchasing plant and franchise of Salmon City Water Works Co.

Decatur, Ill.—Plans have been prepared by City Engineer Elmer Fossum for water mains on Jackson st.

Marion, Ill.—Bids will be received about Feb. 1 for construction of a reservoir, to cost about \$75,000.—R. L. Adams, Engineer; J. Woods, City Clerk.

Constant, Ill.—Citizens have voted \$3,200 for construction of water works.

Bedford, Ind.—Council has decided to install electric pumps at water works pumping station; plans and specifications prepared by W. L. Hurd, Chief Engineer of the Indianapolis water works, have been accepted; cost will be about \$8,000.

Bedford, Ind.—Bids will soon be received by Bedford City Water Works for improvements to water works system; also considering constructing settling basin and reservoir.—J. W. Malott, Superintendent.

Newcastle, Ind.—Council has decided to purchase site for installation of auxiliary water plant.

Shelburn, Ind.—Installation of a modern water works system is being considered.

Canton, Kan.—Water and Light Commission is investigating the matter of constructing water works and electric light plant; cost about \$30,000.

Goodland, Kan.—Commissioners have voted \$10,000 for artesian well.

Many, La.—Water works and electric light system will be installed.

Patterson, La.—City has selected Fred. A. Jones Co., Houston, Tex., as Engineers in charge of construction of water works system; cost \$30,000.

Dedham, Mass.—Water Co. will install \$25,000 engine and a pump with capacity of 2,500,000 gals. per 24 hours and will lay a double line of main pipes on Fuller and Ames st. to High st.; cost \$7,600.

Hyde Park, Mass.—Engineer Wm. S. Johnson, Board of Water Commissioners, has recommended construction of proposed filter bed addition to present water system at cost of \$30,000.

Lawrence, Mass.—Water Board will consider advisability of covering old filter at cost of \$55,000.

South Hadley Falls, Mass.—Board of Water Commissioners is considering \$12,000 loan to provide fire protection for residents of Granby road.

Algonac, Mich.—Bids will be received until Feb. 6 by John H. Ihnken, Village Clerk, for \$10,000 water works and \$10,000 electric light bonds.

North Branch, Mich.—Construction of water works is being considered.

Easton, Minn.—Citizens have voted bonds for erection of steel tower and tank.

Hills, Minn.—Council has decided to install well.

Aurora, Mo.—City will make improvements and extensions to water system.

Columbia, Mo.—Council has authorized H. B. Shaw to prepare specifications for boring two deep wells for water and light plant.

Kansas City, Mo.—Fire and Water Board is considering construction of reinforced concrete reservoir of 400,000-gal. capacity, 120x20 ft. area, 12 ft. deep.—J. P. Tilghof, President.

Marionville, Mo.—Aurora Electric Light

and Water Co. has secured franchise to construct water works; cost about \$25,000.

St. Louis, Mo.—City will issue \$100,000 bonds for improvements to water system outside of city limits.—Maxine Reber, City Engineer.

Gordon, Neb.—Citizens have voted water bond issue.

Grand Island, Neb.—W. K. Palmer Co., Dwight Bldg., Kansas City, Mo., has prepared plans for improvement of water and lighting system.

Louisville, Neb.—Bids will be received about March 1 for the construction of water works; cost about \$16,000.—D. K. Larr, City Clerk.

Norfolk, Neb.—Preliminary plans and specifications have been prepared by W. K. Palmer Co., Kansas City, Mo., for water and lighting improvements.

Wymore, Neb.—Plans are being prepared for installation of water works.

New York, N. Y.—Commissioner Thompson, of Department of Water Supply, has asked Board of Estimate for \$6,500,000 appropriation to complete easterly portion of Jerome Park reservoir of Croton Aqueduct system, construction of filtration plant being necessary to carry out plans.

Charlotte, N. C.—City is considering election of \$25,000 of water works bonds.—T. W. Hawkins, Mayor.

Fargo, N. D.—Plans for new filtration plant for city have almost been completed by City Engineer Anders.

Andover, O.—Plans are being prepared for construction of brick and concrete pumping station.—L. E. Chapin, Frick Bldg., Pittsburgh, Pa., Engineer in Charge.

Cincinnati, O.—City has awarded \$125,000 water works improvement bonds to Seasongood & Mayer.

East Liverpool, O.—Council has recommended election on \$175,000 bonds to system wells in bed of river for better water supply.

Niles, O.—Preliminary sketch of proposed \$40,000 filtration plant has been prepared.

Troy, O.—Bids will soon be received by Board of Commissioners, Miami County, for extension of the city water mains to county infirmary; estimated cost \$12,000.

Monmouth, Ore.—City has levied special tax for installation of water system.

Rock Hill, S. C.—City has retained Thos. W. Cothan, Greenwood, to prepare plans and make surveys for water works and sewerage plants; cost \$250,000.—B. Parks Rucker, Charlotte, N. C., Consulting Engineer.

Clarksville, Tenn.—City has retained James Nisbet Hazlehurst, Candler Bldg., Atlanta, Ga., to supervise reconstruction of water system; estimated cost \$50,000.

Austin, Tex.—Council has forfeited contract that had been entered into with J. C. Dumont for rebuilding of dam.

GRAND RAPIDS, MICH.

Items Received by the Board of Public Works, January 19, 1911, for Filtration Plant, Contract 4, Including Buildings, Filters and Equipment, Hering & Fuller, New York, Engineers

Item.	Quantity.	Engineer's Estimate.	Roberts Filter Manufacturing Co., Darby, Pa. Awarded Contract	American Water Softener Co., Philadelphia, Pa.	Carpenter & Adams Grand Rapids, Mich.	Fred. T. Ley & Co., Springfield, Mass.	Pittsburgh Filter Manufacturing Co., Pittsburgh, Pa.	N. Y. Continental-Jewell Filtration Co., New York, N. Y.	Norwood Engineering Co., Florence, Mass.
Excavation.....	100 cu. yd.	\$0.75	\$0.75	\$0.60	\$0.50	\$1.50	\$0.70	\$0.50	\$0.75
Concrete.....	850 cu. yd.	12.00	9.00	11.00	9.40	13.50	10.00	10.28	10.87
Reinforcing Concrete.....	10 cu. yd.	10.00	9.00	10.50	9.40	11.00	6.50	10.00	10.00
Facing Conc. Floors.....	1,100 sq. yd.	.30	.40	.40	.33	.45	.32	.37	.44
Reinforcement.....	70,000 lbs.	.04	.025	.03	.03	.035	.0275	.03	.03
Structural Steel.....	2,000 lbs.	.05	.04	.039	.04	.035	.045	.04	.04
Castings.....	3,000 lbs.	.04	.05	.0325	.04	.05	.05	.035	.035
Block Masonry.....	10 cu. yd.	15.00	13.50	27.00	16.40	15.00	17.00	17.00	15.00
Asphalt Walks.....	100 sq. yd.	1.75	1.10	1.08	1.00	1.40	1.10	1.15	1.10
Eight Cast Iron Pipe, Well and Spigot.....	1 ton	50.00	46.00	40.00	45.00	38.00	45.00	47.00	40.00
and Spigot Specials.....	1 ton	80.00	91.00	85.00	90.00	80.00	90.00	90.00	88.00
Flange Specials.....	1 ton	100.00	143.00	150.00	145.00	120.00	145.00	145.00	150.00
Filtering Fan.....	Lump Sum	150.00	150.00	134.69	140.00	120.00	200.00	195.00	185.00
Filter Strainer System.....	Lump Sum	11,000.00	13,032.00	8,900.00	14,850.00	11,400.00	14,850.00	14,905.00	15,465.00
Filter Gravel.....	Lump Sum	500.00	1,188.00	341.00	1,375.00	675.00	1,375.00	1,240.00	1,210.00
Filter Sand.....	Lump Sum	3,600.00	4,679.00	7,432.00	5,930.00	3,200.00	5,930.00	6,000.00	5,840.00
Filtering & Filter Equipment.....	Lump Sum	45,000.00	43,749.00	41,125.00	48,245.00	47,000.00	48,245.00	49,645.00	51,400.00
Automatic Feed Controllers.....	Lump Sum	3,000.00	5,678.00	4,604.00	5,500.00	4,000.00	5,500.00	6,025.00	5,820.00
Buildings.....	Lump Sum	56,770.00	54,000.00	58,700.00	52,796.00	61,800.00	58,000.00	57,010.00	56,921.00
High Water Tower.....	Lump Sum	8,000.00	7,568.00	8,471.00	8,323.00	8,700.00	8,000.00	8,180.00	9,268.00
Water Meter.....	Lump Sum	2,300.00	2,575.00	2,315.00	2,700.00	2,000.00	2,700.00	2,610.00	2,800.00
Alum & Hypochlorite Filtering devices.....	Lump Sum	4,000.00	3,390.00	2,205.00	4,100.00	2,400.00	4,100.00	4,000.00	3,550.00
Alum Cleaner.....	Lump Sum	1,200.00	800.00	1,286.00	654.00	1,150.00	1,175.00	1,150.00	1,200.00
Concrete Mixers & Motors.....	Lump Sum	3,000.00	2,460.00	2,574.00	1,749.00	2,300.00	2,700.00	2,948.00	2,840.00
Light Elevator & Motor.....	Lump Sum	3,400.00	1,800.00	3,062.00	3,050.00	2,900.00	2,800.00	2,500.00	2,750.00
Light Elevator, Motor & Spouting.....	Lump Sum	2,000.00	2,100.00	3,477.00	2,117.00	1,700.00	2,200.00	2,750.00	2,800.00
Crusher & Motor.....	Lump Sum	1,000.00	1,139.00	1,181.00	1,013.00	1,100.00	1,200.00	1,250.00	1,210.00
Filtering System.....	Lump Sum	1,100.00	950.00	1,286.00	790.00	1,250.00	1,525.00	1,420.00	1,490.00
Alum Solution Tanks, Strainers & Screens.....	Lump Sum	1,300.00	1,786.00	1,640.00	2,300.00	2,400.00	2,250.00	2,500.00	2,000.00
Hypochlorite Dissolv Tank.....	Lump Sum	200.00	158.00	163.00	200.00	150.00	200.00	260.00	270.00
Alum Baffles.....	Lump Sum	1,200.00	1,390.00	1,455.00	1,200.00	2,700.00	2,000.00	2,200.00	2,390.00
Totals.....		\$165,000.00	\$159,382.00	\$163,323.19	\$168,373.00	\$172,373.00	\$176,662.00	\$178,929.00	\$182,430.50

Gainesville, Tex.—City has sold \$150,000 water works bonds to E. B. Blanton, city; work will begin at once.

Brewster, Wash.—Council will consider installation of water system.—W. M. Allen, Mayor.

Sushonah, Wash.—Council has adopted plans by Consulting Engineer C. H. Green, Spokane, for proposed gravity water system.

White Salmon, Wash.—Installation of water works system and construction of reservoir is being considered.

Watertown, Wis.—Bids will soon be asked for drilling well on west side of river.

CONTRACTS AWARDED

Brawley, Cal.—To Geo. A. Rodgers, Los Angeles, Cal., for construction of system of water works, \$28,201. A. L. Sonderegger, Central Bldg., Los Angeles, Consulting Engineer.

Vallejo, Cal.—Furnishing 800 short tons of 14-in. c.-i. pipe, to U. S. Pipe Co., \$30.25; total, \$24,587.02; only other bidder, C. Froelich, \$25,779.93.

Daytona, Fla.—Erecting water softening reservoir, to A. Vaude Verde, \$1,035.

La Salle, Ill.—To Charley Bros., city, for construction of water supply well.—Joseph Burkart, Jr., City Clerk.

New Bedford, Mass.—Supplies for Water Board: 40 tons various sizes lead pipe, to Chadwick-Boston Lead Co., \$5.02 per 100 lbs.; other bidders: Bedford Boiler and Machine Co., city, \$5.35; National Lead Co., Boston, \$5.62½; furnishing 25 tons of best quality pig lead, to Fitz-Dana & Co., Boston, \$94.42 per ton of 2,000 lbs.; other bidders: Bruce & Cook, New York, \$92.80; National Lead Co., Boston, \$85; Chadwick-Boston Lead Co., Boston, \$93; supplying c.-i. castings, to Fairhaven Iron Foundry Co., Fairhaven, 50,000 lbs. service stop boxes and covers, 3.5c. per lb.; 30,000 lbs. gate boxes and other castings, 2.5c. per lb.; other bidder: Fuller Iron Works, Providence, R. I., 3.6c. and 2.7c. per lb.

Homer, Mich.—To T. C. Brooks & Son, Jackson, for constructing a complete system of water works; \$25,000 available for this purpose.

Perth Amboy, N. J.—Furnishing engine and generator at Runyon, to Westinghouse Electric Manufacturing Co., \$1,179.

Cherry Creek, N. Y.—Building water system, to E. Swanson, Jamestown; cost \$30,000.

Boyetown, Pa.—To Wilhauer & Co., Pottstown, to dig tunnel in which pipes will be laid to carry water from well to borough reservoir.

Spokane, Wash.—Furnishing unit for up-river pumping plant, to Allis-Chalmers Co., \$12,000.

BIDS RECEIVED

Newburg, O.—Water Works Sewer, Pavement and Construction Co., Citizens Building, Cleveland, lowest bidder for following works: 6-in. c.-i. pipe laid, 88c. per lin. ft.; 4-in. c.-i. pipe laid, 88c.; 6-in. valve and box in place, \$20 each; 4-in., \$14; six 4-in. "T" in place, \$6 each; six 6-in., \$7; 4-in. hydrant in place, \$32 each; 6-in. plug in place, \$1 each; extra excavation, 30c. per cu. yd.

Pittsburg, Pa.—Furnishing and erecting two pumping engines, 1,000,000-gal. pumping engine and appurtenances in Lincoln pumping station, Carpenter Co., \$4,985; Snow Pump Co., \$6,500; Wilson-Snyder Co., \$4,650, and Hall Steam Pump Co., \$5,110; 6,000,000-gal. pumping engine and appurtenances for Herron Hill pumping station, Halley Mfg. Co., \$56,000; Wilson-Snyder Co., \$36,580; Todd Co., \$48,500; Chalmers Co., \$44,967, and Bethlehem Steel Co., \$47,769.

LIGHTING AND POWER

Helena, Ark.—Council has passed an ordinance granting 50-year franchise to Scofield Engr. Co., of Philadelphia, Pa., prospective purchaser of the plant of Herena Gas Co.

Jackson, Cal.—John L. Henry has been granted 50-year franchise by the Board of Supervisors to erect and operate electric system.

Live Oak, Cal.—Sutter County Supervisors will call meeting for purpose of deciding on formation of lighting district.

San Bernardino, Cal.—Street lighting contract for city, which expires on March 1, cannot be continued under private contract with company which holds it now, according to opinion rendered to Council.

Utah, Cal.—Snow Mountain Water and Power Co. is arranging for extensive improvements and extensions to its system.—W. S. Graham, General Superintendent.

Willows, Cal.—Northern California Power Co. is considering establishment of high pressure gas plant.

Carbondale, Col.—Board of Trustees has granted to Aspen Light Co. franchise to supply electricity for lamps and motors for 20 years; company agrees to supply electricity at 20c. per kw. hour, with minimum charge of \$2.

Erie, Col.—Plans are being considered for enlarging municipal electric light plant; equipment will consist of a new boiler, larger generator and installation of heating plant.

Fowler, Col.—Council has granted to Pueblo and Suburban Traction and Lighting Co., Pueblo, 10-year franchise to supply electricity for lamps and motors; transmission lines will be extended to this city at once.

Greenwich, Conn.—Housatonic Electric Lighting Co. has appropriated \$100,000 for construction of gas producing and distributing plant.

Milton, Del.—N. W. White, of Georgetown, is interested in construction of plant to furnish electric light and power.

Washington, D. C.—American Consular officer in South America has reported that extensive land owner in his district intends to install a small water power electric lighting plant on one of his plantations and desires from American manufacturers estimates on dynamo and pelton wheel, coupled together, of sufficient size and strength to supply 40 16-c.p. incandescent lamps; also desires in addition to this estimates to include cost of wiring and fixtures and lamps, Mazda preferred; person has within 100 yards of his home waterfall of 150 ft., stream being large enough to fill 5-in. pipe, and two miles distant another waterfall of 250 ft. of sufficient volume to fill an 8-in. pipe. Address No. 6170, Bureau of Manufactures.

Glen Ellyn, Ill.—Spalding Electric Co. will install 150-h.p. boiler and two generators in the near future.—Carl S. Spalding, Manager.

Mt. Olive, Ill.—Extensive additions and improvements are considered for municipal electric plant, including installation of additional water tube boiler with rating of from 200 to 300 h.p. generator and engine.—O. A. Voepel, Manager.

Saybrook, Ill.—R. C. Cooper is considering installation of plant to supply electricity in Saybrook, Arrowsmith and Gibson City.

Virginia, Ill.—Virginia Light, Heat and Power Co. will make improvements to plant, including installation of 150-h.p. Frost boiler and a 200-h.p. engine.—Roy Ray, Manager.

Knightsville, Ind.—Town Board is considering plans for installation of electric light system; electricity to operate the system will probably be supplied by the Terre Haute, Indianapolis and Eastern Traction Co.—Joseph A. McGowan, Secretary.

Dodge City, Kan.—Citizens will vote Feb. 9 on \$25,000 bonds for installation of electric light plant.

McPherson, Kan.—Council is negotiating with the city of Inman on project of running a line from McPherson to Inman to carry current for city lighting purposes there, connecting with new electric plant; similar negotiations are also being made with Canton and Galva.—A. J. Shaw, Superintendent.

Spring Hill, Kan.—Citizens have voted \$6,000 bonds to build electric light plant.

Nicholasville, Ky.—Plans are being considered for installation of a 150-h.p. boiler and a 75-h.p. steam engine in municipal electric light plant.—E. J. Glass, Manager.

Many, La.—Electric light system and water works will be installed.

Ellicott City, Md.—Patapco Electric and Mfg. Co. is considering installation of a gas producer and gas engines.—Otto Wunder, Superintendent.

Franklin, Mass.—W. H. Fritchman, Boston, has petitioned Board of Selectmen for gas franchise.

Grand Rapids, Mich.—Grand Rapids Gas Light Co. is planning to expend \$40,000 on extension of mains.

Tower, Minn.—Council is considering changing of power at municipal lighting plant from steam to water power.

Biloxi, Miss.—C. H. Evans Engineering Co., 145 Van Buren st., Chicago, has prepared plans for 7-mile wrought iron pipe extension of gas main for Gulf Coast Gas Co.

Pascagoula, Miss.—F. Lynn Brown, Chicago, has asked franchise for installation of gas plant, mains, etc.

Marionville, Mo.—Aurora Electric Light and Water Co. is planning construction of electric plant.

Gordon, Neb.—Citizens have voted bonds for electric lights.

Grand Island, Neb.—Plans and specifications have been prepared by the W. K. Palmer Co., 717-720 Dwight Bldg., Kansas City, Mo., for improvement of lighting

and water system and construction of new power plant.

Norfolk, Neb.—W. K. Palmer Co., Dwight Bldg., Kansas City, Mo., has prepared preliminary plan for lighting and water improvements.

Wymore, Neb.—Plans are being prepared for installation of light plant.

Salem, N. J.—Salem Electric Co. will soon extend service to Lower Penn's Neck, Mannington and Quinton Townships.

Columbus, O.—Council is considering resolution asking City Engineer to prepare estimate of cost of placing overhead wires underground in territory bounded by Livingston ave., Front st., Fifth ave. and Fifth st.

Madisonville, O.—Installation of 100-kw., 2,200-volt, direct-connected unit in the municipal electric light plant in the near future is being considered.—D. H. Fisher, General Manager.

Arington, Ore.—City is considering installation of electric light plant.

Homer City, Pa.—Installation of electric light plant is being considered; company has already been formed by J. A. Stokes, C. A. Simons and W. P. Graff.

Wilkes Barre, Pa.—Wilkes Barre Light Co. will soon commence construction of plant.—J. A. Murray, 54 Public Square, Consulting Engineer.

Willow Grove, Pa.—Newly organized Improvement Association will take up matter of street lighting.

Gettysburg, S. D.—Council has granted franchise to John McMaster and D. J. O'Keefe to install gas lighting system.

Germtown, Tenn.—Town will ask permission to issue \$3,000 bonds to install system of electric lights and extend pavements.

Celina, Tex.—Celina Electric Light and Power Co. has been granted franchise for construction of electric light plant.

Madisonville, Tex.—C. C. Murray & Sons have been granted franchise for construction of electric light plant; will organize Madisonville Light and Power Co.

Nacogdoches, Tex.—Installation of municipal light plant is being considered.

Plainview, Tex.—H. E. Powell, of Springfield, Ill., will install gas plant; Council has been asked for a franchise for proposed distributing system.

Sherman, Tex.—Chairman Hopson of Fire Committee has recommended purchase of 1,500 ft. of more fire hose.

Fredericksburg, Va.—C. P. Burkwyn, President Rappahannock Power and Light Co., Richmond, has applied to Council for electric light franchise.

Spokane, Wash.—Washington Water Power Co. is planning to supply town of Creston and Wilbur with light through 35-mile extension from Davenport.

Tacoma, Wash.—Metropolitan Park Board has decided to call for bids immediately for equipment to light Wright Park, including installation of the necessary ornamental poles, wiring, lamps, etc.

Baraboo, Wis.—Jas. Dickie, Geo. McArthur, Sr., and Geo. McArthur, Jr., have organized Merchants' Power & Light Co. to install water power for purpose of generating dry current.

Wausau, Wis.—Board of Public Works has been authorized to secure plans for municipal electric light plant.

CONTRACTS AWARDED

Willows, Cal.—To North California Power Co., two-year contract for installing and maintaining 20 arc lights at \$6 per light.

Marion, Ind.—Furnishing current for street lights, to Marion Light and Heating Co.

Morristown, N. J.—Five-year contract for street lighting of Morris Township, to Morris and Somerset Electric Light Company; contract stipulates that electric company shall furnish seventy or more lights at rate of \$18 a lamp per annum, lamps to be at least 25 candle power; company further agrees to extend its lines without charge to township.

FIRE EQUIPMENT

Los Angeles, Cal.—Fire Commission has asked \$1,800 appropriation for purchase of hose from New Jersey Car Spring and Rubber Co., Jersey City, N. J.

Stockton, Cal.—Citizens have defeated proposition to issue \$507,609 bonds for fire department and other purposes.

Georgetown, Del.—Council has ordered purchase of several hundred ft. of hose for Fire Department.

Jacksonville, Fla.—Mayor Wm. S. Jordan is urging need of fire boat.

Fort Wayne, Ind.—Board of Safety will purchase 1,000 ft. of hose this year and same amount each succeeding year.

Newcastle, Ind.—Council has decided to purchase site for erection of fire department headquarters.

Lexington, Ky.—Special Committee on Fire Apparatus will recommend purchase of new auto machines.

New Orleans, La.—City will establish hose company at Upperline and Laurel sts., steam engine company at Upperline and Ferret sts., steam engine and hook and ladder truck company on Louisiana ave.

Boston, Mass.—Mayor Fitzgerald has announced that auto chemical will soon be installed at foot of Price Hill.

New Bedford, Mass.—Fire Department committee has rejected all bids received for furnishing 5,000 ft. of cotton rubber lined hose; new bids will be received Feb. 8, 7.15 p. m.—E. F. Dahill, Chief.

Southbridge, Mass.—Firemen will ask for establishment of fire alarm service; purchase of auto truck is also being considered.

Detroit, Mich.—Erection of engine house in vicinity of Gratiot and Harper aves. is being considered.

Saginaw, Mich.—Board of Water Commissioners will recommend to Council purchase of two auto fire engines for emergency cases; at present time east side water works are inadequate and situated several miles from the center of distribution.

Eveleth, Minn.—City Property Committee is considering erection of fire hall.

Kansas City, Mo.—City is considering purchase of two two-way fire autos to hold chemical tanks and 1,000 ft. of hose.—J. L. Porter, Mayor.

Butte, Mont.—Council is considering erection of fire station on Harrison ave.

Grenloch, N. J.—Fire department has been formed.—Jos. W. Bright, Chief.

Lorraine, N. J.—Installation of fire alarm system is being considered.—Geo. H. Hornung, Mayor.

Nutley, N. J.—Purchase of 1,000 ft. of hose and auto fire engine and installation of six fire alarm boxes is being considered.

Hudson, N. Y.—Council is considering need of better equipment for fire department.

Larchmont, N. Y.—Town is considering election on \$5,000 bonds for installation of modern fire alarm system.

Port Jervis, N. Y.—Mayor C. N. Knapp has recommended installation of fire alarm system.

Streeter, N. D.—Installation of chemical engine is being considered.

Elyria, O.—Council has voted in favor of auto combination engine and hose truck, new fire station and fire and police fire alarm system.

Astoria, Ore.—Fire Chief Foster has recommended purchase of automobile combination chemical engine and hose wagon; installation of storage battery system on fire alarm, purchase of a 600-gal.-per-minute pump to be placed on steamboat to protect water front.

Lebanon, Pa.—Perseverance Hose Co. is considering purchase of combination chemical and hose wagon.

Wilkes Barre, Pa.—Fire Chief Schuler has recommended erection of fire house, overhauling of hook and ladder truck, purchase of triple combination auto engine, hose, combination auto hose and chemical truck.

Pawtucket, R. I.—Erection of fire station at Sayles and West aves. is being considered.

Howard, S. D.—Howard Fire Co. is considering erection of fire house.

Memphis, Tenn.—Fire Chief John E. Mcadden will ask for \$75,000 expenditure for improvements, including erection of three engine houses and purchase of hook and ladder truck, 16 horses and other minor equipment.

Manchester Center, Vt.—Purchase of auto engine is being considered.

Seattle, Wash.—Board of Public Works has adopted plans for erection of fire station at 10th ave. S. and Southern st., South ark.

Sheridan, Wyo.—Plans have been prepared for erection of fire station.

Port Arthur, Ont., Can.—Council is considering the purchase of motor trucks for fire department. J. J. Carick can be addressed.

CONTRACTS AWARDED

Battle Creek, Mich.—Furnishing 70-h.p. auto chemical and hose wagon, to Seagrave Co., Columbus, O., \$5,500.

Akron, O.—Furnishing combination fire truck and chemical automobile, to L. J. Ritch, \$22,724.95; other bidders: Webb Motor Co., \$2,950; Kanawah Chemical Co., Pittsburg, \$3,200; Speedwell Motor Co., of Dayton, \$3,250; the car ordered will be constructed by the Cadillac Motor Car Co., Detroit.

Hazleton, Pa.—Mayor F. L. Smith will sign contract awarded by Councils to Robson Fire Apparatus Co. for auto-chemical and hose wagon.

BRIDGES

Los Angeles, Cal.—Revised plans and specifications for Arroyo Seco bridge between Garvanza and the ostrich farm have been presented to Board of Supervisors by County Surveyor Noble and bids advertised for building structure.

Wilmington, Del.—Levy Court is planning to erect \$150,000 bridge across Christiana River.—Jas. Wilson, County Engineer.

Fernandina, Fla.—Board of County Commissioners is considering construction of bridge across Nassau River.—W. T. Waas, Chairman.

Rockford, Ill.—City Engineer Hand has completed plans for reinforced concrete bridge; cost \$65,000.

Bedford, Ind.—Lawrence County will ask for bids in spring for construction of two bridges; cost \$4,000 and \$1,200, respectively.—W. H. Field, Mitchell, Engineer.

Michigan City, Ind.—Council has passed ordinance appropriating \$16,500 for repairing and reconstructing Franklin st. bridge.

Rockville, Ind.—Spencer County will soon ask bids for erection of bridge over Big Raccoon River at Arnesburg.

Washington, Ind.—Daviness County is considering construction of bridges near Washington; cost \$8,000.—George Faith, 307½ E. Main st., Engineer; Thomas Nugent, County Auditor.

Atchison, Kan.—Construction of a bridge over Missouri River at Commercial st. is being considered; cost about \$300,000.

South Portland, Me.—Rebuilding of present bridge across Portland Harbor is being considered.

New Augusta, Miss.—Perry County Board of Supervisors has asked bids for repair of Wingate bridge on Leaf River damaged by flood.

Independence, Mo.—County Highway Engineer R. T. Proctor will prepare plans for erection of viaduct of stone or concrete over Chicago and Alton Railroad tracks on 15th st. road.

Joplin City, Mo.—Council has instructed Engineer J. E. Hodgdon to prepare estimates on construction of concrete culverts over Willow Branch on Jackson ave., on Moffet ave. and on Joplin st.

Niagara Falls, N. Y.—Bids will soon be asked for the construction of ornamental bridges over Fisher's Creek, Black Creek, Miller's Creek and Fisherman's Creek; supervision of all work is under Superintendent John H. Jackson, of Queen Victoria Park.

Schenectady, N. Y.—Erection of bridge over Cotton Factory Hollow at Craig st. is being urged.

Cincinnati, O.—Council is considering ordinance for \$250,000 bond issue for construction of Gilbert ave. viaduct.

Wilson, Pa.—Residents of this borough are urging erection of bridge across Monongahela.

Memphis, Tenn.—City is planning construction of steel and reinforced bridge, by railway companies, on McLemore ave.—J. H. Weatherford, City Engineer.

Lampasas, Tex.—Commissioners' Court will consider election on bonds for erection of bridge.

Spokane, Wash.—Complete plans for grade separation at 1st ave. and Sheridan st. have been furnished by City Engineer Morton Macartney; plans involve a concrete trestle over Milwaukee, Spokane and Inland and Great Northern-Northern Pacific transfer tracks and new steel or concrete bridge over Spokane River on Olive ave. just west of Dakota st.; entire improvement is to cost \$318,000 or \$363,000.

Mayville, Wis.—Town will let contract next month for construction of concrete or single desk girder bridge across Rock River; cost \$10,000. H. S. Mann, Town Clerk.

Milwaukee, Wis.—Plans for new Oneida st. bridge have been submitted to Maj. Bromwell, Resident Government Engineer, city.

Superior, Wis.—County Board has decided to construct bridge over Middle River.

St. Catharines, Ont., Can.—The Mayor has recommended construction of high-level bridge.

CONTRACTS AWARDED

Indianapolis, Ind.—Building concrete bridge over canal at College ave., to Volpp & Fritz, \$6,417.

Natchitoches, La.—By Police Jury for building two bridges across Flat River near Powhattan, to Boydston & O'Quin, \$1,100.

New York, N. Y.—To Charles Meades & Co., 299 Broadway, New York, for constructing elevators, stairs, drainage, ornamental and electric work for anchor piers of the Queensboro Bridge over East River, \$57,300.

Portland, Ore.—Constructing substructure

of bridge over Willamette River from plans of Ralph Modjeski, Consulting Engineer, 1750 Monadnock Bk., Chicago, Ill., to the Union Bridge Co., of Kansas City, Mo., \$557,646; other bidders were: Missouri Valley Bridge and Iron Co., Leavenworth, Kan., \$565,923; Bates & Rogers Contracting Co., Chicago, Ill., \$648,284; Porter Bros., city, \$689,561; Pacific Bridge Co., city, \$47,180.

MISCELLANEOUS

Birmingham, Ala.—Jefferson County is considering election on \$50,000 bond issue to erect wing to Hillman hospital.

Gadsden, Ala.—Plans will be received at once by L. L. Herzberg, Judge of Probate Court, for erection of \$25,000 jail for Etowah County.

Mobile, Ala.—In yearly budget sum of \$50,000 has been set aside for construction of steel warehouse.

Union Springs, Ala.—Erection of \$10,000 Carnegie hospital is being considered.

Los Angeles, Cal.—Willour D. Cook, Jr., Wright & Callender Bldg., is preparing plans for landscaping and improving Agricultural Park; work will include sunken gardens, fountains, walks, pergolas, colonnades, etc.; cost will be over \$100,000.

Dover, Del.—Establishment of uniformed police force is being considered.

Douglas, Ga.—Coffee County is considering erection of three-story addition to jail.—D. Yaskin, County Commissioner.

Jonesboro, Ga.—Frank M. Manson desires names and addresses of manufacturers of dump body or dump wagon; Everett preferred.

Macon, Ga.—Council will consider resolution providing for establishment of a public playground on Tattnell Square Park, in connection with other improvements contemplated for square; playground will be equipped with outdoor gymnasium devices.

Bloomington, Ill.—Citizens of Bloomington and Normal Townships will vote on creation of Park Board which is to have charge of construction of inter-city parkway drive and water system along course of Sugar Creek.—Wm. R. Bach, Park Commissioner.

Vincennes, Ind.—Mayor Jas. D. McDowell has recommended purchase of auto patrol.

Cedar Rapids, Ia.—Council has decided to erect jail and town hall.

Clinton, Kan.—Purchase of city park and erection of auditorium is being urged.

New Orleans, La.—System of lakes and lagoons for St. Charles ave. end of Audubon Park, and made in accordance with the plans of Landscape Engineer Omstead, Boston, is being considered for near future; rough estimates on the excavation work alone place cost at figures ranging between \$50,000 and \$80,000.

Cambridge, Mass.—Board of Aldermen has voted to establish police station.

Holyoke, Mass.—Plans have been prepared by Architects Ellsworth & Howes for erection of \$10,000 tuberculosis hospital.

Lawrence, Mass.—Board of Aldermen has adopted order authorizing Mayor Cahill to appoint committee of six to consider erection of city hall.

Lawrence, Mass.—Mayor Cahill is favorable to establishment of garbage incinerator.

Saginaw, Mich.—Board of Police Commissioners has asked committee from Council, composed of Aldermen Buetschen, Button and Trier, to instruct City Engineer to prepare outline plans and estimated cost for modern jail.

St. Joseph, Mo.—Council has appropriated \$4,000 for purchase of combination auto patrol and ambulance.—A. P. Clayton, Mayor.

Merrill, Wis.—Plans by Foeller & Schober, Green Bay, have been accepted for erection of \$38,000 jail.

CONTRACTS AWARDED

Ft. Wayne, Ind.—Hauling city garbage, to D. C. Wilburne.

Dexter, Me.—Building \$7,000 town hall, to Fred M. Young, city.

Fall River, Mass.—Collecting garbage for five years, to J. T. Regan, \$14,400; other bidders: Benjamin W. Brown, \$47,350; Arthur M. Reed, \$47,815; Christopher B. Hicks and James H. Gildard, \$55,706.40; Willard C. Gardiner, \$50,000; A. H. Barney, \$53,000; Isaac E. Willets, \$56,000; Frank Riley, as manager of the Eastern Sanitary Product Co., \$47,000, and Charles N. Menard, \$50,000.

Watertown, N. Y.—To O. B. Colwell for the collection of the city's garbage.

Marlin, Tex.—Erection of brick crematory, to R. S. Winn, Hobart, Okla., \$1,250.

Norfolk, Va.—Building police headquarters at Avon and Cove sts., to S. M. Richardson & Son, Houghton, \$44,273.

Whitehall, Wis.—Building jail, to Van Dorn Iron Works Co., Cleveland, O., \$3,300.

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREET IMPROVEMENTS				
Virginia	Norfolk	Feb. 6, noon	Construct macadam roadway	County Clk. Norfolk Co.
Minnesota	St. Paul	Feb. 6, 2 p.m.	Grading and macadamizing various streets	Board of Pub. Works.
New York	Albany	Feb. 6, 3 p.m.	Removal of street dirt	Isidore Wachsmann, Secy. Bd. C.&S.
California	Huntington Bch.	Feb. 6	Constr. one mile petroolithic pave, curb and sidewalk	J. C. Fountain, Engr.
California	Chico	Feb. 7, 7:30 p.m.	Construct 50 street crossings	B. F. Hudspeth, City Clerk.
Washington	Waterville	Feb. 7, 9 a.m.	Constr. approx. 8 1/2 miles impro. highway	County Auditor.
California	Santa Ana	Feb. 8, 11 a.m.	Furn. 1,000 bbis. road oil and 1,000 lbs. residuum	W. B. Williams, County Clerk.
Maryland	Baltimore	Feb. 8, 11 a.m.	Furn. cement, stone (crushed), sand, gravel, brick, lumber.	Bd. of Awards, c.o J. S. Thomas.
Ohio	Cincinnati	Feb. 24, noon	Resurf. Independence st., also culvert and fill on Mt. Alverno rd	Fred Dreihis, Clk. Co. Comrs.
Ohio	Cincinnati	Feb. 8, noon	Imp. McAlpin ave. with grade, curb and gutter., also furn. 400 tons refined asphalt.	John J. Wenner, Clk. Pub. Serv.
New Jersey	Elizabeth	Feb. 15, 8:30 p.m.	Excav. 5,440 cu. yds. earth and construct curb, flag, etc.	John F. Kenah, City Clerk.
Michigan	Ludington	Feb. 20, 4 p.m.	Pave various streets.	Dean Thompson, City Clerk.
Minnesota	Worthington	March 13, 2 p.m.	Grade approx. 10,066 yards.	E. C. Fannell, Co. Aud.
SEWERAGE				
Minnesota	St. Paul	Feb. 6, 2 p.m.	Constr. sewers on various streets	Board of Pub. Works.
Minnesota	St. Cloud	Feb. 6, 4 p.m.	Constr. concrete wall at sewer outlet	Earl C. Scott, City Clerk.
Washington	Toppenish	Feb. 6, 8 p.m.	Construct 15,000 ft. of 7 to 16 in. pipe sewer.	W. H. Hassig, City Clerk.
Alabama	Uniontown	Feb. 13, 8:15 p.m.	Constr. sewage disp. plant and sewer, incl. approx. 1,840 lin. ft. 15 in., 3,000 ft. 12 in., 7,500 ft. 10 in., 15,200 ft. 8 in. pipe.	J. L. Pope, Town Clerk.
Iowa	Signourey	Feb. 14	Constr. sewerage system, 8, 10, 12 and 15-in. pipe, approx. 9 miles, also disposal works.	J. H. Wyllie, Mayor.
South Dakota	Dell Rapids	Feb. 15, 7:30 p.m.	Constr. main an l lateral and connect. sewers.	Oluf Hegge, City Auditor.
Iowa	Mt. Vernon	Feb. 21, 4 p.m.	Constr. 7 1/2 mile sanitary sewer, 6 to 15 in., pipe, with septic tank and filter beds.	Wm. E. Gamble, Town Clerk.
WATER SUPPLY				
North Dakota	Fargo	Feb. 6	Constr. water purif. plant, and furn. one vertical and one horizontal pump, engine and gas producer pump, plant.	F. L. Anders, City Engr.
Wyoming	Sheridan	March 6, 7:30 p.m.	Constr. 14 and 10 in. water pipe line.	J. J. Withrow, City Clerk.
LIGHTING AND POWER				
New York	Albany	Feb. 6, 3 p.m.	Lighting street lamps five years from June 21.	Isidore Wachsmann, Secy. Bd. C.&S.
FIRE EQUIPMENT				
Minnesota	Duluth	Feb. 3, 3 p.m.	Furn. auto, comb. chem. an l hose wagon, 70 to 80 h.p. with ladders and hooks	John Connelly, Secy. Bd. of F. Comrs.
MISCELLANEOUS				
Maryland	Baltimore	Feb. 8, 11 a.m.	Furn. Linden trees for parks, and various park dept. supplies.	Board of Awards.
Oklahoma	Mangum	Feb. 14, 7 p.m.	Erect city hall and fire station.	City Clerk.
Washington	Spokane	Feb. 17, 2 p.m.	Furn. 1 five pass'gr. elec. auto.	John Gifford, City Purch. Agt.

STREET IMPROVEMENTS

Oak Park, Ill.—Village is considering paying of Erie st.
 Woodstock, Ill.—Town is considering paving of the Square.—H. M. Price, 140 Dearborn st., Chicago, Engineer. Lynn Richard, Town Clerk.
 Delphi, Ind.—City is considering paving of four streets.—E. E. Kirkpatrick, City Engineer.
 Evansville, Ind.—Residents of East Blackford av. are urging paving of that thoroughfare with asphalt; City Engineer Pfafflin will prepare estimate.
 Fairfield, Ia.—City is planning to pave six to ten blocks with brick.—J. P. Starr, Mayor.
 Lowellville, O.—Mayor Robert Erskin has recommended paving of number of streets.
 Point Gray, B. C., Can.—Ratepayers have authorized \$350,000 expenditure on road improvements.

CONTRACT AWARDED

Dustin, Okla.—Laying concrete sidewalks to Ardmore Concrete Co., Ardmore.

SEWERAGE

Alameda, Cal.—Council has decided on plan of building proposed big Alameda st. storm drain system.
 Sawtelle, Cal.—City Trustees have decided to defer action on bond issue proposed for storm and sanitary sewer system.
 Stockton, Cal.—Citizens have defeated proposition to issue \$507,609 bonds for sewers, street work and fire department purposes.
 Nevada, Ia.—Engineer Samuel Steigerwart, Boone, will prepare plans for installation of sewer system.
 Preston, Minn.—Village is considering construction of tile pipe, gravity sewer system at cost of \$5,000.—O. H. Case, Fountain, Engineer; G. A. Love, Mayor.
 Red Wing, Minn.—City is considering extension of sewer at cost of \$9,000.—A. E. Rhome, City Engineer; A. P. Pierce, Mayor.
 Lowellville, O.—Mayor Robert Erskin has recommended immediate construction of proposed sanitary sewer system.

WATER SUPPLY

Preston, Minn.—Village is considering extension of water main at cost of \$1,500.—G. A. Love, Mayor.
 Red Wing, Minn.—City is considering extension of water mains at cost of \$4,000; bids on c. i. pipe, gate valves, etc., will be received about Mar. 1.—A. E. Rhome, City Engineer; A. P. Pierce, Mayor.
 Point Pleasant, N. J.—Establishment of municipal water plant is being considered; present plant is owned by Martin Maloney, of Philadelphia.—Councilman G. H. McCloskey is interested.
 Muskogee, Okla.—Citizens will vote Feb. 16 on \$650,000 bonds to improve water and sewerage systems and construct garbage incinerator.
 Lynchburg, Va.—Fire Chief W. L. Sandidge has recommended extension of 12-in. water main on Jefferson st. and also 16-in. main.
 Snohomish, Wash.—Citizens have voted \$110,000 bonds to build gravity water system for Pilchuck River.
 Porcupine City, Ont., Can.—Plans are being considered for installation of water system.
 Toronto, Ont., Can.—Construction of water mains at cost of \$161,544 has been recommended.

LIGHTING AND POWER

Mammoth Springs, Ark.—The Mammoth Springs Electric Co. is considering installation of a 100-kw. generator and constructing 28 miles of high-tension transmission lines, carrying 33,000 volts; preparations are being made by the company to furnish electricity for lamps and motors in five towns.—E. C. Bellamy, Mgr.
 Lincoln, Ill.—Lincoln Water and Light Co. is considering a change to 60-cycle, 3-phase and increasing capacity within the next six months.—E. MacDonaid, Manager.
 Palestine, Ill.—City proposes to install new generator at municipal light plant in the spring; also install about six miles of new wire.—H. T. Loughrey, Chairman Light Committee.
 Belvidere, Ill.—Council has granted Public Service Operating Co., Belvidere, 10-year franchise for street lighting.

FIRE EQUIPMENT

Bridgeport, Conn.—Erection and equipment of fire house in Ninth District is being considered.
 South Bend, Ind.—Board of Safety is preparing to ask Council to pay \$7,000 to \$8,000 for an automobile chemical wagon for Fire Department.
 Valparaiso, Ind.—City is considering installation of auto apparatus. Aldermen Zea, Alexander and Gast are interested.
 Sioux City, Ia.—Fire Chief Geo. M. Kellogg and Superintendent of Public Safety R. S. Whiteley will recommend purchase of motor-propelled engine.
 Baltimore, Md.—Fire Chief Horan is visiting various cities on lookout for auto supply wagon and auto hose wagon desired for department.
 Everett, Mass.—City will build station for a horse company.
 Escanaba, Mich.—Citizens will vote Feb. 6 on \$15,000 bonds for erection of fire house in Seventh Ward.
 Manchester, N. H.—Board of Aldermen will consider \$5,500 order for establishment of flying squadron.
 West Orange, N. J.—Necessity of auto apparatus is urged in annual report of Fire Chief.

BRIDGES

Louisville, Ky.—City Engineer D. R. Lyman has recommended erection of \$15,000 bridge over Beargrass Creek at Logan st.
 Brownsville, Pa.—Board of Viewers of Fayette and Washington counties have selected site for joint county bridge over Monongahela River.
 Johnstown, Pa.—Council has decided on \$40,000 loan to build bridge and approaches from Iron st. to 5th ave.
 Houston, Tex.—Bids will be asked at once for construction of proposed Main st. viaduct.—H. B. Rice, Mayor.
 Spokane, Wash.—City is considering issuance of bonds to build concrete bridges over Latah creek.
 Marinette, Wis.—Plans have been prepared by Thos. R. Hasley, Grand Rapids, for erection of concrete bridge across Menominee River.

Proposal Advertising

their constituents well by seeing that PROPOSALS for MUNICIPAL IMPROVEMENTS of all kinds are inserted in

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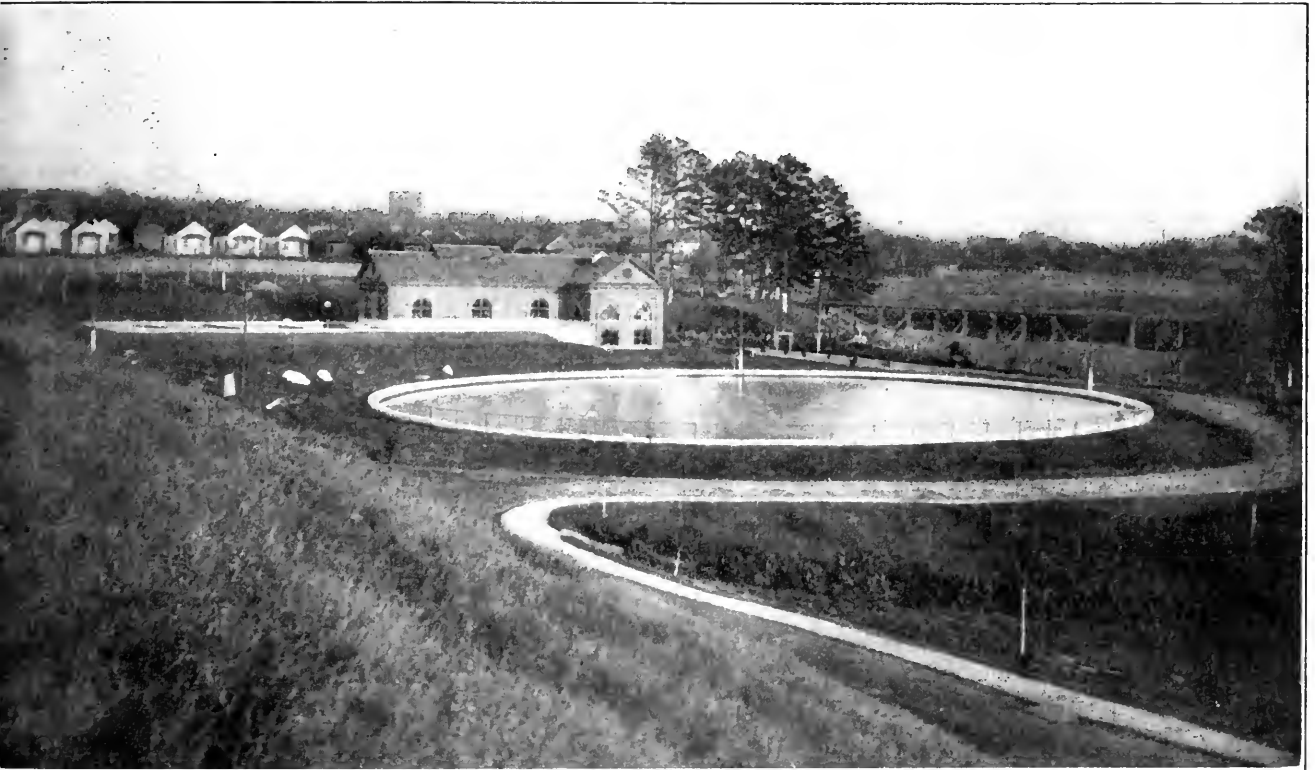
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No. 6



Filtered Water Basin, Coagulation Basin and Filter House, Viewed from Reservoir

COLUMBIA WATER WORKS

umping by Hydraulic Power Plant—Turbines and Centrifugal and Plunger Pumps—Auxiliary Steam Plant—Purification by Mechanical Filters of the Gravity Type—City Under Commission Government

By JOHN McNEAL, M. AM. SOC. C. E., CITY ENGINEER.

COLUMBIA, the capital city of South Carolina, with a population of about 35,000, enjoys the distinction of being the only city in the State governed by a commission. The commission form of government, sanctioned by the State Legislature during the session of January, 1910, was adopted by the electors of the city in May of that year, and the commission, consisting of Mayor W. H. Gibbes and four councilmen, Messrs. R. J. Mallock, R. C. Keenan, R. W. Shand and W. F. Stieglitz, at once took charge of the affairs of the city.

Each commissioner, or member of the City Council, has been assigned to a department of the city government; one department embracing licenses, sanitation and health, and insurance and building permits; another the fire and street departments and markets and lighting; a third law and finance,

schools and parks and trees, and the fourth water works and sewerage, public buildings and charities and the city jail. Each commissioner has direct control over his department, the council as a body exercising general supervision over the affairs of all departments.

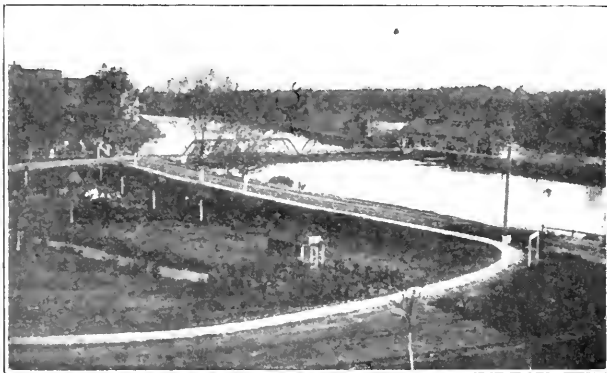
The city owns and operates its own water works. The water works department is under the direct charge of Commissioner W. F. Stieglitz as council superintendent, and Mr. F. C. Wyse as city superintendent of water works. Water works for the city of Columbia were first authorized by the State Legislature in 1818, but a more modern plant was constructed in 1855, and the city replaced this with the present plant in 1907.

Columbia is at approximately the geographical center of the State. It occupies an area about two miles square and is quite uneven in topography, the highest point being approximately

150 feet above the Congaree river, which flows near its western boundary. At a point about opposite the northern boundary of the city the Broad river unites with the Saluda river to form the Congaree. The latter river has a fall of about 36 feet in two miles, and a portion of this fall is utilized for power purposes by several industries along its banks, a canal having been constructed for that purpose. Power from this canal is used by the city as one source of power for the water works pumping plant.

The water supply is taken from the Saluda river, the watershed of which has an estimated area of about 2,475 square miles and contained in 1900 a population of 127,000, making the average population of the shed about 51 per square mile, most of which is consequently rural. The largest town on this water-shed has a population of about 5,000 and is distant about 50 miles from Columbia.

The power canal previously referred to parallels the Congaree river on its eastern shore. The water works plant is located on the bank of the river, the hydraulic power station lying between the canal and the river, while the balance of the plant lies on the other side of the canal. A bridge across the canal at this point gives access to the power plant and also carries the water mains between it and the remainder of the plant.



HYDRAULIC POWER STATION, CANAL AND BRIDGE ACROSS SAME, VIEWED FROM RESERVOIR

The hydraulic power plant comprises two turbine water wheels of 300 horsepower, which operate two centrifugal pumps, each having a capacity of 12,000,000 gallons per day, and two power pumps having a capacity of 3,500,000 gallons per day against the maximum pressure head contributed by the standpipe and friction in the distribution system. In addition to the hydraulic power plant there is an auxiliary steam power plant equipped with two pumping engines, each having a capacity of 5,000,000 gallons per day, the boiler plant for operating these being contained in the same building. This building also contains electrical generators which furnish power to operate the auxiliary machinery in the filter plant and for lighting the works. In addition to these pumping plants there are, immediately adjacent to them, a sedimentation reservoir, mechanical filter plant and filtered water basin; and at another portion of the city a standpipe.

As previously stated, the supply is taken from the Saluda river, the intake being near the junction of this and the Broad to form the Congaree. The intake crib is constructed of concrete and is supplied with two 30 x 30-inch sluice gates, the openings being provided with screens constructed at the outer face of the wall. From the intake crib a 36-inch suction main is laid in the bed of the Congaree river for a distance of about 1,000 feet, which ends at the pumping station in a suction chamber, which also is constructed of concrete.

The water power station, on the bank between the river and the canal, is a brick structure 20 ft. 8 in. by 97 ft. 2 in. Here are two horizontal turbines, each capable of developing 300 horsepower when operating with full gate under a head of 18 ft. and at a normal speed of 150 to 160 revolutions per minute. These turbines are duplicates and work independently of each other,

having separate draft tubes discharging into separate tail-water chambers. Each of these turbines operates one centrifugal pump of the two-stage type and having a capacity of 12,000,000 gallons per 24 hours against a total head of 75 feet (including 21 feet of suction) when running at a speed of approximately 500 revolutions per minute. These pumps lift the water from the suction chamber into a raw water reservoir constructed on a knoll at one side of the plant.

The high duty pumps are two in number, of the horizontal, duplex, double-acting, plunger type, each with a capacity of 3,500,000 gallons per 24 hours against a head of 300 feet. These pumps are connected by gear wheels to the shaft of an independent turbine water wheel. They pump the filtered water into the distribution mains and standpipe, taking it from the clear water basin. The reservoir, which serves as a sedimentation basin, has an approximate capacity of 60 million gallons when filled to within 3 feet of the tops of the banks. It is built partly in excavation and partly in embankment, the banks having a top width of 10 feet and side slopes of two to one. At its highest part the main embankment has a concrete core wall ranging in thickness from 2 to 6 feet. At one side is constructed a concrete gate chamber 5 feet square inside and 36½ feet high, equipped with four 20 x 20-inch sluice gates. A 60-inch cast-iron drain pipe is laid for the entire length of the reservoir and to this are connected a 24-inch outlet pipe and a 24-inch waste pipe.

From the reservoir the water flows by gravity to a coagulation basin which is 52 feet wide, 100 feet long and 18 feet deep. Alum is used as a coagulant, and this and lime are applied to the raw water where it enters the coagulating basin, the amount of coagulant being accurately regulated by an automatic appliance. Close to the coagulation basin is the filter house, in which are two chemical tanks 6 feet in diameter and 6 feet high, provided with crates for holding the alum to be dissolved and an indicator gauge to show the amount of solution used per hour.

The filter house is a brick structure 128 feet long by 54 feet wide, with concrete floors. Here, in addition to the chemical tanks, are located the filters, which are six in number, of the mechanical gravity type, each having 400 square feet filtering area and designed for a capacity of 650,000 gallons per unit per 24 hours. The supply to the filters is controlled by automatic regulators which are designed to permit of variation of not more than one per cent. The filtering material consists of 30 inches of sand on a 6-inch bed of gravel. The filtered water from these is discharged into the filtered water reservoir, and from this is drawn the wash water, which is pumped to and through the filters by means of two 50-horsepower centrifugal pumps, each direct connected to a direct-current variable speed electric motor.

The filtered water reaches the filtered water reservoir through a conduit beneath the center line of the building and a 24-inch pipe. The filtered water reservoir is oval in shape, with inside diameters of 211 and 171 feet, and a total depth of 14 feet, with a capacity of approximately 2,500,000 gallons. The walls and bottom of this reservoir are constructed of concrete.

The auxiliary steam pumping station is a brick structure divided into two sections, a pump room 44 feet by 60 feet and a boiler room 41 feet by 60 feet. The stack is of brick, 5 feet in diameter and 120 feet high. There are four horizontal tubular boilers 72 inches in diameter. The pumping machinery consists of two Worthington horizontal, duplex, compound, condensing, direct acting pumping engines, each with a net capacity of 15,000,000 gallons per 24 hours against a pressure head of 288 feet, the suction lift being 12 feet. In this station is installed a direct-connected generating set having a capacity of 500 kilowatts at 250 volts, the engine being of the vertical type.

From the high-duty pumping plants the water is forced through a 24-inch rising main to the standpipe, which is located about one mile from the plant. This standpipe is of steel, 25 feet in diameter and 100 feet in height. A cut-off valve is located near the standpipe to provide for direct pumping to the distribution system around a by-pass, should this be necessary.

The distribution system consists of about 40 miles of cast-iron pipe ranging in size from 6 to 20 inches.

Frequent analyses of the filtered water are made by the city chemist, Mr. W. H. Beers, a complete laboratory for this purpose being located at the filter station. The following is a typical analysis of the filtered water:

SAMPLE OF WATER, COLUMBIA CITY WATER WORKS

Color	None
Chlorine	2.00
Free ammonia	0.04
Albuminoid ammonia	0.03
Nitrogen in nitrates	0.00
Nitrogen in nitrites	0.00
Hardness (as parts of Ca Co ₃) soap test	25.00
Total solids	90.00

Bacterial Analysis

Coll-group organisms	None
Free from indications of contamination	

The entire plant was designed and constructed under the supervision of Mr. J. L. Ludlow, of Winston-Salem, to whom, as well as to Messrs. Stieglitz and Wyse, the writer is indebted for the information given herewith.

DOUBLE FILTRATION OF WATER

In a paper with the above title which he read before the New England Water Works Association, Mr. H. W. Clark, chemist of the Massachusetts State Board of Health, described some experiments made and results obtained by that board in passing water to be purified through two filters in succession. At the outset he refers to the fact that the board, as long ago as 1894, suggested the double filtration of water.

Experiments conducted by the board all showed that as long as there is any impurity in a water, passing it through a fine sand filter will remove a greater or less percentage of such impurity. In one case water which had been filtered and stored for six weeks, during which a very great reduction in the bacterial content had been effected, was passed through a filter containing but ten inches of sand, which resulted in diminishing the number of bacteria remaining by from 65 to 85 per cent.

During the past five years the board has been endeavoring to answer the question: "Can an equally good result be obtained by double filtration with the two filters operating at such rates that a greater value of purified water per acre of combined filter surface can be secured?" During this time five double filter systems have been operated experimentally at the station, and Mr. Clark describes the results obtained from three of them as follows:

All of these filters were ordinary sand filters containing about 40 inches in depth of sand. In the first system the rates of operation were 10,000,000 and 20,000,000 gallons per acre daily, respectively, the rate of the primary filter being smaller than that of the secondary filter; in the second system the rates were 23,000,000 and 7,500,000 gallons per acre daily, respectively, the rate of the primary filter being greater than that of the secondary filter; and in the third system both filters were operated at equal rates, namely, 6,000,000 gallons per acre daily. The net rate of each system was 6,000,000 and 3,000,000 gallons, respectively; that is, the volume of water filtered per acre of filter surface used.

It seemed during the first few months of this work that greater efficiencies could be obtained by double filtration than by single and with the production of a greater volume of purified water per acre of filter. Taken as a whole, however, the results were as follows: Neither the first nor the second system gave results quite equal to the single filters shown on the previous table operating at a rate of 5,000,000 gallons per acre daily; neither did either system give results in coli efficiency equal to the single filter operating at the rate of 7,500,000 gallons per acre daily. With the system, however, operating at a net rate of 3,000,000 gallons per acre daily, the results were practically the same as with the single filter operating at a rate of 3,000,000 gallons per acre daily.

It is difficult to state just why this double filtration through much greater depths of sand than in use with the single filter does not always give better results than single filtration. One important reason seems to be, however, that the rate of the primary filter has generally been too great for good bacterial efficiency to occur; yet by this primary filtration the organic matter necessary to cause the secondary filter to be an efficient water purification plant has been removed. While we have some results differing from those presented here, still it does not

seem reasonable to assume from all the results of Lawrence work that water of the character of that flowing in the Merrimac River can be purified more advantageously or more economically, as far as net product of filtered water is concerned, by double filtration systems than by a single filter operating at a reasonable average rate.

There is, of course, another reason that has been prominently mentioned for the operation of primary filters, and that is to lessen the area upon which the matter in suspension in the raw water is collected. This is a very prominent feature in the beginning of operation of such systems, especially when the primary filters are operated at rates approximating 100,000,000 gallons per acre daily. It always seems at first that much can be gained in this way; yet as these systems of double filtration are kept in operation at Lawrence, although the water passing to the secondary filter may remain free from matters in suspension, this secondary filter becomes an efficient biological machine, the sand grains throughout its depths become coated with the gelatinous matter necessary for this efficiency, and eventually these secondary filters at Lawrence require scraping almost as frequently and as deeply as if they were receiving raw water without primary filtration.

This, then, must be the conclusion from our Lawrence work: There is little to gain either in economy in sand removal or sand washing, or in bacterial efficiency, in double over single filtration of polluted water such as flows in the Merrimac River; that is, with an equal or nearly equal production of filtered water per acre of filter surface. We realize, of course, that each water presents a separate problem, and Lawrence results are not universally applicable.

We judge from experience elsewhere as well as from the fact that the main object at Lawrence appeared to be bacterial reduction, that these conclusions do not apply to waters high in clay and other suspended matter; although the experiments at Washington (described in our February 1 issue) apparently indicate that sedimentation is more effective than preliminary filtration in treating such waters.

ELECTROLYTIC PURIFICATION

In a recent paper on water purification Mr. H. W. Clark, chemist of the Massachusetts State Board of Health, said: "There are so-called electrolytic methods of water purification in which the electric current is stated to act as a bactericide, but which, in the devices I have examined, simply causes the taking of aluminum from aluminum or composition electrodes and the formation of aluminum hydrate, really an expensive method of coagulation."

We have two or three times referred to a plant at Los Angeles, Cal., for treating sewage by an electrolytic process. It is unfortunate that there is not a State Board of Health or other unprejudiced scientific authority to investigate and report upon this plant. However, it has been operating for over two years and appears to be satisfactory to the officials of the city. In this plant the sewage first passes through sedimentation basins, and the cleaning of these is quite an item of expense in operating the plant. From a letter recently written by the city engineer and made public it appears that the cost of running the plant is in the neighborhood of \$25 per 1,000,000 gallons purified; this including removing the sludge from the sedimentation basins, cost of current for operating the electrolytic plant and labor of attention to the latter, which occupies an hour or more every day. According to the tests made by a representative of the company which constructed the plant, the total residue was reduced from 103.3 parts in the raw sewage to 75.0 in the final effluent; the organic matter from an average of 2.24 to an average of 1.30, a reduction of 42 per cent, and the chlorine was reduced about 30 per cent. Nitrates were reduced from 7.4 parts to 4.4 and nitrites increased from zero to 3.0. Lime, magnesia and iron were reduced to from one-half to one-tenth of the contents of the raw sewage. The change in the nitrites and nitrates indicates a deoxidizing of the sewage, and it is stated that the nitrogen is finally converted by the process into ammonia salts. These results are obtained by the combined action of the sedimentation tank and the electrolytic treatment, we understand, and how much is due to each is not stated. These reports of the chemist and engineer apparently indicate a rather low degree of purification and a high cost of operation.

PAVING AND LIGHTING A SMALL CITY

Brick Pavement With Concrete Base—Concrete vs. Rolled Stone Foundations—Cement vs. Bituminous Filler—Rattler Tests—Cost in Detail

BY P. E. GREEN, Associate M. Am. Soc. C. E.

ROCHELLE, ILL., is a typical small city of the Middle West of about 3,000 population, most of which consists of retired farmers and local business men, and as a community is decidedly wealthy. Although about one hundred years old, it was not until about twenty years ago that much thought was given to the installing of municipal improvements. Since then the town has been well supplied with a water system and sanitary sewer system, and more recently with about 30,000 yards of brick paving and electric street lighting. Although the water works was built twenty years ago and the sewers five years ago, the streets were allowed to remain in the usual frightful condition of the small Western town until about two years ago, when there was a decided demand for modern pavements.

At first there was considerable hesitancy about adopting a paving proposition because of the small size of the town and because in the construction of the sewer system there had been considerable trouble owing to the business failure of the contractor. The citizens finally decided in favor of the improvement, however, and the Board of Local Improvements, which Illinois law provides shall take charge of special assessment work, was composed of the Mayor and three members of the Council. This board desired that a first-class pavement be constructed, and, in spite of bitter opposition of many property owners to the expenditure which this would involve, it was decided, after consultation with the writer as engineer, to lay a brick pavement on five inches of concrete, filling the joints with asphaltic cement, and to make the curb and gutter of concrete, except that at points where a large amount of teaming had to pass over the sidewalk it was decided that a sandstone header sunk to the level of the pavement would be more suitable.

Before a decision was reached as to the character of the foundation, many points were considered by the authorities and the engineer. A rolled stone base was contemplated, and in part of the system of paving it would have been decidedly advantageous on account of the lesser cost. Also, from the writer's experience, he feels justified in recommending the rolled stone base where there is not any great probability that the foundation will be disturbed to any large extent. However, in the city in question there was the possibility of the construction of a street car line within a comparatively short time, and also a probability that before many years an adequate storm water system of sewers would have to be put in. For this reason, on account of the much greater adaptability in making repairs, it was decided to use a concrete base, and the next point to be taken up was the thickness of this base. It is probable that concrete foundations having a depth of six inches are more common than any other kind, but there is little likelihood of such a depth being necessary in a town in which the traffic is of such a character as that at Rochelle. On the other hand, a foundation of four inches of concrete has been advocated by some engineers, but this is believed by the writer to be too small in any situation where loads of as much as four tons may be drawn over them, although in many locations in cities where the topographical conditions are such that only comparatively small loads are used four inches is adequate on many residence streets. As the strength of the foundation increases directly as the square of the depth, a foundation of five inches of concrete is over 50 per cent stronger than one of four inches, while it is at least 15 per cent cheaper than one of six inches. It was decided to use a mixture of one part of cement, three parts of sand and six parts of crushed stone or gravel.

The question of filler is also a very live one in pavement work. The National Paving Brick Manufacturers' Association strenuously advocates a cement grout filler. After having had the supervision of several hundred thousand yards of pavements

in which the filler was a cement grout, a tar filler, or an asphaltic filler, the writer believes that the asphalt filler if properly and carefully applied is the best. The grout filler makes a smooth pavement at first, and, according to its advocates, holds and protects the edges of the brick. It is not believed that this contention is sound. In the course of three or four years, if there is any traffic to speak of on a grout filled street, the filler near the top of the brick becomes all broken out and the edges are then as badly battered as any bituminous filled pavement. On the other hand, in the bituminous filled pavement, the noise is always lessened, and, in the writer's opinion, the edges are as well protected as those having a cement grout filler. Also a bituminous filled brick pavement may be refilled much easier than a grout filled one.

In regard to tar and asphaltic fillers, it has been claimed that the asphaltic filler pulls entirely out of the joints in strips, and this is more or less true when the filler is applied cold or on wet brick. Where sufficient care is taken, however, it is not true, and the asphalt has the further advantage that it is not nearly so much affected by the heat or cold; and since such filler is now scarcely any more expensive than a tar filler, the writer prefers the asphalt. It is believed also on account of the fact that asphalt does not soften up so much under heat that it may very properly be "squeegeed" instead of poured, with a considerable advantage to the noiselessness and appearance of the pavement.

Sandstone headers were put at the ends of all streets and alley intersections, and at points crossing the railroad yards where a large amount of teaming is done. These are more expensive than the wooden headers so often found in use in paving, but there can be no question of their much greater usefulness, not only in protecting the pavement from wear, but from the fact that they will never rot out and thus tend to lessen the life of the pavement.

After the usual formalities required in the State of Illinois, the work was laid out and construction started in the spring of 1910. One of the problems confronting the engineer on this work was the establishment of the grade, for, as in most cities where no pavements have ever been put in, very little attention had been paid to the question of grade. A good deal of curb had been built on the various streets, but the grades consisted mostly in running from John Smith's walk to Tom Brown's corner with the resultant steps and jogs in the sidewalks. After talking the question over with the authorities, it was decided to take the bull by the horns and establish the grades somewhere near where they should be and let the property owners build their sidewalks to meet them. This is what the writer has advocated for years in this character of work, but he has generally been restrained by the authorities, who fear results from a political standpoint. Subsequent events proved this to be the wisest course that could have been taken, though at the start of construction a great deal of complaint was heard.

The concrete base for the pavement consisted of 5 inches of 1:3:6 concrete, upon which was spread a sand bed of 2 inches, and on this sand bed the brick wearing surface was laid and the joints filled with asphaltic cement. Tests were made of all material that entered into the construction, that is of the cement, the asphalt filler and the brick. These tests were made according to the standard methods, and, as regards the cement and the asphaltic filler, were not remarkable in any way. The same thing might also be said of the brick. There was nothing remarkable in any way about the test, except that, to the writer's mind, it confirmed the opinion he had for several years that the rattler test as now conducted is of very little benefit to anybody. The rattler tests were made with the greatest care and with the idea that, since such bitter objections had been made to the improvement, every possible precaution should be taken to see that no defective material be used, and there can be no question but that every effort was made to have the rattler as near standard as it is possible to get one and meet the requirements of the description. Yet, in spite of this fact, brick from the same pile showed the most remarkable variation in results. As far as could be seen by close examination they were identi-

cal in every way in the evenness of texture, in color and in size and weight. Dozens of them were broken with a hammer and examined closely. It is the writer's opinion that, taken as a whole, they were well burned brick. They were tested under the specifications advocated by the National Paving Brick Manufacturers' Association, and also under the Chicago City Specifications. It might be explained that the Chicago City Specifications provide that the test shall be made in a standard 20 x 28-inch rattler, but that the test is made by grinding brick on brick in the rattler instead of brick on shot as required by the National Paving Brick Manufacturers' Association test. This test has been objected to for many years by the manufacturers, who insisted that it is a much more severe test than the one that their association advocates, although in the Chicago city tests a 20 per cent loss is allowed instead of 18 per cent as in the other test. It is rather curious to note, however, that, though both of these tests were used on precisely similar samples of brick, just as often as not the loss in the National Paving Brick Manufacturers' Association test was as great or greater than the loss in the Chicago city test. The loss in the rattler was anywhere from 14 to 24 per cent, and great variation would occur in two tests made on the same day from a batch of brick from the same pile. Some thirty different tests of brick were made, and at no time did they give consistent results. It is the writer's belief, based not only on this series of tests, but on many other tests of the same character made by him on other work, that the rattler test as now used is absolutely unreliable.

A careful force account was kept by the resident engineer on this work, of which the following is a copy:

COST OF PAVING AT ROCHELLE, ILL.

	Total Labor Cost.	Labor Cost per Unit.	Total Mat'l Cost.	Mat'l's Cost per Unit.	Total Cost.	Total Cost per Unit.	Contract Price Per Unit.	Total.
Concrete combined curb and gutter—10,475 lin. ft.; av. sec., 162 sq. in.; 1-2-4 mix.; 6" cinders; 14,265 lbs. castings.....	\$1,512.00	\$0.154	\$1,792.00	\$0.171	\$3,304.00	\$0.325	\$0.45	\$4,713.75
Concrete gutter—864 lin. ft.; av. sec., 120 sq. in.; 1-2-4 mix.; 6" cinders...	149.00	0.172	75.00	0.087	224.00	0.259	0.25	216.00
Sandstone curb and headers, 2585 lin. ft. (4" x 24").....	353.00	0.137	646.00	0.25	999.00	0.386	0.45	1,163.25
Catch basins, 20.....	245.00	12.25	308.00	15.40	553.00	25.65	40.00	800.00
Manholes, 4' deep, 3.....	20.00	6.67	35.00	11.67	55.00	18.34	35.00	105.00
Valve boxes, 5' deep, 8.....	65.00	8.13	109.00	12.50	165.00	20.63	35.00	280.00
Tile pipe, 9" (av. cut 4'), 518 lin. feet.....	85.00	0.164	95.00	0.183	180.00	0.347	0.50	259.00
Tile pipe, 10" (av. cut 5'), 738 lin. feet.....	196.00	0.266	170.00	0.23	366.00	0.496	0.60	442.80
Grading (including excavation, fine grading, rolling, etc.) 4800 cu. yds....	3,764.00	0.784			3,764.00	0.784	0.09	432.00
Adjusting 20 old manholes and catch basins, furnishing four new iron covers, weighing 470 lb. each.....	24.80		75.20		100.00			104.00
Concrete foundation (29,096 yards equals 4,041 cu. yds.), 1-3-6.....	2,511.00	0.086	7,270.00	0.249	9,781.00	0.335		
Brick pavement, 29,096 sq. yards.....	3,621.00	0.125	20,813.00	0.715	24,434.00	0.839	1.78	51,790.88
Filler, 29,096 square yards.....	1,104.00	0.038	3,048.21	0.105	4,152.21	0.143		
Total	\$13,649.80		\$34,427.41		\$48,077.21			\$60,306.68

OTHER EXPENSES.

Timber for forms.....	\$300.00
Bond.....	700.00
Depreciation of tools and interest.....	1,220.00
Traveling expenses.....	100.00
Insurance.....	280.00
Profit to sub-contractor, C. & G.....	1,000.00
Total cost	\$51,677.21

PRICES.

Cement	\$1.25	per bbl.
Paving brick.....	17.00	per thousand
Sewer brick.....	6.00	per thousand
Castings	0.04	per pound
Sewer pipe, 9".....	0.18	per foot
Sewer pipe, 10".....	0.22½	per foot
Sandstone curb (4" x 24").....	0.25	per foot
Gravel	0.90	per yard
Sand	0.90	per yard
Cinders on street.....	0.75	per yard
Filler	15.00	per ton

WAGES.

Finishers, \$4.80 per day of 8 hours (union scale of C. & G. gang).
Laborers, \$3.00 per day of 8 hours (union scale C. & G. gang).
Laborers, \$2.00 per day of 10 hours.
Teams, \$5.00 per day with teamster.
Helpers, \$2.00 per day.
Foreman, \$5.00 per day.
Superintendent, \$6.00 per day.
Brick mason, \$10.00 per day.

In connection with above table, it is to be noted that the foundation consisted of approximately 4,000 cubic yards of concrete. The cement ran about eight-tenths of a barrel of cement to a cubic yard or one barrel of cement to each nine square yards of concrete foundation five inches in depth. This small amount of cement is explained by the fact that the gravel used in making the concrete was a very clean product, practically bank run, the size varying from two inches down to



WASHINGTON STREET, ROCHELLE, ILL.

coarse torpedo sand. A great many experiments were made to find out what the proper amount of cement should be in a 1 : 3 : 6 mixture with this gravel, and it was invariably noted that the cement ran one barrel to each ten square yards. However, it was insisted that this amount of cement be increased because while, theoretically, less cement is required when the amount of the voids in the stone is small than when the percentage of voids is large, still it is an actual fact founded on experience that a fine stone aggregate requires more thorough mixing to get the cement evenly distributed and that with the ordinary machine mixer more care is required in mixing fine material than in mixing more carefully graded stone. The asphalt filler averaged 1.65 gallons per square yard. The bricks were stand-

ard paving blocks averaging between 42 and 43 blocks per square yard. The curb and gutter consisted of 1 : 2 : 4 concrete with one-half inch of 1 : 1 finishing coat and the cement ran 1.3 barrels per cubic yard.

From the above table it will be seen that the contractor netted about \$8,600 on his work, or an equivalent or about 29 cents per yard of finished pavement, as near as could be told by keeping close account of the work; and while, of course, it is not known what prices he paid for his material, still current prices were assumed, and the figures are believed to be nearly correct. That part covering labor is from daily force account. From this profit also should be deducted the cost of carrying a certain part of the contractor's organization during the winter and other office expenses, so that a probable net profit of between \$6,000 and \$7,000 was realized.

One of the most interesting features in connection with the installation of this pavement was the indirect result in the appearance of the town. The pavement itself, of course, did much to improve this, but in addition new sidewalks were put in by practically all property owners where old sidewalks were not at the adopted grade, and this added fully as much to the appearance of the street. Moreover, after the pavement had been partially completed the business men of the town decided to

install ornamental electric lights and some seventy of these were located within two or three blocks of the center. These lights consisted of groups of three 60-watt tungsten lamps on top of cast-iron posts some 13 feet high, the lamp being enclosed in a white ground-glass globe. The cost of this lighting system was about \$4,400, and besides making the business part of the town very attractive after dark it is an ornament during the daytime as well.

It is probable that the paving will be extended into other streets, and agitation for establishing a complete system of grades for the entire town is increasing. The reputation of the improvement made has drawn to the town delegations from towns nearby and even one or two several hundred miles away. Property values have appreciated, rents have been advanced in many cases, and altogether the business men consider it one of the best investments they ever made.

The Mayor of Rochelle, Mr. W. B. McHenry, was active during construction and personally saw to it that poles, hydrants and other obstructions were promptly removed from the roadway. In every way the Board of Local Improvements and the City Council co-operated with the engineer and the contractor. Mr. Kendrick Harger was resident engineer for the engineers, the Aetna Engineering Bureau, of Chicago, who prepared the plans and supervised the construction.

CHICAGO STREET LIGHTING

THE city council of Chicago in 1909 created a commission on city expenditures to regulate the various departments of the city. This commission has recently published a preliminary report on the affairs of the Department of Electricity, covering the street lighting of the city by gas and gasoline as well as by electricity, and the fire alarm and police telegraph systems. Less criticism has been directed by the commission against this department than against some of the others investigated, although recommendations were made for a number of changes, especially in the arrangement made with the Park Department for lighting park roads at the expense of the city rather than of the Park Board. There were, however, some criticisms of the conduct of the department itself, and it was recommended that a more systematic and rigid inspection be made of the gas and gasoline lamps; also that the position of chief gas inspector be placed under the merit system and that some economy be effected by reducing the payroll.

With reference to the use of gas lamps, the commission stated that for the past few years the number of these used for street lighting has steadily decreased, as electric arc lamps are adopted more and more generally; and it is probable that before long no gas lamps will be used except in the outlying districts. The gas lamps are lighted and extinguished according to a regular schedule by men who are paid one cent per lamp per night, their duties including also the cleaning of the glass-ware once a week and of the burners once a month. For the care of mantle lamps an additional ten cents a month is paid to cover the extra labor of replacing mantles and adjusting burners.

In the outlying districts of the city, where gas mains and service pipes have not been laid, and also in some of the residence districts, the street lighting is done by gasoline lamps. These are owned, installed and operated by a private corporation which receives \$26.40 per year per lamp. The contract provides for a proportionate rebate in case a lamp is reported out any number of hours or days, or if the actual effective candlepower delivered is not up to the required standard. Deductions are made, "in proportion to the rate charged, for each lamp that does not furnish continuously a full 60-c.p. effective light. The tests will be made by means of a portable photometer using a standard incandescent lamp for comparison." The outages are reported by policemen and citizens, but up to the present time no candlepower tests with a portable photometer have been made; but laboratory tests of burners taken from the company's shops have shown the lamps capable of furnishing this candlepower.

The gas lamps also are rated at 60 c.p., and while it is not to be expected that they will not vary more or less from this in actual service, some of the conditions discovered by the commission certainly called for the criticism which they received. The commission inspected 956 mantle gas lamps in one district and of these found about 20 per cent in good condition, 41 per cent were called fair, 26 per cent bad, 10 per cent very bad, 3 per cent out. Seven per cent had no chimney and 4 per cent were found with broken glass. Lamps were assumed to be in good condition when the glass was clear, the mantle in good condition and the burner well regulated. Those classed as fair could have been much improved by cleaning the glass and regulating the burner. The bad and very bad included lamps which were very dirty, with mantles broken, chimneys smoked, and in such a condition that the "very bad" might as well have been out entirely. Consequently, but 61 per cent of the lamps inspected could be considered as passable. "The reason for this condition is lack of proper care on the part of lamp-lighters and poor inspection."

In addition to this inspection, photometric field tests were made to determine the actual candlepower of both styles of lamps under service conditions. Of the mantle lamps which could be classed as passable the candlepower ranged from 10.6 to 41.6, the average being 24.8. Tests made of flat flame lamps gave results varying from 6.3 candlepower to 16.7, the average being 11.0. The commission stated that while varying gas pressure has much to do with the intensity of the light, this could probably be increased fully 50 per cent in the case of both flat flame and mantle lamps by proper care on the part of those paid by the city for this service.

A large part of this failure of the lamp-lighters to perform their duty is attributed to the lack of systematic inspection of the lamps and oversight of the work done by the lamp-lighters; combined with the fact that too many lamps are assigned to one man, this number ranging from 200 to 400, to look after which the lamp-lighters hire boys at a lower rate than that paid by the city, and much of the care of the lamps is consequently done by boys without any adequate inspection or supervision.

The need of more detailed and careful supervision by the department is also shown by the unreliability of the figures of the department as to the number of lamps in service. There is an old map in the gas office showing the location of each lamp in the city, but this has been altered so often that it is unreliable and no effort is made to keep an accurate location of all gas lamps in operation. An actual count of the lamps in one district showed a variation of 3.5 per cent from the official records. In paying for these lamps the city pays the lamp-lighters, as stated above, one cent per lamp, and it pays for the gas by assuming a rate of flow of three feet per lamp per hour for the flat flame burners and three and one-half feet for the mantle burners. Consequently, any error in the number of lamps in service and also in the rate of consumption of gas has its direct effect upon the bills. According to the report there is less criticism to be made of the gas company than of the city, as the commission found from testing a number of burners at random that there was no doubt that the city was getting more gas than it was paying for; the average capacity of the mantle burners tested showing a consumption of 4.1 cubic feet per hour, and of the flat flame burners 5.2 cubic feet per hour.

As a result of the inaccuracy of the record of lamps, it is estimated that, should the same percentage of error be found in the whole city as was found in one district, the city is paying for gas and labor which it does not receive about \$7,000 a year.

Another way in which the city is more remiss than the private corporations is in the matter of placing wires under ground. "It is often the case in districts where by ordinance all wires should be under ground that the city's circuits are still aerial and two or three wires necessitate the presence of ungainly poles along the curb where companies' wires are under ground."

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239 West Thirty-ninth Street, New York
Telephone, 2046 Bryant, New York
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A. PRESCOTT FOLWELL, Editor
F. E. PUFFER, Assistant Editor

Business Department

S. W. HUME, President
J. T. MORRIS, Manager. A. PRESCOTT FOLWELL, Secretary

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FEBRUARY 8, 1911

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Value of City Records

WHILE we have several times before referred to the great desirability that cities should make and keep up-to-date, complete and accurate records not only of their finances but of the physical structures and all their details which are in charge of or utilized by the various departments, we offer no apology for again referring to the subject, for we think this is warranted by its importance. An illustration of this importance is offered in the article on page 196, in which it is stated that an investigating commission in Chicago found that, owing to the fact that there was no correct record of the street lamps in the city, the city was paying about \$7,000 a year for lamps which had no existence. It is easy to imagine other losses or inconveniences occasioned by this same lack of accuracy of the records. For instance, if it were decided to change from one style of lamp to another it is conceivable that the number of new lamps to be ordered would be taken from these same records.

This illustration in Chicago could undoubtedly be dupli-

cated in some one or more departments in most of our large cities and many small ones. For instance, we published some months ago abstracts from a report of an investigating committee in Boston, in which report it was stated that the city was paying for cleaning many catch basins which have no existence, the apparent cause being that the records of catch basins were not correct.

In a sewer department similar over-payments might well be occasioned by inaccurate records of the number of automatic flush tanks in use.

In many instances inaccuracy of amounts and measurements of these physical structures may seem to be of no special importance and not worth the labor involved in correcting them; but it is impossible to tell just what error or confusion may at some future time result from the use of inaccurate figures which are allowed to stay upon the records through this failure to appreciate the importance of completeness and exactness in such records.

Motion in Brick Pavements

THAT brick pavements, and in fact pavements made of all kinds of material, expand with the heat and contract with the cold is of course well known; such expansion having in some instances resulted in the arching of a pavement, the center lifting in some cases several inches from the foundation. We do not recall, however, having seen any figures as to the actual amount of expansion and contraction caused in pavements by temperature changes. An investigation of the amount of such movement is being undertaken by the Bureau of Standards, which has sent from Washington two of its engineers to study the brick speedway at Indianapolis, which is considered perhaps the most perfect specimen of brick paving in the country. From the results of these tests it should be possible to estimate with more exactness the size of expansion joints which it is necessary to provide in constructing brick pavements of various widths and in various climates.

At the same time these engineers propose to test the rigidity of the pavement—that is, the deflection occasioned by the passing of a load over it. For this purpose a sensitive spirit level will be used which will indicate a change in level at one end of one ten-thousandth of an inch. This would not seem to have as much immediate value to the engineer, although it may serve to indicate the value of certain coefficients of elasticity and other properties of brick pavements.

Brick Pavement Details

On another page there are given, by an engineer, reasons for preferring bituminous to cement filler, contrary to the opinions and urgent teachings of the National Paving Brick Manufacturers Association; and also the conditions under which, in his opinion, a rolled stone foundation is preferable to a concrete one.

Standardizing, whether of specifications or of machinery, has been of great service in the development of engineering arts; but standard methods are best fitted for standard conditions only, and there is danger that an engineer may be so mentally indolent or so cautious as to fail to depart from standard methods when conditions would better be met by an independent decision on details or possibly on vital principles. Such independence has in the past been one of the most striking and commendable features of American engineering, and it is to be hoped that it will never be smothered by standardization.

Canadian Public Health Exhibit

THE Provincial Board of Health of the Province of Ontario is arranging to hold a public health exhibit this year in connection with the Canadian National Fair which is held annually in the city of Toronto, beginning about the end of August. In addition to this exhibit the board will arrange for daily 15-minute lectures, illustrated by lantern slides, upon various subjects relating to public health and prevention of disease. It is proposed that this exhibit shall contain appa-

ratus, appliances, materials, etc., which would be serviceable to health boards, and firms are invited to send any such materials to the exhibit. The space is limited, however, and any who desire an allotment are requested to communicate as soon as possible with the chief health officer, Mr. John W. S. McCullough, M.D., Parliament Bldg., Toronto, Ont., Canada.

SMALL DREDGE FOR SEWAGE CHANNELS

By E. S. RANKIN, Engineer of Sewers and Drainage,
Newark, N. J.

For several years past the Engineering Department of the City of Newark, N. J., has advocated the purchase of a small dredge to be used in deepening and widening a number of narrow creeks or ditches flowing through the salt meadows in the southeasterly part of the city. The surface of these meadows lies about one foot or less above high water level and is composed of a soft mud of varying depth. The streams are used as the outlets for storm water sewers, but are not of sufficient depth and are more or less obstructed with vegetation and with the sediment washed down by the sewers.

When authority was obtained to purchase a dredge great difficulties were experienced in finding one small enough to meet the requirements. The nature of the work was such that the machine would have to be operated from a scow, the ground not being solid enough to support a land machine, and ten feet was considered as about the outside width desired. It would also be necessary to transport the dredge from one point to another and carry it across a number of railroad tracks. It was therefore essential to find the lightest machine that could be operated practically. After many interviews and much correspondence with makers and operators of dredging machinery a contract was finally made with the Lambert Hoisting Engine Company, of Newark, N. J., to build a dredge to be mounted on a scow 10 feet by 30 feet. The bucket is of one-third cubic yard capacity and the boom 14 feet in length.

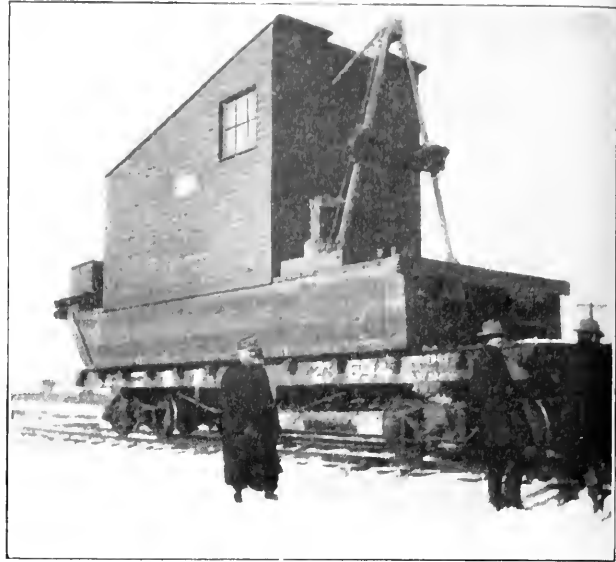
During the first five weeks of operation a ditch about 2 feet deep by 4 feet wide was enlarged to 4 feet deep by 10 feet wide for a distance of 2200 feet at a total cost of \$339.35, including engineer, labor, coal, oil, etc., or approximately 10½ cents per cubic yard of excavation.

At this point it was necessary to cross a number of railroad tracks, and as the season was so far advanced arrangements were made with the railroad company to pick up the dredge with a wrecking crane, load it on a platform car and ship it to another point, where work will be resumed in the spring.

So much difficulty was experienced in securing a dredge suitable for the work required and its operation when finally secured has proved so satisfactory that this article is written in



DREDGE AT WORK



DREDGE LOADED ON CAR READY FOR TRANSPORTATION

the hope that it, may prove of value to some other municipality similarly situated.

The accompanying photographs show the dredge in operation and ready for transportation.

MILWAUKEE INCINERATOR

MUNICIPAL JOURNAL AND ENGINEER,
231 West Thirty-ninth Street, New York City.

Gentlemen: Our attention has been called to a clipping from your publication under date of January 25, in which it is stated that the city of Milwaukee is about to abandon its incinerator plant and substitute therefor a piggery system for the disposal of garbage. Said article goes on to discuss, with considerable detail, alleged plans for accomplishing the above-mentioned purpose.

We wish to state that the city of Milwaukee is not considering any such proposition for the reason that none such has been made to the city. This department has just assumed the responsibility of the collection and disposal of the city's garbage. We propose to operate the incineration plant constructed recently for the city of Milwaukee by Power Specialty Company, of New York, and are installing a new system of record keeping and accounting in order to give us data as to the exact operation of the plant. We as yet have nothing to base any conclusion upon in regard to the operation of said plant and therefore are not in position to make a comparative study of the various methods of disposal of garbage.

From our records it will be possible for us to secure accurate information as to the cost of collecting, hauling and a detailed statement of the costs of the various processes to which the refuse material is subjected in the incinerator. We will also be enabled by these records to credit the plant with the production of a certain amount of clinker which may be used in various ways and the production of a certain amount of steam which we propose to use as advantageously as possible.

After we have had one year's time in which to thoroughly organize the work of collection and disposal of the garbage we will be in much better shape to discuss the incineration method of disposal of garbage and refuse in Milwaukee.

Trusting that you will correct the statements made in the above-mentioned number of your periodical, I am,
January 30, 1911.

Yours respectfully,
H. E. BRIGGS,
Commissioner of Public Works.

We are glad, indeed, to learn that the incinerator is not to be abandoned at once, but will be given a test of another year. It would be very unfortunate if this plant, which was carefully planned by such a prominent engineer, should be abandoned without the utmost effort having been made to secure satisfactory operation. We are informed by those conversant with affairs that there was some foundation for both the item referred to by Mr. Briggs and for another a few weeks earlier, and that the present administration is not satisfied with the plant. But we hope that the test of this incinerator and of the general system to be made this year will result in the ultimate approval of it.

NEWS OF THE MUNICIPALITIES

Current Subjects of General Interest, Under Consideration by City Councils and Department Heads—Streets, Water Works, Lighting and Sanitary Matters—Fire and Police Items—Government and Finance

ROADS AND PAVEMENTS

To End New York Highway Commission

Albany, N. Y.—A bill to carry out the recommendation of Governor Dix in his annual message to the Legislature to abolish the State Highway Commission, which was established originally with a view to bringing about important reforms in State road administration, has been introduced in the Legislature. The present State Highway Commission of three members and a large force of office employees are to be eliminated and a new State Highway Commission is to be established to be composed of a business man at the head in the person of State Superintendent of Public Works Charles E. Trenan, of Ithaca, a personal friend of Governor Dix, who as Superintendent of Public Works will award the good roads construction contracts hereafter.

Stone Road, New York-Montreal

Albany, N. Y.—A complete stone road all the way from New York to Montreal is now practically assured. The Senate finance committee has reported favorably Senator Sherman's bill appropriating \$2,500,000 for highway improvements, to connect incomplete highways from New York to Rouse's Point. These improvements are to be made along the east side of the Hudson to Albany, and then north to Rouse's Point, filling in the bad spots here and there. The Canadian authorities have already arranged to build a complete stone road from Montreal to connect with this State's highway work at Rouse's Point.

Highways Cost \$6,000,000

Albany, N. Y.—County highway superintendents at the semi-annual conference with the State Highway Commission reported the expenditure during 1910 under their supervision on maintenance and repair of roads and bridges to be about \$6,000,000. This is apart from the expenditure on roads improved as State or county roads by State aid. Of the total amount expended, the State contributed about \$1,500,000, and the balance was provided by the town highway tax. It was claimed that more than \$250,000 had been saved during the year in construction and repairs of town bridges, owing to the adoption of the permanent type of bridges and culverts, built of concrete whenever possible.

Repaving Baltimore Streets

Baltimore, Md.—City Engineer B. T. Fendall has completed an exhaustive study of Baltimore's paving problem in view of the election on the question of floating a \$5,000,000 paving loan. At present there are 250 miles of cobblestone streets and about 108 miles of alleys. If the whole work were done with first-class granite block the cost would be \$18,600,000; if vitrified brick and asphalt were used the cost would be \$10,000,000; if bituminous macadam was used, the plan being to lay it to a depth of three or four inches immediately on top of the stone, the cost would be 4,000,000. Mr. Fendall favors using all of these materials, selecting the kind most suitable for each street. He figures that an expenditure of \$2,000,000 a year for six years would be the best arrangement.

Will Require Pavement Guarantees Again

Binghamton, N. Y.—The Board of Contract and Supply has recommended that maintenance guarantees from paving contractors be hereafter required. Several years ago all paving specifications required a two-year guarantee, secured by cash or bond. Bondsmen who guaranteed poor pavements, however, acquired the habit of disappearing when about to be called on for funds for repairs. For the last three years paving contracts have been let without any guarantee. Lower prices were obtained and sometimes poorer work. Now a medium point is sought and a reasonable guarantee proposed. This it is proposed to secure by cash return of 5 per cent of the cost of the work.

Ordinances Regarding Pavement Excavations

Leavenworth, Kan.—An ordinance is under consideration regarding pavement excavations. It first requires that a bond be filed and a permit be obtained before any excavation may be made. The city is released from all liability for damages to persons or property occurring in any manner from the excavation. A particularly important feature of the ordinance is the provision against making excavations within a specified time after a pavement has been laid. Notice shall be given all property owners along a street which is to be paved and they will be required to make water, gas or sewer connections before the pavement is laid. In the case of brick pavement no excavations or cuts shall be made within one year after the pavement is laid. No asphalt pavement may be cut into for five years after the improvement is made. Exception is made, in the case of necessity for repairs. Also excavations must be filled by the one making them. The work must be done under the immediate inspection of the city official designated to have charge of the work. The material shall be of the kind ordered by the city. Barriers must be provided at all excavations, and red lights placed there at night. The details for all provisions are worked out. Any infringement of the ordinance shall be punished by a fine of from \$5 to \$200 upon conviction.

Louisville, Ky.—An ordinance to prevent the tearing up of streets is under consideration by the Board of Public Works and Councils. The Louisville Gas Company challenges the right of the city to pass any kind of legislation telling the company how, when and where it can tear up pavements. The company officials assert that they are operating under a charter granted by the Legislature and that their company is beyond the reach of ordinance-made legislation. The remaining companies do not contest the right of the city to pass an anti-street destroying law on legislative grounds, but maintain that a great and unnecessary hardship would be the result of a law requiring the laying of all pipes and conduits before the placing of a pavement. The Board of Public Works believes the ordinance a necessity to the protection of the city's streets and will send a measure to the General Council. After its passage the corporations may test its legality in the courts if they see fit.

Says State Engineer Controls Road Funds

Sacramento, Cal.—According to an opinion delivered by Attorney-General U. S. Webb, the department of engineering must have entire charge of the expenditure of the \$18,000,000 good roads funds, and the legislature will be unable to create a department of highways, which action is contemplated by a series of bills now in the hands of the committee. Mr. Webb told the roads and highways committee that such a proceeding would be unconstitutional. The committee has been working for a week in an attempt to devise a law which will allow the appointment of a high salaried official to be at the head of the road building work. The attorney-general was asked to give an opinion as to the constitutionality of such an appointment. "The constitutional provision for the passage of the highways act," said Mr. Webb, "expressly forbids the repealing of the act until all indebtedness incurred by the sale of bonds has been paid. To take away any of the power, which the act clearly delegates to the department of engineering, would amount to a repeal of the act. The legislature may do nothing which would remove any of the powers of the engineering board to spend the money and build the highways. As long as no bonds have been issued, there is still the possibility of repealing the act, but the moment a dollar of indebtedness is incurred the act will be irrevocable until 1961, and must stand until that time. The legislature may change the department of engineering in any way it sees fit, within statutory and constitutional limits, but the building of the roads is absolutely in the hands of the engineers and no one else."

Offers Land for Boulevard

Cincinnati, O.—The first donation of land to aid in establishing a boulevard along the course of the canal within the city limits has been made, providing the Association for the Improvement of the Canal succeeds in having a legislative bill passed allowing the city to acquire the waterway for boulevard and interurban road purposes. This donation, conditional only that the land offered is needed to give the boulevard its proper width at a given point was made by Louis B. Reakirt.

Problem of Narrow Roads in Canyons

Los Angeles, Cal.—The Supervisors have been greatly puzzled for some time by offers from owners of new tracts to give the county streets of less than 40 feet width. The law specifies that no public street can be less than 40 feet wide, and it has been a question whether such thoroughfares could be accepted as public highways. For several weeks such an offer from the owners of Beverly Glen, a tract in the hills north of Beverly, has been hanging fire. The offer includes a roadway 40 feet wide running through a canyon in the middle of the tract, but the lots extend up the steep hillsides, where no roads could be built. The lots cannot be sold unless public highways are set aside to reach them, and it is illegal to sell such lots until the plats of them are accepted by the Board of Supervisors and made a matter of record. The Board devised the plan of calling them lanes instead of highways, but Hartley Shaw, the legal adviser, rendered an opinion that they are not properly lanes. Mr. Shaw suggested, however, that inasmuch as they are in a mountainous section, they can be accepted as public trails. Supervisor Butler raised the question whether the country will be compelled to open and improve them if they are accepted as public trails, but Supervisor Nellis, in whose district Beverly Glen lies, said it is his understanding that the county does not have to improve any highway less than 40 feet in width. Whether the supervisors will be personally responsible for an accident on them is still an open question. Supervisor Nellis said it is desirable to obtain a right-of-way for a road through the canyons in that locality that can be improved for the benefit of the San Fernando valley, and for this reason the plat was accepted as a public record, trails and all.

Paving in Louisville in 1910

Louisville, Ky.—During 1910 there was spent out of city revenues a total of \$922,349 for the construction, reconstruction and repair of streets. In 1909 the same item was \$544,585. In addition to this new work paid for by assessment amounted to \$384,902, as compared with \$114,722 for the previous year. This amount includes new sidewalks as well as roadways. The sidewalk work amounted to \$38,505.

Supplemental Contract Declared Void

Philadelphia, Pa.—The Common Pleas Court has declared void the supplemental contract for asphalt pavement repairs which increased the contract with the Filbert Paving & Construction Company from \$50,000 to \$200,000. It further ordered a full accounting and restitution of all sums paid the Filbert Company in excess of the original \$50,000. The three judges unanimously agree that the Filbert Company's bid was submitted on what both the company and city officials knew to be misleading information in the specifications, and that the bid was so grossly unbalanced as to have been sufficient notice in itself that some sort of fraud was contemplated.

Map of Paved City Streets

Rochester, N. Y.—A map of Rochester on which all the paved streets are designated by different colors, according to the character of the pavement, has been prepared for the city by a Philadelphia firm. The maps will be placed in the bound volumes of the report of the City Engineer for the years 1908, 1909 and 1910, for which bids are now being advertised. On the map the streets designated in red are those paved with Medina block; green, Medina stone; blue, asphalt; yellow, brick, and brown, macadam. The unpaved streets, which are mostly in the outlying sections, are white on the map.

SEWERAGE AND SANITATION

Advisory Boards to Improve Public Health

Syracuse, N. Y.—Mayor Schoeneck has named members of two advisory boards created to improve public health conditions. One of these, the Advisory Board for the Protection of Skaneateles Lake, elected Harry W. Jordan chairman. The other, the Advisory Board of Physicians, chose Dr. T. H. Halsted chairman. Deputy Commissioner of Public Safety S. T. Friedrich presides at joint meetings. One of the ideas expressed at the first meeting was that the boards could render important assistance in investigating the methods employed in the bureaus of Health and Water suggesting improvements and helping to create public sentiment in support of reform measures.

Bans Public Drinking Cups

Concord, N. H.—The House last week sounded the death-knell of the public drinking-cup in New Hampshire when, concurring with the Senate, it passed a bill to give the State Board of Health authority to "restrict the use of common drinking-cups in public places." The bill is along the line of the one passed in Massachusetts a year ago.

State Department Takes Control of City Water Supply

Erie, Pa.—Following a serious typhoid outbreak, and analyses of city water showing the presence of intestinal bacteria, the State Department of Health took charge of the city water supply, installed a chloride of calcium plant at water works and issued a notice warning all persons to boil the city water before drinking it. The notice read as follows:

State Department of Health,
Harrisburg, Pa., Jan. 28, 1911.

To the Public in Erie:

During the month of January there have been 24 deaths from typhoid fever in Erie city and 185 cases of the disease. This is certainly an alarming condition.

The state department of health will undertake an exhaustive investigation to ascertain the origin of the fever outbreak and to assist in stamping out the disease.

The Erie board of water commissioners will install apparatus at the pumping station to treat the water chemically and destroy micro-organic life. This treatment will be in use within 24 hours and other precautionary measures will follow. However, it is absolutely essential that the public continue to boil all water used for drinking and culinary purposes.

I am convinced that the public notices to this effect, issued by the Erie city board of health, have not been universally heeded. I hereby warn the citizens of Erie, the hotel, boarding house and restaurant and other proprietors and users of public water that the interests of public health demand all water used for domestic purposes shall be raised to the boiling point and maintained at the boiling point for at least 20 minutes before being used.

SAMUEL G. DIXON,
Commissioner of Health.

House Drains Must be Run to Sewers

Haddonfield, N. J.—All house drains in Haddonfield must be connected with main sewers. This is the order of the Board of Health which has issued a proclamation to that effect. The expense incurred in complying with this sanitary regulation it is said will be small compared with the cost of digging up the drains frequently to clear away refuse which prevents the flow of water.

A Sewerage Dilemma

Kenmore, N. Y.—The village trustees have received a letter from Colonel Ward, Commissioner of Public Works, Buffalo, notifying them that if they do not pay for the use of a Buffalo main sewer into which the Kenmore sewage drains, the service will be discontinued April 17. It seems that the connection with this sewer had never been authorized and when the Buffalo officials discovered it they made a demand for \$12,000 for back charges and \$2,500 annually thereafter. Kenmore can neither raise the money nor do without the sewer.

Sewer Nears Completion

Tonawanda, N. Y.—The Gastown sewer system, which has been a source of trouble from the day the original contract was awarded three years ago, will be completed about February 15th. Contractor Lawrence Schultz of Fredonia, who is doing the work stated last week that he had 50 men working on the job. Only a short stretch on Fillmore avenue remains to be completed, and then the tile pipe, which was laid on East Niagara street instead of iron pipe, will be replaced. Of the \$22,000 raised for the work, \$2,650.74 is left in the fund to complete the job.

New Plan of Franchise for Sewerage Companies

Vincennes, Ind.—Representative Racey has introduced a bill in the Legislature designed to enable municipal corporations to grant franchises to private corporations for the construction and maintenance of sewer systems, as street car, electric light, water or gas franchises are now granted. The peculiar needs of Vincennes prompted him to introduce the bill. If the measure becomes a law, he said, it would be of great benefit to a large number of cities in Southern Indiana, where the State Board of Health has held that the construction of sewers is necessary to the preservation of public health. In Vincennes, Racey said, the city authorities had attempted to construct a sewer system by parts, as the city was not able, financially, to build an entire system at one time. But the topography of the Vincennes site was such that the system could not be built successfully in its entirety. Racey's bill provides that such franchises shall be let only on an election by the voters of the city concerned, and that whatever rental is paid by the city during the control of the franchise right by the holder shall be applied on the purchase price when the city decides to take over the property, a right retained by the corporation by the terms of the bill. Under this bill all a city could grant a franchise to a private person, firm or corporation who would construct a sewerage system and charge property owners for the use of the sewers.

WATER SUPPLY

City Asks State Board for Assistance

Bay City, Mich.—The State Board of Health will be asked to make an investigation and suggestions for the improvement of the water supply. The prevailing theory as to the cause of pollution is this: A number of local factories have been emptying sulphuric acid into the water, which killed the fish. Owing to ice in the river they were not carried out to the lake, but, decomposing, polluted the water.

Give Water for Right-of-Way

Denison, Tex.—The actual construction work on the pipe line from Denison to the new city reservoir, four miles from the city, has commenced. About 100 laborers are engaged in laying pipe. The work was started in the center of the city. A 12-inch main is being laid in the city, but a 14-inch main will be used for a considerable distance. Nearly all of the pipe—about 1,000 tons—necessary for the pipe line has arrived, but the work has been delayed for lack of valves and fittings. The right of way for the line was secured from farmers through whose property the survey passed by contracts to be paid out in water when the line is in operation. Every farmer on the line will be supplied, and all are very much elated over being placed so that they need not fear droughts in the future.

Asks \$6,500,000 for Reservoir

New York, N. Y.—Commissioner Thompson, of the Department of Water Supply, has applied to the Board of Estimate for an appropriation of \$6,500,000 to complete the westerly portion of the Jerome Park reservoir of the Croton Aqueduct system, the construction of a filtration plant being necessary to carry out all the plans. As \$2,200,000 has already been expended on this work the cost of the lower half of the reservoir will be \$8,700,000. The request was referred to a committee with the request from Mr. Thompson for early action, as he is desirous of beginning the work by June 1. If this can be done he figures out that the job can be finished by January 1, 1914.

Sebago Water Pure

Portland, Me.—The Portland Water District has received from Director H. D. Evans, of the State Laboratory of Hygiene, an analysis of the public water supply, and the result is most satisfactory. A copy of Mr. Evans' letter follows:

Augusta, Me., Jan. 23, 1911.

Portland Water District,
Portland, Me.

Gentlemen—The analysis of the winter sample of water from your public supply, sent to me on the 17th inst., shows the water to be in first-class condition to use for drinking and for all domestic purposes. There is neither chemical or bacterial evidence of sewage pollution of this water, while the recent rains and thaw have had no effect on its quality. The analysis shows the water to be practically in identical chemical condition with the samples sent to me the last of November, 1910.

Enclosed are the results of the present analysis.

Very truly yours,
H. D. Evans, Director.

For and Against Water Company

Racine, Wis.—What is said to be the most important Council meeting in 25 years took place on January 23, when representatives of the water company and of citizens discussed Alderman Lange's resolution which called for an investigation of the conditions prevailing in Racine regarding the supply of water. Attorney T. M. Kearney, for the water company, stated that the rates charged for water were in accordance with terms of a contract which expired in 1912. At that time the company would be prepared for a reasonable adjustment to be made by experts. He denied that there had been any failure to supply adequate fire service. Attorney Gillen, speaking for several large consumers of water and individuals, said that the water company was incorporated for \$500,000. It placed a mortgage on the plant for \$1,200,000 and then floated a bond issue of \$1,000,000 drawing 5 per cent interest. He said that the plant originally cost \$360,000, but had been improved and with equipment had increased in value until recently it was appraised by an expert for \$771,000. He said the bonds were floated and sold by the American Water Works & Guarantee Company of Pittsburg, a corporation that guaranteed both principal and interest. The interest alone on the issue amounted to \$50,000 a year which the consumers of the company had to pay in rentals each year. In addition to this the company was getting a lot of velvet on the plant amounting all the way from 5 to 9 per cent. He compared the water rates in Racine with those in Kenosha, where there is a municipal plant, as follows:

Kenosha—500 gallons per day, 12 cents; 500 to 1,000 gallons, 10 cents; 1,000 to 10,000 gallons, 9 cents; 10,000 to 25,000 gallons, 8 cents; 25,000 to 50,000 gallons, 7 cents; 50,000 to 75,000 gallons, 6 cents; 75,000 to 100,000 gallons, 5 cents, 100,000 gallons up, 4 cents.

Racine—Less than 1,000 gallons, 28½ cents; 1,000 and less than 2,000 25 cents; 2,000 and less than 4,000, 20 cents; 4,000 and less than 7,000, 15 cents; 7,000 and less than 10,000, 12 cents; 10,000 and less than 14,000, 10 cents; 14,000 and less than 18,000, 9 cents; 18,000 and less than 23,000, 8 cents; 23,000 and less than 30,000, 7 cents; 30,000 and over, 6 cents.

Improving Water Supply Without Additional Cost

Hyde Park, Mass.—The Board of Water Commissioners has issued a report by their engineer, William S. Johnson, upon the water supply of the town. The engineer reports that a supply sufficient for the town's needs for the next 25 years can be secured by a system of filter beds in connection with the present sources, the Neponset River and Mother Brook. The average daily quantity taken from Neponset River during the last year has been 340,000 gallons, and from the brook 781,000 gallons. The latter supply is generally safe, the former unsafe. At a cost of \$30,000 a supply of 2,000,000 gallons a day of filtered water could be developed from Mother Brook and the Neponset station abandoned. The saving in abandoning this station would be about sufficient to pay the annual charges in the improved plant. The other alternative of taking metropolitan water would cost \$7,000 to \$8,000 a year more.

Injunction Served on Water Commissioners

Canastota, N. Y.—An injunction restraining the Board of Water Commissioners of Canastota or its agents from cutting off the supply of water of the Watson Wagon Company from the village water mains, or from interfering with said supply and from enforcing payment of \$62.50 water rent, as per a resolution passed by the board, and from compelling the Watson Wagon Company to rearrange its water supply pipes to permit of water being metered, was served on the Board of Water Commissioners last week. The injunction was granted by Justice Coman, at Wampsville, and orders the Board of Water Commissioners to show cause why the injunction should not be continued during the pendency of the action now started by the Watson Wagon Company. The present trouble arises over the recent increase in water rents made on certain manufacturers and others by the Board of Water Commissioners, the commissioners now desiring to place meters on certain supply pipes.

Water Pressure Found Too Heavy

Hibbing, Minn.—The water pressure and the coming change in the voltage of the village lighting system were the chief items brought up at the meeting of the Water and Light Commissioners last week. It was mentioned in connection with the water pressure that at a recent fire the pressure was actually greater than could be handled with comfort by the fire fighters, three men being required to manipulate one nozzle. It is probable that for future fires the pressure will be slightly decreased leaving a reserve in case of real need. The approaching change of the voltage from 1,100 to 2,200 was mentioned and the inevitable shutdown of the lights for one or two days while the change is being made, but no definite information was given by the commission as to when this would take place.

Public Wells Ordered Closed

Louisville, Ky.—Two more public wells in suburbs of the county, just south of Louisville, were ordered closed last week by Dr. B. W. Smock, County Health Officer. The county patrolmen were directed to put out of commission pumps at the public wells in Stratton's addition, between the Preston street and the Ashbottom roads. The closing of the wells results from the probe made to ascertain the cause of typhoid fever among the employees of the Louisville & Nashville shops. The analysis of the water used at the shops and the sanitary conditions there showed that the origin of the disease was not at the big plant, and Dr. Smock then directed his attention to the surrounding suburbs where most of the workmen live. Chemical analysis of the water of the suburbs was made by Dr. Albert A. Stoll, county bacteriologist. The water in the two public wells at Stratton's Addition was found to be badly polluted. There are several cases of typhoid fever in that section. A public well at Highland Park containing impure water was closed by Dr. Smock last week. Other reports of polluted water are in the hands of Dr. Smock, but he will not act further until another analysis has been made.

Tests Show Meters in Good Condition

Norfolk, Va.—Chief Engineer Thomas B. Dornin, of the Water Department, has tested 100 meters placed in service three years ago. Of these, one failed to register because it had a lump of solder inside and three were clogged with grit. On full stream test 84 met the standard requirements; on 1/4-inch stream test, 85; on the 1/2-inch stream test, 88; on 1/16-inch stream, 84. These meters had seen service varying from the measurement of 903,000 gallons to 212,000 gallons, the average amount measured being 559,282 gallons. This amount of water would be used ordinarily by the average family in about six years.

Roseau Drinking Water Declared Impure

Roseau, Minn.—An analysis of the water in the local wells received by Dr. Delmore, the village health officer, from the State Board of Health, shows the water more or less impure. Wells that are on level depth with the river show the most germs. One well, which is only 10 feet deep, has the least germs. Dr. Delmore fears that typhoid or some other epidemic will break out in the spring and

Meters Placed in City Buildings

South Bend, Ind.—Approximately 60 water meters have been placed in the school buildings, fire houses and other city buildings. The readings taken so far show that much more water has been used than was estimated.

Temple Water Charge Schedule

Temple, Tex.—The Board of City Water Commissioners has adopted a new schedule allowing patrons of the meter service a total of 9,000 gallons per quarter without increase in price, instead of 6,000 gallons formerly allowed. This practically reduces the rate to 42 cents per 1,000 gallons for the first 9,000, and all in excess of that is 25 cents per 1,000. The commission has also adopted plans for a filtration system to cost about \$30,000, with a capacity of 2,000,000 gallons per day. The plant is owned by the city and since being placed in the hands of a commission the revenues have increased nearly 200 per cent and the efficiency in greater proportion.

STREET LIGHTING AND POWER

Municipal Plant Profitable

Richmond, Ind.—The local foes of municipal ownership have received a severe backset by the annual report of the finances of Richmond's lighting and power plant. The report submitted to the Board of Works shows the total receipts for the year ending January 1 to have been \$77,341. Operating expenses were \$48,649. The administration forces assert that the municipal plant is showing as good returns or better than the plant owned by a private corporation that runs in opposition to the city.

Light Plans Criticized

Cincinnati, Ohio.—Criticism of the new light specifications by Consulting Electrical Engineers Mailloux and Knox, of Columbia University, to whom they were referred by the bureau of municipal research, were handed Service Director Sundmaker last week by Director Miles, of the bureau. The criticism is very lengthy, but, according to Director Miles, the principal criticism is aimed at the 10-year period of the contract, which the experts hold is too long a time and the system of measuring the current by wattmeters, held as inadequate and inaccurate. Other changes recommended are technical.

Advertising Municipal Light

Pasadena, Cal.—Work is nearly completed on an elaborate sign which the municipal light department is planning to place in front of the office building occupied by the department just north of the City Hall on the Fair Oaks side. This big sign will read: "Use City Light." and is about 15 feet up and down, for it is not designed to protrude far over the sidewalk. The sign is a novelty in many respects. The big letters are each cast out of porcelain and house the sockets of the lamps which outline the letters themselves. Using porcelain, the danger from fire is greatly diminished, while weather will not affect the letters or tarnish them in the least.

Racine Gets Dollar Gas

Racine, Wis.—Following a fight of months, the city of Racine won an important victory over the Racine Gas & Light Company, when the State Railroad Commission issued an order requiring the company to reduce its rate on gas for illuminating and fuel purposes. The order requires a flat rate of \$1 per 1,000 feet, the price to decrease according to the amount used. This means a reduction monthly on an average of 15.2 cents per 1,000 feet. Other important features of the decision are the fixing of a minimum charge for installment of fixtures and the elimination of the double meter system; the elimination of the double meter system is especially important, as hereafter the same price will be paid for gas used for lighting and cooking purposes. The new schedule of rates and regulations is to take effect on March 1. The agitation for lower gas rates for the city of Racine was begun about two years ago. Alderman Davis introduced a motion providing for an appeal to the rate commission. Owing to the amount of work which the rate commission had on hand and the voluminousness of the

FIRE AND POLICE

End of "Third Degree"

Anderson, Ind.—Frank Matthews, President of the Police Board, has announced that the Board has ordered Chief of Police Pritchard to abolish the use of the "third degree" in obtaining confessions from prisoners.

"There will be no more of this confession business with the police," President Matthews said, "except where a confession is made fully and willingly in the presence of a third person. No more coercion, threats or promises, held out to obtain a confession, will be tolerated by the Police Board. We have issued orders against it, and the orders will be enforced. It is wrong to get a man or woman into police headquarters and then browbeat or sound them into a confession for the purpose of making a case."

Evolution of a Police Department

Centralia, Wash.—It seems a long step from a town marshal with a corn-cob pipe to a sleek, uniformed police force with a real chief of police, yet that is the state of affairs brought about by the growth of Centralia in a remarkably short time. Not so long ago the city had its marshal and night watch, and was content to let it go at that. Later the size of the city demanded more help in preserving law and order and the marshal blossomed into the dignity of a police chief and uniforms were brought into usage. Now, the City Council is making an effort to have the policemen "slicked up" and the city fathers are debating the question of having either long-tailed coats or short blouses for the officers. They are also planning in order to make each officer shave before going on duty or for the sake of a natty appearance.

To Obviate Collisions of Cars and Fire Apparatus

Ft. Worth, Tex.—The suggestion that street cars stop at corners as they approach certain street crossings instead of on the opposite sides in the business sections to avoid collisions with fire department apparatus meets with the approval of Chief Bideker, but he does not like the idea of fire gongs at street corners to ring when the alarms are turned in and warn vehicles. He says the latter plan has been tried in some large cities and has not proven a success. A conference has already been held between fire department representatives and traction company officials to devise a plan to decrease the probability of collisions and it is believed that the suggestion that cars be stopped before crossing certain cross streets instead of after crossing them will be adopted. The necessity for adopting some measures of safety was emphasized by recent accidents in which fire apparatus suffered collisions, thereby injuring firemen.

Imported Police Dog Arrives

Glen Ridge, N. J.—The new police dog for the Glen Ridge Police Department, which was recently imported from Belgium, arrived in the borough last week and is now under the charge of Police Chief Patrick Higgins. According to Higgins, the animal is considered one of the best dogs that has ever come from Belgium. Its color is brown and black, and the dog is about the same size and weight as "Visky," one of the present police dogs, which will soon be returned to Belgium on account of a defect in one of its front feet, which has incapacitated it from duty. The Belgian police dogs have demonstrated their value in a number of American cities.

Making Chart of Fire Alarm Wires

Perth Amboy, N. J.—A new aid for keeping the fire alarm system in order has been devised by Superintendent Chamberlain, of the Public Service. He has decided to make a chart of the system showing everything in detail. At the present time it is a puzzle. It is difficult to find a break and in attempting to locate one two or three others are sometimes caused. To make the map every part of the system will be tested. Mr. Chamberlain will remain on watch over the apparatus in the City Hall while his men go from box to box. They will attach telephones to the wires, communicate with the City Hall, and thus the location of the wires will be plotted.

Bloodhounds Locate Stolen Jewelry and Catch Thieves

Topeka, Kan.—Former Chief of Police J. J. Creed and his bloodhounds were the central figures in a man hunt which resulted in the recovery of \$500 worth of jewelry and the arrest of two men who are charged with burglary. The dogs were put on the trail, which was several hours old, and soon located the stolen jewelry hidden in a culvert under railroad tracks. The dogs were then turned loose in the crowd and soon picked out two men who were already suspected of the crime.

Age Limit for Policemen

Los Angeles, Cal.—Increase of minimum and maximum ages for applicants for the police force will be recommended to the Civil Service Commission by the Police Commission. Chief Sebastian has presented a report to the Police Board in which he suggested that the minimum be increased from 21 to 25 years and the maximum from 32 to 40 years. The Police Commission feared that the Civil Service Board would not look kindly on the 40-year maximum because of the increased danger to the pension fund, and reduced the age limit to 35 years and to give the 11-year range that now prevails made the minimum 24 years.

Object to Siren Fire Alarm

Ivry, France.—M. Jules Constant, the Mayor of Ivry, is taking precautions for the safety of his jurisdiction against fire which have not received unanimous support. He has set up a powerful siren, not at all unlike, as far as sound goes, those in use on the great liners. The alarm can be heard anywhere within a radius of six kilometres, or nearly four miles. The apparatus is not worked by steam, but by electricity. The principal ground of objection to the Mayor's proposals seems to have been based on prejudice—that the siren sounded at night would disturb the slumberers of Ivry. The Mayor, however, requires some stronger reasons before he gives heed to the malcontents.

Telephone Fire Alarms Go to Central Office

Syracuse, N. Y.—A new system of sending and receiving fire alarms by telephone has been put in operation. Hereafter such calls will go directly to the central office in the City Hall. A telephone operator will be there at all times. He will receive the alarms and transmit them to the engine houses instead of having this done by the operator at the telephone central office.

Approves the "Fire Stops"

Washington, D. C.—Fire Chief Wagner says he would oppose with a great deal of vigor any attempt to abolish "fire stops," as suggested in a statement published in a daily paper. The records of the Fire Department show few accidents arising as the result of collision between cars and fire apparatus, but the accidents which have occurred have been of the hairbreath-escape kind. It is thought by Chief Wagner that with "fire stops" eliminated there would be great danger to apparatus and passengers on the street cars. These "fire stops" are designated by the Commissioners as crossings where street cars must come to a full stop, give the motorman a chance to see whether a fire engine is running or not and then proceed. The stops are recommended by the Chief of the Fire Department according to the location of fire houses, fire plugs and changes in the running cards of engine companies.

New Way to Work Prisoners

Russellville, Ala.—Perhaps one of the most novel plans ever attempted by any city or town in the State for the handling of city convicts is now in force in Russellville, and so far it has worked successfully. When any one is convicted in the court of Mayor W. S. Douglass and given a street sentence in addition to the fine and costs, the fine is made secure with a good security bond, then the convict is allowed to go to his home at night and return the next morning to report for street duty. So far only one man has escaped, and the city authorities are not at any expense in maintaining a stockade or place for caring for the prisoners at night. This unique plan was worked up by Mayor W. S. Douglass and now a regular street force of convicts is maintained at no expense to the city, with the exception of a superintendent of streets.

Apparatus Arrives at Psychological Moment

South Bristol, Me.—A chemical engine, the first piece of fire apparatus the town ever owned, arrived opportunely. The engine had been unloaded from the car and put in the freight shed when a fire was discovered in the annex of a summer hotel at De Grasse Point. The machine was hurriedly unpacked and dragged by volunteers to the scene, where it was effective in preventing the spread of flames to the neighboring cottages.

Citizens to Be Given Patrol Box Keys

Spokane, Wash.—In connection with the new police signal system which it is proposed to instal the police will give out numbered keys to citizens with which the police box near their homes can be opened and direct phone connection with headquarters established. Citizens' keys, however, by an arrangement of the mechanism will not permit a call for a patrol wagon by signal. The citizen must explain why he wants the wagon. Likewise, when he unlocks the box his key cannot be removed till a patrolman releases it. As it is numbered, the police have a check on who uses the police boxes and false alarms can be traced to the persons responsible.

One Vehicle for Ambulance and Patrol Service

Springfield, Mass.—That a combined automobile police patrol and ambulance would save the city several hundred dollars annually and give as good service as is now provided is the belief of a number of city officials who have given the subject some thought. Chief of Police O'Brien has received a picture and description of a similar combination vehicle now in use by the city of Lowell, Mass., and it is reported most successful there.

Annual Report of Nashville Fire Department

Nashville, Tenn.—The annual report of Chief A. A. Rozetta, of the Nashville Fire Department, to the Board of Public Works shows that during 1910 the department responded to 496 alarms and that the total losses by fire amounted to \$217,794.24, on which there was insurance of \$2,288,742. There are now in service 9 steam fire engines, 2 steam fire engines in reserve, 2 aerial hook and ladder trucks, with one service truck in reserve; 2 hose wagons with turret nozzles attached, 6 combination chemical and hose wagons, 4 hose carriages in service with 2 hose carriages in reserve, 1 chemical engine in service, 1 chemical engine in reserve, 1 supply wagon, 1 auto for chief, 1 buggy for assistant chief and 2 buggies in reserve. The department has on its pay roll 144 members, besides the chief, assistant chief, superintendent fire alarm telegraph, etc. There are 15 companies and 62 horses, 58 of which are in service with the various fire-fighting apparatus. The expenses for running the department last year, including pay roll, fuel, repairing, etc., are given at \$145,520.32.

Cost of Auto and Horse Apparatus Compared

Wilkes-Barre, Pa.—Chief Engineer Joseph G. Schuler, of the Fire Department, in his annual report submitted a comparison of the cost of the automobile at No. 2 house and the cost of keeping the engine team in the same house:

Automobile, per month, \$6.80.

Engine team, per month, \$28.

The automobile traveled in that time 51 miles.

The engine traveled in that time 16 miles.

Reorganization of Fire Department Probable

Newark, N. J.—As a result in part of the recent serious fires and loss of life, a reorganization of the Fire Department seems probable. The fire losses of Newark for a number of years have been high as compared with those of other cities. A single headed commission with a view to eliminating politics from the department is probable. It is claimed that in the past, transfer and promotion have been inspired by others than the responsible heads of the department. The need of a drill school, in view of the increasing number of high buildings, is apparent, and one will, no doubt, be established. Whether the system of automobile squad wagons, which has been so successful in Springfield, Mass., and other places, will be adopted, is under discussion, but not yet decided. It is notable that Newark has not until recently had any automobile apparatus. The business section of the city is exceptionally well protected.

GOVERNMENT AND FINANCE

Commission Government Elections

Sterling, Ill.—Commission government was defeated January 27 by a majority of 8—574 for and 582 against. The saloon interests fought the innovation. Only half a vote was polled.

Peoria, Ill.—An election will be held February 28 to decide on the adoption of commission government.

Kewanee, Ill.—Kewanee adopted the commission form of government at a special election in January by a majority of 505 out of a total vote of 1,736.

Quincy, Ill.—At a special election January 24 the proposition to adopt the commission form of government was defeated by 1,800 votes out of a total of over 6,000.

Monmouth, Ill.—The commission form of government proposition was defeated January 24 by a majority of 221. Only about 5 per cent of the normal vote was cast.

Guthrie, Okla.—By a large majority Guthrie voted in favor of a commission form of government.

Town's Water Works Does Away with Taxes

Farmington, Me.—This town doesn't know just what to do with the surplus earnings of the municipal water works system, but one way of disposing of the money, recently announced, will be to use it for city running expenses next year, thus eliminating the levying of any taxes. The water works earn more than \$5,000 annually. The assessors suggested reducing water rates 60 per cent, but as they are low now it was decided against.

Commission Cost the City More

Topeka, Kan.—The expenses of the city of Topeka for December, 1910, under the commission form of government were more than \$4,000 higher than under the old council system in 1909.

The New Municipal Idea

Philadelphia, Pa.—The National Municipal League has issued this summary of what it terms the "New Municipal Idea."

It puts the emphasis on the good of the city, rather than on the interest of a party or a candidate.

It requires that municipal affairs shall receive due consideration on their merits without regard to irrelevant questions, such as State or national politics.

It insists upon directness of nomination, election and responsibility after election.

It demands simplicity of electoral and governmental machinery; the short ballot and responsiveness to the public will; it therefore encourages easy and intelligent voting, checks partisan and factional domination by giving control to voters—if they wish to exercise it.

It believes that thorough publicity insures effective control.

It demands that efficiency and merit shall be the sole basis of all appointments in a democracy.

It demands concentration of authority and responsibility.

STREET CLEANING AND REFUSE DISPOSAL

Rebuilding Garbage Reduction Plant

Bridgeport, Conn.—C. C. Fisher, who has the new contract for the disposal of the city's garbage, has a force of 12 men at work upon the old plant of the Bridgeport By-Products Company, making alterations. New machinery will soon arrive and be installed. He expects to have the plant ready for operations during the second week in March.

Mayor Discusses Garbage Disposal

Schenectady, N. Y.—In the annual message of Mayor Duryee one of the most important paragraphs deals with garbage disposal. At present the individual method costs citizens \$1 a year each. The Mayor would have ashes and garbage placed in separate receptacles and collected by city teams. The garbage would go to an incinerator of a capacity of about 150 tons a day and a maximum of 180 tons a day. The incinerator would be of the Decarie or similar type, which made a favorable impression on a committee that inspected the Minneapolis plant. Such a plant would cost about \$60,000; other items are estimated as follows: Land, \$5,000; 20 wagons, \$8,000; 40 horses, \$8,000; engineering and contingencies, \$4,000; total, \$85,000.

Year's Work of Garbage Crematory

Jacksonville, Fla.—According to the report of William C. West, Superintendent of the Street Cleaning Department, during the year 1910 there was removed by the teams of this department a total of 111,479 loads of an estimated weight in pounds of 161,529,892, equaling 80,765 tons of garbage and other refuse matters during the 12 months. Of this amount 8,702 loads were hauled by city teams and delivered to the crematory, which together with night soil, dead animals, fish, chickens, etc., amounts in the aggregate to a weight of 13,157,492, equaling 578 3/4 tons of refuse matter consumed by the crematory during the period embraced in this report. An average of about 18 tons per day of 365 working days. In the destruction of this matter by the crematory there was used 587 cords of wood at a cost of \$1,531.99, an average of approximately \$2.61 per cord. The cost of labor and incidental expenditures amounted to \$2,352.75, making a total expenditure on account of operating the crematory for the 12 months aggregate the sum of \$3,884.75. This indicates an average cost per ton of material destroyed of 60 cents. The average cost per ton would be materially reduced had the crematory been taxed to its full capacity of 50 tons for 24 hours, but the figures herewith submitted show that at no time was that average amount delivered per day. It is expected that it is possible to run the plant to its full estimated capacity for practically the same cost of labor and material herewith stated, if supplied with material to its full capacity the average cost per ton of amount destroyed could be reduced to 22 cents. Considering the character of material delivered at the crematory, especially during the summer months, Mr. West seriously doubts the ability of the present plant to consume or destroy an average daily amount of 50 tons. Certainly not without quite an increase in the cost of fuel.

RAPID TRANSIT

Freight Terminal Improvements Suggested

New York, N. Y.—Dock Commissioner Tomkins has filed supplemental report with Mayor Gaynor on his proposed \$100,000,000 joint railway freight terminal on the west side of Manhattan, in which he goes into greater detail than he has before in his plans. He now suggests the elevation of the Eleventh avenue tracks of the New York Central at the city's expense, and gives three reasons for this, namely: first, the recovery of marine commerce in the port of New York, the west side water front being now unnecessarily used for the storage of car floats by transferring the cars across the marginal street to be loaded and unloaded; second, the existing disorder and congestion on the west side, with its attendant expense, should be terminated and provision made for room to meet the needs of the rapidly expanding railroad and steamship business of Manhattan, incidentally providing additional berths for sound, river and harbor boats; third, the termination of the New York Central surface track nuisance.

October Traffic Heavy

New York, N. Y.—The Public Service Commission has issued a summary of street railway operations in the city of New York for the month of October, 1910, which, in comparison with the figures for the corresponding period of 1909, not only shows a large increase in the number of passengers carried, but also in both gross and net earnings and in surplus after charges. The number of passengers carried during the month was 136,172,103, an increase over October, 1909, of 3,571,328. The revenue from all sources amounted to \$7,085,034, an increase of \$225,621. Operating expenses were \$3,700,584, a decrease of \$54,348, and net earnings \$3,384,450, an increase of \$279,060. After deducting all charges, etc., the companies earned a surplus of \$1,065,533, an increase of \$103,288. The number of passengers carried by the Brooklyn Rapid Transit Co. was 5,496,604; by the Manhattan surface lines 34,040,484; by the Bronx surface roads, 6,402,510, and by the Queens surface lines, 3,124,647. The Brooklyn Rapid Transit showed a surplus for the month of \$191,842; the Metropolitan Street railway of \$198,438; the Third avenue of \$85,242, and the Bronx surface roads of \$31,015.

Favors City Ownership of Tracks on Bridge

Cedar Rapids, Ia.—Councilman Smith has made a proposition said to have the support of a majority of the Councilmen to the effect that the city should own and control the street car tracks on the new Third avenue bridge. Councilman Smith takes the position that if the city owns the trackage on the new bridge opportunity will be afforded for possible interurban companies to obtain entrance to the business district of the city. Not only would Councilman Smith have the city own the trackage on the new Third avenue bridge, but he would also have the city build and own all the trackage from Second street west on Third avenue to Second street east on Third avenue, thus providing a possible down-town loop of such scope as would afford ample street car facilities for every citizen anywhere in the city who wants to reach any portion of the downtown district, east side or west side.

Plan Municipal Railroad Without Cost

Los Angeles, Cal.—It is possible to build a municipal railroad between Los Angeles and the harbor without taking a dollar from the city funds or placing an indebtedness upon this municipality. This is the contention of Attorney Russ Avery, who declares that the road should be built at once, in order that this city may realize the magnificent possibilities of the great proposed terminal for all incoming trans-continental lines, as attractively outlined by T. E. Gibbon in the communication sent to the City Council. Mr. Avery's plan briefly is the organization of a private corporation, in which the only stockholders would be certain public officials, each to have one share of these securities as trustees, the remainder to be held as the perpetual property of the people. The company then would issue bonds in small parcels and at such attractive rate of interest that loyal Los Angeles citizens would purchase the entire issue. The road, under the plan proposed by Mr. Avery, would create sufficient dividends to care for all indebtedness and become a municipal property without incumbrance upon Los Angeles at any time.

Incinerator Bills High

Milwaukee, Wis.—The expenditure for labor at the new refuse incinerator was \$502.13 higher in December than in November, and \$305.75 higher than in October, according to pay rolls in the City Controller's office. During October 70 men were employed at the incinerator. In November the ranks were reduced to 66, but on account of labor troubles the administration decided to reinstate the men let out, with the result that 75 men were employed the last month. The figures were secured by minority party members of the Council who are watching the attitude of the administration on the incinerator proposition.

Statutes Amended to Aid Municipal Road

Sacramento, Cal.—Senator Burnett's bill to amend the civil code relative to the use of the same street or tracks by two lines of street railways so as to afford the city of San Francisco freedom from the present five-block restriction in laying out its municipal railroad, has been passed by the Senate without opposition. Under the terms of the bill the city will not be hampered by the United Railroads franchises in extending its Geary street line to the ferry or in using any streets now occupied by railroad companies.

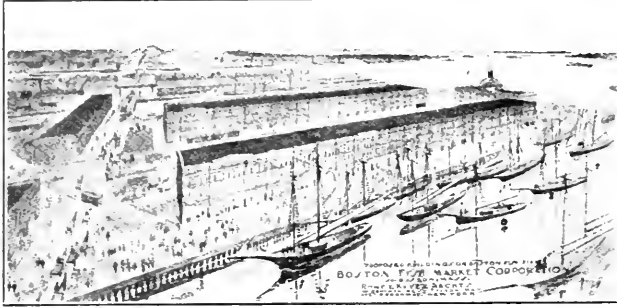
State Law to Provide for Municipal Ownership

Toledo, O.—Immediate municipal ownership of the street railway plant and system in Toledo will be possible if the bill introduced in the State Legislature by Representative Myer Geleerd is passed. Mayor Whitlock and City Solicitor Schreiber will appear later before the committee in favor of the bill. The bill is purposed to amend section 3615 of the General Code relative to power of municipalities, so as to include street railways in addition to the right to establish and operate lighting plants, &c. The right to appropriate property necessary for street railway purposes is provided, also the right to appropriate right of way over existing street railways. This bill gives cities, in order to establish street railway systems, the right to issue bonds, not subject to any limitations as to amounts, such as governed the issue of other city bonds.

MISCELLANEOUS

Boston Harbor Improvements

Boston, Mass.—The Boston Chamber of Commerce has been instrumental in bringing about two harbor improvements of great importance. The larger of these is the improvement of the East Boston flats, for which the Legislature has authorized the expenditure of \$3,000,000. The other is the new T wharf for fish dealers. The State is



BOSTON'S NEW WHARF FOR FISH DEALERS

spending \$500,000 in building a new pier on the South Boston shore. When it is completed the fish dealers will erect buildings of concrete and brick which will cost another half million. This latter improvement accomplishes these valuable ends, it enables the fish dealers to move from cramped and un-sanitary quarters to a location where they can greatly increase their industry, one of the most important in Boston; it makes the T wharf, right on the city water front, available for improvement for the use of some coastwise steamship service; it secures for the State a tenant who will pay a reasonable return on a large amount of property which has been idle for many years.

Smoke Costly in Chicago

Chicago, Ill.—Smoke costs the citizens of Chicago \$21,830,000 a year, or about \$10 per capita, according to statistics given out by City Smoke Inspector Bird. Because of smoke, Mr. Bird says, the laundries are reaping a harvest, and the clothing merchants, dyers, house renovators and painters and operators of vacuum cleaning machines are rapidly becoming millionaires. "The idea of determining just what smoke costs each Chicagoan every year came to me when a similar experiment was made in Cleveland," he said. "I found that in Chicago our loss is \$10 per capita, or a little matter of \$21,830,000 a year. This condition could be remedied in three or four years if we had the men and the money to go ahead. As the matter stands now, we are able to make some headway against the violators and have a host of suits in the courts all the time."

Municipal Drink Cure

Chicago, Ill.—A municipal drink cure is planned by Mayor Busse, Chief of Police Steward and Superintendent Whitman, of the House of Correction. A note or a sentence from any judge of the municipal courts will give an entree to any man who desires to be cured. Investigation of records indicates that the troubles of more than 75 per cent of the prisoners are due to drink. Chicago will try to cure its inebriates by engaging the best medical talent and the most successful medicine.

\$70,000,000 London Docks

London, England.—To make London the greatest port of the world in reality as well as in name, the port authorities will expend more than \$70,000,000. Experts have been studying the subject for a year and a half. The scheme includes the dredging of the river channel from Tilbury to London Bridge, the part used by large vessels being widened to 1,000 feet and deepened to 30 feet. Half a million pounds already has been expended in a dredging plant. Other striking features of the scheme are the construction of three new docks at Tilbury of 65, 126 and 138 acres, respectively, to accommodate the largest vessels afloat or projected, which will be "capable of dealing with any possible growth in the size of vessels for very many years to come."

No More Standing in Theaters

New York, N. Y.—There will be no more standing room in New York theaters. Theatrical managers were notified by Fire Commissioner Waldo that the prevalent practice of allowing patrons to stand in the passageways back of the seats is as much a violation of the law as the prohibited standing in aisles. He bases the ruling on a recent decision of the Supreme Court.

Park Receives Shrubbery

Oklahoma City, Okla.—Another donation of shrubs and plant cuttings has been received by the Board of Park Commissioners from the Topeka Park Board, which makes about 15,000 pieces that the Topeka Board has given to Oklahoma City. The donations were received by C. Pohl, landscape gardener, for the Park Board here. Mr. Pohl says that the addition gives Oklahoma City's nursery about 50,000 shrubs and plants.

Plans for Toledo Municipal Exhibit

Toledo, O.—Plans for the municipal exhibit which will open at Memorial Hall March 6 are being worked out in detail by the various departments. There will be a moving picture show illustrating the scenes inside a fire house when an alarm rings at night. The Board of Education will demonstrate manual training and show models of the new high school. The street department will illustrate the magnitude of its work by interesting comparisons. The visitor will be told that there are enough sidewalks in Toledo to reach as far as New Orleans and roadway pavements to reach to Pittsburg. The Harbor Department will show how enough river front has got away from the city to pay the cost of putting up all the group buildings so far suggested.

Employment for Idle

Topeka, Kan.—Arrangements have been made to provide work for all who need it. When the plan is in full operation no one need be idle. It is Mayor J. B. Billard's idea. He has arranged with the Provident Association so that any one out of work will be given the job of trimming and cutting down trees where needed throughout the city. The tree limbs will be cut up into fire wood. This is to be distributed among the destitute or to be sold. The proceeds will go to pay the hire of the laborers and to maintain a relief fund for the needy.

Trimming of Boulevard Trees Called Vandalism

Jersey City, N. J.—Arthur Bradshaw, an expert landscape gardener, recently appeared before the Bergen Improvement Association and made a strong denunciatory address concerning the trimming of the trees on the Hudson boulevard. In part he said: "Trees on the boulevard are being



APPEARANCE OF TREES ON BOULEVARD

trimmed in a manner that is simply killing them. The trees are in perfect condition and to cut them to pieces, to butcher them, as is happening to them now, means their extinction. We have a Shade Tree Commission and as soon as we get shade a lot of vandals are turned loose on our trees and we have no shade. Are we going to allow our shade trees to be thus wantonly destroyed? We should not, and some immediate steps should be taken to end the slaughter."

LEGAL NEWS

Summary and Notes of Recent Decisions—Rulings of Interest to Municipalities

Initiative and Referendum Provisions

Kiernan vs. City of Portland et al.—Constitution, article I, section 2, as amended June 4, 1906, provides that corporations may be formed only under general laws, but shall not be created by the legislative assembly by special laws, and, further, that "the legislative assembly shall not enact, amend or repeal any charter or act of incorporation for any municipality, city or town," and that "the legal voters of every city and town are hereby granted power to enact and amend their municipal charter subject to the Constitution and criminal laws of Oregon." Held, that the first sentence of section 2 places no restriction on the Legislature as to the enactment of general laws, except that no special laws creating or affecting municipalities shall be enacted by the legislature, the exception reserving to the legislative department the right, whether by the people directly through the initiative or indirectly through the Legislature, to enact general laws on the subject, indicating that the inhibition in the next sentence has reference only to special laws.

The term "republican," as used in the Federal Constitutional provision guaranteeing to every State a republican form of government means a government by the citizens in mass acting directly, though not personally, according to rules established by the majority.

Constitution, article I, as amended June 4, 1906 (section 2), provides that initiative and referendum powers reserved in the people are also reserved to the legal voters of any municipality and district, as to all local, special and municipal legislation. Section 2 provides that the legal voters of every city and town are granted power to enact and amend their municipal charter, subject to the Constitution and criminal laws of Oregon. Held, that such provisions did not deprive the State of a republican form of government in violation of Constitution United States, article 4, section 4, in that they were a deprivation of legislative power to enact, amend or repeal a city charter or act of incorporation, since the sovereign power to legislate residing in the people may be exercised either directly by the initiative or referendum or indirectly by the Legislature without in any way endangering the republican form of government.—Supreme Court of Oregon, 112 P. R., 402.

Assessment of Benefits—Revision

City of Spokane vs. Gilbert et al.—Rem. & Bal. Code provides that it shall be the duty of eminent domain commissioners to apportion the benefit from the taking of property for a street between the property owners and the city. One of the sections provides that on the hearing of an objection the trial shall be by the court, and if it shall appear that the objector is not properly assessed a proper judgment shall be entered. Another section provides that the court before whom such proceedings are pending shall at any time have power to modify, etc., any assessment returned. Held, that the assessment by the commissioners is not conclusive, and the court has power to modify the apportionment of the assessment as between the city and the property owners, and to that end may hear evidence.—Supreme Court of Washington, 112 P. R., 380.

Municipal Indebtedness—Public Sewer

Southworth et al. vs. Mayor, Councilmen and Citizens of City of Glasgow et al.—A "public sewer" is not necessarily one to accommodate a whole city, but is one which serves the public and not an individual, and which connects with and receives the discharges from district sewers and the surface water which falls on the street near to or under which they run. Taxpaying citizens of a city could not object to an ordinance to increase the city's indebtedness \$4,000 to construct public sewers within the city limits on the ground that such amount would not construct a public sewer; plaintiff's right to complain not accruing until the council by ordinance undertakes to use the funds for a sewer other than a public sewer.—Supreme Court of Missouri, 132 S. W. R., 1168.

Sewer Contract—Construction

Borough Construction Company vs. City of New York.—A contract for the construction of a sewer provided that Portland cement should be used when directed by the city engineer in such portions of the sewer as were wholly or in part below the city's high water line, and that the contractor during the progress of the work and until final acceptance was to keep the sewers, basins, culverts and connections clean. The city engineer demanded that the contractor should use Portland cement in portions of the sewer which were above the high water line, and, in order to facilitate inspection by city officials, that he should clean and illuminate the sewer throughout and prepare a lift by which to lower automobiles into it. Held, that the requirement as to cement was not so clearly outside the provisions of the contract that the contractor was required to refuse to comply therewith, and on acceding to the demand he could treat the contract as broken and recover damages therefor, but the requirements as to illumination and automobile lift was so obviously beyond the terms of the contract that compliance would afford no cause of action. Where a judgment for damages might be sustained as to some of the items proved, but the jury were permitted to take into account other items which were not proper for its consideration, and where it is not possible to determine from the verdict which ones they made the measure of damages, the judgments must be reversed.—Court of Appeals of New York, 93 N. E. R., 481.

Dumping Ground—Non-Compliance with Contract—Remedy by Injunction

City of Bozeman vs. Bohart.—A city leased its land, reserving the use thereof for the burial of dead animals and for a dumping ground for garbage and required the lessee to superintend the disposition of garbage and the burying of dead animals. The lessee failed to bury dead animals, and permitted many of them to remain unburied for many days. In other instances dead animals were buried with only light covering, and though the city demanded compliance with the contract he refused to do so. The city could not acquire any other place to make proper disposition of the garbage and dead animals. Held, that under Rev. Codes authorizing an injunction when during the litigation the continuance of some act will produce irreparable injury, and authorizing an injunction to enjoin a nuisance, the city suing for unlawful detainer was entitled to a temporary injunction restraining the lessee from interfering with the city's use of the property since there was no proper measure of damages by which the city could be compensated for the unlawful interference with its rights by the lessee and since his act created a nuisance.—Supreme Court of Montana, 112 P. R., 389.

Obstructions in Street—Evidence

Huffman vs. City of Crookston et al.—In an action to recover for personal injuries, in which defendants were jointly charged with negligence in obstructing a public street, defendant bridge company, in placing building material on and across a sidewalk and the city, with knowledge of the fact, permitting the same, it is held that the evidence presented questions of fact, both with reference to the alleged negligence of defendants and the contributory negligence of plaintiff and sufficiently supports the verdict.—Supreme Court of Minnesota, 120 N. W. R., 210.

Defective Streets—Instructions—Liability

City of Montgomery vs. Wyche.—Where, in an action for injuries to a driver on a defective street, the evidence conclusively showed that the street had been out of repair for many years prior to the injury because of the maintenance of a ditch on the side of the street, and that plaintiff fell into the ditch, an instruction that it was the duty of a city to erect a barrier along the ditch and its failure to do so was negligence, provided the ditch into which plaintiff fell was a dangerous place, was not erroneous as assuming facts. Where a street had been out of repair because of the existence of a ditch on the side of it for many years, there was a presumption of notice to the city of the defect and an opportunity to repair.—Supreme Court of Alabama, 53 S. R., 786.

Changing Grade of Street—Damages

City of Rome vs. Selman.—Where it was admitted that a written notice had been served under Act December 20, 1890, claiming damages on account of injury to a lot arising from grading by a municipal corporation and the description, including boundaries by streets and other lots, showed clearly that the notice claimed damages on account of the lot described in the plaintiff's petition beginning the suit, a mere misdescription, by which the lot was referred to in the notice as on the "northwest" side of a named street, while the petition alleged it to be on the southwest side thereof, was immaterial; it not appearing that the plaintiff owned or was claiming damages on account of any other lot.—Supreme Court of Georgia, 69 S. E. R., 706.

Streets—Rights of Abutting Owners

Crawford vs. Town of Marion et al.—Where a town obstructed by a sidewalk an alley over a person's lot to a street forming a means of ingress and egress and adopted an ordinance prohibiting citizens from driving across the sidewalk did not prevent the person from suing in equity for the removal of the obstruction, since the suit was not one to restrain the enforcement of the ordinance, and since, notwithstanding the pendency of the suit, criminal prosecutions could be brought for violations of the ordinance.—Supreme Court of North Carolina, 69 S. E. R., 763.

Opening Highway Through Railway Embankment

Cincinnati, Indianapolis & Western Railway Company, Plaintiff in Error, vs. City of Connersville.—The expense of constructing a railway bridge over a highway, made necessary by the action of the municipality in opening such highway through the railway company's embankment, may be cast upon the railway company without denying the due process of law guaranteed by the Federal Constitution, which requires that compensation be made when private property is taken for public use.—United States Supreme Court, 31 S. C. R., 93.

Contractor—Liability for Negligence

Froelich vs. City of New York et al.—An independent contractor for the whole of an improvement for a city and a subcontractor doing a part of the work are not servants or agents of the city reserving the right to supervise and inspect the work, and it is not liable for the negligence where the plan for the work is reasonably safe, and there is no interference therewith by the city which results in injury, whether a subcontractor, to relay a water main, negligently failed to relay it in a workmanlike manner. Held, under the evidence, for the jury.—Court of Appeals of New York, 93 N. E. R., 79.

Removal of Dead Animals

Smith et al. vs. City of New Albany.—An ordinance prohibiting any one but the city contractor from removing any carcass of a dead animal unless the contractor fails for six hours after notice to remove such carcass, in which case any person may lawfully remove it, refers only to such carcasses as are or are likely to become nuisances as detrimental to health or offensive to the senses, and, so construed, the ordinance is valid as protecting the public health.—Supreme Court of Indiana, 93 N. E. R., 72.

Contract for Water Supply—Performance

Mayor, etc., of Jersey City vs. Flinn et al.—The contract between a water supply company and a city, under which water works were constructed by the former for supplying water to the city, provided that the operation of sewage and disposal works constructed by the company shall not be an expense to the city, and further provided that if the water works were purchased by the city under its option to purchase, they should be delivered to it "as a completed, operating plant, free from pollution as aforesaid." The city claimed, in a suit to compel the transfer of the water works under its option to purchase, that the annual cost of operating a device for removing germs should be capitalized, and, as capitalized, be deducted from the contract price. Held, that the company's contract was to deliver a plant, and not the money with which to operate it, and the cost of operating such device should be borne by the city; such cost not being a part of the completed plant.—Court of Chancery of New Jersey, 78 A. R., 391.

Officers—Statutory Duties—Mandamus

Attorney-General vs. Common Council and Mayor of City of Adrian.—While Public Acts 1909, requiring the council of a city to provide for the expenses of a charter revision and for the election of charter commissioners, gives to the council discretion as to fixing the date of the election of the commissioners, the amount of their compensation and the total expenses of the commission, yet where there is a refusal to take the action required, mandamus lies to compel the council to proceed in compliance with the law, though it does not lie to compel the adoption of a particular resolution on the subject.—Supreme Court of Michigan, 129 N. W. R., 44.

Injunction—Malicious Suing Out—Damages

Doyle vs. City of Sandpoint.—A municipal corporation cannot be held for the malicious suing out of a writ of injunction without probable cause, for the reason that such an act would be ultra vires and beyond and without the scope of authority of the municipal officers, and would become the personal and individual act of the officers so acting.—Supreme Court of Idaho, 112 P. R., 204.

Personal Injuries—Notice

Donaldson vs. Village of Dieterich.—Acts 1905 require one about to sue a city, village, etc., for personal injuries to within six months, etc., file in the office of the city attorney (if there be one), and also in the office of the city clerk, a written statement, giving the name of the person injured, the date and place where the accident occurred, etc. Section 3 provides that, if the notice is not filed, the suit shall be dismissed and the action be forever barred. Held, that the city or village attorney referred to must be a licensed attorney having an office or place of business, and where a village has no such attorney the notice may be served on the village clerk.—Supreme Court of Illinois, 93 N. W. R., 366.

Regulating Telephone Rates—Jurisdiction of Courts

City of Memphis, Appellant, vs. Cumberland Telephone & Telegraph Company.—A suit to enjoin the enforcement of a municipal ordinance regulating telephone rates is not one in which the Constitution or law of a State is "claimed" to violate the Federal Constitution, within the meaning of the act of March 3, 1891, governing direct review in the Federal Supreme Court of decrees of circuit or district courts, where the first and only reference to the Federal Constitution is in the opinion of the circuit judge on final hearing, holding that the rates are confiscatory and destructive of the telephone company's rights under that Constitution, the case as made by the bill being that the ordinance was passed without legislative authority, and its further allegations as to the confiscatory character of the ordinance being referable only, if consistency with its other provisions is to be observed, to the State Constitution, which would be violated if such allegations were true.—United States Supreme Court, 31 S. C. R., 115.

Excavations in Street—Liability

Allen et al. vs. Town of Minden.—It is negligence for a town in making repairs to leave a pit in a public street with no railing around it, nor any lights, or danger signs, to warn people using the street. A municipality making excavations in a public street is held to the same degree of care to prevent injury as any individual, and the public has a right to believe that a municipality will not expose them to danger and that it will do everything to make their passage along the public street reasonably safe.—Supreme Court of Louisiana, 53 S. R., 666.

Street Improvements—Petition

Shank et al. vs. City of Asheville.—Upon a petition filed with the Mayor and Board of Aldermen purporting to be signed by the owners of a majority of front feet on a certain street, the Mayor and Board, under Private Laws, passed an order that such street should be paved. The abutting owners were given the notice as required by statute. Held, that an owner who did not appeal could not later claim an assessment levied thereunder to be void upon the ground that the petition had not been actually signed by a majority; that being a prerequisite, but not a jurisdictional requirement. Supreme Court of North Carolina, 69 S. E. R., 681.

MUNICIPAL APPLIANCES

Turbo-Impeller Pump for Discharging Water Against Pressure

The Columbus Impeller Pump has been placed on the market by the Roth Manufacturing Company, Indianapolis, Ind., to meet the demand for a pump that would elevate water from a deep well and discharge it to any height above the ground or against a pressure. The device of an impeller pump placed in the well to lift the water, a centrifugal member at the top of the well, capable of delivering against a pressure, and a steam turbine engine which drives both.

The Columbus impeller pump is of the same construction as that which has been on the market for several years. It consists of a shaft suspended in the well, provided with impellers as shown in the illustration. For convenience in installing, it is built in 10-foot sections. Each impeller has an annular cast integral with it; surrounding this impeller and carried by three stationary bars is a steel protecting shield. Below each impeller are three retarder blades, secured to the stationary bars. Each 10-foot section has three impellers, three sets of retarders and three stationary bars. This constitutes a cage section. Any number of cage sections up to 20 can be coupled together, thus lifting water from any depth up to 200 feet.

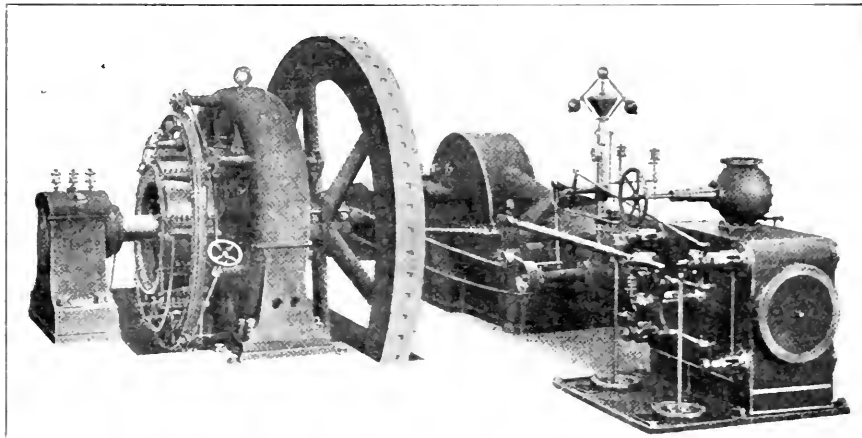
In the turbo-impeller combination the water unit and the steam turbine are arranged in alignment with the impeller sections, and when connected up form a concentric unit which will elevate water from a deep well and discharge it against pressure. The engine is arranged to run condensing or non-condensing. When running condensing the steam discharges with the water pumped. The pump and impellers may be driven by motor or belt, if circumstances make such an arrangement preferable. The maximum lift is 100 feet and the maximum discharge 100 pounds pressure for the turbo-impeller pump.

Some of the advantages claimed for the impeller pump are that the expense of digging a well pit are avoided; that it will lift more water than any other system; it has no wearing parts below the ground such as pistons, valves and packing; it increases the capacity of a low-producing well.



Direct Connected Reynolds-Corliss Engines

The first Allis-Chalmers heavy duty Reynolds-Corliss direct connected engine was made fifteen years ago. Since then more than one thousand of the type have been manufactured and are to be found in electric light and power stations the world over. Many of the first engines have had hard and continuous service, often overloaded, in fact, ever since they were built, and have given good satisfaction. However, as steam pressures, speeds and capacities



REYNOLDS-CORLISS HEAVY DUTY DIRECT CONNECTED ENGINE AND GENERATOR

have increased, improvements in design have been made.

The manufacturers, the Allis-Chalmers Company, Milwaukee, Wis., claim the following merits for the engines:

(1) Their great strength, rigidity and ability to withstand all strains resulting from the highest pressures and the most severe shocks to be met in the hardest kind of service.

(2) Their reliability and durability in

operation and the small cost of repairs and maintenance, due to correct design, great care in the selection of material and the employment in their construction of the best mechanical equipment and the most skilled labor.

(3) Their economy in steam consumption, which has not been equaled by engines of any other build under like conditions of operation.

(4) Their high mechanical efficiency, due to superior design, liberal proportions, careful selection of materials and high grade workmanship.

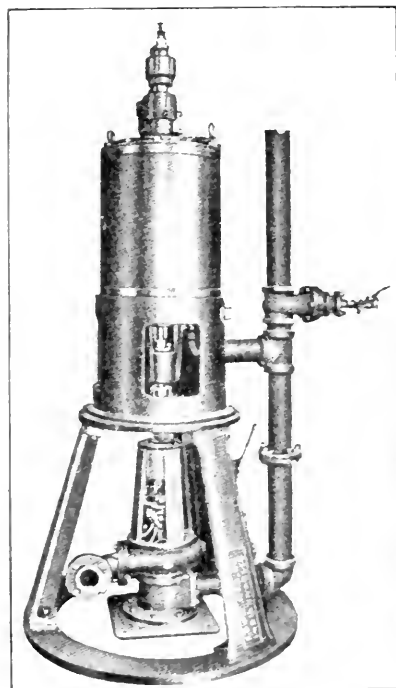
(5) Their adaptability to all the various requirements and conditions of electric service. An extensive line of patterns for both horizontal and vertical machines affords ample opportunity for selection to meet any specified condi-

tions of capacity, location and operation.

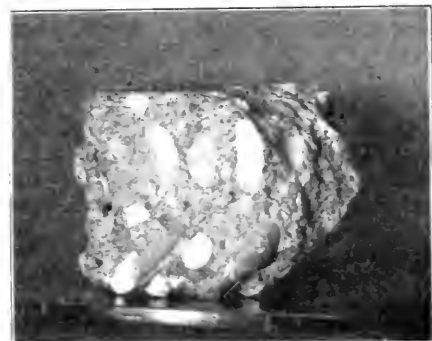
Concrete of Bank-Run Gravel

The sample of concrete shown in the illustration was made in Asbury Park, N. J., with the Coltrin mixer. The material was placed during the week of October 14, 1910. The proportions were one part of Atlas Portland cement to six parts of bank run gravel, shoveled directly from the car into the mixer, sufficient water being added to render the concrete mass of pasty consistency. The bank run of gravel contained a slight percentage of clay and some fine sand, the balance running from coarse sand to gravel the size of a chestnut. Repeated tests prove that the aggregate was about two volumes of sand.

The sample of concrete is uniform in texture and very dense. The lines of fracture run through the gravel stones, showing that the mortar is as hard as the pebbles and that the adhesion of cement and mortar is perfect.



STEAM TURBINE AND CENTRIFUGAL PUMP FOR DEEP WELLS



CONCRETE MADE OF BANK-RUN GRAVEL WITH COLTRIN MIXER

Sieben Sewer Cleaner

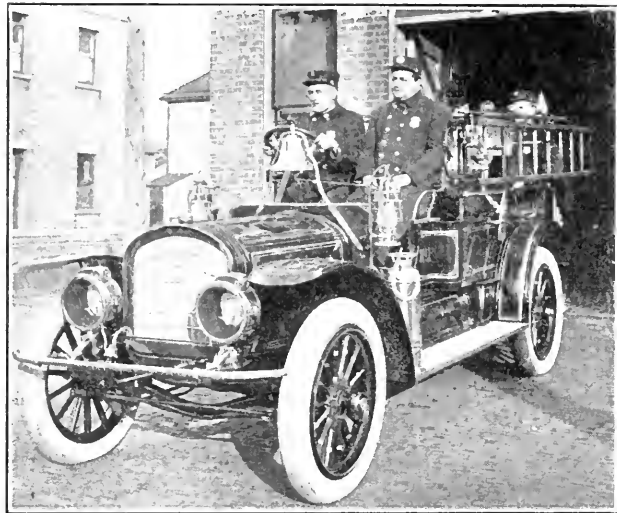
ALL of the appliances and attachments to clean, scrub and disinfect sewers, used by the Sieben System of Sanitation Co., Eighteenth and Central streets, Kansas City, Mo., are shown in the accompanying cut. The cleaner itself consists of a nozzle supported on runners which discharges through a small turbine water motor, causing one or two sets of hook-shaped blades to revolve rapidly. In so doing they stir

full of mud, rocks, brick, etc., and no water was going through to the east. A deposit of 10 inches of mud and rocks showed at the manhole, No. 4, at Brooklyn avenue. The distances between manholes were: From No. 1 to No. 2, 371 feet; from No. 2 to No. 3, 134 feet; from No. 3 to No. 4, 591 feet. The Sieben machine was to clean the sewer from manhole No. 1 to No. 2. The average depth of sediment in this sewer was about 12 inches. At 12.30 p. m. the Sieben crew, consisting of four laborers, one foreman and one team, began the work of stringing hose to the nearest fire plug, 1,250 feet distant, and getting rods through the stretch of sewer between No. 1 and No. 2 preparatory to running the machine through. All preparatory work was done, water turned on and the machine started from manhole No. 2 at 3 p. m. A few minutes after the machine was started a length of hose burst, which caused a delay of 12 minutes while a new length

Length of sewer cleaned.....371 feet
 Cost per foot of sewer by Sieben machine2.52c

Rambler Motor Combination Wagons

The first public exhibition of Rambler service cars and the initial public announcement of the intention of the Thomas B. Jeffery Company to build municipal service cars will be made at the opening of the Commercial Vehicle Show, at the Chicago Coliseum. The first car to be shown will be the Rambler combination chemical and hose truck. A special chassis, built in its entirety in the Rambler factory at Kenosha, Wis., will be a distinguishing feature. The car is 45 horse-power, has a speed of from five to forty miles an hour on high gear, and will accommodate six men in addition to a thousand feet of 2½-inch water hose, including regular chemical equipment. This consists of a 40-gallon chemical tank, 200 feet of chemical hose, one 12-foot roof ladder with folding hooks, one 22-foot extension ladder, two 8-foot combination pike poles and plaster hooks, two fire department lanterns and holders, two axes, one combination door opener and hose shut-off, two nozzle plugs, and extra acid bottles and receptacles. The Rambler Spare Wheel will give this car an advantage over other service cars, owing to the fact that it is exclusively carried on the Rambler, and in truck equipment will undoubtedly be important. In addition to chemical trucks, the Rambler Company will also build chiefs' cars, insurance and salvage patrols, police patrols and ambulances.



RAMBLER AUTO COMBINATION CHEMICAL WAGON

up the dirt and sediment in the sewer to a thin grout, which the waste water from the turbine carries out. The machine is drawn slowly through the sewer by means of cables operated by windlasses. The attachments shown in the cut include a forcing jack and quick coupling rods, which are used when a sewer is so clogged that it is impossible to run a cable or rope through it. Four men are necessary to operate the machine, two on the windlass pulling it through the sewer and two feeding in hose at the manhole.

A report on the operation of the Sieben sewer cleaner on a clogged sewer in Kansas City last December was made by Theodore Naish, Engineer in Charge of Comprehensive Sewer System, which is substantially as follows:

Part of the Westport 18-inch sanitary sewer, between Woodland and Brooklyn avenues, on or near Forty-seventh street, was chosen for the test. This sewer is an interceptor from the 4-foot sewer flowing into Brush Creek at Lydia avenue, and runs from there to intercept the sewage from the Flora avenue 6-foot sewer at Woodland avenue, running thence between Forty-sixth and Forty-seventh streets to intercept the Garfield avenue sewer at Garfield avenue and emptying into Brush Creek about 100 feet east of Prospect avenue. The interceptor in Flora avenue sewer at Woodland was entirely stopped up and no water was going through the sewer east of Woodland avenue. The first manhole east of Woodland avenue, called hereafter manhole No. 4, showed an 8-inch deposit of mud and gravel with no water running. In the next manhole, No. 3, a deposit of 11 inches of mud was found. In the next, or Garfield interceptor No. 2, while the Garfield avenue sewage was emptying into the manhole and being carried off by the storm overflow pipe south to Brush Creek, the interceptor sewer was

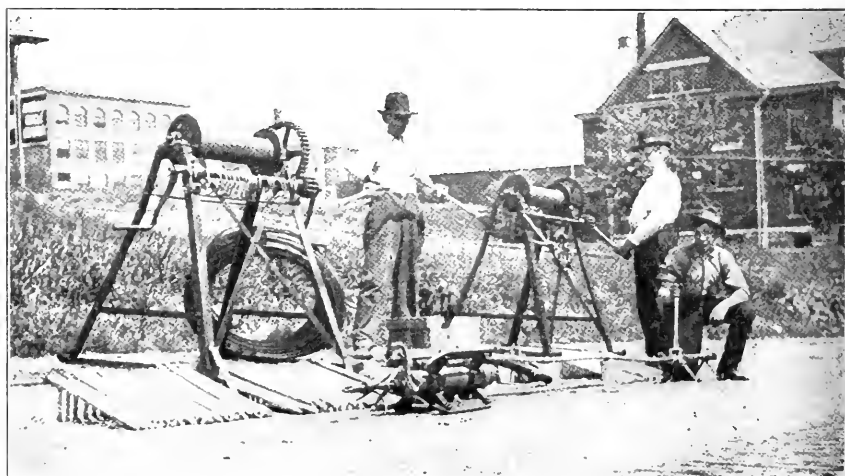
being put in. The machine was taken out at manhole No. 1 at 3.42 p. m., having traversed the 371 feet of pipe in 42 minutes, or, deducting the 12 minutes' delay for repairing hose, the actual time of cleaning the sewer was 30 minutes. The hose was then taken up and rolled, and everything was cleaned and put away by 5.30 p. m. That this sewer was actually cleaned was shown by running a Shannon bucket through the sewer after the Sieben machine had gone through. In the whole length of the sewer only about one-third of a cubic foot of dirt was gathered in the bucket. The cost of cleaning the section of sewer, after the machine was on the ground, was as follows:

Foreman, 5 hours, at 37½c.....\$1.85
 Team, 5 hours, at 50c..... 2.50
 Labor, 20 hours, at 25c..... 5.00

Total labor cost.....\$9.35

Pipe and Boiler Insulation.

The H. W. Johns-Manville Co., 100 William street, New York, manufactures many types of pipe and boiler covering which they have developed during their fifty years' experience in the manufacture of asbestos and magnesia products. High-class insulation is imperative, owing to the present high cost of fuel and the growing demand for the reduction of unit costs. Among the types of sectional pipe covering illustrated and described are: Asbestos-sponge felted; asbestos fire felt; magnesia; vitribestos; indented; safety blow-off; asbestosoil; air cell; molded asbestos; perfection; eureka; wool felt. Each of these types has its special use in economical insulation.



SIEBEN SANITARY SEWER CLEANER AND ACCESSORIES

NEWS OF THE SOCIETIES

Ohio Engineering Society.—The third-second annual convention of the society was held in Columbus, O., January 24-26. The report of the Secretary-treasurer showed a gratifying increase in membership and a sound financial condition. The President, E. G. Bradbury, Columbus, occupied the chair throughout the sessions. Much interest was shown in the excellent programme, and considerable time was devoted to consideration of the proposed bill providing for the registration and examination of civil and mining engineers and surveyors, which was introduced in the late Legislature following its indorsement by the society. H. S. Holton, Director of Public Service, Columbus, addressed the society, welcoming its members to the city and referring briefly to its recent great public improvements. The President, in his address, pointed out some of the causes of unsatisfactory professional conditions, especially calling attention to the frequency with which engineers permit themselves to be handicapped by insufficient force, and the evils of price competition.

The construction of bituminous macadam roads was treated at length in a paper read by James T. Vo-hell, Assistant Engineer, Office of Public Roads, United States Department of Agriculture. Will P. Blar, Secretary of the National Paving Brick Manufacturers' Association, presented a paper on the manufacture of paving brick and their use in street and road construction. Both of these papers were illustrated with lantern slides and were followed by interesting discussions led by James C. Wonders, J. M. Harper, A. J. Horton and D. W. Seitz.

W. J. Watson, Consulting Engineer, Cleveland, gave an illustrated description of the famous bridges of history.

The road laws of Ohio were outlined by James C. Wonders, State Highway Commissioner, who also described proposed legislation controlling the location, construction and maintenance of township and county roads, prepared by him under instructions of the Legislature and soon to be introduced. The location of roads is to be placed in the hands of the County Surveyor and a highway superintendent will be placed in charge of all completed roads. The superintendent, by the aid of a patrol system, will detect and repair defects. The County Surveyor shall act as such superintendent on county roads and an elected official on township roads, under the supervision of the Surveyor.

D. W. Seitz, Assistant State Highway Commissioner, presented a paper on the maintenance and repair of macadam roads. A novel through arch concrete bridge near Cincinnati was described in a paper by E. A. Gast. The bridge has a span of 73 feet, with 31 feet roadway and 50 feet over all width. The concrete floor slab is supported on transverse reinforced girders hung from two reinforced hingeless arches built entirely above the floor level. Thrust is provided for by tension steel in the floor slab, thus relieving the abutments. The bridge is designed to carry two 40-ton traction cars. The floor and haunches were built on falsework and the arches constructed last. The cost of the bridge was about \$7,200.

Professor C. E. Sherman, of Ohio State University, described the methods of the United States Geological Survey in determining the area of Ohio, and stated the correct area to be 41,240

square miles, exclusive of water surface in Lake Erie and its estuaries. Inland lakes have an area of 50 square miles. The figures given are projected on sea level.

Paul Hansen, State Sanitary Engineer of Kentucky; Wm. H. Dittoe and R. W. Ferris, Assistant Engineers Ohio State Board of Health, presented a symposium on the operation of sewage purification works, dealing respectively with general considerations, small sprinkling filter plants and plants comprising intermittent sand filters and contact beds. Mr. Hansen urged the employment of competent men, the keeping of records, the use of measuring devices and careful attention regarding neatness and appearance. Mr. Dittoe discussed in detail the operation of sedimentation tanks and sprinkler nozzles, and called attention to the intelligence and care necessary for their maintenance. Mr. Ferris treated the operation of the intermittent sand filter and contact bed in a comprehensive manner.

The province of disinfection was discussed in a paper by Mr. Clyde Potts, consulting engineer, New York. Mr. Potts considers sodium hypochloride preferable to calcium hypochloride for use in connection with water supplies, but believes that chloride of lime at \$30 per ton is cheaper than sodium hypochlorites where electric currents can be obtained for 1 cent per k.w. hour. The use of hypochlorites is recommended as an emergency measure in case of epidemic and in small proportions for the treatment of filtered water, thereby avoiding the necessity of overdosing with alum to secure bacterial efficiency. Disinfection of sewage effluents discharged into potable waters or waters containing shellfish is also advised.

Philip Burgess, consulting engineer, Columbus, read a paper entitled "Some Features of the Design of Infiltration Plants," in which he called special attention to the fact that water drawn from sand or gravel deposits beneath the bed of a river frequently proves to be ground water flowing to the river rather than filtered river water, and outlined the studies and tests necessary for proper design of a plant of this type. Brief descriptions of several such installations were given. Where a permanent supply can be thus obtained Mr. Burgess considers infiltration plants very satisfactory and economical, assuming that disinfection be resorted to when necessary to produce proper bacterial results. Discussion followed the reading of the papers on sewage disposal and water supply, in which A. Elliot Kimberly, Wm. R. Copeland, Paul Hansen, Prof. C. E. Sherman and others participated. An excursion to the Columbus garbage reduction plant and the State experimental road was fairly well attended despite the inclement weather.

The following officers were elected for the ensuing year: President, Hugh K. Lindsay, Columbus; Vice-President, Frank R. Landor, Cleveland; Secretary-Treasurer, C. J. Knisely, New Philadelphia.

Among the resolutions adopted was the following:

Whereas, In the conduct of municipal affairs it becomes frequently desirable to employ the services of expert engineers in consultation with the regularly employed engineer of the municipality or for the performance of work for which the office of such regularly employed engineer is not equipped, and

Whereas, It has been brought to the attention of this society that such expert or consulting engineer is frequently employed by city officials without regard to the wishes of the regularly employed City Engineer, and

Whereas, Such condition is contrary to professional courtesy and ethics and to the universal practice among other professions and tends to create discord and an undesirable relationship among the members of our profession; now, therefore, be it

Resolved, by the Ohio Engineering Society, in convention assembled, That it is the sense of this society that the employment of any expert or consulting engineer by any municipality having a regularly employed engineer should be only undertaken on recommendation of such regularly employed engineer, and that the selection of such consultant or expert should be by him, and that the Committee on Legislation be instructed to consider the feasibility of preparing and introducing such measures before the General Assembly of the State of Ohio as will render the procedure herein outlined mandatory upon the officials of any municipality within the State.

A resolution was also passed indorsing a legislative bill providing for the creation of a State board of registration and examination for civil and mining engineers and surveyors and for the issuance of certificates to competent persons entitling them to practice such professions.

National Electric Light Association.—The Executive Committee, at a meeting held in New York, January 12, adopted resolutions urging that a joint commission of Congress be appointed at this session to investigate fully the situation pertaining to the public lands of the United States in connection with the development of water powers. The association represents about \$2,000,000,000 invested in central stations for electric light and power and the apparatus they employ, with 100,000 employees, and includes within its ranks 90 per cent of the investment and capacity for public service thus represented. It therefore speaks as an authority. Secretary T. C. Martin, of the association, says: "There are already nearly 1,000 central stations in this country using water power, but, under the present conditions that have tied up such development, very few new water-power plants can be undertaken, and the result is that for lack of such utilization of such water power the consumption of coal and other fuel goes on at a rapidly increasing rate. It is to relieve this deadlock that Congress is invited to investigate fully at once all the aspects of the matter with the idea that a great many communities, particularly in the West, which are seeking to enjoy electric light, power and traction, through the development of unused water-power sites, may be enabled to gratify their natural wishes in this respect.

Association of Manufacturers of Corrugated Steel Culverts in the Northwestern States.—The first annual convention was held in Minneapolis, Minn., December 28. The purpose of the association is to standardize the gauge and weight of the material used in culverts, to obtain adequate transportation facilities and proper freight rates, to educate the public to the value and efficiency of metal culverts and for general publicity purposes. Officers of the association are: President, T. M. Thompson; Vice-President, B. W. Harris; Secretary-Treasurer, N. V. Lux.

Wake County Good Roads Association.—The association has issued an invitation to all the counties and cities along the line of the proposed "Central Highway" from Beaufort to Marshall to send delegates to the convention to be held in Raleigh, N. C., on February 14. The following are the counties and principal cities through which this great highway will pass as it winds from the sea to the top of the mountains at Marshall: Cartaret; Craven, New Bern; Lenoir, Kinston; Wayne, Goldsboro; Johnson, Smithfield; Wake, Raleigh; Durham, Durham; Orange, Hillsboro; Alamance, Graham; Guilford, Greensboro, High Point; Davidson, Thomasville, Lexington; Rowan, Salisbury; Iredell, Statesville; Catawba, Hickory, Newton; Burke, Morganton; McDowell, Marion; Buncombe, Asheville, and Madison, Marshall. The idea of having a great "Central Highway" from the ocean to the mountains has the endorsement of the high officials, and with the proper co-operation between the counties and cities along this line it can easily be built. The Mayors of all cities and towns, organizations, and counties along this proposed road are urged to appoint not less than five delegates each to attend this convention, which will be held in the court house in Raleigh.

Municipal Art Society of Baltimore.

—The annual meeting of the society was held at McCoy Hall, January 12. Francis K. Carey described the proposed Jones Falls improvement. William L. Ellicott advocated the establishment of a national forest between Baltimore and Washington. The following officers were re-elected: President, Theodore Marburg; Vice-Presidents, Henry D. Harlan, W. W. Spence, R. Brent Keyser and Mendes Cohen; Treasurer, S. Davies Warfield; Secretary, Josias Pennington; Counsel, John E. Semmes.

Engineers' Society of Western Pennsylvania.—The thirtieth annual banquet of the society was held at the Fort Pitt Hotel on January 21. Most of the 960 members of the society were present. The speakers were: James Mapes Dodge, of Philadelphia, an honorary member of the society and past president of the American Society of Mechanical Engineers; Col. H. P. Bope, vice-president of Carnegie Steel Company; Robert Kennedy Duncan, professor of industrial chemistry at University of Pittsburgh. Charles F. Scott, consulting engineer of Westinghouse Electric Company, a member of the society, was toastmaster.

State Firemen's League of Rhode Island.—At the meeting at Pawtuxet the following officers were elected: President, Thomas H. Rhodes, of Pawtuxet; First Vice-President, John A. Hamilton, of Arlington; Second Vice-President, William A. Brown, of Wakefield; Third Vice-President, Capt. John J. Mullen, of East Providence; Fourth Vice-President, Everett E. Fiske, of Fiskeville; Fifth Vice-President, Daniel M. Patt, of Providence; Secretary and Treasurer, Frederic W. Cady, of East Providence.

Minneapolis Engineers' Club.—R. B. Fanning was elected President of the Engineers' Club, at a meeting January 16, in the Building Exchange. Other officers: Vice-President, Arthur Overholt; Secretary, George Anderson, Librarian, W. W. Redfield. Papers were read by G. H. Schofield and R. B. Fanning.

Civic League of St. Louis, Mo.—For the convenience of voters the league has prepared an abstract of forty pages from the old and new charters. The original documents comprise over 125 printed pages each. The abstract, besides saving citizens time in merely reducing the number of pages, by its contrasts and arrangement of headlines and parallel columns, is a great help in bringing to the reader's attention the essential differences. The abstract is valuable to students of charters not locally interested.

Water Works Manufacturers' Association.—In connection with the approaching convention of the American Water Works Association, to be held at Rochester, N. Y., the association has appointed the following committees: Membership—O. B. Mueller, Chairman; C. R. Wood, W. C. Sherwood, W. H. Van Winkle, R. E. Milligan. Entertainment—C. R. Wood, Chairman; W. H. Van Winkle, B. C. Little, F. A. Smith, E. A. Fisher, Local Chairman; G. H. Bliven, R. E. Milligan. Exhibit—F. S. Bates, Chairman. Transportation—R. E. Milligan, Chairman; W. H. Van Winkle, E. F. Walker.

Michigan Association of Drain Commissioners.—At a meeting in Lansing, January 23, the following officers were elected: President, Leonard Alger, Saginaw; Vice-President, L. F. Green, St. Johns; Secretary-Treasurer, Walter Carven, Mason.

Albany Society of Civil Engineers.—The annual meeting was held at the Hampton, January 24. The report of the Secretary showed a membership of 111, an increase of twenty during the year. The speakers were: Mortimer G. Barnes, D. R. Cooper, A. F. Hunting, C. V. Merrick, James R. Watt, Mr. McCullough and William R. Horton. The following officers were elected: President, Russell S. Greenman; First Vice-President, James R. Watt; Second Vice-President, David R. Cooper; Third Vice-President, Emory E. Brandow; Secretary, Rupert Sturtevant; Treasurer, Robert F. T. Wilke; Librarian, Clark Brown.

Calendar of Meetings

- February 6-11.**
National Brick Manufacturers Association.—Annual Convention, Louisville, Ky. T. A. Randall, Secretary, Indianapolis, Ind.
- February 14-15.**
Iowa Drainage Association.—Convention, Mason City, Ia.—W. H. Stevenson, Secretary.
- February 14-15.**
Connecticut Society of Civil Engineers.—Annual Meeting, New London, Conn.—J. Frederic Jackson, Secretary, New Haven, Conn.
- February 15.**
New England Association of Gas Engineers.—Annual Meeting, Boston, Mass.—N. W. Gifford, Secretary, 26 Central Square, East Boston, Mass.
- February 16.**
Fourth Annual Chicago Cement Show, Coliseum, Chicago, Ill.
- February 28-March 1.**
Northwestern Cement Products Association, West Hotel, Minneapolis, Minn.—Henry B. Smith, Secretary, 834 Security Bank Building, Minneapolis, Minn.
- May.**
City Commission Congress.—Meeting, Galveston, Tex.—Mayor Lewis Fisher, Chairman of Committee, Galveston, Tex.
- May 29-June 3.**
National Electric Light Association.—Annual Convention, Engineering Societies Building, New York, N. Y.
- June 6-10.**
American Water Works Association.—Thirty-first Annual Convention, Powers Hotel, Rochester, N. Y.—John M. Diven, Secretary, 14 George street, Charleston, S. C.

TRADE NOTES

Cast Iron Pipe.—Chicago quotations 4-inch, \$25; 6 to 12-inch, \$24; 16-inch and up, \$23.50. Birmingham—Manufacturers report fair tonnage placed. Quotations: 4 to 6-inch, \$20; 8 to 12-inch, \$19.50; over 12-inch, average \$18. San Francisco—The tonnage ordered is larger than usual for the season. Inquiries indicate an active spring market. New York—Municipalities are generally slow in making their contracts. Some manufacturers are feeling firmer in their views as a result of booking considerable business, but others are taking low priced contracts. Quotations: 6-inch, carloads, \$21.50 to \$22.

Lead.—New York, 4.50c.; St. Louis, 4.32c.

Heated Stone and Bitumen Roads.—The Ruggles-Coles Engineering Company, No. 50 Church street, New York, who manufacture a carefully designed portable rotary stone heater, call attention to the fact that the process of heating stone, sand or gravel for bituminous roads is not wholly an immediate economic loss. So far as quality is concerned, everyone knows that heated material only admits of perfect mixture and that therefore a road made of heated material must be better than one made of cold stone, over which hot bitumen is poured. If bituminous roads were guaranteed this point would be brought out more clearly. There is, however, an economy in the use of heat in that less bitumen is required. This item may be greater or less than the cost of the heating, depending on differences in specifications and, in no small part, on the skill of the superintendent in charge of the work. If heating of the stone were specified the knack of doing the work economically in this way would soon be acquired. In all cold processes there is a waste of bitumen. The additional thickness of bitumen resulting from its chilling as it is poured over the stone is an absolute waste without any benefit. All experience with bituminous mixtures goes to show that a thin coating is as good and probably better than a thick one—the complete covering of each particle with a coating of bituminous paint being the one essential requirement.

Concrete in Parks.—The Universal Portland Cement Company, No. 115 Adams street, Chicago, Ill., in their January bulletin, illustrate and describe the use of cement in the Chicago city parks. The views are of seats, lighting pillars, flower vases and a pergola.

Steam Turbines.—The De Laval Steam Turbine Company, Trenton, N. J., have issued a catalogue of 120 pages which contains a discussion of the practical thermodynamics of the steam turbine and of the bearing of various types of construction upon ultimate efficiency. Illustrations are included of the applications of steam turbines in driving alternating and direct current generators for belt and rope drives, for direct connection to centrifugal pumps, blowers, etc. There is a chapter on low-pressure and mixed flow turbines for the utilization of exhaust steam and of low pressure vapors from industrial processes.

Rubber Tires.—R. J. Firestone, sales manager of the Firestone Tire and Rubber Company, is authority for the statement that Firestone solid truck tires were in the lead at the recent New York Automobile Truck Show and that 26 vehicles were equipped with them.

THE MUNICIPAL INDEX

Which Are Listed and Classified by Subjects All Articles Treating of Municipal Topics Which Have Appeared During the Past Month in the Leading Periodicals

It is our purpose to give in the second issue of each month a list of all articles of any length or importance which have appeared in all the American periodicals and the leading English, French and German ones, dealing more or less directly with municipal matters. The index is kept up to date, and the month of literature covered each time will be brought up to within two or three days of publication. Our chief object in this is to keep our readers in touch with all the current literature on municipal matters. In furtherance of this we will furnish any of the articles listed in the index for the price named after each article, except that where an article is continued in two or three issues of the paper, the price given is for each of said issues. In addition to the titles, where these are not sufficiently descriptive or where the article is of sufficient importance, a brief statement of its contents is added. The length also is given, and the name of the author when it is a contributed article.

ROADS AND PAVEMENTS

Good Roads. By A. McGillivray, Highway Commissioner for Manitoba. Illustrated. 41-2 pp., Western Municipal News, January. 15 cts.

Good Roads Train in Pennsylvania. 1-4 p., Municipal Journal and Engineer, Feb. 10 cts.

The Road Problem. Paper by R. O. Wynne-Roberts before Institute of Cleansing Superintendents at Surbiton. 2-1-2 p., Surveyor, Dec. 30. 15 cts.

Highway Construction in the Borough of Richmond. Illustrated. 3 pp., Good Roads, January. 10 cts.

Maine, What State Aid Has Done in. Paper by Paul D. Sargent, State Highway Commissioner, before American Road Builders' Association. 2-3 p., Good Roads, January. 10 cts.

North Dakota, Progress of Good Roads Movement in. Paper by T. R. Atkinson, State Engineer, before American Road Builders' Association. 2-3 p., Good Roads, January. 10 cts.

Michigan, Progress of Road Building in. Paper by Frank F. Rogers, Deputy Highway Commissioner, before American Road Builders' Association. 1-1-2 pp., Good Roads, January. 10 cts.

Legislation, Highway. Paper by L. W. Ge, Director U. S. Office of Public Roads, before American Road Builders' Association, Indianapolis. 2 pp., Engineering-Contracting, Jan. 11. 10 cts.

Some Notes on Highway Law as Affecting Property Owners. From paper by E. H. Lake before Surveyors' Institution. Surveyor, Jan. 13, 2-1-2 pp.; Jan. 20, 3-1-2 pp., cts. Surveying, Jan. 13, 3 pp.; Jan. 20, pp. 15 cts. 3-4 p., Contract Journal, n. 18. 20 cts.

Highway Law, The. Editorial, 1 p., Surveying, Jan. 13. 15 cts.

Traffic Regulations, English and American Highway. Paper by Prof. Arthur H. Archard, of Brown University, and Henry B. Drowne, Asst. Engineer of Rhode Island and Board of Public Roads, before American Association for the Advancement of Science. 2 pp., Engineering Record, n. 14. 10 cts.

Hygiene des Routes. By Dr. Melchior. 50 p., La Technique Sanitaire, January. 50 s.

Bituminous Binder and Aggregate. Importance of aggregate too often overlooked; detecting road by cushion coat; grades used in St. Louis for surface treatment. From paper before American Association for Advancement of Science. By James C. Cavilla. 1-2 p., Municipal Journal and Engineer, Jan. 18. 10 cts.

Experimental Asphalt Macadam Pavement at Washington, D. C. 1-2 p., Engineering-Contracting, Jan. 4. 10 cts.

Bituminous Concrete and Macadam Details. 1-4 p., Municipal Journal and Engineer, Jan. 25. 10 cts.

The Physical and Chemical Characteristics of Bituminous Road Materials. By Rev. Hubert, Asst. Chemist, U. S. Office of Pub. Roads, Washington. 3 pp., Surveying, Jan. 20. 15 cts.

Massachusetts Method of Bituminous Road Construction. By Harold Parker, chairman, State Highway Commission, paper before American Road Builders' Association. 1-1-2 pp., Good Roads, January. 10 cts.

Certain Considerations Affecting the Section of Bitumens and Mineral Matter in Road Construction and Road Surface Treatment. Paper by Jas. C. Travilla, street Commissioner, St. Louis, Mo., before American Association for the Advancement of Science. 2-3 p., Engineering-Contracting, Jan. 18. 10 cts.

Materials, Experiments With Road Binding. Supplementary Report of Ohio Highway Department. 1 p., Surveyor, Dec. 30. 10 cts.

Present System of Laboratory Tests and Use of Materials in Road Construction. Paper by Maj. W. W. Crosby, Chief Engineer, Maryland Geological and Economic Survey, before American Association for the Advancement of Science. 1 p., Engineering-Contracting, Jan. 18. 10 cts.

Cost per Mile, Average, of "State Reward" Gravel and Macadam Roads in Michigan. 1-2 p., Engineering-Contracting, Jan. 4. 10 cts.

Road Construction. Notes On Steam Rolling in. Paper by Walton Maughan at Meeting of Municipal Engineers of Great Britain. 1 p., Engineering-Contracting, Jan. 18. 10 cts.

Road Construction Methods in Semi-Arid Regions. By Chas. M. Thomas, Highway Engineer, Abilene, Tex. 1-2 p., Engineering-Contracting, Jan. 25. 10 cts.

Maintenance, The Remedy for the Worst Places in the Road. By W. S. Gearhart, State Highway Engineer of Kansas. From address before American Road Builders' Association. 2 pp., Good Roads, January. 10 cts.

Men in Highway Work, Opportunity for Technically Trained. Paper by A. N. Johnson, State Highway Engineer of Illinois, before American Association for Advancement of Science. 1-1-3 pp., Engineering Record, Jan. 21. 10 cts.

U. S. Office of Public Roads, Work of the. From Report of the Secretary of Agriculture. 2 pp., Good Roads, January. 10 cts.

Street Surfaces and Motor Traction. Are old conditions suited to the new? 2 pp., Surveying, Jan. 20. 15 cts.

Straw Road, Florida. 1-4 p., Municipal Journal & Engineer, Jan. 25. 10 cts.

Concrete Roads in Wayne County, Mich. 2-1-2 pp., The Contractor, Jan. 15. 20 cts.

Bridge Specifications, Relation of, to Highway Improvement. Paper by Prof. Albert Smith before Indiana Engineering Society. 1 p., Engineering Record, Jan. 21. 10 cts.

Pavements, Selection and Maintenance of. By George W. Tillson, Chief Engineer of Highways, Manhattan. 2 pp., Bulletin of the League of American Municipalities, November. 25 cts.

Pavements of German Cities. From semi-official German report. 1-1-2 pp., Engineering Record, Jan. 21. 10 cts.

Notes on Roadways for Residence Streets and Thoroughfares in and About New York City. 6-1-2 pp., Engineering News, Jan. 19. 15 cts.

Wood Blocks in England, Crosetting. 1-4 p., Municipal Journal and Engineer, Jan. 25. 10 cts.

Laying Wood Paving with Cement Grout Cushion along Street Car Tracks. 1-3 p., Engineering News, Jan. 12. 15 cts.

Wood Preserving with Asphalt Oils. Illustrated. 3-4 p., Municipal Journal and Engineer, February 1. 10 cts.

Brick Paving Applied to the Roads of Allegheny County, Pa. Progress made during past year. Half tones and drawings. 2 pp., The Clay Worker, January. 25 cts.

Brick as Paving Material. Editorial, 1 p., Surveyor, Jan. 20. 10 cts.

Cushion, Cement Grout, in Street Railway Pavement Construction. 1 p., Engineering-Contracting, Jan. 25. 10 cts.

Sidewalk Construction, Some Notes on. From paper by Jerome B. Landfield, before National Association of Cement Users. 2 pp., Cement Age, January. 15 cts.

SEWERAGE AND SANITATION

Sewer Systems, Water and, at Wetas-kiwin. Interesting features--problems encountered. Illustrated. 1-1-2 pp., Contract Record, Jan. 18. 10 cts.

Sewerage of Sea Coast Towns. By Henry C. Adams. With drawings. 3 pp., Surveying, Jan. 6. 3 pp., Jan. 13. 15 cts.

Sewer Construction at La Porte, Ind. By Ezra C. Shoecraft, city engineer. With half-tone and drawings. 1 p., Engineering Record, Jan. 28. 10 cts.

New Type of Excavator Used on the North Shore Drainage Canal, Chicago. With half-tones and drawings. 1 p., Engineering-Contracting, Jan. 18. 10 cts.

The Richmond Hill Trunk Sewer, Long Island. Details of construction. Drawings. 2 pp., Engineering Record, Jan. 28. 10 cts.

Wet Trenches, Methods of Laying Sewers in. From information collected for the American Society of Municipal Improvements. With drawing. 1 p., Engineering-Contracting, Jan. 11. 10 cts.

Pumping Station, Sewage, and Siphon at Wichita. Drawings. 1-2 p., Engineering Record, Jan. 21. 10 cts.

Sewage Disposal Works, Ponnypack Creek, Philadelphia. With drawings. 3 pp., Engineering Record, Jan. 14. 10 cts.

Operating Sewage Plants. Instructions Issued by Ohio State Board of Health. Screens, sedimentation tanks, sludge beds, filters, form for records. 11-2 pp., Municipal Journal and Engineer, Jan. 25. 10 cts.

Sewerage and Sewage Disposal in 1910. Editorial, 1 p., Contract Journal, Dec. 28. 20 cts.

Purification of Industrial Wastes. "L'Épuration des Eaux Résiduaires Industriels." 2 pp., La Technique Sanitaire, January. 50 cts.

Russian Trickling Filter Plant. 1-2 p., Municipal Journal and Engineer, Feb. 1. 10 cts.

Sewage Sludge Disposal. Foreign and American methods. By W. B. Ruggles, New York. 1 p., Engineering Record, Jan. 21. 10 cts.

River, Purifying the Ohio. 1-4 p., Municipal Journal and Engineer, Jan. 25. 10 cts.

Sanitation of Villages and Premises without Sewers. By John W. Hill, member Ohio State Board of Health. 2-1-2 pp., Canadian Engineer, Jan. 26. 15 cts.

Mayors and Municipal Health. By John A. Kingsbury, Asst. Secretary, New York Charities Aid Association. 3 pp., The American City, January. 15 cts.

WATER SUPPLY

Waterworks Engineering in 1910. 11-2 pp., Surveying, Jan. 13. 15 cts.

Report, Minneapolis Water Works, 1 p., Municipal Journal and Engineer, Jan. 18. 10 cts.

Cincinnati Water Works Efficiency. 1-4 p., Municipal Journal and Engineer, Jan. 25. 10 cts.

Co-operation in Rural Water Supplies, Advantages of. From paper by F. Graham Fairbank, before Association of Water Engineers. Surveyor, Jan. 6, 3 pp.; Jan. 13, 3 pp., 20 cts.

Structural Features of the Vancouver Water-Works, with General Construction Costs. With drawings. 2 pp., Engineering-Contracting, Jan. 4. 10 cts.

Concrete Pipe, Method and Cost of Molding and Laying Reinforced, for an Aqueduct, Monterey, Mexico. Waterworks. From "Waterworks and Sewerage of Monterey, N. L., Mexico," by G. R. G. Conway. With drawings. 1-1-2 pp., Engineering-Contracting, Jan. 11. 10 cts.

Water Tower in Holland, Concrete. 1-2 p., Municipal Journal and Engineer, Feb. 1. 10 cts.

Reservoirs, Some Methods Employed in Constructing Two Reinforced Concrete. From "Water-Works and Sewerage of Monterey, N. L., Mexico," by G. R. G. Conway. With drawings. 3-1-2 pp., Engineering-Contracting, Jan. 11. 10 cts.

Dams On Sand Foundations. Some principles involved in their design. Paper to be presented March 15, before American Society of Civil Engineers. Drawings. 15 pp., Proceedings of American Society of Civil Engineers, January. \$1.

Design and Construction of the Dam at St. Andrew's Rapids, Manitoba. By A. H. Harkness. With half-tones and drawings. 5 pp., Canadian Engineer, Jan. 26. 15 cts.

Flow of Water Over Dams, by Gardner S. Williams, professor of Civil, Hydraulic and Sanitary Engineering, University of Michigan. With drawings. 1 p., Engineering News, Jan. 12. 15 cts.

Use of the Pitot Tube. "Methode du Tube de Pitot. Pour Mesurer Le Debit des Masses Liquides." With drawings. 3 pp., La Technique Sanitaire, January. 50 cts.

Deduction of a General Formula for Determining the Most Economic Size of Pipe to Carry Pumped Water. A technical discussion. 2 pp., Engineering-Contracting, Jan. 25. 10 cts.

Purification Plant of the Rochester and Lake Ontario Water Co. Paper read by James M. Caird before New England

Waterworks Association. Illustrated, 1 p., Jan. 25, 10 cts.

Water Purification and Sanitation at Panama, 11-2 pp., Engineering Record, Jan. 14, 10 cts.

Methods and Cost of Constructing Water Purification Works at Springfield, Mass. Paper by Charles R. Gow, before American Society of Civil Engineers. With drawings, 6 pp., Engineering-Contracting, Jan. 18; Drawings, 5 1-2 pp., Jan. 25, 10 cts.

Mechanical Filtration Plant at Bangor, New. Half-tones and drawings, 2 pp., Engineering Record, Jan. 21, 10 cts.

Coagulating Non-alkaline Water, 1-4 p., Municipal Journal and Engineer, Feb. 1, 10 cts.

Washington Filtration and Typhoid, 3-4 p., Municipal Journal and Engineer, Jan. 18, 10 cts.

Operation of Washington Filtration Plant. Replacing washed sand by ejectors; amount of sand removed by scraping; cost of all items of maintenance; experiments in preliminary filtration; sedimentation and rapid filtration. Illustrated, 5 pp., Municipal Journal and Engineer, Feb. 1, 10 cts.

Methods and Costs of Operating the Washington, D. C., Slow Sand Filter Plant; with Particular Reference to Handling Sand. From "Water Purification Plant at Washington, D. C., Results of Operation," by E. D. Hardy, 11-2 pp., Engineering-Contracting, Jan. 4, 10 cts.

Velocity of Flow Through Filter Beds. From paper by W. R. Baldwin Wiseman in Proceedings of the Institution of Civil Engineers. With table, 2 pp., Engineering Record, Jan. 28, 10 cts.

Hypochlorite at Harrisburg, 1-4 p., Municipal Journal and Engineer, Feb. 1, 10 cts.

Use of Hypochlorite of Lime in Filtration. Illustrated, 1 p., Fire and Water Engineering, Jan. 4, 10 cts.

Plant for Applying Hypochlorite. Illustrated, 1-2 p., Municipal Journal and Engineer, Feb. 1, 10 cts.

Corrosion by Hypochlorite Solutions, 1-2 p., Municipal Journal and Engineer, Jan. 25, 10 cts.

Chlorine. The Effect of, upon the Micro-organisms of a River Water. By Leslie C. Walker. Illustrated. With tables, 11 pp., Journal of the Royal Institute of Public Health, January, 2 pp., Water and Gas Review, January, 20 cts.

Meters in Service, Care and Maintenance of. From paper before American Waterworks Association, by A. W. Cuddeback, 21-2 pp., Water and Gas Review, January, 20 cts.

Effect of the Installation of Water Meters in Cleveland. By John C. Beardsley, 3 pp., Bulletin of the League of American Municipalities, November, 25 cts.

Are Water Meters Advantageous or Otherwise? By Edward W. Bemis, 2 pp., Engineering Record, Jan. 28, 10 cts.

Recent Waste-Detection and Meter Work in the New York City Water Department. By Edward W. Bemis, 21-2 pp., Engineering News, Jan. 12, 15 cts.

The Metering of Fire Lines. Correspondence between President of Terre Haute Water Works Co. and Water Commissioner of Kalamazoo, Mich., 1 p., Water and Gas Review, January, 20 cts.

Management, Some Comments Upon Water Works, Suggested by the Recent Special Reports of the U. S. Commerce and Labor Department. Paper by Leonard Metcalf before Pennsylvania Water Works Association, 21-2 pp., Water and Gas Review, January, 20 cts.

Water Waste and General Inefficiency in the Water Department of New York City, 1-2 p., Engineering News, Jan. 12, 15 cts.

Cost of Furnishing Water, with Reference to Rates and Rate Making. From paper by Daniel W. Meade before American Waterworks Association, 4 pp., Water and Gas Review, January, 20 cts.

Life of Water Works Construction. From paper before New England Water Works Association. By Leonard Metcalf, 3-4 p., Municipal Journal and Engineer, Feb. 1, 10 cts.

Liability for Water Supply, 1-4 p., Municipal Journal and Engineer, Feb. 1, 10 cts.

STREET LIGHTING AND POWER PLANTS

Street Lighting, Recent Progress in, 2-3 p., Engineering Record, Jan. 21, 10 cts.

Companies, Cultivation of Friendly Relations Between the Public and the Lighting. Paper by Wm. J. Clark before American Gas Institute, 11-2 pp., American Gas Light Journal, Jan. 20, 10 cts.

Conduit Work, Methods on Difficult. Contract recently completed at Salt Lake City. Illustrated, 2 pp., The Contractor, Jan. 15, 20 cts.

Electrolysis, Effect of, on Metal Embedded in Concrete. Paper by Cloyd M. Chapman before National Association of

Cement Users, 11-2 pp., Engineering-Contracting, Jan. 25, 10 cts.

Gas Mains, Laying a 48-inch and Two 36-inch, under the Harlem River. With half-tones and drawings, 21-2 pp., American Gas Light Journal, Jan. 16, 2 pp., 10 cts.

Power Plant Records, Keeping. By Warren O. Rogers. With drawings and specimen sheets, 61-2 pp., Power, Jan. 24, 5 cts.

Point du Bois Hydro-Electric Development. Outline of design, construction and progress of Winnipeg enterprise. Illustrated, 21-2 pp., Contract Record, Jan. 18, 10 cts.

STREET CLEANING AND REFUSE DISPOSAL

Snow, Magnesium Chlorate for Removing, 1-4 p., Municipal Journal & Engineer, Jan. 25, 10 cts.

Removing Snow from Roads and Streets by Spreading Coal or Earth upon the Snow, 1-2 p., Engineering-Contracting, Jan. 25, 10 cts.

Garbage Collection. Only dry garbage wrapped in paper collected in Minneapolis; can does not become offensive; less frequent collection required. Paper before American Public Health Association. By Dr. P. M. Hall, 1 p., Municipal Journal and Engineer, Jan. 25, 10 cts.

Refuse Crematory at Houston, Tex. Illustrated, 1 p., Municipal Journal and Engineer, Jan. 18, 10 cts.

Montgomery Refuse Destructor, 1-2 p., Municipal Journal and Engineer, Jan. 25, 10 cts.

Waste Disposal during 1910, Progress of City. By Wm. F. Morse, 3 pp., The American City, January, 15 cts.

Garbage Disposal at Pasadena, 1-4 p., Municipal Journal and Engineer, Jan. 25, 10 cts.

Clinker in Concrete, Use of Destructor. Experiments at Staten Island, 1-3 pp., Engineering Record, Jan. 14, 10 cts.

Plant for Handling and Storing Destructor Clinker. With half-tone and drawing 1 p., Engineering Record, Jan. 21, 10 cts.

TRAFFIC AND TRANSPORTATION

Transportation Problem, City, 1-4 p., Municipal Journal and Engineer, Feb. 1, 10 cts.

Overcrowding Street Cars, 1-2 p., Municipal Journal and Engineer, Feb. 1, 10 cts.

Rapid Transit Problem, Report of Citizens' Committee on the New York, 21-2 pp., Engineering News, Jan. 12, 15 cts.

Twelve Years' Development of Rapid Transit in Boston. The extensions and additions of the Boston Elevated Railway Co. With maps, 1 p., Engineering News, Jan. 26, 15 cts.

The City's Subway Problem. Report of joint committee appointed at request of Mayor, 18 pp., Proceedings of the Merchants' Association of New York, January.

Social Aspects of Subway Plans. By John Martin, 3 pp., Survey, Jan. 28, 10 cts.

Subway System, The Paris. With special reference to franchise terms and conditions. With map, 5 1-3 pp., Engineering News, Jan. 17, 15 cts.

Boston Subway Extensions. Editorial, 1-2 p., Engineering Record, Jan. 14, 10 cts.

Constructing the Land Section of the La Salle Street Tunnel, Chicago. Methods of. With half-tones and drawings, 41-2 pp., Engineering-Contracting, Jan. 11, 10 cts.

Rebuilding the La Salle Street Tunnel Under the Chicago River. With half-tones and drawings, 41-2 pp., Engineering News, Jan. 12, 15 cts.

Valuation of Interurban Street Railways, Logical Basis for. From paper by C. G. Young before Central Electric Railway Association, 21-3 pp., Electrical Review, Jan. 28, 10 cts.

Railway Terminal Situation in St. Louis and the Municipal Bridge. Abstract of address before St. Louis Railway Club, Nov. 11, by Edgar E. Rombauer, Speaker of the House of Delegates, 2 pp., Engineering News, Jan. 26, 15 cts.

'MATERIALS OF CONSTRUCTION

Cement, Experience with Portland, Blended by Grinding with Tufa for Making Concrete for the Los Angeles Aqueduct. With drawings, 11-2 pp., Engineering-Contracting, Jan. 18, 10 cts.

Tests to Determine the Values of Clay and Ground Cement for Securing Impermeable Concrete. From Bulletin No. Y, Iowa State College, Ames. With drawings, 1 p., Engineering-Contracting, Jan. 25, 10 cts.

Sands for Mortar and Concrete, Proper. By R. P. Davis. With charts and tables,

10 pp., The Cornell Civil Engineer, January, 20 cts.

Broken Stone, Reducing the Cost of, 1 p., Engineering News, Jan. 12, 15 cts. New Stone Crushing Plant of Tomkins Cove Stone Co., Tomkins Cove, N. Y. Description with half-tones and drawings, 6 pp., Engineering News, Jan. 12, 15 cts.

Concrete Practice, General. Abstract of paper by Thos. Potter before Concrete Institute, 2 pp., Canadian Engineer, Jan. 25, 15 cts.

Some Tests to Determine the Effect of Varying Percentages of Mixing Water on the Impermeability of Concrete. Paper by Cloyd M. Chapman before National Association of Cement Users. With drawings, 1 p., Engineering-Contracting, Jan. 18, 10 cts.

Complete Floating Concrete Plant. Extract from Professional Memoirs, by Lt. L. M. Adams. With drawings, 2 pp., Contractor, Jan. 15, 20 cts.

Some Thermal Properties of Concrete. From paper by Prof. Chas. L. Norton, Mass. Institute of Technology, before National Association of Cement Users, 6 pp., Cement, December, 20 cts.

Comparison of the Initial Cost of Concrete and Wood Piling. By Phillip J. Kealy, 1 p., Engineering-Contracting, Jan. 25, 10 cts.

Comparative Tests of Concrete in Tension and Compression. By A. P. Mills. Half-tones and tables, 8 pp., The Cornell Civil Engineer, January, 20 cts.

Waterproofing with Water. Paper by Cloyd M. Chapman before National Association of Cement Users. With charts, 3 pp., Cement, December, 20 cts.

MISCELLANEOUS

Commission Government, Cities Having, 1-4 p., Municipal Journal and Engineer, Jan. 18, 10 cts.

Red Deer's System of Government by Commission. By Commissioner A. T. Stephenson, 2 pp., Western Municipal News, January, 15 cts.

Commission Form of Municipal Government. By Charles R. Lane, 31-2 pp., Bulletin of the League of American Municipalities, November, 25 cts.

Commission Government in New Jersey, 1-4 p., Municipal Journal and Engineer, Feb. 1, 10 cts.

City Government by Commission. Issued by the Allied Bodies of Pennsylvania, 11-2 pp., Bulletin of the League of American Municipalities, November, 25 cts.

Simplified City Government. By Samuel A. Carlson, Mayor of Jamestown, N. Y. From address before League of American Municipalities, 3 pp., The American City, January, 15 cts.

Home Rule for Cities. By J. Barry Mahool, Mayor of Baltimore. Paper before League of American Municipalities, 5 pp., The American City, January, 15 cts. Municipal Journal and Engineer, Jan. 25, 10 cts.

Organization, Municipal. Illustrated, 3 pp., The Municipal World, January, 15 cts.

Civil Service Reform in Municipalities. By Albert de Roode, Asst. Secretary, National Civil Service Reform League, 3 pp., The American City, January, 15 cts.

Records, Unreliability of City, 1-2 p., Municipal Journal and Engineer, Jan. 25, 10 cts.

Fire Alarm Systems. "Creiger" Equipment at Los Angeles. Illustrated, 8 pp., Insurance Engineering, January, 25 cts.

New York Fire College, 1-2 p., Municipal Journal and Engineering, Jan. 25, 10 cts.

New Central Fire Station for Hornell. By Otis Dockstader, architect. Illustrated, 2-3 p., Fire and Water Engineering, Jan. 25, 10 cts.

Newark Fire Horror. Illustrated, 10 pp., Insurance Engineering, January, 25 cts.

City Planning in Practice. What it comprises; plan never finished but growing with the city; special department or official desirable. Paper before American Civic League. By F. L. Olmsted, 11-2 pp., Municipal Journal and Engineer, January 25, 10 cts.

Housing and Town Planning. From Presidential address of Robert Green before Institute of Sanitary Engineers, 11-2 pp., Surveyor, Dec. 30; 11-2 pp., Jan. 6, 20 cts.

The Development of German Cities and the Dusseldorf City Planning Exhibit. By Horatio M. Pollock, 21-2 pp., The Albany Citizen, Year Book of Civic League, 1911.

Housing Awakening; Reform in Cold Storage. By Edward T. Hartman, Secretary, Massachusetts Civic League, 21-2 pp., The Survey, Jan. 21, 10 cts.

Parks and Boulevards, St. Louis. City planning to have the finest park system in the country; now constructing the Kings-highway, a park boulevard connecting all the large parks. Details of plan. By C. C. Casey, Illustrated, 3 pp., Municipal Journal and Engineer, Jan. 18, 10 cts.

Forestry Department, Work of Buffalo's in charge of City Forester and Board of Park Commissioners; has operated for three seasons; sixty thousand quarts of egg masses purchased from children; spraying and pruning. 23-4 pp., Illustrated, Municipal Journal and Engineer, Jan. 25. 10 cts.

Public Comfort Station in Genoa. 1-2 p., Municipal Journal and Engineer, Jan. 25. 10 cts.

Abbatolr, Model, by Dr. M. A. Walker. Bulletin of Texas State Board of Health, pp., December.

Zoological Park, A Great. New York's remarkable collection of animals. By Walter L. Beasley. Illustrated. 4 pp., Scientific American, Jan. 7. 10 cts.

Improvements. The Rejuvenation of Poughkeepsie. By M. V. Fuller. Illustrated. 8 pp., The American City, January. 15 cts.

Improving Poughkeepsie's Main Street. Illustrated, 3-4 pp., Municipal Journal and Engineer, Jan. 25. 10 cts.

What May Be Done in Waterloo. From report of Charles Mulford Robinson on civic improvement possibilities in Waterloo, Iowa. Illustrated. 3 pp., The American City, January. 15 cts.

The Cities of the Future. By E. Henard. Illustrated, 5 pp., The American City, January. 15 cts.

Libraries, Municipal Reference. Preventive for repeating mistakes in municipal government and work; what some cities have done. Paper before National Municipal League. By Dr. Horace E. Flack. 2 pp., Municipal Journal and Engineer, Jan. 8. 10 cts.

Building Codes. New ordinance for Newark, N. J. Action prompted by fire of Nov. 26. Insurance Engineering, 2 pp., January. 25 cts.

Engineering Work in Public Buildings. By R. Owen Allsop. With drawings. 2 1-2 pp., Surveying, Jan. 20. 15 cts.

Telephone, Philadelphia Municipal. Six hundred local stations; special service for police department; messages recorded; patrol boxes. Illustrated, 11-4 pp., Municipal Journal and Engineer, Feb. 1. 10 cts.

An Unreasonable Reduction of Telephone Rates. Editorial, Electrical Review. 1 p., Jan. 28. 10 cts.

Subsurface Structures, Locating. Work of Division of Sub-Structures of Brooklyn, N. Y. Method of making field measurements; value of existing records; method of mapping and filing records; value of the work. Illustrated, 41-2 pp., Municipal Journal and Engineer, Feb. 1. 10 cts.

Retailing Walls, A Discussion of Experiments on, and of Pressures on Tunnels. By William Cain. Drawings, 46 pp., Proceedings of American Society of Civil Engineers, January. \$1.

Specifications, Standard. 1-4 p., Municipal Journal and Engineer, Jan. 18. 10 cts.

Contractors' Construction Camps. By Daniel J. Hater. 2 pp., The Contractor, Jan. 1; 2 rp., Jan. 15. 20 cts.

Transit, Shaft, for Tunnel Alignment. -3 p., Engineering Record, Jan. 14. 10 cts.

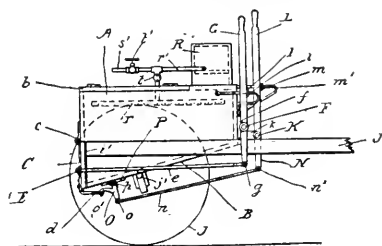
Data, Furnishing, on Request. 1-4 p., Municipal Journal and Engineer, Feb. 1. 10 cts.

Periodical, Value of a. 1-3 p., Municipal Journal and Engineer, Jan. 18. 10 cts.

PATENT CLAIMS

981,653. GARBAGE-CART. William Nepean-Hutchison, Victoria, British Columbia, Canada, assignor of one-half to Alexander M. Sinclair, Victoria, Canada. Serial No. 527,369.

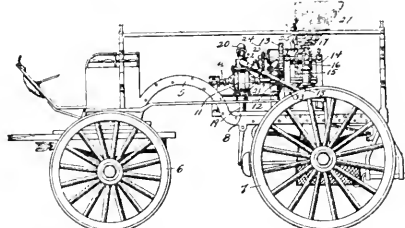
In a garbage cart, the combination, with a receptacle having a hinged discharge door at its rear; of a rock-shaft journaled at the front end of the receptacle, an operating lever secured to the said rock-shaft, an arm secured to the rock-shaft and projecting downwardly, an eye secured to the middle part of the discharge door and pro-



jecting under the bottom of the receptacle when the door is closed, a catch lever having its upper end pivoted to the bottom of the receptacle and having a hook which projects from its middle part and which engages with the said eye, and a rod pivoted to the said arm and to the lower part of the catch lever below the hook, said door being pressed against the receptacle by the said hook when the said rod is pulled upon.

983,006. CHEMICAL-ENGINE. John A. Thomas, Zanesville, Ohio, assignor of one-half to Samuel A. Weller, Zanesville, Ohio. Serial No. 571,812.

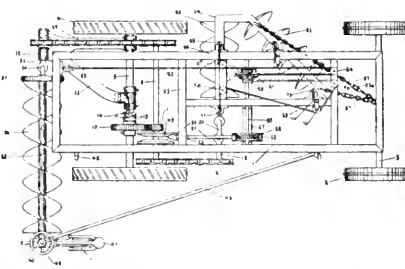
A water motor comprising a pair of rotative shafts arranged side by side and in parallel relation to each other, a force pump driven from one of said shafts, a



conveyer driven from the other of said shafts, a casing in which said conveyer is located, a hopper for containing a chemical to be conveyed by said conveyer, a mixing chamber into which said chemical is delivered by the conveyer, a suction line from the force pump to said mixing chamber, and a delivery line from said force pump to the discharge line of the water motor.

982,944. ROAD-GRADER. John Brown Fender, Kaufman, Tex. Serial No. 523,462.

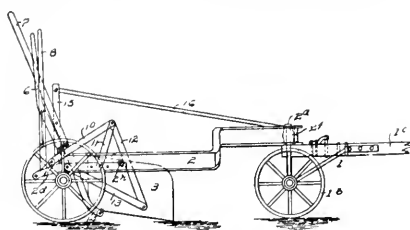
In a road grader, the combination with the frame, axles and transporting wheels thereof, of a plurality of rotatably mounted disk plows, carried by said frame, having their axes in alignment, a spiral conveyer rotatably mounted behind said plows,



adapted to remove the dirt from the ditch which the plows excavate, means by which said conveyer and plows may be raised or lowered, means by which the conveyer and the center line of the plows may be adjusted at an angle with the ground, a second spiral conveyer adapted to receive the dirt ejected from the first-named conveyer and to spread it upon the road, and mechanism by which the power generated by the motion of the machine is applied to rotate the two conveyers.

983,065. WHEEL-SCRAPER. Jefferson Kindleberger and Andrew J. Granville, San Diego, Cal. Serial No. 528,956.

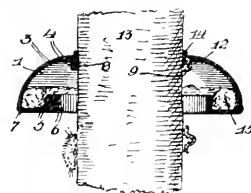
A wheel scraper comprising a front truck, a main frame pivotally mounted thereon, said frame mounted upon suitable rear wheels, a scoop mounted on said frame by means of four bars pivoted at each of



their ends, and two of them pivoted on said frame, one of said bars being pivoted upon a rocker arm which in turn is attached to a rocker lever, and all adapted to raise and lower said scoop and to lock it in its raised and lowered positions, a double pivoted lever pivoted on said scoop and upon an upright arm upon said frame adapted to dump said scoop, all substantially as set forth.

983,114. VERMIN AND BUG SHIELD FOR TREES. Alphonse M. Barry and Robert D. Barry, Pittsburg, Pa. Serial No. 586,728.

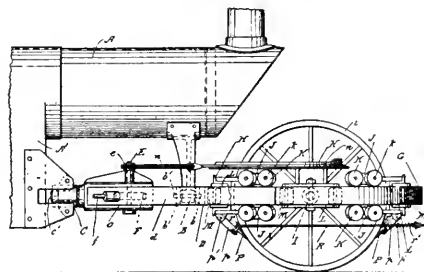
A tree shield comprising two adjustable telescopic sections having the lower edges



thereof shaped to provide pockets and the upper edges thereof shaped to interlock.

983,197. STEERING MECHANISM FOR ROAD-ENGINES. Gustaf Arvid Anderson, Waynesboro, Pa., assignor to The Geiser Manufacturing Co., Waynesboro, Pa. Serial No. 534,710.

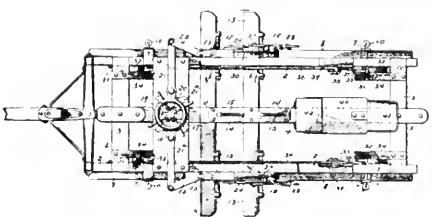
In a steering mechanism, the combination, with a support, of a main frame piv-



oted at one end and at its middle part to the said support and provided at its free end with a turntable track, said frame and track being arranged to rock on a horizontal axis, of a turntable-frame mounted on the said track and free to turn on a vertical axis, a steering road-wheel journaled in the turntable-frame, and steering mechanism for oscillating the turn table-frame and road-wheel.

982,319. SCRAPER AND GRADER. William H. Violett, Fruita, Col. Serial No. 570,476.

A scraper and grader comprising side runners, a scraper frame pivotally connected with the runners, a scraper blade



carried by said frame, a seat frame pivotally mounted upon the runners and carrying a seat, and a lever fulcrumed with relation to the runners and operatively connected with the seat frame and the scraper frame.

PERSONALS

BASS, J. W., was elected Mayor of Whiteville, Tenn.

CARTER, H. E., was elected Mayor of Bolivar, Tenn., by a majority of one over D. E. Bishop.

FURLONG, JAMES F., has been elected to the Water Board of Lowell, Mass., defeating Major Robert J. Crowley.

GREEN, CARLTON, has been appointed resident engineer at Schenectady by State Engineer Benschel, in place of E. J. Pickwick, who resigned. The salary is \$2,700.

HEARD, R. C., is the first Mayor of Grove Hill, Ala., a new municipality.

JOYNER, FRANK H., of the Massachusetts Highway Commission, has been appointed by the Board of Supervisors of Los Angeles county, California, engineer in charge of maintenance and repairs of the county highways system; salary, \$6,000.

KEUBLER, FRED L., after two months service as deputy engineer, has been appointed City Engineer of Kendallville, Ind., vice Willis Sawyer.

MEIRS, J. F., has succeeded A. K. Loeb as head of the Fire Department at Dun- cirrk, N. Y.

THE WEEK'S CONTRACT NEWS

Relating to Municipal and Public Work—Street Improvements—Paving, Road Making, Cleaning and Sprinkling—Sewerage, Water Supply and Public Lighting—Fire Equipment and Supplies—Bridges and Concrete Work—Sanitation, Garbage and Waste Disposal—Police, Parks and Miscellaneous—Proposals and Awards

To be of value this matter must be printed in the number immediately following its receipt, which makes it impossible for us to verify it all. Our sources of information are believed to be reliable, but we cannot guarantee the correctness of all items. Parties in charge of proposed work are requested to send us information concerning it as early as possible; also corrections of any errors discovered

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
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STREET IMPROVEMENTS

Pennsylvania	Wilkes Barre	Feb. 10, noon	Grad. curb. and pave. portions of streets.	Fred H. Gates, City Clerk.
Texas	San Antonio	Feb. 10, 11 a.m.	Graveling 2½ miles road.	Thos. E. Ramsey, County Auditor.
Ohio	Cleveland	Feb. 10	Paving various streets with brick and grading, curbing and paving with dressed block Medina stone.	Ira O. Hoffman, Secy. B. I. Pub. Serv.
Indiana	Frankfort	Feb. 11, 1 p.m.	Construct gravel road.	C. F. Cromwell, County Auditor.
Virginia	Norfolk	Feb. 11, 11 a.m.	Pave navy yard.	R. C. Hollyday, Chief of Bureau.
Illinois	E. St. Louis	Feb. 11, noon	Lay approx. 11,350 sq. yd. brick pave. and 7,000 lin. ft. granitoid comb. curb and gutter.	Frank B. Hanna, Clk. of Bd.
Pennsylvania	Erie	Feb. 13, 8 p.m.	Paving part of W. 20th street.	F. Hanlon, City Clerk.
Oklahoma	Oklahoma City	Feb. 13, 5 p.m.	Pave with sheet asphalt and grade various streets.	Bob Parman, City Clerk.
Massachusetts	Boston	Feb. 13	Furnishing gravel and sand.	J. E. Mullen, Supt. Supplies.
California	Riverside	Feb. 14	Grade, macad. and oil, and furn. comb. curb and gutter and galv. corrug. iron culverts.	N. A. Jacobs, City Clerk.
Illinois	Chicago	Feb. 14, 4 p.m.	Furn. approx. 1,000 tons asph. cem.; 5,000 cu. yd. crush. limestone; 520 cu. yd. crush. granite; 1,600 cu. yd. bank sand; 1,600 cu. yd. torpedo sand.	Geo. A. Mugler, Secy. W. Chicago Park Comrs.
Michigan	Menominee	Feb. 14, 2 p.m.	Constr. gravel road on bay shore.	Carl A. Anderson, Clerk.
Indiana	Covington	Feb. 14, 1:30 p.m.	Constr. improved highway.	W. B. Gray, County Auditor.
Ontario, Can.	Ottawa	Feb. 14, 4 p.m.	Furn. broken stone, brick, curb, stone sets, cement, plank and cedar, sand, etc.	Chm. Bd. Control, City Clerk.
Minnesota	Crookston	Feb. 14	Construct pavement.	Wm. H. Mahoney, City Clerk.
Ohio	Springfield	Feb. 15	Paving and macadamizing various streets.	S. N. Boland, Clerk.
Iowa	Williamsburg	Feb. 15	Road work in Troy township.	J. T. Goldenbogen, Clk. Co. Comrs.
Ohio	Cleveland	Feb. 15	Constr. Broad View road.	John F. Kenah, City Clerk.
New Jersey	Elizabeth	Feb. 15, 8:30 p.m.	Excav. 5,440 cu. yds. earth and construct curb, flag, etc.	John Bing, Dir. Pub. Serv.
Ohio	San Lusk	Feb. 15	Furn. crushed stone to repr. sts. during 1911.	
New York	Brooklyn	Feb. 15	Pave with asph. on concr. found. 1,386 sq. yd. and regulate grade and curb. also lay sidewalks on various streets, in all 55,070 sq. ft. cem. sidewalk, 10,010 lin. ft. curb, etc.; also furn. and deliver 10,000 cu. yd. asph. sand, 2,500 cu. yd. binder stone, 25,000 asph. paving blocks, 10,000 wood paving blocks, 30,000 sq. ft. bluestone flagstone, 4,000 bbl. Portland cem., 200,000 gal. tar road oil, 2,500 cu. yd. broken trap rock and 1,500 cu. yd. trap rock screenings.	Alfred E. Steers, Boro. Pres.
Alabama	Mobile	Feb. 16, noon	Lay 33,000 sq. yd. wood block pave. incl. grade and concr. foundation, with 13,426 ft. cement curb.	Board of Pub. Works.
Massachusetts	Westfield	Feb. 17, 2 p.m.	Repairing streets, including recutting and laying on concrete foundation about 11,647 sq. yd. old granite block and furn. and lay 4,185 sq. yd. new.	James R. Bryan, Chm. Com.
Massachusetts	Boston	Feb. 17	Furn. crushed stone and stone dust for year ending Feb. 1, 1912.	J. Edw. Mullen, Supt. Supplies.
Indiana	Franklin	Feb. 18, 1 p.m.	Grad. gravel and otherwise improve highway.	Wm. B. Jennings, County Auditor.
West Virginia	Huntington	Feb. 20, 1 p.m.	Paving two alleys.	John Coon, Comr. of Streets.
Ohio	Defiance	Feb. 20	Stoning 1½ mile road, approximate cost, \$5,000.	County Auditor
Massachusetts	Boston	Feb. 20, 1 p.m.	Constr. roads, walks, drains, etc. at Ft. Andrews.	Capt. A. M. Miller, Constr. Q. M.
Michigan	Ludington	Feb. 20, 4 p.m.	Pave various streets.	Dean Thompson, City Clerk.
New York	Mineola	Feb. 20, 10:30 a.m.	Constr. and impr. two county roads.	W. E. Luyster, Clk. Bd. of Supvrs.
Washington	Adna	Feb. 20	Macad. about 16,000 sq. road.	H. H. Swofford, County Auditor.
Ohio	Columbus	Feb. 23	Grade and gravel road.	F. M. Sayre, County Auditor.
Oregon	Portland	Feb. 23	Constructing pavement on Jersey st.	J. W. Morris, City Engineer.
Oregon	St. Johns	Feb. 23	Constructing several hard service streets.	A. M. Eason, City Representative.
Ohio	Cincinnati	Feb. 24, noon	Resurf. Independence st., also culvert and fill on Mt. Alverno rd.	Fred Dreises, Clk. Co. Comrs.
Dist. of Col.	Washington	Feb. 27, 3 p.m.	Pave alley at P. O. Bldg., Little Rock.	James Knox Taylor, Treas. Dept.
New Jersey	Atlantic City	Feb. 27	Pave two streets.	E. D. Rightmire, City Engr.
New York	Fort Niagara	Feb. 28	Construct concr. walks and macad. and clay roads.	Lieut. E. H. Wagner, 29th Inf. U.S.A.
New York	Sackett's Harbor	March 1, 2 p.m.	Constr. approx. 28,800 sq. ft. macad. road and 800 sq. ft. concr. walk at Madison Barracks.	Constructing Q. M.
Manitoba	Winnipeg	March 1, 11 a.m.	Supply 1,000 to 1,500 tons asphalt for paving.	A. Peterson, Secy. Bd. of Control.
Indiana	Portland	March 1, noon	Improving certain highways.	W. Lea Smith, County Auditor.
Georgia	Savannah	March 9, noon	Furn. 5,000 cu. yd. cem. gravel or like material for imp. pub. rds.	County Commissioners
Mississippi	Jackson	March 9	Constr. gravel and sand roads. \$100,000 bonds issued.	Maves Cooper, Hwy. Engr.
Minnesota	Worthington	March 13, 2 p.m.	Grade approx. 10,066 yards.	E. C. Pannell, Co. Aud.

SEWERAGE

Minnesota	Minneapolis	Feb. 10, 7:30 p.m.	Furn. sewer brick spl. castings and vitri. clay pipe.	Henry N. Knott, City Clerk.
Illinois	E. St. Louis	Feb. 11, noon	Furn. approx. 1,750 ft. 12 in., 2,000 ft. 15 in., 2,650 ft. 18 in. vit. clay sewer pipe.	Frank B. Hanna, Clk. of Bd.
Alabama	Uniontown	Feb. 13, 8:15 p.m.	Constr. sewerage system and disp. plant, incl. 1,840 lin. ft. 15-in., 3,000 ft. 12-in., 7,500 ft. 10-in., 15,200 ft. 8-in. pipe sewer.	D. P. Coleman, Mayor.
Colorado	Trinidad	Feb. 13, 8 p.m.	Construct sanitary sewer.	I. Q. Milliken, City Clerk.
Indiana	Richmond	Feb. 13	Constr. about 5,500 ft. of 12 to 42 inch sewer.	Fred R. Charles, City Engr.
Missouri	St. Louis	Feb. 14, noon	Constr. Forest Park Foul Water Sewer.	W. B. Dryden, Secy. B. P. Imp.
Iowa	Signourey	Feb. 14	Constr. sewerage system, 8, 10, 12 and 15-in. pipe, approx. 9 miles, also disposal works.	J. H. Wylie, Mayor.
South Dakota	Dell Rapids	Feb. 15, 7:30 p.m.	Constr. main and lateral and connect sewers.	Oluf Hegge, City Auditor.
North Carolina	Wilson	Feb. 15, noon	Constr. from one to two thous. ft. 30 to 49 in. brick storm sewer.	T. A. Hinnant, Clerk.
Alabama	Mobile	Feb. 16, noon	Constr. approx. 10,350 lin. ft. storm sewer ranging in size from 5x11 ft. canal to 10 in. vit. pipe; also 6,000 ft. 6 in. vit. pipe hose connect.	Board of Pub. Works.
West Virginia	Huntington	Feb. 20, 1 p.m.	Laying sewers in various streets.	John Coon, Comr. of Streets.
Iowa	Mt. Vernon	Feb. 21, 4 p.m.	Constr. 7½ mile sanitary sewer, 6 to 15 in., pipe, with septic tank and filter beds.	Wm. E. Gamble, Town Clerk.
Iowa	Clarinda	Feb. 21	Furn. one mile of 6-in. sanitary sewer.	C. W. Stuart, City Clerk.
Oklahoma	Clinton	Feb. 21, 8 p.m.	Constr. 26,000 ft. of 8-in. lateral sewers, vit. pipe, with man-holes, lampholes, etc.	C. C. Smith, City Clerk.
Minnesota	Melrose	Feb. 21	Constr. sewerage system.	F. J. Weissner, City Clerk.
Illinois	Paris	Feb. 23, 2:30 p.m.	Furn. and lay approx. 710 ft. 36-in. and 3,834 ft. of 60 in. reinf. concrete or brick sewers.	Granville Jenkins, Chm. Sewer. Com.
Maryland	Baltimore	Feb. 23	Construct Pratt St. Trunk Sewer.	J. Sewell Thomas, City Reg.
New York	Hastings-on-Hud	Feb. 24	Construct sewers in various streets. About 16,000 feet.	Jos. F. Murphy, Clerk Bd. Trust.

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
WATER SUPPLY				
Minnesota	Minneapolis	Feb. 10, 7:30 p.m.	Furn. for use in 1911 c.i. pipe, hydrants, valves and special castings, and two 30-in. meter tubes for measuring water pumped by two 20,000,000 gal. centrif. pumps.	Henry N. Knott, City Clerk
Illinois	Chicago	Feb. 11	Furn. and install two 20,000,000 gal. centrif. pumps and two 1,000 h.p. synch. elec. motors, with pip., wiring, switchbl., etc.	B. J. Mullaney, Comr. Pub. Wks. Chas. Anderson Boro. Clerk
New Jersey	South River	Feb. 13	Constr. suction well, brick and l. coner, 25 ft. diam and 133 ft. deep	
Ontario, Can.	Pembroke	Feb. 13, 2 p.m.	Lay approx. 5,900 ft. of 16-in. water main, with fixing valves and hydrants, constr. coner. pipe well and lay approx. 5,400 ft. of 18-in. lap well l steel intake pipe.	E. A. Dunlap, Chm. Water Com. Chm. Water Works Com. E. H. Goodman Town Clerk
Ontario, Can.	Ottawa	Feb. 14, 4 p.m.	Furn. brasswork, spl. pipe cast, hydrants, c.i. pipe, lead pipe, pig lead, valves, oil, grease, etc.	
Montana	Townsend	Feb. 14	Constr. water supply system.	
Ohio	Toledo	Feb. 14, noon	Constr. extension water purif. wks. incl. 14 filters, etc., capable purifying 14,000,000 gals. daily.	J. R. Cowell, Dir. Pub. Serv.
Ohio	Sandusky	Feb. 14	Furn. 8,000 lin. ft. 6, 8, 10 and 12-in. c.i. pipe, 700 water meters and 300 tons filter alum.	John Bing, Dir. Pub. Serv. R. O. Breckenridge, Town Clerk
California	Ontario	Feb. 14	Furn. pipe an l specials an l constr. water system.	
Georgia	Dalton	Feb. 16	Constr. water works incl. coner. reservoir, 2,000,000 gals. capacity, approximate cost, \$30,000.	Paul B. Trammell, Mayor. A. M. Branlenburg, City Clerk.
Montana	Bozeman	Feb. 16, 5 p.m.	Excavating for reser. and laying coner. approx. 4,846 sq. yds.	Frank D. Howe, City Clerk.
Nebraska	North Bend	Feb. 17, 8 p.m.	Install pumping sta. incl. l. wells pipes, engines, etc.	City Clerk.
California	Madera	Feb. 20, 8 p.m.	Constr. water system.	S. E. Levorsen, City Clerk.
Minnesota	Fergus Falls	Feb. 20	Furn. 1,200 ft. of 6-in. and 500 ft. of 4-in. c.i. pipe, c.i. T's, etc.	
Quebec, Can.	Mont. Laurier			
	(P.O. Rapide de L'Original)	Feb. 20	Construct water supply.	Anthime Dubreuil, Mayor.
Iowa	Marshalltown	Feb. 20, noon	Install waterwheels, pumps, etc., at dam.	F. B. Wiley, City Clerk.
BRIDGES				
Quebec, Can.	St. Geo. de Beauce	Feb. 13	Constr. iron and coner. bridge over Chaudiere river.	Chas. Boldus, Secy. Treas.
Virginia	Richmond	Feb. 15	Constr. bridge over Great Creek near Lawrenceville.	P. St. J. Wilson, St. Hwy. Comr.
Ohio	Columbus	Feb. 23	Constr. floors on and grade for various bridges.	County Commissioners
Ohio	Cincinnati	Feb. 24	Construct culvert and fill on Mt. Alverno Road.	F. Dreih, Clk. B. I. Co. Comrs
South Dakota	Yankton	Feb. 27, 7:30 p.m.	Constr. steel reinforced coner. bridge over Rhine creek.	John W. Summers, County Auditor.
Ohio	Springfield	Feb. 28	Constr. 120 ft. bridge over Mad river.	County Commissioners.
Virginia	Danville	March 1	Constr. superstructure for bridge, est. cost \$40,000.	J. O. Wayman, City Engr.
New York	Kingston	March 2	Construct concrete bridge across creek at Eldyville.	Jas. F. Loughran, Supt. Hwys.
California	Los Angeles	March 6, 2 p.m.	Constr. concrete arches, graveled approaches, curbs, fences, hand-railing, pylons, etc., across Arroyo Seco and extension of Pasadena Ave.	H. T. Lelande, County Clerk City Clerk.
California	South Pasadena	March 6, 2 p.m.	Constr. 6 arch coner. bridge, 600 ft. long.	
LIGHTING AND POWER				
Ohio	Niles	Feb. 11, noon	Furn. transformers, incand. lamps, solid carbons 1/2 x 12 in., cored carbons 1/2 x 12 in., light meters.	Clare Caldwell, Dir. Pub. Serv. John Griffiths, Secretary.
Pennsylvania	Washington	Feb. 20, 7:30 p.m.	Light borough for five and ten years, commencing May 1.	Frank Good, City Auditor.
West Virginia	Parkersburg	Feb. 23, 8 p.m.	Furn. and install elec. light plant.	E. T. Nichols, City Clerk.
Iowa	Atlantic	March 1	Imp. Elec. Lt. and Power Plant, probable cost \$40,000.	Lewis Lukes, Apartado 58.
Mexico	Monterey, N. L.	March 1	Erection of gas plant.	Davi Ewing, Ch. Engr.
Alberta, Can.	Strathcona	March 1	Install engines, boilers an l generators.	Comr. Rourke, D. P. W.
Massachusetts	Boston	March 1	Furn. street light by 12,000 gas lamps.	
Pennsylvania	Coraopolis	March 1, 7 p.m.	Furn. one 1,500,000 gal. triplex pump; one 150 h.p. gas eng. for driving pump; two 225 h.p. gas engines, to be d.r. con. to 175 K.V.A., 2,300 volts, 60 cycles, 3 phase alter. cur. gener.; one 75 h.p. gas engine to be dir. con. to 50 K.V.A.; two 175 K.V.A., 2,300 volts, 60 cycles, 3-phase alter. cur. gener., comp. with exciters; one 50 K.V.A.; one 5-panel switchboard, compl. one 50-light series, luminous or metallic flame arc lamp equipment complete.	Borough Clerk.
FIRE EQUIPMENT				
Washington	Seattle	Feb. 10	Furn. 2,000 ft. of 3 1/2 in. and 3,000 ft. of 3 in. rubber lined cot. h	H. W. Carroll, City Clerk.
Washington	Spokane	Feb. 10, 2 p.m.	Furn. 25 fire alarm boxes.	John Gifford, City Purchas. Agt.
California	Los Angeles	Feb. 14	Furn. one motor propelled city service hook and ladder truck, with 80 h.p. motor; one motor propelled comb. chem. and hose wagon, 80 h.p.; three chassis, motor, 50 h.p.	L. A. Handley, City Clerk Commissioners of the Dist. of Col.
Dist. of Col'bia	Washington	Feb. 15, 2 p.m.	Furn. one gasoline motor driven fire eng. and hose wagon comb	
Montana	Helena	Feb. 29, 8 p.m.	Furn. comb. auto. fire wagon, carry, 2,000 ft. hose and one 35 gallon chemical tank	J. A. Mattson, City Clerk.
Montana	Bozeman	March 2, 5 p.m.	Furn. 80 to 90 h.p. A. L. A. M. rating auto, chem. gasoline wagon with speed of 45 mi., including 1,200 ft. of 2 1/2 hose, 40-gal. chemical, tank, etc.	A. M. Branlenburg, City Clerk. E. M. Uplike, Chm. F. & W. Com.
New Jersey	Princeton	July 5	Furn. auto pumping engine.	
MISCELLANEOUS				
Louisiana	New Orleans	Feb. 10, 11 a.m.	Furn. uniforms for city police force.	Jas. McRacken, Acting Mayor.
Oklahoma	Mangum	Feb. 14, 7 p.m.	Erect city hall and fire station.	City Clerk.
Nebraska	Rushville	Feb. 15, noon	Erect jail and sheriff's residence.	J. F. Wasmund, County Clerk
Dist. of Col'bia	Washington	Feb. 17, 10:30 a.m.	Furn. rod and angle reinforcement materials for concrete piles, brakeshoe keys and hose.	Gen. Purch. Officer, 1sth. C. Com
Washington	Spokane	Feb. 17, 2 p.m.	Furn. 1 five pass'gr. elec. auto.	John Gifford, City Purch. Agt
Pennsylvania	Wilkes Barre	Feb. 10, noon	Furnish. 200 shade trees.	Park Commission.
North Dakota	Grand Forks	Feb. 20	Constr. new city hall.	City Auditor.

STREET IMPROVEMENTS

Montgomery, Ala.—Board of Revenue is considering large number of petitions for new roads and improvements on old ones.

Trinity, Ala.—Construction of turnpike road connecting Decatur and Courtland turnpikes is being considered.

Solomonville, Ariz.—Territorial road will be built from Globe through Gila Valley to Clifton, thence to Springville.

El Centro, Cal.—City is considering 35,000 sq. yds. of paving.

Greeley, Cal.—Weld County Commissioners are considering \$1,000,000 bond issue to build 600 mi'es of macadam roads.

Los Angeles, Cal.—Supervisor Nellis has reported about 3,960 lin. ft. needed to be improved on Slauson ave., which will connect present highway project on Compton ave. with Huntington Park, where one section of Long Beach blvd. begins; material will cost \$2,217.60 for rock and \$440 for oil; similar stretches of road in other parts of

county will be improved from time to time as the local road districts wish it done.

Redwood City, Cal.—Plans and specifications have been completed for improving certain streets in District No. 15; cost \$10,680.

San José, Cal.—Widening of San Fernando st. is being considered.

New London, Conn.—Council has decided to lay granolithic sidewalks at cost of \$150,000.—C. R. Darron, Highway Commissioner.

Stamford, Conn.—Contract will be let at once for several more blocks of paving. Address Mayor Blanchett.

New Castle, Del.—Citizens will vote April 14 on \$30,000 bonds to pave streets.

Washington, D. C.—Manager of a stone-crushing company in Far East advises American consul that he wishes to purchase machine capable of crushing hardest rock; crusher is wanted which can be guaranteed to last for one year, working 12 hours daily; the quarry produces 500 tons daily, stone

being crushed to size suitable for ballast for railways; an automatic stone driller is also wanted. Address No. 6165, Bureau of Manufactures.

Atlanta, Ga.—Improvement of West Mitchell st. is being considered.

Atlanta, Ga.—Bids will be received about April 1 for 4,400 lin. ft. wood block at cost of \$40,000.—R. M. Clayton, City Engineer.

Belleville, Ill.—Bids will be received about Feb. 15 for paving in C st. district; cost \$75,000.—F. J. Kern, Mayor.

Cairo, Ill.—Local Board of improvements is considering estimates for filling and paving of three streets and filling of five other streets; resolutions have been adopted covering improvements, total amount of which will be \$56,630.

Jacksonville, Ill.—Board of Local Improvements has rejected all bids for laying brick pavement on Franklin St.—H. N. Bancroft, President.

Lincoln, Ill.—Board of Local Improvements is considering boulevarding and paving of number of streets during summer.

Moline, Ill. Cost of widening 5th ave. has been estimated at \$6,131.—C. G. Anderson, City Engineer.

Peoria, Ill. Board of Local Improvements is considering paving of Lydia and Missouri aves. and Window st. in two sections.

Angola, Ind.—Council has decided to pave public square.

Logansport, Ind.—Board of Public Works will ask for new bids for paving Fifth ave. with vit. brick; City Engineer H. H. Thompson is preparing plans for resurfacing Market St. with asphalt and paving North st. with vit. brick.

Peru, Ind.—Bids will be received about Feb. 14 for six blocks of vit. brick paving.—J. Horan, City Engineer.

Rushville, Ind.—New bids will soon be asked for constructing Jas. Brown gravel road in Anderson Township.

Cedar Rapids, Ia.—Council has adopted specifications for paving and curbing during year; \$85,000 will be spent for former and \$7,000 for latter.

Charles City, Ia.—City is considering paving of one mile.

Keokuk, Ia.—Paving of portion of North D st. is being considered.

New Iberia, La.—City is considering considerable street paving.

Annapolis, Md.—City will pave 2d, Madison, Washington and Clay sts. with tar or asphalt macadam.—J. C. Little, City Engineer.

Annapolis, Md.—The City Clerk will receive bids Feb. 10 on \$20,000 bonds for street improvements.

Rockville, Md.—Good Roads Commission will improve $4\frac{1}{2}$ miles of road from this city to Norbeck.—M. Donaldson Knight, Superintendent of Roads Montgomery County.

Boston, Mass.—Council has passed order requesting State Highway Commission to construct for width of 60 ft. Washington st. from LaGrange st., West Roxbury, to Dedham line, at cost of \$24,000.

Boston, Mass.—Bill has been filed with State Senate to authorize Massachusetts Highway Commission to expend \$15,000 for purpose of constructing a State road from the New Hampshire line to Salisbury beach.

Chelsea, Mass.—City is considering paving of Marginal st. at cost of \$8,000.—Wm. E. McClintock, Chairman Board of Control.

Springfield, Mass.—Superintendent A. A. Adams, Street Department, has asked for \$100,000 for paving during coming year.

Adrian, Mich.—City is considering improvement of number of streets.—John Mawdsley, City Clerk.

Detroit, Mich.—Board of Public Works will ask for bids for paving Wreford ave. with sheet asphalt at cost of \$6,720.—J. J. Haarer, Commissioner.

Detroit, Mich.—Bids will be asked by Department of Public Works for paving following streets with cedar blocks: Beaufort ave., \$24,815; Willis ave., \$21,000; Bern st., \$17,424; Missouri ave., \$9,120; Dearborn ave., \$11,664; Dix ave., \$13,464; also Canton ave. with sheet asphalt, \$24,600.—C. A. Nichols, City Clerk.

Lansing, Mich.—Estimates will be prepared by the City Engineer for tearing up and relaying on concrete foundation of pavement on Michigan ave.

Albert Lea, Minn.—Council is considering paving of about one mile of streets.

Breckenridge, Minn.—County Commissioners are considering building of road from this city to Otter Tail county line.

Mankato, Minn.—City is considering laying of about 45,000 yds. of brick paving.—John Wilson, City Engineer.

Winona, Minn.—City will pave 7,000 yds. with brick during summer.—H. Walling, City Engineer.

Springfield, Mo.—Bids will be received by City Engineer C. E. Ferguson for brick paving on Grand ave., National Blvd. to King's Highway, 4881.33 sq. yds., and Hassam paving, patented, on Campbell st., College st. to Olive st., 1,063 sq. yds.

St. Joseph, Mo.—Proposition of making boulevard out of Highland ave. from St. Joseph ave. to Dewey ave., distance half a mile, will be taken up by Park Board with George Kessler, Landscape Architect.

Omaha, Neb.—City will soon let contracts for street improvements to cost \$200,000.

Boonton, N. J.—Improvement of streets is being urged.

Collingswood, N. J.—Paving of number of streets is being considered.

New Brunswick, N. J.—Freeholders of Middlesex and Somerset Counties have passed resolutions to macadamize Franklin Park-Little Rock Hill road between the two counties.

Albany, N. Y.—State Highway Commission has reported that \$40,000,000 in addition to the \$50,000,000 already authorized will be needed to complete State and county systems of improved highways.

Corning, N. Y.—Bids will be received about April 1 for five blocks of brick paving at cost of \$35,000.—R. H. Canfield, City Engineer.

Lion, N. Y.—Paving of Main st. is being considered.

Lackawanna, N. Y.—Citizens have voted in favor of paving Ridge road, South Park ave. to Hamburg turnpike with Medina stone; cost \$126,000.

Niagara Falls, N. Y.—City has sold \$15,000 grade crossing bonds to Chisholm & Chapinan, New York; bids will soon be asked by Grade Crossing Commission for approaches to structure over New York Central track on North 11th st.

Troy, N. Y.—Estimated cost of paving 6th ave., Rensselaer to Middleburgh st., is \$7,330.—Edmund J. Sweeney, City Clerk.

Watervliet, N. Y.—Mayor Hanratta has recommended paving of Broadway north of 19th st.; 19th st. west of 12th ave. will be improved in spring.

Ft. Recovery, O.—Stacy & Braun, Toledo, have purchased \$19,500 street paving bonds.

Geneva, O.—City is considering paving of business section with brick on concrete foundation.

Pleasant Ridge, O.—Council has instructed Village Engineer James E. Stewart to prepare plans and estimates for macadam street, curb and gutter in Forest pl. and for a sidewalk in Bell and Penn sts.

Youngstown, O.—Property holders on West Federal st. are endeavoring to secure widening of street.

Portland, Ore.—Proceedings for paving all streets from Grand ave. to East 20th st. and from Hawthorne ave. to East Burnside have been started by Council.

The Dalles, Ore.—City is planning to expend about \$175,000 this year for street paving.

Altoona, Pa.—City Engineer Frans Engstrom has directed communication to members of Councils soliciting information concerning unimproved highways of city.

Erie, Pa.—Consulting Engineer George N. Kimball, Detroit, has submitted final plans for elimination of grade crossings.

Philadelphia, Pa.—Council has passed \$30,000 appropriation to enable Mayor Reyburn to prepare plans for improvement and development of city and for an exhibition of Comprehensive Plans' Committee exhibits.

Springdale, Pa.—Borough is considering election on \$10,000 for grading public streets and alleys.—R. M. Sample, President.

Chattanooga, Tenn.—Boulevard Commission and Board of Public Works have adopted plans submitted by City Engineer Hooke looking to opening of Rossville ave. from East End ave. to terminus of present boulevard, and widening of East End ave. from Main st. to Rossville ave.

Dallas, Tex.—Municipal Commissioners have ordered paving of Bryan st., distance about one mile; bids have been asked for grading Jefferson st. and opening and grading Turtle Creek drive.

Dallas, Tex.—City Commissioners have decided to pave portion of East Ross ave. at cost of \$19,805.28 if bitulithic is used, or \$24,029.54 if brick is used.

San Marcos, Tex.—Council has decided to call election on \$4,000 street improvement bonds.

Staunton, Va.—Augusta County is considering election on \$1,000,000 bonds to macadamize 200 miles of public roads.

Spokane, Wash.—Councilman A. T. Cartwright is interested in proposed organization of paving district on south side.

Tacoma, Wash.—Commissioner Owen Woods, of Department of Public Works, will soon call for bids for pavement of the South Tacoma Blvd. from Center st. on the north to the city limits on the south, as well as extension of the Pacific ave. pavement south to city limits; cost about \$500,000.

St. Lambert, Que., Can.—Citizens will vote on \$225,000 street and sewer debentures.

Victoria, B. C., Can.—Plans and specifications are being drawn preparatory to calling for tenders for large amount of street work contemplated.—Angus Smith, City Engineer.

CONTRACTS AWARDED

National City, Cal.—Improving Ave. A, to Clouse & Peabody, San Diego.

East St. Louis, Ill.—Improving Linden ave., to Meyer & Thomas, city, \$3,584.50; 40th st., to same, \$20,956.45.

Moline, Ill.—Brick paving, to Gust Ed Construction Co.; 20th st., \$3,705; 3d ave., \$21,298.

Springfield, Ill.—Paving East Edwards st., to N. Nitch & Son, \$1.49 per sq. yd. for paving and 48c. per lin. ft. for curbing.

Bloomfield, Ind.—Building macadam road in Green County, to Samuel Hays, Wilmington, \$5,010.

Crawfordsville, Ind.—Building rock road

in Montgomery County, to Geo. B. Lynch, \$7,699.

Greencastle, Ind.—Building gravel road in two townships, to A. G. Day, Greencastle, \$6,500.

Lafayette, Ind.—Building macadam road in Fairfield Township, to Wm. F. Frey, \$6,231.

Lebanon, Ind.—Building brick roadway and curb on North Lebanon st., to Geo. I. Miller, \$6,432.

Peru, Ind.—Building two gravel roads in Washington Township, to H. C. Modlin & Co., \$11,492.

Richmond, Ind.—Building sidewalks, to A. F. Hoelen, D. Schneider Bros. and Daniel Burkhardt.

Terre Haute, Ind.—Constructing a gravel road in Sugar Township, to Thomas Glynn, \$12,290; other bidders: Hawkins Bros., \$12,589; M. C. Lloyd, \$13,000; O. T. Piety, \$13,400; J. P. Peters, \$12,000; W. C. Dorsey, \$13,040; Joseph McGuire & Son, \$13,021.

WilliamSPORT, Ind.—Graveling road in Jordan Township, to W. W. Crane, Hedrick, \$5,000.

Jennings, La.—To De Jersey & Barnard for construction of eight or ten miles of sidewalk and curbing.

New Orleans, La.—To Roach & Manigan, Memphis, Tenn., for laying about 6,000 yds. of asphalt paving, about \$18,000.

Bainbridge, N. Y.—Improving Dugway road, to Newport Construction Co., Newport, N. Y.

New York, N. Y.—Repairing sheet asphalt pavements in Borough of Manhattan, to Uvalde Asphalt Co., 1 Broadway, \$266,800; repairing asphalt pavement along North, East and Harlem Rivers, to Sicilian Asphalt Paving Co., 41 Park Row.

Akron, O.—To W. W. Hatch & Sons Co. for building of section 4 of public road to be paved between Akron and Cuyahoga county line, \$80,000; brick is to be used.

Cincinnati, O.—Improving Dayton pike, to Wm. P. Flynn, \$5,634.

Fosteria, O.—To Modern Construction Co., Fremont, for 21,000 sq. yds. of brick paving.

Erie, Pa.—Paving Parade st. with Bessemer brick, to J. & M. Doyle, \$7 per sq. yd.; base, 40c.; curbing, 30c.; inlets and spills, \$5 each; 9-in. pipe, 80c. per ft.; 6-in. pipe, 60c.

Memphis, Tenn.—To Koehler & Co. for paving three streets, about \$10,000.

Beaumont, Tex.—County Commissioners have purchased \$25,000 worth of oyster shells from Walter A. Myrick at 75c. per cu. yd.

Fort Worth, Tex.—To the Texas Bitulithic Co. for paving North st., \$2.08%, and to General Construction Co. for paving East 16th st., \$2.11%.

Hillsboro, Tex.—To Ockander Bros., Temple, for paving streets within business district with Hassam pavement, \$1.95 per sq. yd.

San Antonio, Tex.—By Los Angeles Heights Improvement Co., George HogeStein, President, to C. E. Miller for 1,000,000 ft. of cement sidewalks on Los Angeles Heights.

Everett, Wash.—Improvement of Hoyt ave., to Atlas Construction Co., \$10,945.

Pasco, Wash.—Grading business section and a part of the residence section, to Jordan & Wright, Ellensburg, 38c. per cu. yd. and 1½c. for overhaul.

Seattle, Wash.—Replanking 6th ave. South, to Elmer Johnson, 1018½ Franklin ave., \$3,090.90.

Tacoma, Wash.—To Warren Construction Co. for street paving in Districts 27 and 28, \$23,448.

BIDS RECEIVED

Stockton, Cal.—Improving Cherokee lane, lowest bidders: For bridges, F. H. Martin, \$4,695; for repairing, W. J. O'Brien, \$41,771.65.

Springfield, Ill.—Paving (a) 16,750 sq. yds. brick pavement on Edward st., asphalt fill, 6-in. rock foundation, 2-in. sand cushion, (b) 10,860 lin. ft. sandstone curb, (c) 6,100 sq. yds. brick pavement on Jackson st., (d) 3,750 lin. ft. sandstone curb; John E. Bretz, city, (a) \$1.54, (b) and (d) 47c.; (c) \$1.57; R. P. Egan, city, (a) \$1.54, (b) 52c., (c) \$1.515, (d) 51c.; Henry Nelech & Son, city, (a) \$1.525, (b) and (d) 48c., (c) \$1.495; John Striffler, 215½ S. 5th st., city, (a) and (b) \$1.64, (c) and (d) 53c.

New Bedford, Mass.—Furnishing paving blocks: (a) 200,000 blocks, small, (b) 300,000 blocks, large; Flavia Cote, (a) \$1.50 per sq. yd., (b) \$1.58; Buzzards Bay Pink Granite Co., (a) \$1.50, (b) \$1.65; John B. Sullivan & Son, (a) \$1.65, (b) \$1.65; N. B. & Dartmouth Granite Co., (a) \$1.65, (b) \$1.65; New England Granite Co., Westery, (a) \$1.57½, (b) \$1.57½; Smith Granite Co., Westery, (a) \$1.58, (b) \$1.58; Simpson Bros. Corp., Boston, (a) \$1.69; F. A. Mallory, North Chelmsford, (a) \$1.79, (b) \$1.79.

SEWERAGE

Attalla, Ala.—City will soon open bids for stallation of sewer system; \$30,000 bonds have been authorized.

New Decatur, Ala.—City will expend \$9,400 for storm sewers of brick and pipe.—M. A. McCala, Decatur, Engineer; Henry Artung, City Clerk.

Fordyce, Ark.—No contract was let by the Commissioners of Sewer District No. 1 for construction of approximately six miles of sanitary sewers and two septic tanks.—M. J. Parks, Main st., Pine Bluff, Engineer.

Los Gatos, Cal.—Town Engineer R. B.andler has prepared profile and plans for proposed septic tank, filter bed and outlet sewers; cost \$30,000.

Oakland, Cal.—Plans and specifications for the extension of the big storm sewer of Lake Shore ave. to Lake Merritt and from commencement northeast to Mandana vd. have been prepared and work on the project will be rushed by City Engineer urner.

Winters, Cal.—Trustees have awarded to W. Jasper contract for making surveys or proposed sewer system.

Colorado Springs, Col.—City is considering \$40,000 expenditure for sewers.

Aurora, Ill.—Plans for sewers in District 0, 7 and Pigeon Hill have been prepared y City Engineer Myron Tarble.

Kokomo, Ind.—Bids will be received about pril for sewer construction, at cost of 0,000.—Jackson Morrow, Engineer.

Westfield, Ia.—Installation of septic sewer stem is being considered.

Donaldsonville, La.—Mayor Maurin has en authorized to secure engineer to es-imate cost of installing sewer system.

New Iberia, La.—City is considering in-allation of sewer system.

Cassopolis, Mich.—Village will issue \$30,00 bonds for installation of sewer system.

Manistee, Mich.—City is considering in-allation of sewers on six streets with terials on Elm, Spruce and Pine sts.

Mankato, Minn.—City is considering con-struction of one mile of sewer.—John Wil-n, City Engineer.

St. Cloud, Minn.—Bids will be received ut May 1 for sewer work; cost about 1,000.—S. S. Chute, City Engineer.

Paris, Mo.—Preliminary plans are being epared by Engineers Rollins & Westover, als Bldg., Kansas City, for system of ewers.

Sparks, Nev.—Consulting Engineer Louis Ke-sey, 402 Dooly Bldg., Salt Lake City, ah, has recommended reconstruction of nitary sewerage system at estimated cost \$33,476.06; report has been adopted by uncil; bonds will be issued, when bids ill be asked for construction.—W. J. Stin-n, Mayor.

Bogota, N. J.—City instead of joining th Hackensack and other municipalities matter of a sewage disposal plant will ill plant of its own.

Cliffside, N. J.—Plans have been com-eted for a sewer system for Cliffside Park; t about \$50,000.

Hightstown, N. J.—Town has decided to end \$40,000 for sewer system; work will gin at once. Address Mayor Blauvelt.

Binghamton, N. Y.—Council has decided on-struct sewer on Charles st.

Brewster, N. Y.—Plans will be prepared y T. H. McKenzie, Southington, Conn., for sewer system.

Corona, N. Y.—Business Men and Tax-er Association is interested in proposed stallation of trunk sewer system.

Far Rockaway, N. Y.—Construction of a sewer system for this place is being con-dered by Local Board.

North Pelham, N. Y.—Village has voted enter into contract with village of Pel-m to construct outlet sewer through cer-n streets in Pelham as far as northerly de of Colonial ave.; also to issue \$15,000

London, Ont., Can.—Engineer Van Cleve has recommended storm sewer system for city.

Nelson, B. C., Can.—City Engineer G. C. Mackay has recommended sewer construc-tion in south of city at once at cost of \$4,703.

New Westminster, B. C., Can.—Plans for sewerage systems in the west and east end of the city will be prepared by the City Engineer.

Porcupine City, Ont., Can.—Plans for sewers are being considered.

St. Lambert, Que., Can.—Citizens will vote on \$225,000 sewers and street deb-en-tures.

Momence, Ill.—Bids received by Board of Local Improvements, Jan. 11, for construct-ing concrete and vitrified clay pipe sewers: (A) Kinney & Vineyard, Evansville, Ind.; (B) Langan & Clifford, Waukegan; (C) A. C. Schrieter, Manitowoc, Wis.; (D) William oran & Co., Joliet; (E) Avery, Alpine & Co., Kankakee; (F) Henry McMullin, Kankakee; Union Engineering Co., Chicago, made lump sum bid of \$45,792.—H. P. Hallett, Aurora, Engr.

Louisville, Ky.—Bids received by Commissioners of Sewerage, Jan. 20, for installing Second st. sewer: (A) James Ferry & Sons, Inc., Pittsburg, Pa.; (B) Henry Bickel Co., City; (C) C. T. McCracken & Co., Columbus, Ohio; (D) L. W. Hancock Co., City; (E) B. C. Milner & Sons Co., City.

	A	B	C	D	E
1,425 lin. ft. earth excavation and refilling	\$9 30	\$10.00	\$11.20	\$10 80	\$15.00
1,005 lin. ft. earth excavation and refilling	7 10	8 50	6 30	7 00	13 00
30 lin. ft. branch sewers	10.00	6 50	25.00	7 00	13.00
800 cu. yds. concrete masonry	11 50	11 00	11 00	11 50	13 00
21 cu. yds. concrete in manholes and sewers	15.00	18.00	15.00	20.00	13.00
5 sq. yds. brick masonry	3 50	3 00	5 00	5 00	4 60
10 cu. yds. excavation below masonry	3.00	2.00	1.00	4.00	2 30
10 cu. yds. gravel refilling below masonry	3.00	1 50	4 00	4 00	2 30
Vitrified pipe (lump sum)	275 80	220.64	275 80	275 80	297.86
300 lin. ft. 8-in. underdrain . . . . .	.35	.35	.35	.35	.35
Cleaning up (lump sum)	500.00		150.00	500.00	1,300.00
Totals	\$31,161	\$32,541	\$32,792	\$33,241	\$47,275

bonds to defray the expenses of construc-tion of such an outlet sewer.

Wilmington, N. C.—Plans for sewer sys-tem are being considered by State Board of Health; cost about \$140,000.

Flasher, N. D.—C. F. DeLamere, Consult-ing Engineer, Bismarck, N. D., is preparing plans and estimates of cost of installation of sewer system.

Cincinnati, O.—City Engineer Shipley has submitted to Service Director Sundmaker estimate of cost for new sewer to be built in McKeone, Schiff and Lewis sts. at \$34,378.70.

Muskogee, Okla.—Citizens will vote Feb. 16 on \$650,000 bond to improve sewerage and water systems and construct garbage in-cinerator.

The Dalles, Ore.—Plans are being pre-ared for proposed sewer system.

Hastings, Pa.—Bids will soon be asked for construction of sewage disposal plant.

Millersburg, Pa.—City will expend \$2,000 for sewers.—W. L. Reidenbach, Engineer; S. Franks, City Clerk.

Springdale, Pa.—Borough is considering election on \$12,000 for construction of sew-ers.—R. M. Sample, President.

Uniontown, Pa.—Engineer J. B. Hogg has prepared plans and specifications for con-struction of \$150,000 sewage plant.

West Chester, Pa.—Borough Council is discussing other plans for proposed sewage system and disposal plants.

Madison, S. D.—Citizens will vote April 18 on bonds for construction of sewers.

Dallas, Tex.—Municipal Commissioners have decided to construct storm sewer on Columbia st. at cost of \$9,068.72.

Houston, Tex.—Plans and specifications have been submitted by Consulting Engi-ner Frank L. Dormant for storm sewer in Sawyer st., Decatur st. to Washington ave.

Pecos, Tex.—Citizens have defeated pro-posed bond issue for sewerage system; new election will be called.

Davenport, Wash.—Council will ask bids at once for construction of sewer system through main part of city at cost of \$6,000.

Esquimalt, B. C., Can.—Plans have been prepared for construction of \$250,000 sewer system.—J. H. Mohun, Victoria, Engineer in Charge.

Hamilton, Ont., Can.—Tenders for supply of concrete pipe for sewers in west end will be called.

London, Ont., Can.—Engineer Van Cleve has recommended storm sewer system for city.

Nelson, B. C., Can.—City Engineer G. C. Mackay has recommended sewer construc-tion in south of city at once at cost of \$4,703.

New Westminster, B. C., Can.—Plans for sewerage systems in the west and east end of the city will be prepared by the City Engineer.

Porcupine City, Ont., Can.—Plans for sewers are being considered.

St. Lambert, Que., Can.—Citizens will vote on \$225,000 sewers and street deb-en-tures.

	A	B	C	D	E	F
70 lin. ft. 36-in. concrete pipe	\$3 20	\$3 20	\$4 10	\$3 50	\$3 50	\$3 25
60 lin. ft. 30-in. concrete pipe	2 90	2 65	3 00	3 00	3 00	2 25
100 lin. ft. 24-in. concrete pipe	2 20	2 25	2 37	2 00	2 00	2 00
10 lin. ft. 24-in. vitrified pipe	1 80	1 83	2 38	2 00	1 90	2 10
100 lin. ft. 18-in. vitrified pipe	1 10	1 31	1 62	1 65	1 75	1 56
75 lin. ft. 15-in. vitrified pipe . . . . .	.90	1 06	1 09	1 33	1 30	1 45
25 lin. ft. 12-in. vitrified pipe . . . . .	.70	.85	.93	1 33	1 20	1 30
25 lin. ft. 10-in. vitrified pipe . . . . .	.70	.86	.88	1 03	1 15	1 15
25 lin. ft. 8-in. vitrified pipe . . . . .	.60	.70	.55	1 03	.80	1 10
9 manholes & flush tanks, combined	48.00	65.00	50.00	50.00	55.00	85.00
53 manholes	25.00	28.00	30.00	26.00	30.00	35.00
98 catch basins	25.00	30.00	30.00	26.00	30.00	35.00
25 cu. yds. concrete	6 00	6 50	9 00	9 75	9 00	8 60
1 M. ft. B. M. lumber in place	20 00	30 00	35 00	25 00	30 00	30 00
1 cu. vd. extra excavation	1 50	1 50	.65	1 75	1 75	3 00
100 lin. ft. 20-in. iron pipe	2 50	2 70	3 00	2 70	3 75	5 10
Totals	\$30,862	\$34,830	\$38,162	\$41,357	\$41,526	\$43,572

CONTRACTS AWARDED

Denver, Col.—Building sewers, North Side Improvement District No. 12, to Denver-Pueblo Construction Co., \$29,333; Capitol Hill Improvement District No. 6, to Clinton Construction Co., \$29,291.

Richmond, Ind.—Building sewer between Chestnut st. and Pennsylvania Railroad, to Philip Hipskind, Wabash, \$4,200.

New York, N. Y.—Sewers in Buena Vista ave., to John C. Rodgers, Jr., 121 W. 125th st., \$15,403.

Dallas, Tex.—Building storm sewer on Haskell st., to C. W. Ocott, \$8,516.40; other bidders: Dallas Home Improvement Co., \$8 870.20; Tarrant Construction Co., \$8,622.21; Dallas Lime and Gravel Co., \$9,153.79.

Auburn, Wash.—Constructing 8,000 ft. sewers, to Hicklin Plumbing and Heating Co., city, \$4,150.

BIDS RECEIVED

Chicago, Ill.—Furnishing necessary lead pipe during year; Gardiner Metal Co., 1374 W. Lake st., lowest bidder, 5.04c. per lb.; furnishing sewer pipe, Wm. E. Die & Co., 108 La Salle st., lowest bidder, 30,000 ft. of 4-in., 3 2-5c. per ft.; 600 ft. 6-in., 5c.; 600 ft. 9-in., 10c.—B. J. Mullaney, Commissioner of Public Works.

Louisville, Ky.—Contract 77, sewers on 2d st.: Jas. Ferry & Sons, Inc., Pittsburg, Pa., lowest bidder, as follows: 1,425 lin. ft. earth excavation and refill, \$9.30; 1,005 lin. ft. earth excavation and refill, \$7.10; 30 lin. ft. earth excavation, branch sewers, \$10; 800 cu. yds. concrete masonry, \$11.50; 21 cu. yds. concrete in branch sewers and concrete in manholes, \$15; 5 sq. yds. brick masonry, \$3.50; 10 cu. yds. excavation below masonry, \$3; 10 cu. yds. gravel refill below masonry, \$3; vit. pipe, \$276; 300 lin. ft. 8-in. underdrain, 35c.; cleaning up, lump sum, \$500; total, \$31,161; totals of other bidders: Henry Bickel Co., city, \$32,541; C. T. McCracken & Co., Columbus, O., \$32,792; L. W. Hancock Co., city, \$33,241; B. C. Milner & Sons Co., city, \$47,275.

Elizabeth, N. J.—Repairing sewer on Washington ave., extending from Edgar road to Garden st., T. Foster Callahan, 11-229.50; John C. O'Neil, \$1,149; James Jacques, \$999.99.

WATER SUPPLY

Morgan Hill, Cal.—Citizens are consider-ing construction of water works.

Riverside, Cal.—City will consider pur-chase of domestic water system.

Sacramento, Cal.—National Board of Fire Underwriters has recommended installation of two additional pumps of 10,000,000 gals. each and two 250-h.p. boilers at pumping station; also installation of additional gate valves and pumps.

Grand Junction, Col.—Citizens will vote March 28 on either purchase of Kannab Creek water rights or for artesian water system.

Tampa, Fla.—Residents of Palmetto Beach section have asked for extension of water mains.

Chicago, Ill.—Finance Committee of Council has voted \$151,000 appropriation to enlarge pitometer system of Water Bureau in order to stop waste of city water.

Herrin, Ill.—Bids will be received about April 1 for construction of reservoir; cost about \$75,000.—R. L. Adams, Engineer.

Adair, Ia.—Contract will be let in March for proposed water works from plans of W. K. Palmer Co., Kansas City, Mo.; cost about \$20,000.—J. J. Hayden, City Clerk.

Altoona, Kan.—Plans are being prepared by Engineers J. S. Worley & Co., Reliance Bldg., Kansas City, Mo., for system of water works.

Coldwater, Kan.—Final plans are being prepared by Engineers J. S. Worley & Co., Reliance Bldg., Kansas City, Mo., for system of water works and electric light plant; cost \$30,000.—W. E. Baker, City Clerk.

Englewood, Kan.—Citizens have voted bonds for the construction of system of water works.—J. S. Worley & Co., Reliance Bldg., Kansas City, Mo., Engineers.

LaCygne, Kan.—Preliminary plans are being prepared by Engineers J. S. Worley & Co., Reliance Bldg., Kansas City, Mo., for system of water works and electric light plant; cost \$30,000.—C. L. Potter, Mayor.

Luray, Kan.—Town is considering installation of water and electric lights.

Mound City, Kan.—Plans have been completed by Engineers J. S. Worley & Co., Reliance Bldg., Kansas City, Mo., for system of water works.

Sylvan Grove, Kan.—Town is considering installation of water and electric lights.

Donaldsonville, La.—Council is considering installation of 1,000-ft. extension to water system.

Lunenburg, Mass.—Town has petitioned State Legislature for permission to issue \$60,000 bonds for water supply system.

Columbia, Mo.—City will have plans and specifications prepared by H. B. Shaw, city, for drilling two deep wells.

Marionville, Mo.—Lawrence County Water, Light and Cold Storage Co. has secured franchise to construct water works and electric light plant; cost about \$40,000.

Helena, Mont.—Bids will be received about April 20 for the construction of water works; cost about \$600,000; bids for bonds will be received April 12.—W. Heimick, City Engineer.

Chappell, Neb.—Citizens will vote on bonds for installation of water works system.

Camden, N. J.—City has engaged consulting engineer to prepare plans and submit estimate for separate water supply for commercial and manufacturing purposes; laying of 16-in. mains on four streets is being considered.

Camden, N. J.—Stockton Water Co. is considering installation of additional stand-pipe.

Cranford, N. J.—Consulting Engineer Jas. H. Fuertes, 140 Nassau st., New York, is preparing preliminary plans for system of water works; pumping station will be built.

Florence, N. J.—Committee recently appointed to look into ways and means of building water plant is nearly ready to report.

Hightstown, N. J.—Installation of filtration system has been decided. Address Mayor Blauvelt.

Ithaca, N. Y.—Bids will be received Feb. 8 by City Comptroller for \$157,000 water bonds.

Lyons, N. Y.—Village Board has adopted resolution permitting expenditure of not over \$300 to investigate possibility of obtaining pure water supply for village.

Watervliet, N. Y.—Mayor Hanratta is favorable to city water works.

Reidsville, N. C.—E. W. Myers, Engineer, Greensboro, has recommended construction of water plant at Troublesome Creek; cost \$42,500.

Flasher, N. D.—C. F. De Lamere, Consulting Engineer, Bismarck, is preparing plans and estimates of cost on installation of water works system.

Cincinnati, O.—Board of Water Works Commissioners has recommended construction of additional reservoir.

Elyria, O.—Council has selected the Aetna Engineering Co., Chicago, Ill., to examine and report on water works.

Oakwood, O.—Village has voted \$31,000 bonds to lay pipes through which water will be pumped from Detroit water works.

South Charleston, O.—Citizens are considering installation of water works plant.

Wooster, O.—Wayne County National and Citizens National Banks, Wooster, have jointly purchased \$25,000 water works bonds.

Oklahoma City, Okla.—Fire Chief M. H. Kesler will recommend building of ten reservoirs, each holding 500 bbls. of water.

Snyder, Okla.—Citizens will vote Feb. 7 on \$15,000 bonds to enlarge water system.

Bandon, Ore.—Bids will be received Feb. 15 for \$60,000 bonds for construction of water system.

Etna, Pa.—Plans have been prepared by J. R. Jommer, for \$50,000 pumping station and electric lighting plant.

Springfield, Pa.—Borough Council is considering construction of a municipal water supply system; cost \$50,000.

Westerly, R. I.—Robert P. Thorne, new owner of Wakefield Water Co., is planning to build pumping station near Rocky Brook and install 4,000,000-gal. pump.

Charleston S. C.—Rudolph Hering, Engineer, New York, has been selected to investigate construction of water works and submit recommendations with estimate of cost.

Davton, Tenn.—City is considering construction of water works.—K. McNenson, Mayor.

Kingsport, Tenn.—City is having plans prepared for construction of water works.

Kirbyville, Tex.—J. W. Fleming and J. Morton are considering construction of water works.

Lometa, Tex.—J. E. Parker, Killeen, new owner of water works, will improve system.

Lott, Tex. City has decided to construct water works.

Lexington, Va.—Citizens have voted \$75,000 bonus for additional water supply.

Romney, W. Va.—Bids will be received March 1 by A. N. McKeever, Mayor, for \$15,000 water bonds.

Seattle, Wash.—Board of Public Works has approved plans for steel water tower on Magnolia Bluff.

Marysville, Wis.—City is considering construction of water works system.

Harriston, Ont., Can.—Citizens have voted \$35,000 bonds for following water works improvements: Water tower and foundations, \$1,100; driven wells, \$1,000; pumping station, \$1,500; power plant and pump, \$6,000; concrete reservoir, \$2,000; distribution system, \$18,055; real estate, \$5,000; engineering and incidentals, \$1,845.—Herbert J. Bowman, Toronto, Consulting Engineer.

CONTRACTS AWARDED

Douglas, Ariz.—Construction of municipal water system, to M. F. Discus, city, \$45,000; work includes the construction of the building, laying of pipe and the reservoirs; to Chicago Bridge and Iron Works, for water tower, \$11,950; power equipment, to the De La Vergne Machinery Co., \$19,945; bids of M. F. Discus were as follows: \$1,450 for pump house complete; concrete sump, oil reservoir and well tunnels, \$880; 10-in. 70-lb. pipe, \$1.63 per ft.; 10-in. 64-lb. pipe, \$1.47 per ft.; 8-in., 47-lb. pipe, \$1.12 per ft.; 10-in. gate valves, \$42.60 each; 8-in. gate valves, \$33.40 each; 5-in. hydrants, \$41.50 each; 4-in. hydrants, \$39.50 each.

Pasadena, Cal.—By North Pasadena Land and Water Co., to John Lee, 415 Galena ave., for excavating for 5,000,000-gal. reservoir to be constructed on bank of the Arroyo Seco; bids will be taken for the concrete work later.—Willis Eason, Union Savings Bank Bldg., President; Allen Bros., N. Raymond ave., Engineers.

Vallejo, Cal.—Furnishing cast-iron bell and spigot water pipe, bids opened Jan. 23, to U. S. Pipe Co., San Francisco, for \$24,587.—W. J. Torney, City Clerk.

Atlanta, Ga.—By Water Board and Bond Commission, to General Pipe and Foundry Co., city, for c.-i. water pipe, about \$25,000; to Sanitary Co., Cleveland, O., for brass, \$3,367; to National Lead Co., Cincinnati, O., for lead pipe, \$5.60 per cwt.

Louisville, Ky.—Installing hydrants: 34 to L. R. Figg & Co.; 26, to G. W. Gosnell & Co., and 4 to Stancel & Riddle Co.

Marblehead, Mass.—Installing \$15,000 pump at water plant, to Landlaw-Dumagan-Gordon Co., Boston.

Kansas City, Mo.—Construction, delivery and erection of a horizontal shaft centrifugal pump, direct-connected to a vertical cross-compound engine, of a capacity to deliver 30,000,000 gals. of water 50 ft. high at a speed not exceeding 150 r.p.m., to Allis-Chalmers Co., Milwaukee, Wis., \$21,036 for one unit, and \$42,072 for two units; furnishing 2,000 tons of pipe and specials, to U. S. Cast Iron Pipe and Foundry Co., \$23.80 per ton for pipe and \$50 per ton for specials.

Trenton, Neb.—To P. A. Strayer, for laying pipe for Trenton water works system.

Somerville, N. J.—Borough officials have about closed contract with Somerville Water Co. for 20-year supply of water.

Hudson, N. Y.—Furnishing 10-in. iron pipe for enlarging water main in Second Ward, to Chas. Miller, Utica, \$21.60 per ton; fillings, \$50 per ton.

Youngstown, O.—Water supply requirements: Water pipes and pipe specials, to United States Cast Iron Pipe and Foundry Co., 600 tons of pipe, \$21.70 per ton; valves, to Darling Valve and Mfg. Co., 6-in. valves, \$10.40 each; corporation cocks, 5½-in., to Monarch Brass Co., 55c. each; hydrants, to D. R. Wood Co., \$24 each; curb boxes, 5½-in., to Farnam Brass Co., \$265 each; valve boxes, to Morgan Mfg. Co., \$2.75 each; lead, 25 tons, to Wilkins-Leonard Hardware Co., \$4.60 per hundred pounds; hauling pipe and specials, to W. S. Dennison, \$1.08 per ton; alum for the year, 100 lbs. in bags, to Central Chemical Co., 90c.

Heavener, Okla.—To the T. C. Brooks & Sons Co., Jackson, Mich., for constructing water works, \$40,699.

Guthrie, Okla.—Furnishing c.-i. water pipe, standard bell and spigot, to American Cast Iron Pipe Co., Birmingham, Ala., as follows: 1,600 ft. 10-in. and 2,800 ft. 12-in., \$25.20 per ton, and 4,000 ft. 6-in. at \$25.30 per ton.

Astoria, Ore.—Rebuilding 7½ miles of 18-in. main conduit of water system, to C. G. Palmberg, city, \$68,117.

Johnson City, Tenn.—To W. C. Swanwick, Joplin, Mo., to install water works system; cost \$165,000; United States Foundry Co., Chattanooga, will furnish water pipes, which will be laid from this city to Big Blue Springs, Union County, distance of 12 miles; Council recently purchased entire distributing system of the Watauga

Water Co. for \$150,000, which will be utilized in connection with the new water works.

Austin, Tex.—Constructing filtration trench at lower water works, to Ray McDonald, \$8,500.

Taylor, Tex.—Andrew J. Zilkner, Austin, owner of Taylor water works and service, has contracted with H. B. Seiders, of this city, for building of new water supply reservoir for storage of water for fire and domestic uses during the time that will be consumed in enlarging two main reservoirs to four times their present capacity.

BIDS RECEIVED

Lordsburg, Cal.—Construction of additions to the municipal water works, Braun & Russell, Redondo Beach, lowest bidder, \$35,000 for all work or \$37,054 if the 8-in. wrought-iron pipe is changed to cast-iron pipe and surface reservoir added.—Olmsstead & Gillen, Wright & Colender Bldg., Los Angeles, Engineers.

LIGHTING AND POWER

Dothan, Ala.—City will construct electric plant and water works, erect building and install equipment.—R. W. Lisensy, Clerk.

Troy, Ala.—Plans are being prepared for improving electric light and water plant, including installation of one electrically driven pump, having a capacity of 2,500 gals. per hour, a 150-h.p. boiler, one 250-kw., 3-phase, 60-cycle generator, direct-connected to steam unit.—A. B. Campbell Superintendent.

Enson, Ariz.—R. G. Arthur has secured franchise from County Supervisors for electric light and power plant.

Colton, Cal.—City Trustees will at once let contract for 600 cu. ft. per minute air compressor, three 6-in. air lifts, two electric motors and two transformers.

Los Angeles, Cal.—Mayor Geo. Alexander has recommended establishment of electric lights.

Needles, Cal.—E. H. Rose, Los Angeles, has acquired the property of Needles Light and Power Co. and will improve and enlarge plant.

Redlands, Cal.—Plans have been prepared by City Engineer and bids will be asked shortly for ornamental and electric lighting system for business section of the city, to be extended from Olive ave. to Cajou st., to Citrus ave. and State st., to Orange st. and to the Casa Loma Hotel; cost \$14,000.

Santa Ana, Cal.—Newport Beach is to vote on \$55,000 bonds to purchase gas and electric plants.

Groton, Conn.—City is considering adding 500 kw. within year to the municipal electric light plant.—T. A. Graves, Superintendent.

Milton, Del.—Bids will be received March 1 for the purchase of \$20,000 bonds for construction of proposed plant for Milton Light and Power Co. O. S. Betts, city, is interested.

Wilmington, Del.—Mercantile Committee of Board of Trade is considering establishment of "White Way" on Market st.

Atlanta, Ga.—Georgia Power Co. has secured sites to furnish 200,000-h.p. to city and surrounding territory.—C. Elmer Smith President.

Malad City, Ida.—The Idaho Light and Power Co. is considering extending transmission lines to Downey and St. John, distance about 15 miles; company also proposes to increase capacity of plant by about 500 h. p.

Gibson, Ill.—Plan of Gibson Electric Light and Power Co. will be improved and engaged under direction of F. J. Postel Consulting Engineer, Chicago.

Fort Wayne, Ind.—Henry B. Monning and John F. McCarthy, Ft. Wayne, will soon ask for bids for construction of a central heating plant in business districts.

Vincennes, Ind.—The Vincennes Electric Co. has incorporated to establish and equip a plant for generation of current for heating lighting and power purposes.—Albert J. Heintz, Wm. T. Barnes and Charles W. Sherman, Directors.

Centerville, Ia.—Lighting of town by electricity is being considered.

Independence, Ia.—Plans are being considered for enlarging the municipal electric light plant, including addition to the power house and the installation of a 250-kw. generator and engine.—E. R. Stanard, Superintendent.

Iowa Falls, Ia.—Oscar F. Peterson, Des Moines, has petitioned for heating and lighting franchise for Peterson Heat and Light Co.

Webster City, Ia.—City has secured site for erection of \$50,000 light and power plant.

Coldwater, Kan.—Engineers J. S. Worley & Co., Reliance Bldg., Kansas City, Mo. are preparing final plans for electric light plant.

LaCygne, Kan.—Preliminary plans are being prepared by Engineers J. S. Worley Co., Reliance Bldg., Kansas City, Mo., for electric light plant.—C. L. Potter, Mayor.

Luray, Kan.—Town is considering installation of electric lights and water.

Sylvan Grove, Kan.—Town is considering installation of electric lights and water.

Wanago, Kan.—Plans are being considered for installation of 200-kw. single-phase generator, direct connected to Corliss engine, in municipal electric plant next spring.—D. A. Course, Superintendent.

Springfield, Mass.—Superintendent Gaslight Co. is planning to expend \$250,000 in installation of new apparatus chiefly of German make.

Durand, Mich.—Citizens have authorized 2,000 bond issue for extensions to the municipal electric light plant and water works system, including 200-kva. generator and one 75-kva. generator and a 275-h.p. engine and alternating current motor of 50 to 20-h.p. to operate pumps.—H. F. Josenkrans, Manager.

Delano, Minn.—City is considering building and equipping of entire new electric light plant next summer.—Nels G. Sanberg, Superintendent and City Electrician.

Farmington, Minn.—L. Larson has asked Council for franchise to install electric light plant.

Grand Rapids, Minn.—Village Electric Light Commission is planning extension of line to La Prairie.

Minneapolis, Minn.—Minneapolis General Electric Co. has decided to erect relay power station of 10,000-kw. power; cost \$1,000,000.—A. W. Leonard, Local Manager.

Cnappell, Neb.—Citizens will vote on installation of electric light plant.

Camden, N. J.—Business Improvement Association is considering establishment of independent electric light plant.

Jamesburg, N. J.—Jamesburg Electric Co. has been incorporated to supply the borough with electric light; capital, \$10,000.—Louis Rafello, Philadelphia, Pa.; Merritt W. Haro, Tuckerton, and Milton I. Voorhees, N. Y., Incorporators.

Las Cruces, N. M.—Las Cruces Electric Light and Gas Co. has asked Board of Trustees for franchise.

Sodus, N. Y.—Sodus Gas and Electric Co. is considering extension of its transmission lines east to Wolcott, N. Y., to supply electric service for lamps and motors in Alton, Wallington, North Rose, Butler, Rose, Red Creek, Wolcott and surrounding country.

Murphy, N. C.—George A. Browning, H. Regal, has formed company to construct water power and electrical plant to develop 600-h.p.

Grove, Okla.—W. T. and O. W. Killam are interested in construction of electric light system; have applied to Council for franchise.

Snyder, Okla.—Citizens will vote Feb. 7 \$25,000 to equip light plant.

Waukomis, Okla.—A. Williams, Ames, is considering construction of electric plant; \$5 applied for franchise.

Eugene, Ore.—Council is favorable to 5,000 bond issue for installation of series incandescent street lighting system.

Etna, Pa.—Plans have been prepared by R. Jommer for \$50,000 electric lighting plant and pumping station.

Charleston, S. C.—Rudolph Herring, Engineer, New York, has been selected to investigate construction of electric light plant and submit recommendations with estimate cost.

Newberry, S. C.—Southern Power Co. has asked for 60 years' franchise to furnish power.—Albert Millmore, Charlotte, Engineer.

Henry, S. D.—Henry Light and Power Co. has been granted franchise to install electric light system.

Menno, S. D.—Franchise has been granted to Peter A. Orth to install electric light system.

Mobridge, S. D.—Tanner Bros., Webster, and Hill & Smith, Mobridge, have applied for franchise for installation of electric light plant.

Waubav, S. D.—Boyle & Weller, Webster, are petitioned for franchise for installation of electric light plant.

Tellico Plains, Tenn.—Tellico Power Co. has been granted franchises by Blount and Monroe County Commissioners to extend its power line from Tellico Plains into Knoxville, having a capacity of 6,000 h.p., power will be generated by means of a waterfall on Tellico River.

Kirbyville, Tex.—J. W. Fleming and Julius Morton are planning to supply town with electric lights.

Lometa, Tex.—J. E. Baker, Killean, new owner of electric light plant, will enlarge and improve.

Springville, Utah.—Plans are being considered for installation of municipal electric plant with output of from 250- to 500-kw., to include new pipe line, pressure pipe, water wheel, generators, switchboard, etc.—Myron Manwaring, Superintendent.

Pasco, Wash.—Pacific Power and Light Co. has petitioned Council for vacation of a portion of Riverside addition, which will be used as site for \$400,000 electric substation and gas plant.

Spokane, Wash.—Spokane Falls Gas Light Co. will spend about \$500,000 in improvements.—A. N. Cantril, General Manager.

Mosinee, Wis.—Establishment of electric light system is being considered.

Kingston, Ont., Can.—City will expend about \$13,000 for improvements to the electric light plant.—C. C. Felger, Engineer.

Ottawa, Ont., Can.—Municipal Electrical Commission is having plans prepared to place all wires on St. J. St. underground.

Fortage La Prairie, Man., Can.—Council is considering installation of municipal electric lighting plant.

Strathcona, Alta., Can.—City will at once ask for bids for furnishing machinery for the electrical plant to cost \$72,000.

Victoria, B. C.—Ratepayers have passed \$25,000 electric lighting by-law.

auto formerly used by Street Department is under consideration; chemical tanks being proposed for machine.

Albert Lea, Minn.—Fire Chief Mitchell has recommended purchase of 500 ft. of hose.

Clayton, Mo.—Fire Department is considering purchase of 1,000 ft. of hose.

Fair Grove, Mo.—Fire Department has been organized with J. T. Smith as Chief.

Manchester, N. H.—Purchase of aerial truck and auto ambulance is being considered.—Edw. C. Smith, Mayor.

Camden, N. J.—City is considering purchase of combination wagon, 80-ft. aerial truck, auto for Chief and motor-propelled combination hose wagon; additions to fire alarm system are also contemplated.

Collingswood, N. J.—Plans are being considered for installation of modern fire and police alarm system.

Millville, N. J.—Fire Commissioners are considering purchase of auto chemical engine.

Moorestown, N. J.—E. F. Penners, Relief Engine Co., and John C. Bradford, Moorestown Hose Co. No. 1, are interested in proposed purchase of two auto hose trucks.

Albany, N. Y.—Erection of fire house for Steamer No. 2 is being urged.

Conces, N. Y.—City has asked permission to issue \$16,000 bonds for improving fire department.

Tuckahoe, N. Y.—Citizens will vote Feb. 16 on \$8,000 expenditure for purchase of motor fire engine for Waverly Engine and Hose Co.

Cleveland, O.—Purchase of several fire engines and auto truck is being considered.—Geo. A. Wallace, Fire Chief.

Martin's Ferry, O.—Council is considering auto trucks for two companies.

Portland, Ore.—J. W. Wood, Naval Architect, Chicago, has been chosen by Fire Committee of City Executive Board to prepare the plans and supervise construction of steel fireboat.

Woodlawn, Pa.—Fire Department has been organized with C. E. Miller as Fire Chief; type of apparatus not yet decided.

Lakewood, R. I.—Firemen are looking for first-class hand engine.

Columbia, S. C.—City desires to purchase 100-ft. tower for fire bell.—G. F. Cooper, Clerk.

Mount Pleasant, Tex.—Site at Depot St. and Kauffman ave. has been selected for erection of combined fire station and city hall.

Texarkana, Tex.—City is in the market for two auto combination chemical and hose wagons, 35-gal. hammered copper chemical tank hose body partitioned, capacity 1,200 ft. 2 1/2-in. hose, dual ignition system electrically lighted, regulation artillery wheels, each wagon to have in addition to standard equipment one 30-ft. extension ladder, one 12-ft. roof ladder, one plaster hook, August patent.—A. B. DeLoach, Mayor.

Lynchburg, Va.—Fire Chief Sandidge has recommended purchase of chief's motor car, comb. chemical, hose wagon and 75-ft. aerial truck; also 2,000 ft. 2 1/2-in. rubber-lined cotton hose.

Norfolk, Va.—Board of Control has recommended appropriation of \$25,000 for erection and equipping fire station at corner of Williams ave. and 12th st.

Petersburg, Va.—Plans for a larger and better equipped fire department, including number of new men, modern alarm system and extension of the present number of boxes, with other features looking toward increased efficiency, have been presented to Joint Finance Committee of Council by Chairman N. T. Patterson, of Fire Commission.

Seattle, Wash.—Bids have been rejected by Board of Public Works for erection of fire station No. 28; revised plans will be prepared.

Spokane, Wash.—Council has asked for additional \$34,000 appropriation for fire department improvements.

Spokane, Wash.—Erection of fire station at Stone St. and Glass av. is being urged.

Edmonton, Alta., Can.—City Commissioners will shortly purchase the following apparatus for the fire department: Motor chemical and hose wagon, motor car, one aerial ladder, 3,000 ft. of hose and a life saving net.

FIRE EQUIPMENT

Gentry, Ark.—Council has decided to purchase chemical fire engine.

Modesto, Cal.—City will purchase auto chemical engine and hose wagon.

Sacramento, Cal.—National Board of Fire Underwriters has recommended purchase of two first size engines, autos for Chief and Assistant Chief, fuel wagon, 75 ft. motor-driven aerial truck and auto combination wagon carrying two 35-gal. tanks and 500 ft. of 2 1/2-in. hose; also minor equipment.

Ansonia, Conn.—City is considering establishment and equipment of fire station in Fourth Ward.

Bridgeport, Conn.—Council has purchased site on Putnam st. for erection of fire house.

Waterbury, Conn.—Bids will be asked at once for alterations to East Main st. engine house.—Theo. B. Peck, Architect.

East St. Louis, Ill.—City is considering erection of two engine houses.—T. Brucks, Chief Fire Department.

Moline, Ill.—Fire and Light Committee will recommend purchase of auto hose truck with engine equipment.

Rockford, Ill.—Fire Chief F. Thomas has recommended purchase of engine and aerial truck, rebuilding of present truck and erection and equipment of two stations with motor apparatus.

Poseville, Ill.—Village Council is considering purchase of fire engine.

Sterling, Ill.—Council has authorized purchase of 5 play pipes or patent nozzles, 3 hydrant valves, 1 smoke helmet, 1 cellar pipe or distributing nozzle, fireman's axes and wire cutters.—Savona Stril, Chief.

Fort Wayne, Ind.—Fire Chief Henry Hilbrecht has recommended installation of at least 50 more fire alarm boxes and purchase of 5,000 ft. of hose.

Richmond, Ind.—Fire Chief Ed. Miller has recommended purchase of auto chemical truck.

Knoxville, Ia.—Architects Kraetsch & Kraetsch, Des Moines, have prepared plans for erection of fire station.

Haverhill, Mass.—Fire Chief Gordon has recommended repairing of hand tubs in outlying district with hand-drawn chemicals; also purchase of auto engine and hose truck.

Haverhill, Mass.—Equipping of Station No. 6 is being considered; rebuilding of



Hand-Wiped Joint

or lead flange, in from one to eight branch.

Gooseneck Headquarters

ALL SIZES—ANY STYLE—FOR ANY MACHINE
GET OUR PRICES BEFORE PLACING ORDERS

Glauber Brass Mfg. Co. Cleveland

BRIDGES

Torrington, Conn. Town has rejected proposition to build bridge across Naugatuck River to connect with proposed extension of Prospect st.

Jacksonville, Fla.—Board of Health is asking for bids for erection of temporary emergency hospital for contagious diseases, which will be built on grounds of present St. Luke's Hospital.

Boise, Ida.—State Senate has passed bills for bridges across the Snake River between Canyon County, Ida., and Malheur County, Ore., near Payette, Ida.; cost \$25,000; across Salmon River in Custer County, \$10,000, and across Snake River, near Glenn's Ferry, \$15,000.

Fort Wayne, Ind.—Replacing of State st. bridge by modern cement structure is being considered.

Rockville, Ind.—Construction of bridge over Big Raccoon River is being considered; cost about \$7,000.—H. Davies, Marshall, Engineer; Jas. E. Elder, County Auditor.

Cedar Rapids, Ia.—Bids will be asked about March 1 for construction of \$150,000 concrete bridge.—T. F. McConley, City Engineer.

Newton, Kan.—Butler County Board of Commissioners has rejected bids for construction of bridge.—J. A. Hunter, County Clerk.

St. Paul, Minn.—City Engineer has estimated cost of constructing Earl st. bridge at \$57,000.

Boonton, N. J.—Morris County Board of Freeholders has made an appropriation of \$8,000 for purpose of building new bridge to span Rockaway River.

Montclair, N. J.—Board of Freeholders, Newark, has been petitioned to aid in construction of viaduct of the Lackawanna Railroad Co. across Bloomfield ave.; total cost will be about \$70,000, of which railroad company will pay about \$45,000.—Ernest C. Hinck, Mayor.

Monaca, N. Y.—Citizens are considering erection of bridges over Elkhorn and Black's Run on Monaca and Aliquippa road.

Warsaw, N. Y.—Construction of bridge over Oatka Creek is being considered.—I. G. Botsford, Village Clerk.

Drayton, N. D.—Commissioners of Pembina County, Pembina, are considering construction of bridge over the river.

Cincinnati, O.—Council has passed ordinance authorizing city and the P., C. C. & St. L. Railway Co. to proceed with construction of the Rockwood crossing viaduct and subway.

Washington Court House, O.—Fayette County is considering construction of five concrete and steel bridges this year.

Ivyland, Pa.—Residents of Warminster and Ivyland have presented petition to County Commissioners of Bucks asking for county bridge over stream near Ivyland Borough.

Wilkes Barre, Pa.—Work on plans for a steel and concrete bridge to cross South st. has been started by Architects Torren & Taylor, New York; City Engineer Finch is engaged in furnishing data concerning the grades and dimensions of proposed structure.

Seattle, Wash.—City Engineer R. H. Thomson has estimated cost of the construction of overhead foot bridge on Pike

st., between 1st ave. and the water front, at \$6,000.

Spokane, Wash. Board of Public Works is about to let contract for constructing a concrete bridge over Hangman Creek at 6th ave.

Spokane, Wash.—Mayor Pratt will sign ordinance passed by Council authorizing \$415,000 bonds for two proposed concrete bridges over Latah Creek.

CONTRACTS AWARDED

Peoria, Ill.—Building bridge, to Milwaukee Bridge Co., \$166,896.50.

Des Moines, Ia.—Construction of Melan bridge, to Clinton Bridge Co., Clinton, \$25,000.

Dubuque, Ia.—To Spolin-Rose Lumber Co., city, for furnishing lumber to repair and build bridges during year.

Grundy Center, Ia.—By County Commissioners, to L. F. Volberding, Hudson, for construction work and repairs and cement work on steel bridges during 1911.

Newton, Kan.—To B. H. Northcott & Son, Hesston, for construction of two iron and concrete bridges in Butler County.

Minneapolis, Minn.—Building bridge over Lake Minnetonka, to Minneapolis Steel and Machinery Co., city, \$38,500.

MISCELLANEOUS

Little Rock, Ark.—Erection of \$250,000 annex to court house is being considered.

Redlands, Cal.—Citizens have voted \$82,000 bonds to purchase land for two parks.

Augusta, Ga.—City will at once rebuild hospital for negroes destroyed by fire.—Thos. Barrett, Jr., Mayor.

Chicago, Ill.—Bion J. Arnold has about completed plans for construction of subway system.

Mayfield, Ky.—Council has ordered numbering of all houses of city.

Whitesburg, Ky.—Perry County will erect \$12,000 jail and \$25,000 court house.

Donaldsonville, La.—Cost of repairing present market house has been estimated at \$3,500.

New Bedford, Mass.—Mayor Ashley has recommended purchase of auto for use of City Committee; purchase of auto truck for use of drain men is also being considered.

Grand Rapids, Mich.—Council will expend \$200,000 in purchase of park and playground sites.

Grand Rapids, Mich.—Council has adopted block system of numbering houses.

Grand Rapids, Mich.—Cost of building east side flood wall along Grand River has been estimated at about \$385,000 by City Engineer McCutcheon.

Manchester, N. H.—Committee on Lands and Buildings, Alderman V. W. Roy, Chairman, will recommend erection of annex to city hall.

Newton, N. J.—Board of Freeholders has voted appropriation of \$10,000 for repairing and remodeling court house damaged by fire.

Toms River, N. J.—Board of Freeholders is considering election on bonds for County Clerk's office.

West Orange, N. J.—Necessity of auto apparatus for both police and fire departments is being urged in annual reports of respective chiefs.

Binghamton, N. Y.—Purchase of auto police patrol is being considered.

Lockport, N. Y.—Bids will be asked by Chairman Burke, of Street Committee, for street cleaning; one, two and three-year contracts; contract to begin March 1.

Lockport, N. Y.—Street Superintendent Johnson has been directed to purchase 300 ft. of hose for the use of Street Department.

New York, N. Y.—Park Department will soon begin work on \$25,000 model playground building at Amsterdam ave. and 59th st. from plans by Architect Vidette, of Park Department.

Rochester, N. Y.—Board of Contract and Supply will soon ask bids for sprinkling 600 streets during coming season.

Watervliet, N. Y.—Mayor Hanratta is favorable to erection of city hall.

Cincinnati, O.—Council is considering purchase of \$3,100 40-h.p. auto for Water Works Superintendent Laidlaw.

Lexington, O.—R. M. Chatterton, Chairman Building Committee, is receiving information concerning building of town hall; planned to have business stores on first floor, with council rooms and executive offices in rear; also hall on second floor with seating capacity for 600 people, with stage; committee will be pleased to hear from architects who can send literature and information concerning such building.

Altoona, Pa.—Department of Health has recommended installation of modern 40-ton garbage incinerating plant at cost of \$25,000.

Franklin, Pa.—Board of Visitors to County Farm has recommended erection of workhouse.

Columbia, S. C.—City is considering installation of garbage destructor.—J. McNeal, City Engineer.

Dillon, S. C.—Architect W. A. Edwards Candler Bldg., Atlanta, Ga., has prepared plans for erection of two-story \$15,000 jail.

Corisicana, Tex.—W. G. Clarkson, city will prepare plans for remodeling and repairing jail; cost \$6,000.

San Antonio, Tex.—All bids have been rejected for remodeling Bexar County jail.

Brewster, Wash.—Erection of town hall will be considered.—W. M. Allen, Mayor.

Seattle, Wash.—Board of Public Works has approved plans for refrigerating plant alterations and enlargements at municipal hospital.

Milwaukee, Wis.—City has obtained option on from 500 to 600 acres of land on both sides of Milwaukee River for establishment of public park.

CONTRACTS AWARDED

Lexington, Ky.—To Henry Vogt, for collecting the garbage and operating city crematory.

Fall River, Mass.—Mayor Thos. F. Higgins has signed order revoking contract for collecting garbage awarded to Timothy Reagan and relieving him of bond, and awarding contract for a term of one year to Representative Isaac E. Willets, agent for A. H. Barnev, of Seekonk.

Philadelphia, Pa.—Building superstructure of Vine st. pier, to W. S. P. Shields, \$339,000.

Plainview, Tex.—Erecting city hall, to McRae Building Co., \$10,000.

TOO LATE FOR CLASSIFICATION

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREET IMPROVEMENTS				
Alabama	Montgomery	Feb. 13, noon	Grade and gravel about two miles of road	Board of Revenue.
Iowa	Mason City	Feb. 13, 7:30 p.m.	Furn. approx. 32,800 sq. yds. of cement, 282 sq. yd. of brick pave and 15,000 lin. ft. of cement curb	J. H. McEwen, City Clerk.
Pennsylvania	Newtown	Feb. 14, noon	Curb and pave street with brick	Patrick Mohan, Secy. Bd. Rd. Supv.
Maryland	Baltimore	Feb. 15, 11 a.m.	Furn. brick or vit. brick for public parks	Board of Awards.
Pennsylvania	Turtle Creek	Feb. 15, noon	Paving various streets	Philip Jones, Chm. St. Com.
Iowa	Corning	Feb. 20, 8 p.m.	Curb., repair, grade and pave various streets	City Clerk.
Minnesota	Worthington	March 13, 2 p.m.	Construct about 10,066 cu. yd. grade	E. C. Pannell, County Auditor.
SEWERAGE				
New York	Rochester	Feb. 15, 10 a.m.	Construct about 6,000 ft. intercepting sewer	F. D. Pifer, Secy. Bd. C. & S.
WATER SUPPLY				
Texas	Dalhart	Feb. 13, 10 a.m.	Sinking 3,000 foot well	C. S. Harrington, Co. Judge.
Florida	Jacksonville	Feb. 13, noon	Furn. approx. 6,000 ft. of iron pipe	Fred G. Yerkes, Secy. Armory Bd.
Minnesota	Fergus Falls	Feb. 20, 8 p.m.	Furn. 1,200 ft. of 6 in. and 500 ft. of 4 in. c.i. pipe, with fittings	S. A. Levorsen, City Clerk.
LIGHTING AND POWER				
Maryland	Baltimore	Feb. 15, 11 a.m.	Furn. illum. gas for street lamps on 1 all munic. bldgs.	City Register.
BRIDGES				
Texas	Corpus Christi	Feb. 13	Constr. reinforced concrete bridge	E. Cubage, Act. City Cont.
FIRE EQUIPMENT				
New York	Schenectady	Feb. 15, 2:30 p.m.	Furn. approx. 2,000 ft. 2½ in. and 1,000 ft. 3 in. hose	Harry F. Miller, Secy. Bd. C. & S.
MISCELLANEOUS				
Texas	Wichita Falls	Feb. 16, 10 a.m.	Constructing county jail	Commissioners' Court.
Pennsylvania	Wilkes Barre	Feb. 24, noon	Constructing police station	Fred H. Gates, City Clerk.

Municipal Journal

And Engineer

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NEW YORK, FEBRUARY 15, 1911

No. 7



Municipal Garage, Showing also a Number of City Automobiles

MUNICIPAL GARAGE AND AUTOMOBILE SERVICE

Louis Keeps Fifteen Machines in the City Garage at the Street Department Stables—Controlling Use of Automobiles to Prevent “Joy Riding”—Economies Effected by their Use in the Several Departments

By CHAS. CLAUDE CASEY

Motor conveyances are becoming popular for municipal work in St. Louis. In the last two years more than a dozen automobiles have been added to the city service, and a garage has been equipped with all modern conveniences for the care and housing of these machines.

The street department is using seven machines, two of them seven-passenger American Mors, and five one-seat Buicks. The water department is using two large machines, the president of the Board of Public Improvements uses one, the building commissioner one, public service commission one, fire chief one and the police department two. In addition, the fire department is using a motor fire engine, the hospital department is using three auto ambulances and the police department has one motor patrol wagon. The police department also uses a dozen motorcycles in its speed squad.

All of the machines, except those in the police and fire departments, are housed and cared for at the city garage. The

garage is in the yards of the street department stables on Forest Park boulevard at Vandeventer avenue. It is modern in every respect, houses the 15 machines without crowding, and provides for emergency repairs, cleaning, etc.

During the last few months Street Commissioner James C. Travilla, who has control of the garage, has worked out a system of reports which seems to have suppressed the “joy riding” tendency of some city officials and chauffeurs. A daily report is made in triplicate and signed by the man in charge, covering every machine, showing the exact times of the departure and return, miles traveled (as shown by register), number of gallons of gasoline and oil used, etc. Copies of the report go daily to the commission, the city comptroller and the president of the Board of Public Improvements. If a machine does not reach the garage as soon after it is released by an official as it should, or if it goes out when the official has not ordered it out, the record shows it, and if it goes out of its way to or from its destination the mile gauge tells the story.

MUNICIPAL GARAGE.

Daily Report of Automobiles at Municipal Garage, for the Twenty-four Hours from

6 A. M. 19
to 6 A. M. 19

Auto Number	Official in Charge of and Department assigned to.	Time of departure.	Time of return.	Number of gallons of gasoline supplied.	Number of Miles registered.
		M	M		
		M	M		
		M	M		
		M	M		
		M	M		
		M	M		
		M	M		
		M	M		
		M	M		
		M	M		

In Charge of Garage

To be Forwarded Daily to
B. J. TAUSSIG, Comptroller

FORM FOR DAILY AUTOMOBILE REPORT

All machines in the city service now bear the name of the department in plain letters, so that citizens may also see if the machines are used for carrying others than officials. Some months ago a machine which had been assigned to the department of the supervisor of city lighting, carrying two women, was damaged in an accident after midnight in a public park and the department head seriously injured. Soon after the accident the official tendered his resignation. The new department head stated he did not need a machine and it was transferred to the president of the Board of Public Improvements. Another machine from the water department ran over a boy while in charge of a chauffeur and while out of the garage without authority. These two accidents brought about the lettering of the machines and strict regulations at the garage to prevent joy riding.

The assistant street commissioner uses one machine in general inspection work, and carries a plain clothes police officer, instructed to make arrests for littering, obstructing or damaging streets, or other violations of laws likely to come to his attention. Wagons hauling dirt, ashes, etc., which have cracks or are so overloaded as to permit scattering of the material along the street are particularly watched. The occupants of this machine also keep a close watch on sprinkling contractors to see that they carry out their contracts. Fines last year aggregated about \$30,000, deducted from sprinkling contract bills, for failure to sprinkle as frequently as required.

The superintendent in charge of garbage collection, two sprinkling inspectors, the engineer of construction and the superintendent of street cleaning, all under the street commissioner, have one-seat Buick runabouts. It was found that these

machines would save enough in salaries of men whose services could be dispensed with to more than pay for all of the machines the first year. This argument proved so strong that objections which had been made by the city comptroller were withdrawn and the machines were purchased a year ago.

The health department last year saved the salaries of three ambulance drivers and the expense of feeding from four to six horses by the purchase of one motor ambulance, and liked the better service and the saving so well that two additional ones have recently been added. It is the intention of the hospital commissioner to replace all of the eighteen horse-drawn ambulances with motor-driven ones, probably six or eight machines being required. The police department has had the same experience with patrol wagons, the number of machines required being so much less that one or more sets of men, three shifts, were saved for each motor wagon added. The up-keep of the machines has also been found less than the expense of feeding and caring for horses.

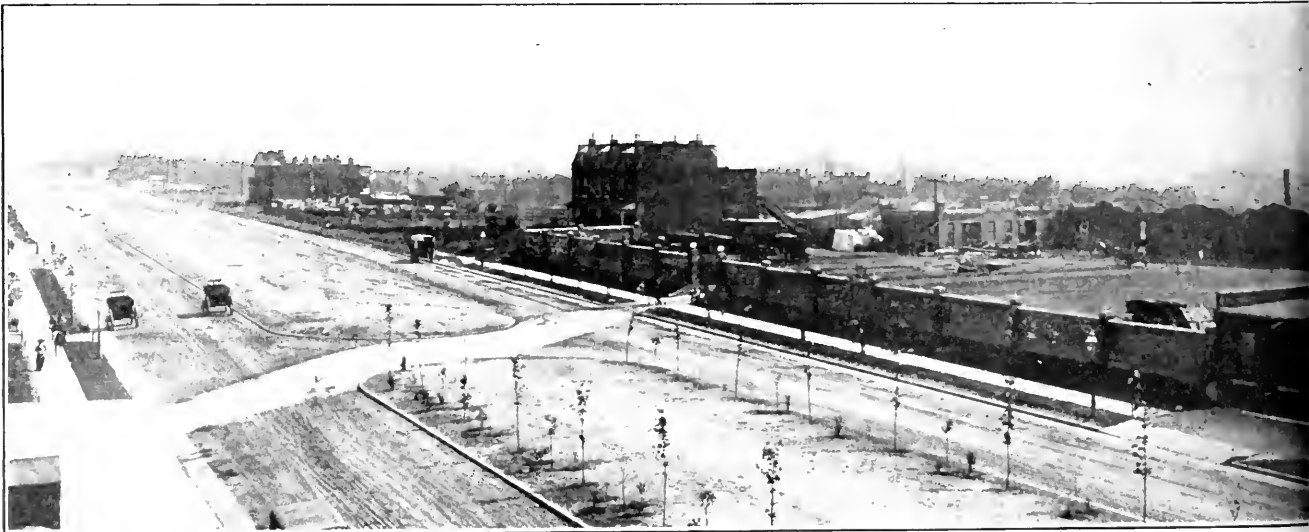
The motor ambulances are kept at the city garage, which is located at about the center of the city, and answer all the long runs. The police department houses its own machines, as does also the fire department.

Construction work on the municipal bridge across the Mississippi river, big additions to the city sanitarium, city infirmary, and city hospital and other scattered public work have kept the machine of the Board of Public Improvements pretty busy. The Public Service Commission's Ford runabout has been used mostly by the engineers in gathering data in connection with the Union Electric Light & Power Company rate investigation and the service report on the street railways.

Inspection work requiring the presence of the building commissioner, where the individual inspectors could not serve the purpose, was the reason given for the purchase of the building department machine.

Many other machines have been asked for from time to time but have been refused so far. The hospital commissioner, the assistant health commissioner, the fumigating corps and others are among those who claim they could save the cost of machines in time and salaries.

Besides the regular work of the city machines, each one belonging to a certain department, all are occasionally used for special inspection work. The Municipal Assembly formerly had large livery bills to pay every year for taking committees to inspect streets in connection with street vacation, grade crossing and other legislative problems, but during the past year all of these trips have been made in city machines. Last summer when a campaign was being made for the outer park reservation district, several city machines carried parties of city officials, newspaper men and others on a number of whole-day tours



STREET DEPARTMENT STABLES AND MUNICIPAL GARAGE. ALSO FOREST PARK BOULEVARD, NEWLY PARKED

ound the hundred-mile circle to the west of the city. City officials also have frequently had occasion to entertain visiting officials who wished to see parks or street improvement work. and city machines have frequently been used for that.

Since the purchase of the water department machines, Columbia Bottom road, north of the city to the Chain of Rocks water works plant, has been improved by the city until it now rivals some of the city boulevards as a pleasure drive. The drive is about three miles long, extending from the end of Broadway, eight miles north of the Court House, to Chain of Rocks park.

SAMPLING FUEL GAS

In making a complete test of steam plants connected with pumping stations, lighting stations and other power plants, or the coal used in such plants, one of the important steps is the sampling of the flue gas. A method of collecting such samples which is simple and at the same time is believed to furnish fair average samples even for large flues is described in a Bulletin of the Bureau of Mines, in which Messrs. D. T. Randall and Henry Kreisinger described experiments conducted by them in the use of North Dakota lignite as a fuel for power plant boilers.

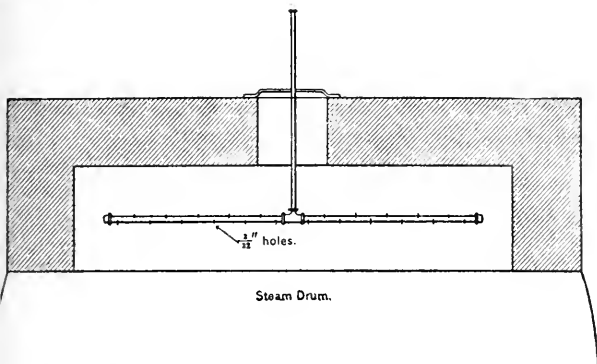


FIG. 1.—SECTION THROUGH UPTAKE SHOWING LOCATION OF FLUE GAS SAMPLER

The general features of this simple contrivance and its location are shown by the accompanying illustration, the device being placed in the uptake about 18 inches below the damper. The gas sampler is a standard 3/4-inch iron pipe closed at both ends with caps and having two rows of small (3-32 inch) holes four inches apart drilled in a staggered way on two sides of the pipe. This 3/4-inch pipe is connected at the middle to a 1/2-inch pipe, which extends out of the setting and leads down to within three feet of the floor, where it is connected to a steam ejector, as shown in Fig. 2. The sample of gas for chemical analysis is taken through the petcock shown. The object of the steam ejector is to induce a continual stream of gas to flow

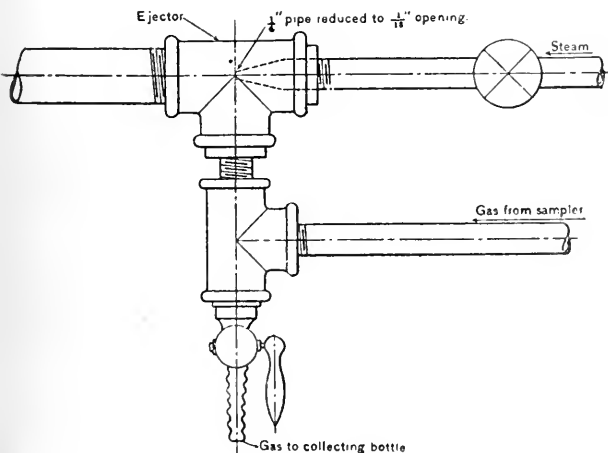


FIG. 2.—STEAM EJECTOR AT END OF PIPE FROM GAS SAMPLER

from the uptake through the sampling apparatus. The construction of the 3/4-inch pipe placed in the uptake permits of drawing the gas from a large area, so that the sample drawn represents fairly well the average composition of all the gases passing through the uptake.

During a test regular samples were taken through the sampling device during a period of about 30 minutes, the analyses of the samples determining the average chemical composition of the gases during that time.

THE MAYOR'S CABINET

By DARIUS A. BROWN, MAYOR OF KANSAS CITY

The inauguration in Kansas City, Mo., of what has come to be known as the "Mayor's cabinet" was prompted by a desire to accomplish several purposes. In the first place, where there are several branches or departments of the city government there has always been a tendency for each department to consider itself an independent body, and there has been lack of co-operation by the various departments, and it was thought that in order to have the greatest efficiency there must be, as nearly as possible, perfect co-operation by these departments.

In the next place, it is not only essential that the heads of departments should be thoroughly familiar with the service sought to be rendered by that department, but it is also essential that the chief executive should be as familiar with the activities and details of each of the various branches as possible.

It was to realize these objects that on the third Monday after my entering upon the duties of the office of Mayor, I requested the Chief of Police, the City Engineer, one member of the Board of Police Commissioners, the President of the Public Utilities Commission, the City Auditor, the City Comptroller, the Speaker of the Lower House of the Common Council, a member of the Upper House of the Common Council, the President of the Board of Fire and Water Commissioners, the President of the Board of Public Welfare, the President of the Board of Park Commissioners, a member of the Hospital and Health Board, the Municipal Librarian, the President of the Board of Civil Service, the City Counselor and the City Treasurer to meet at the Mayor's office at ten o'clock a. m. At that time I stated to those present that it was my desire to hold these meetings each Monday morning at ten o'clock sharp, and that I desired each member of the conference during the week to make notation of such suggestions as might occur to him in regard not only to the transaction of the business of his particular department but as to the transaction of the business of every other department of the city government. At each of these meetings each member of the conference is called upon to offer for discussion such suggestions as may occur to him. The matters are then thoroughly discussed by all present and the consensus of opinion arrived at as to the best policy to pursue, and then the matter is referred to the particular department having jurisdiction over it, accompanied by the recommendation of the conference.

Many valuable improvements in the municipal service have been secured as the result of suggestions and discussions; many irregularities and abuses have been detected and remedied; there has come to be complete harmony and co-operation between the various branches of the city government, and the executive officer of the city has received invaluable assistance and has become thoroughly familiar with the activities of each branch of the municipal service. Matters of legislation, of municipal service, of public improvements, and of every kind and character connected with the municipal government have been referred to the special committees, who have furnished exhaustive reports as to the law and the facts, on which reports action has been taken.

After about nine months of these conferences it occurred to me that valuable suggestions might be received from men who were entirely disconnected with the city government. In other words, that suggestions, complaints and criticisms should be received from citizens engaged in the civic and industrial life of

the city. For that reason I requested the following civic and industrial bodies of the city to select one of their number as an accredited representative at these weekly meetings: The Commercial Club, City Club, Kansas City Fruit and Produce Exchange, Board of Trade, Industrial Council, Jackson County Medical Society, Kansas City Homeopathic Society, Team Owners' Association, Real Estate Exchange, Master Builders' Exchange, Kansas City Implement, Vehicle and Hardware Club and the Kansas City Press Club. These civic and industrial organizations have very gladly and kindly responded to the request and have selected one of their members to appear at these meetings, offer suggestions and participate in the discussions. In this way not only has the Mayor been able to take advantage of the advice and counsel of the heads of departments and the business men of the city, but the head of each department has had the benefit of the counsel and advice of all of these men.

These conferences have proven of incalculable benefit to every branch of the city service.

WATER RATES IN MANY CITIES

An Analysis of Flat and Meter Rates in Two Hundred and Forty-nine Cities—Very Wide Range of Rates

The water rates charged by companies and municipal plants in a large percentage of the cities of the country have been collected and tabulated by Mr. Frank C. Jordan, Secretary of the Indianapolis Water Company, who has recently presented in a paper a table of such rates revised to November, 1910. These show the rates in more or less detail, but it might be instructive to select two classes of rates, the maximum meter rate (since it is the maximum rate which is ordinarily paid by the majority of consumers) and the rates for a house of six rooms. Taking first the meter rates, we find these ranging from a minimum of 4 cents to a maximum of 60 cents. An inspection of the accompanying table shows the rates pretty well scattered over this extremely wide range, although the lowest rate given by more than ten companies or cities is that of 10 cents per thousand gallons, which rate was reported by seventeen cities. A 15-cent rate was reported by fourteen cities, a 16-cent rate by eleven cities, a 20-cent rate by twenty-nine cities, a 25-cent rate by thirty-six cities, a 30-cent rate by thirty-one cities. A rate lower than 10 cents was reported by twenty cities, between 10 and 15 cents by nineteen cities, between 15 and 20 cents by twenty-nine cities, between 20 and 25 cents by ten cities, between 25 and 30 cents by eleven cities, between 30 and 35 cents by thirteen cities, between 35 and 40 cents by eleven cities, between 40 and 50 cents by eight cities and 60 cents by one city. It is seen that the rates between 15 and 25 cents, both inclusive, seem to represent those most commonly used, 118 cities being found between these limits, or almost one-half of the entire number.

The table of flat rates was compiled using as a unit a six-room house having hot and cold water at the kitchen sink only. Few rate cards agree entirely on any unit of this kind, but an effort was made to reduce all to this common basis as nearly as could be judged from the rates in the several cities. Twenty-seven of the cities in the list sold water by meter only, and twenty-four others did not furnish sufficient data to enable a unit of this kind to be calculated. Of the one hundred and ninety-eight whose rates for this unit were given by Mr. Jordan's table, it is seen that fifty-three charge \$6.00 for such a house, the next being the \$5.00 rate, which is charged in thirty-six cities; and the only other rate common to more than ten cities is the \$4.00 rate, found in fourteen cities. The rates between \$6.00 and \$10.00 contained odd cents and fractions in a number of cases, and in preparing our table from the itemized table we have reduced all rates to the nearest 25 cents and grouped them accordingly.

In the second table about 60 per cent of the cities are found to have rates between \$4.00 and \$6.00, both inclusive. The maximum rate is nine times the minimum. There is still greater

variation in the meter rates, the maximum of these being fifty times the minimum.

In the cities where meter rates only are charged, with no flat rates, the following rates are each found in one city only: 1 cent, 10 2/3 cents, 13 cents, 14 cents, 16 2/3 cents, 19 cents, 21 1/3 cents, 22 2/3 cents, 26 cents, 33 cents, 35 cents, 48 cents. Fifteen cents was found in three cities, 16 in two cities, 20 in three cities, 25 in four cities.

In discussing these Mr. Jordan stated that he found that practically all cities which have installed water filtration plants during the past few years have found it necessary to increase their rates in order to meet the increased expenditures of interest and depreciation on capital investment and the additional cost of operation. This he found to be especially true in the case of Columbus, Ohio, Pittsburg and McKeesport, Pa. The meter rate per 1000 gallons in Columbus is 12 cents maximum and 12 cents minimum; that in Pittsburg is 18 cents maximum and 10 cents minimum; in McKeesport 26 2/3 cents maximum and 9 1/3 cents minimum. These rates have been advanced during the past two or three years from the following maximum and minimum rates previously in force: Columbus, 8 cents straight; Pittsburg, 18 cents and 6 cents; McKeesport, 20 cents and 6.4 cents.

Comparing rates where the water is furnished by a private company with those where the plant is municipal, we find the meter rates to average 30 cents where the water is supplied by private company and 20 cents where supplied by municipal plant. In the flat rates the average rate for a six-room house is \$7.00 where supplied by private company and \$6.05 where supplied by a municipal plant. This would appear to indicate that water can be furnished more cheaply by a municipal plant than by a private company; but we have several times called attention to the unreliability of any such comparisons, owing to the fact that a part of the operating expenses, sinking fund or other overhead charges may not be provided for in the municipal rate; and to the general condition, found in private as well as municipal plants, that the rate is seldom based upon any intelligent and scientific calculation, and that in the case of many private plants but of perhaps the majority of municipal ones, water is furnished for public buildings, street flushing, etc., without an charge against the municipality.

METER RATES IN 249 CITIES

Rate Cents per 1,000 Gals.	No. of Cities.	Rate Cents per 1,000 Gals.	No. of Cities.	Rate Cents per 1,000 Gals.	No. of Cities
4	2	12	7	21 1/4	2
5	2	12 1/2	2	22 2/3	5
5 1/2	1	13	3	23 1/2	2
5 2/3	1	13 1/2	3	24	1
6	4	14	2	25	36
7	2	15	14	26	7
7 1/3	1	16	11	27	2
8	5	16 2/3	4	28	2
9	1	17	1	30	31
9 1/2	1	18	7	31 to 35	13
10	17	18 2/3	5	36 to 40	11
10 2/3	1	19	1	41 to 50	8
11	1	20	29	60	1

RATES FOR SIX-ROOM HOUSE, WITH HOT AND COLD WATER
IN KITCHEN, IN 198 CITIES

Rate Dollars Per Year	No. of Cities	Rate, Dollars per Year *	No. of Cities	Rate, Dollars per Year.*	No. of Cities.
\$2.00	2	\$5.50	7	\$8.50	1
3.00	5	5.65	1	9.00	3
3.20	1	5.75	2	9.50	1
3.50	1	6.00	5	9.75	1
3.80	1	6.25	2	10.00	3
4.00	14	6.50	7	10.20	1
4.30	3	6.75	4	10.65	1
4.50	1	7.00	9	11.00	1
4.75	10	7.25	1	11.40	1
4.80	2	7.50	2	12.00	5
5.00	36	7.75	1	12.55	1
5.30	4	8.00	8	15.60	1
				18.00	3

* Rates between \$6.00 and \$10.00 are given to the nearest 25 cents.

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239 West Thirty-ninth Street, New York
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A. PRESCOTT FOLWELL, Editor
F. E. PUFFER, Assistant Editor

Business Department
S. W. HUME, President

J. MORRIS, Manager. A. PRESCOTT FOLWELL, Secretary

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to do so gladly and without cost.

FEBRUARY 15, 1911.

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A Semi-Official Municipal Body

It often happens that more beneficial service is rendered in municipal governmental affairs by non-official than by official organizations, especially when it is desirable to lift the affairs out of the worn ruts. In some cases the non-official organization not only antagonizes the officials, assuming that they are wrong in their intentions as well as in their actions. But we doubt if this assumption is ever correct concerning the majority of officials, and we believe that if the well-intentioned ones should receive as much positive support and encouragement from the citizens as they do from the others, our city governments would be greatly improved. To criticize and "muck-rake" gains more publicity and notoriety for a civic organization than to co-operate with the officials, but the latter is more apt to secure actual results, besides offering less discouragement to unselfish, capable men who might be induced to serve the public in official capacities.

There is described on another page a semi-official body connected with the city government of St. Louis which was organized with the purpose of securing a recognized co-operation such as we have referred to, but with the difference that here the citizen organizations and officials advise together through the initiative of the latter rather than of the former; and that the conferences, being held regularly, do not imply an intention to adversely criticize, but merely a willingness to receive and give opinions and advice on any questions of policy and conduct which may arise.

There are other objects of this "Mayor's cabinet," one of the most important being the co-operation among the city departments themselves; and it is probable that this will serve to increase the effectiveness of the government even more than will the support of the citizens. But the latter is the more novel, and should help to stimulate in the officials that civic patriotism without which no amount of improvement in methods will prove effective of results.

Water Rates

EVERY few days we receive an inquiry for data concerning water rates in various cities for water and street lighting from some subscriber, whose object is to use such figures as a basis for deciding upon the justness or otherwise of rates charged or proposed by public service corporations. Such figures are available, and undoubtedly have their value in arriving at decisions on this point, but they should be taken as the last source of information used for this purpose rather than the chief or only one, being employed for their corroborative evidence only. In fact, owing to the unscientific way in which most water rates are made up, it is doubtful whether it may not be dangerous to use them in any capacity at all; since only a complete investigation of each case can determine whether the rate in question pays an adequate return upon the investment, or to what extent the corporation receives other remuneration, as from hydrant rates or in the form of the franchise granted. Not only is this method of fixing rates by comparison with those in other cities inadequate and objectionable because of the doubtful character of the latter, but the conditions in various cities on which rates should be based differ so greatly that there may be excellent and justifiable reasons why rates in one city should be two or three times those in another.

We can hardly believe, however, that conditions could be so different as to warrant the rates in one case being fifteen times those in another. And yet data given on page 226 show that this is the case with the meter rates listed there; two cities having a rate of 4 cents per thousand gallons, while one city has a rate of 60 cents. Moreover, thirty-seven cities are found to have rates of 10 cents or less, while sixty-six have rates of 30 cents or more. The wide divergence illustrated in this table not only shows how useless it is to endeavor to determine what a corporation ought to charge, by comparing its rates with those in other cities, but it would seem to offer almost proof positive that existing rates cannot all of them have any scientific foundation, but that some must be so low that the department or company must be operating at a loss, while others are so high as to be warranted only by extraordinary difficulties and expenses in construction and operation, if at all.

It would seem from this table that 20 cents was about the average meter rate in the 249 cities referred to, but we doubt whether any one in the country is capable of saying whether this is the average of what should be the legitimate charges in these same cities. There would seem to be no short cut to the fixing of proper rates; but the only defensible way is to adopt the business method of determining what the service costs (including in this all overhead charges), allowing for a reasonable profit in the case of a private corporation, and then so adjusting rates that they may serve to place and keep the department or company on a sound financial basis and at the same time give as nearly uniform justice to all consumers as is possible.

EMSCHER TANKS FOR ERIE

For the Classification of Sewage to be Discharged Into Lake Erie—Detail Plans for Fifteen Million Gallon Plant

THE City of Erie, Pa., is quite completely sewered, but the system discharges at present at a number of points along the waterfront, most of them in Presque Isle Bay, a portion of Lake Erie almost entirely surrounded by the city on the south, the peninsula of Presque Isle on the west and north and points of land partly natural and partly artificial at the east end, at which point a channel between breakwaters is provided for the passage of shipping from the lake to the docks along the bay waterfront. There is also considerable filth which finds its way into a stream called Mill creek, which approximately bisects the city into an eastern and western half.

There has resulted from this a very serious condition which makes it necessary for the city to withdraw from Mill creek the pollution which enters it and also to prevent the nuisance now being created in the harbor by sewage discharged among the docks. In working out these problems the solution of the former appeared to be comparatively evident and simple—the construction of an intercepting sewer through the valley of Mill creek. This was decided upon some time ago, and most of this intercepting sewer has already been constructed, beginning from a point about five blocks back from the waterfront and terminating well out toward the limits of the settled part of the city. Plans for the prevention of a nuisance along the waterfront were prepared last year by City Engineer B. E. Briggs, Mr. Rudolph Hering being called in as consulting engineer. These plans were approved (with one or two minor provisions) by the Pennsylvania State Board of Health on December 29 last. From the Board of Health permit and the report of Engineer Briggs, supplemented by additional information from the latter, we have prepared the following description of the proposed plan:

In addition to the intercepting sewer along Mill creek it is proposed to build another interceptor following along the waterfront east and west from Mill creek, to receive the dry weather flow of all of the sewers which at present discharge there. The west waterfront interceptor will join the Mill creek interceptor near the outlet of this creek into the harbor; and an east interceptor will join the short trunk sewer formed by the combination of the two former, a short distance nearer the lake. This east interceptor will drain land so low as to necessitate pumping. Just below the junction of these three interceptors will be located a plant for treating the sewage. The effluent from this plant will be carried by a long sewer outlet, which will be conveyed into the lake to a point where there is 26 feet of water, this point being 3,800 feet off shore and 4,500 feet from the entrance to the harbor, at which point the effluent will be discharged through a number of outlets into Lake Erie.

The site selected for the purification plant is a piece of land bordering the shore of Presque Isle Bay at its eastern extremity and lying between the bay and the junction of the interceptors. The general features of the purification plant are a combination screen and grit chamber and three pairs of settling tanks and sludge drying beds. From the junction of the intercepting sewers a concrete aqueduct will be carried across the creek with a 26-foot span, and the sewage, after passing over this, will flow in a northerly direction through a concrete culvert under the railroad tracks to the grit chamber immediately north of the tanks.

At the entrance to the grit chamber is a screen of bars with 2-inch slots between them. The grit chamber, which is a rectangular trough of concrete 94 feet in length, is divided into three compartments by two partition walls running parallel for almost the entire length, but coming together and forming V-shaped ends to the middle compartment. This arrangement is for the purpose of permitting the sewage to flow into either of

the two outside compartments while the other one is being cleaned and also to provide a middle chamber for taking care of the increased discharge from the sewers during rain storms. At the two ends of the grit chamber, extending from the V-shaped ends just described, there are short partition walls dividing the grit chamber into two compartments only; and at this point at the upper end of the grit chamber there is, in each of these compartments, a $\frac{3}{4}$ -inch bar screen. At the end of the chamber each of these two compartments is 5 feet 1 inch deep by 8 feet 3 inches wide, but narrows to 6 feet 3 inches where the third compartment is introduced; this middle compartment being 3 feet 6 inches wide. During normal flow of sewage the depth in the grit chamber will be approximately 3.3 feet and the velocity 0.9 foot per second.

The object of the grit chamber is to intercept the large floating matters and to collect the sand and gravel which may reach the sewer and which might otherwise find its way into the sludge-collecting wells of the Emscher tanks and interfere with their proper operation. It is proposed to roof over the grit chambers in order to afford protection for the laborers in cleaning them and to prevent a nuisance from the odors.

From the grit chamber the sewage passes through a short length of rectangular trough 4 feet by 3 feet 2 inches, which carries it to the settling basins. Of these basins there are three, each of which is divided into two sections by a submerged baffle wall, which rises to a point $2\frac{1}{2}$ feet below the surface of the sewage in the basin. Each double basin is 28 by 28 feet at the top, with walls slightly battering for a depth of about 20 feet, and a batter of two to nine for an additional 9 feet, below which there is an inverted cone shaped bottom the apex of which is 6 feet below the base. Beginning a short distance below the top in each basin are two slabs, one sloping from each side on a slope of 1 to 1.2, forming a V-shape

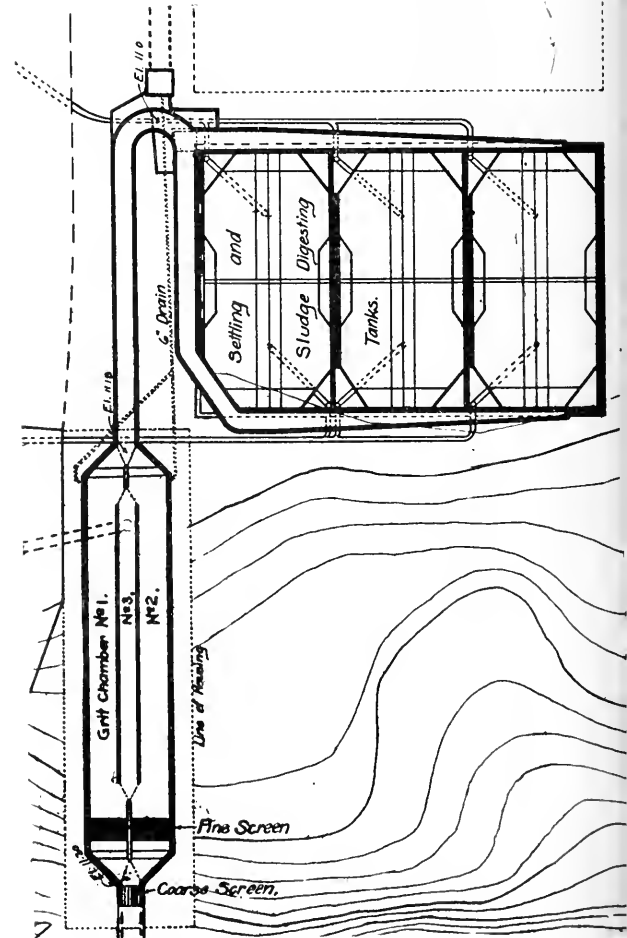


FIG. 1—GENERAL PLAN OF PLANT

ough in the top of the basin. These slabs (which may be constructed of wire glass, or possibly of reinforced concrete) do not entirely come together at the bottom, but their bottom edges are 4 feet 8 inches apart, leaving a slot of this width through the center of the basin. Suspended in this slot is a low horizontal bar of triangular cross-section, with its base horizontal, 5 feet in width and 20 inches below the bottom of the inclined slabs. This leaves a space between the bottom of each slab and the side of the hollow bar of about 1 foot. These

basins are designed to act as Emscher tanks, the principle of which has been described in previous issues of MUNICIPAL JOURNAL AND ENGINEER. The suspended matter in the sewage,

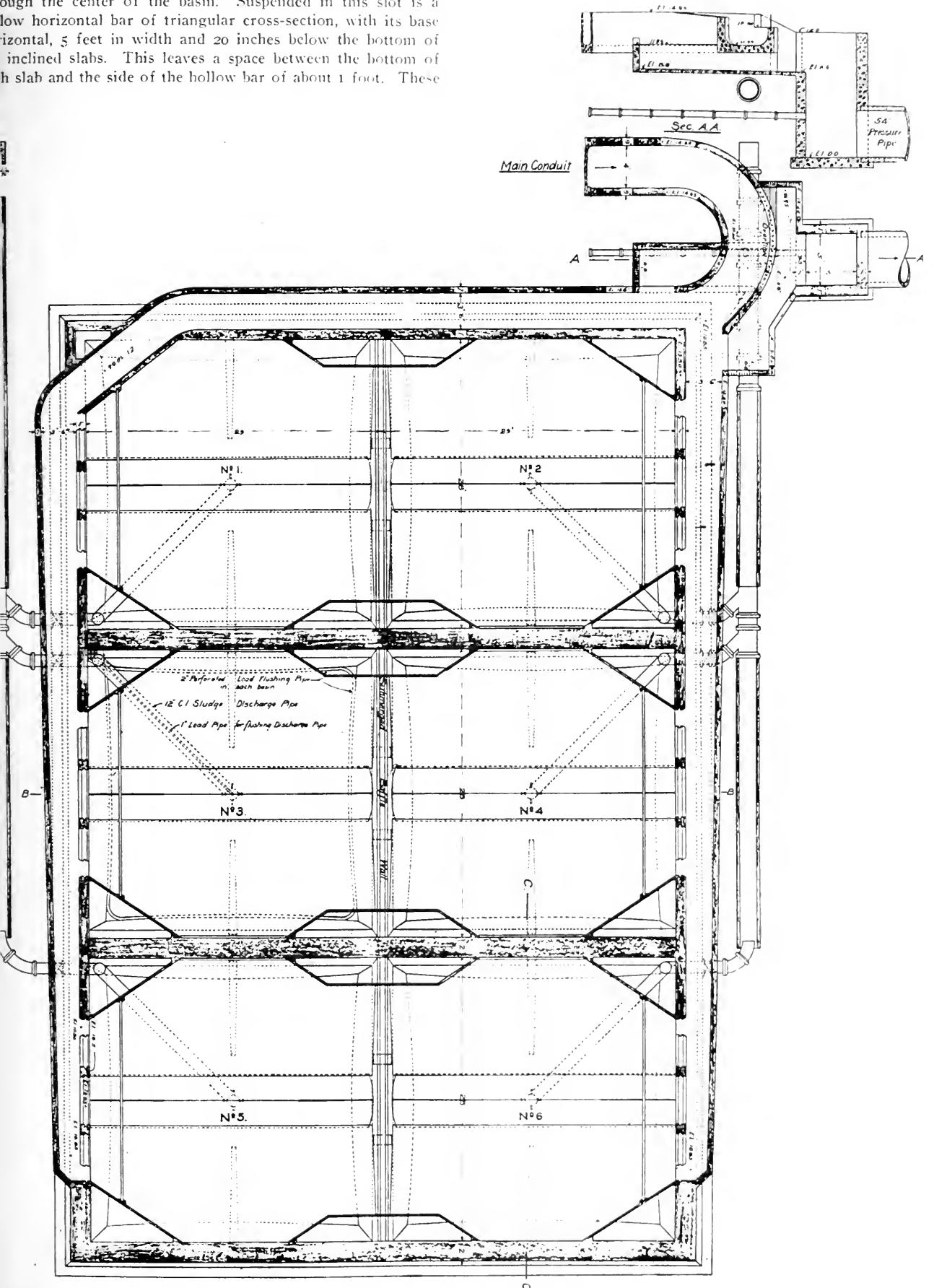


FIG. 2—GENERAL PLAN OF EMSCHER TANKS

in settling down, falls upon the inclined slabs and, owing to the smooth surface and steep pitch of these, slides off of them and through the 1-foot slots at their lower edges into the bottom of the basin, which acts as a sludge well. The purpose of the hollow horizontal bar referred to is to prevent the gases which form in the sludge well from rising up into the trough, this being accomplished through the protruding of the base of the bar 2 inches beyond the bottom edge of each slab; the gases therefore rise up on the under side of the slabs rather than rising through the slot.

Each of the sludge wells (called "sludge digesting tanks" on the plan) has a capacity of 6,850 cubic feet—that is, 13,700 cubic feet to each double basin, or 41,100 cubic feet for the three basins planned for in the first installation. It is estimated that this furnishes sufficient capacity for holding four months' deposit of sludge. The settling flumes, or upper trough-like portions of the tanks, have a total capacity of 54,800 cubic

feet, which would insure a sedimentation period of 40 minutes during normal flow, which is estimated to be 23 cubic feet of sewage per second; and a sedimentation period of 24 minutes during a rain storm, when it is estimated that 38 cubic feet per second will reach the plant. It is not supposed, of course, that this estimate would provide for all of the run-off. In order to limit the quantity of storm water which may enter the intercepting sewers, an overflow is provided at each connection between the existing combined sewers and the proposed interceptors. Also, to guard against excessive floods, it is proposed to provide an overflow in the side of the aqueduct which carries the sewer across the creek and another at the well between the grit chamber and settling basins.

To insure the equal distribution of sludge throughout the entire length of each basin the channel which distributes the sewage to the several tanks is so arranged that, by manipulating gates in this feeder trough, the direction of flow through

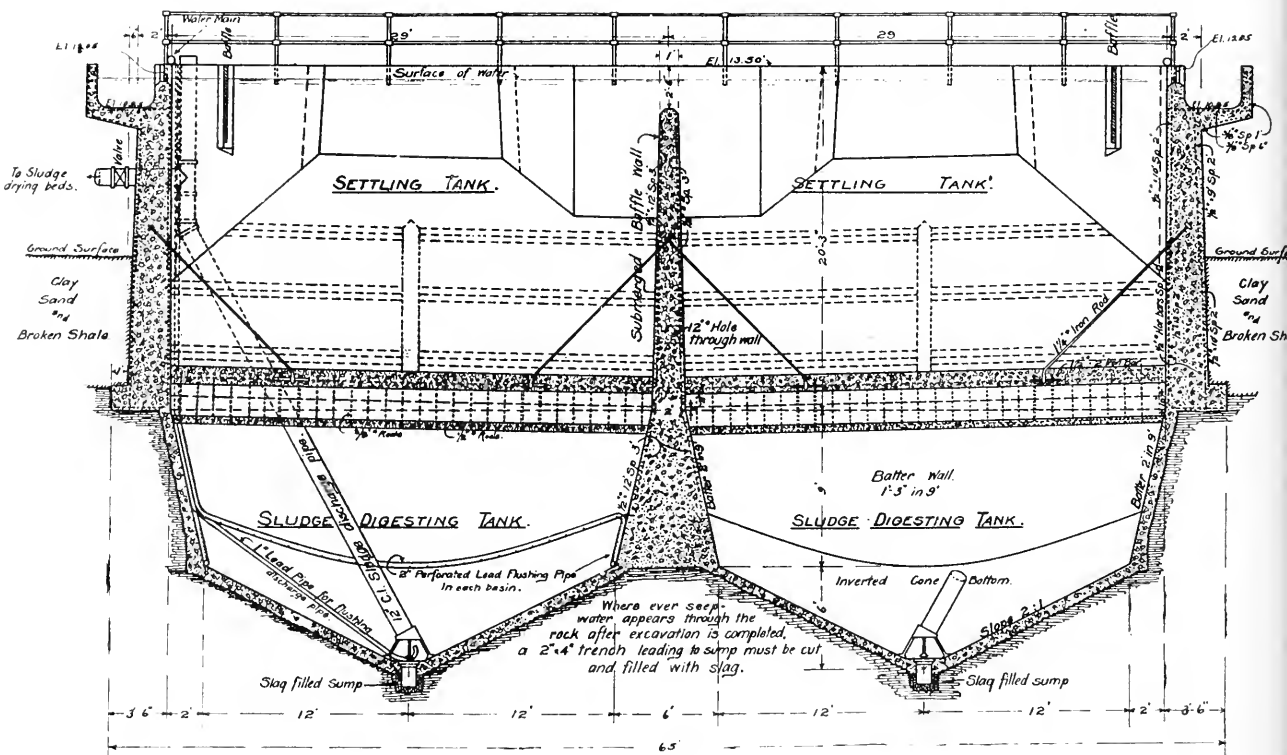


FIG. 3—SECTION ON B B OF FIG. 2

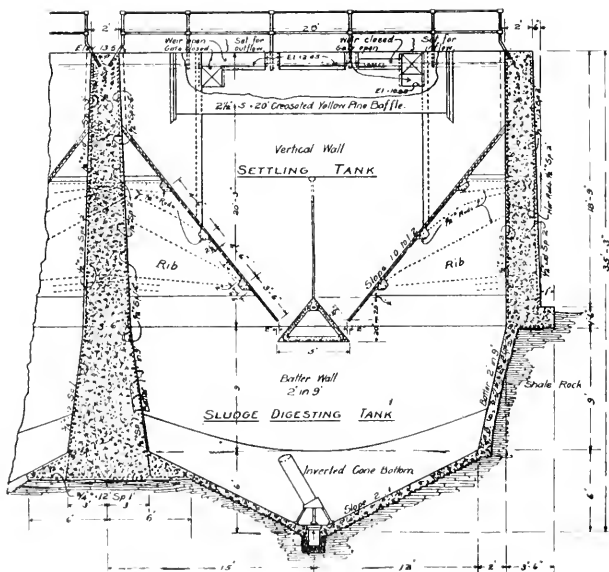


FIG. 4—SECTION ON C C OF FIG. 2

the basins may be reversed, the sewage entering from either end of the tank and discharging at the opposite end. Each tank is provided at each end with gates and weirs for regulating the inflow and outflow of the sewage.

The effluent, after flowing through the settling trough portion of a pair of basins, is discharged into a well from which a 54-inch pipe extends in a northeasterly direction, passing for a distance of 2,500 feet through the grounds of the Soldiers' and Sailors' Home and thence for 5,500 feet under the lake to an outlet in 26 feet of water. At the end of this outfall pipe is placed a cap which can be removed should it be decided any future time to extend its length. At the end this outfall branches into two dispersion pipes, each 40 inches in diameter at the main outfall and tapering to 26 inches at the outlet. One of these dispersion pipes extends 80 feet to the north and contains 53 dispersion orifices in its upper quarter, each orifice being 5 inches in diameter. The other dispersion arm extends to the east 60 feet and contains 40 dispersion orifices.

The sewer invert at the junction of the interceptors is 13 feet above mean lake level, which permits the use of the amount of fall in the purification plant and as a head to force the sewage through the outfall main. This outfall main starts at the well with an invert elevation of zero and is laid on

continuously descending grade to its outer end. Observations conducted by City Engineer Briggs in pleasant weather show that the currents at this point may be in any direction, depending entirely upon the strength and direction of the wind. When the wind is from the west the surface and lower currents travel together; when the wind is from the east they move in opposite directions. This condition would seem to favor general dispersion, and it was concluded that no more favorable point for the discharge of the clarified sewage could be found within a reasonable distance of the disposal plant. The city water works intake is five miles distant and on the inner side of the peninsula known as Presque Isle.

The sediment which collects in the sludge digesting tanks—at least, the bottom portions of the Emscher tanks—will be removed after it has been well digested, a portion from the bottom of the tank being drawn off from time to time onto sludge drying beds. A 12-inch pipe, placed inside the tank, leads from the bottom of each digesting tank, its lower end resting upon a cast iron pedestal at the center of the bottom and its upper end resting against and attached to the upper portion of one side of the tank, where, at a point 5½ feet below the surface of the sewage in the tank, it is continued horizontally through the wall. This is the sludge discharge pipe, and the 5½-foot head suffices to force the sludge through this pipe onto the sludge beds; the discharge through the pipe being controlled by a valve just outside the tank.

The sludge drying beds are designed to occupy an area of 400 square feet; to be underdrained with 3-inch drain tile laid in lengths 6 feet between centers and covered with 1 foot coarse cinders.

The clarification portion of the plant is planned with a view to future extensions which would double its capacity. The layout of the plant, from the junction of the intercepting sewers at the end of the dispersion pipes in the lake, is estimated at \$10,000; which estimate does not include the cost of the four acres of land on which the plant is to be located.

Concerning the disposal of the sludge upon beds, the State Board of Health, in its permit for constructing the plant, states:

The proposed disposal of the digested sludge is looked upon with some apprehension. It is problematical to what extent bacterial activity will destroy the organic matter in the sludge. Experiments have been conducted in Erie to determine the best method for Erie's sewage. If the processes were impeded for some unknown reason there would likely be a nuisance accompanying the proposed drying out of the sludge. The site selected for the sewage works is not over 1,000 feet from the lake. It is in a section of the city devoted to manufacturing pursuits and adjacent to land which in the future will be used for dockage purposes. The only other available site for sewage works is that on Presque Isle, and the cost of works to convey the sewage to this point would be greater than the direct cost of the disposal works proposed. It is feasible to dry out the sludge taken from the digestors in mechanical presses and to dispose of the matter by combustion. The local authorities are now considering the destruction of the city sewage by cremation. The practicability of erecting the crematory on the land bought by the city for the sewage works could be considered in connection with its possible utility as an adjunct to the sewage disposal works. . . . The Emscher process has been tried out in practice in Europe sufficiently to have established it as worthy of careful consideration. However, the degree to which Erie sewage may be treated with success by this process is problematical. The cost of erecting a small experimental station and of conducting analytical tests of the process at Erie would be small and the observations made by the experiment would be of great benefit to the city. Practical results should accrue that would make the design or the application of the design of the tank to Erie's needs one of certainty. The State Department of Health does not wish to discount the merits of the plan now proposed, but believes that the city should go somewhat further with the study of its disposal problem before deciding definitely and finally on definite details for the construction of the works.

It is probable that Council will in a short time arrange for the construction of such an experimental plant early in the coming year and the conducting of such experiments throughout the remainder of the year and possibly longer.

BITUMINOUS CONCRETE ROADWAYS

At the convention on January 24 of the New Jersey State Association of County Engineers the president of the association, Mr. Fred J. Epple, Engineer of Mercer County, discussed the matter of bituminous concrete for road construction and the patents thereon.

As to the desirability of this form of pavement, he stated:

"After due consideration I am prepared to place myself unqualifiedly upon record in stating that a form of construction calling for the use of a mineral aggregate, so proportioned as to size as to give the greatest possible degree of density and which provides for the mechanical coating, while hot, of said aggregate with the required amount of a first-class bitumen of the proper consistency will produce, when laid upon a good base, an ideal wearing surface for either new or renewal construction work. I will not even qualify this statement by referring to the question of initial cost. In my judgment, any reasonable difference in first cost will be more than balanced in a very few years by its superior conditions during all seasons of the year and the undisputed increased length of service it will give; and these advantages will, without doubt, result in the end in an actual saving in total cost when compared with other forms of construction."

It is to be borne in mind that in making this statement Mr. Epple refers to roads and not to city pavements.

The recent decision of the Circuit Court in the case of Warren Brothers against the City of New York, which was reported in our issue of December 21, 1910, is discussed by him. He quotes from the report the statement that "Any one using a Warren pavement will infringe, no matter how the pavement is produced"; the method of production especially referred to by the court being that of using run-of-crusher stone instead of actually proportioning various sizes of aggregate. Mr. Epple states:

"It would seem from this broad and sweeping opinion of the court that any form of pavement composed of mineral aggregate so proportioned as to size as to produce a mass having 21 per cent or less of voids at the time of construction, or which will at any later date constitute a mass having this percentage of voids, even if this latter condition be due to changes of temperature and the action of forces over which the contractor or owner has no control whatever, would constitute an infringement upon the Warren patents."

Mr. Epple stated his belief that all engineers would admit that perfection in road paving composed of mineral aggregates would approach perfection in proportion as they approach maximum density, and that the paramount principle was grading to produce such density. If the opinion of the court is upheld by the higher courts, this class of roadway could not be used in anything approaching a condition of maximum efficiency without infringement. The speaker suggested, as a remedy for this, that States and counties should enter directly into agreement with the owners of the bitulithic patents, paying royalties to cover all work in such State or county under such specifications as the several engineers might think best to adopt.

Only in this way, he thinks, can the engineer be free to prepare specifications calling for whatever quantities of binder, sand and stone he may consider necessary to produce the best results; and in road work, as in other engineering work, there is a general feeling that specifications rather than trade names should form the basis of awarding contracts for either materials or construction. In fact, in several States it is required by law that the engineers prepare specifications on which it is possible for more than one or two to present competing bids for all kinds of public work.

Should the decision referred to be sustained by the Court of Appeals and the Supreme Court there is a question as to how far-reaching its effect will be; whether gravel taken directly from the gravel bank and mixed with bituminous filler, for example, would not be an infringement. Considering the vast amount of work of this character which is being constructed and is contemplated in all parts of the country, this decision would seem to be one having the most general importance of any which may be before the court.

NEWS OF THE MUNICIPALITIES

Current Subjects of General Interest, Under Consideration by City Councils and Department Heads—Street
Water Works, Lighting and Sanitary Matters—Fire and Police Items—Government and Finance

ROADS AND PAVEMENTS

Sandstone Best Paving for Use on Hills

Beloit, Wis.—“Sandstone paving for steep hills is certainly the best preventive for slipping that I know of,” said Robert Caldwell, City Engineer, after returning from Milwaukee, where he inspected the stone used there. “I rode up a hill about as steep as our own St. Lawrence avenue hill on a wagon with an immense load drawn by three horses and the horses’ feet didn’t slip half an inch before they got a hold on this stone,” he said, pointing to the sample of sandstone with which the Council is contemplating paving certain Beloit hills. The stone is not cheap, says the City Engineer, but it does have the great merit of being the only paving for hillsides on which horses will not slip. Mr. Caldwell suggests that it is not necessary that the entire roadway be covered with the sandstone block, but a strip sixteen or twenty feet wide down the center of a hill could be paved with sandstone and the sides with ordinary brick.

Build Two Miles of Walk in Day

Clifty, Tenn.—In accordance with plans adopted at the mass meeting held here on the night of Jan. 14, the citizens of this place turned out February 1 to build sidewalks over the town. More than one hundred men and a number of boys volunteered to do a good day’s work, and thirteen wagons and teams were gratuitously provided for the project, and the work was vigorously and systematically prosecuted. Most of the men were mine workers, and had their own tools. A rain interrupted the work and it was completed a few days later by the volunteers. As a result, Clifty now has over two miles of sidewalks.

Report of Erie Grade-Crossing Elimination

Erie, Pa.—At a recent Council meeting Consulting Engineer George H. Kimball explained the final plans for the elimination of grade crossings. The main points covered by the report follows:

Total undivided cost, \$1,421,682.36.

Location of new passenger station between Peach and State streets with subway entrance.

Elevation of main tracks at Peach street, nearly eight feet.

Number of tracks—Three main tracks on each side and three tracks for local trains at each end of union station.

Space allotted to railway use—All property between Fourteenth and Fifteenth streets.

Final report placed on record at the city hall is accompanied by plans and includes the preliminary report made to councils Aug. 27, 1910

Much Street Work Done in Wichita

Wichita, Kan.—City Engineer Bert C. Wells advises that 1910 has been a banner year in public improvements in Wichita, and he doubts if any city of equal size—55,000 population—has done so much. The record of the work done is as follows:

Asphalt pavement: 12.88 miles constructed at a cost of \$587,693.55.

Bitulithic pavement: 4.17 miles constructed at a cost of \$195,527.22.

Brick block pavement: 3.13 miles constructed at a cost of \$128,899.42.

Total, with other kinds of pavement and work done on uncompleted contracts, 20.8 miles, and a total cost for pavement work of \$1,018,989.73.

A reinforced concrete dam was completed across the Little Arkansas River at a cost of \$24,469.29.

Thirty-three miles of sidewalk built; 10½ miles of curb built, exclusive of curb built in connection with the pavement; 5.6 miles of gutter built, exclusive of gutter built in connection with the pavement.

Sanitary sewers: 23.6 miles constructed at a cost of \$134,839.86.

Storm sewers: 2.5 miles constructed at a cost of \$43,984.81.

Total expended for sewers in 1910, \$178,824.67.

Total amount expended under the supervision of the Department of Public Improvement for the year 1910 was \$1,299,507.03.

Expenses of the department, \$35,865.24.

Sewer contracts for the coming year, amounting to approximately 50 miles, have already been ordered. Pavement contracts and petitions granted, 20.4 miles of pavement to be built in 1911.

In view of this record, the city’s motto, “Watch Wichita Win,” goes without saying.

Paving in Montgomery in 1910

Montgomery, Ala.—Last year Montgomery laid 4.5 million feet of paving. The amounts in linear feet of roadway of each kind laid is as follows: Asphalt, 17,320; wood block, 90,000; mineral rubber, 446; gravel, 3,900; bitulithic, 849; granite block, 342; gravel roadway, 1,300. The linear feet of curbs laid was 48,379; gutter, 7,248.

New Riverside Drive Section Open

New York, N. Y.—The section of the Riverside Drive extension between 145th and 158th streets has been completed and opened. There was no ceremony to mark the completion of what is one of the most important sections of the work and which has been six years building, under the direction of George Stuart Williamson as chief engineer. It includes the steel cantilever structure which carries the driveway over the New York Central tracks between 153d and 155th streets. The construction work was done by J. C. Rodgers. The total width of the roadway from curb to curb is 60 feet, except where it is divided by six-foot parking into two roadways of equal width. A 22-foot bridle path is built adjacent to the main roadway from which it is separated by parking, and does not always parallel the main road. The cantilever cost \$250,000. The driveway is 100 feet long and 50 feet wide. The handsome masonry supporting it is one of the engineering novelties of the drive. When the drive is completed it will be eight miles long and will have cost \$25,000,000. A resolution has been passed by the Board of Estimate practically discontinuing for the present the extension of Riverside Drive north from 155th street. Plans were drawn for the extension of the drive to Spuyten Duyvil three years ago and part of the work has been done. When the present Board of Estimate came into office, however, it decided that the plans were not what they should be and the work was discontinued. The new resolution provides for the redrawing of the plans. It has been estimated that the cost of the extension, including the proposed Hudson Memorial Bridge, will be about \$13,000,000.

Will Give Patrol System of Maintenance a Trial

Paterson, N. J.—The Road Committee of the Board of County Freeholders of Passaic County have decided to give the patrol system of road maintenance a trial. A beginning will be made by employing three men on this work. Each man will be provided with a horse and cart, or a wheelbarrow, and road materials will be delivered in advance of immediate needs along the road. The man will be paid \$800 for eight months, or \$600 a year. It is expected that he will use about \$200 worth of materials. On roads of light traffic it is believed that one man can take care of nearly 10 miles.

Would Make Concrete Cubes by Prison Labor

Rochester, N. Y.—County Superintendent J. J. McClintock read a paper last week before the Fairport Grange in which he advocated the employment of the labor of the penitentiary in making concrete cubes for road construction. The most practicable material for road making in this county, Mr. McClintock said, is two-inch artificial concrete cubes of gravel concrete made with Portland cement, because it will stand well under ordinary traffic and there is an abundance of gravel and it is the cheapest. These cubes can be made satisfactorily without skilled labor and their manufacture by the convicts in the county penitentiary would be most advantageous to the men and the community.

Roads of Washington County, Pennsylvania

Washington, Pa.—Washington county had up to January 1, 1911, 36.7 miles of county roads improved with macadam or brick at a cost of 85,791. The work under contract, 1.5 miles, is estimated to cost \$152,221. There were also 27.5 miles approved by the Grand Jury but not under contract, estimated to cost \$356,661. Besides this the county had 22.15 miles improved under the State act, costing \$266,911.

New York State Highway Commission Report

Albany, N. Y.—The report of the New York State Highway Commission to the Legislature says that of the original fund of \$50,000,000 appropriated for road improvements, \$10,000,000 remains unspent. When the whole of the appropriation is spent, the system of state and county roads will not much more than half completed and \$40,000,000 will be required to finish. The work now completed and under contract amounts to 2,850 miles, of which 1,787 were built during the ten years preceding January 1, 1909, and the balance during 1909 and 1910. The item of maintenance and repair in 1909 was \$1,500,000, of which \$900,000 went for resurfacing and the balance for less complete repairs. In 1910, the amount was \$1,800,000, including \$725,000 for resurfacing. In this year the mileage maintained was 2,200 miles, and the repairs were ordinary, maintained by patrol and oiling. The amount oiled was about 1,000 miles at a cost of \$350 per mile.

While the number of miles macadamized is a small percentage of the total of 80,000 miles, a sufficient amount has been completed to form continuous improved roads between many of the principal cities of the State. The longest single stretch contemplated is that from New York to Buffalo, 487 miles, which will be the longest continuous State road in the world.

Several interesting comments are made in the report. The use of a top course of bituminous material has been found very satisfactory both in eliminating dust and in standing traffic. The scarcity of labor and materials is noted as causes which have retarded work. The cost of labor is estimated to have increased 25 per cent, while efficiency has decreased. The demand for 16-ft. roads instead of 12 has also increased construction cost. A million dollars has been saved by building reinforced concrete culverts and bridges.

The River Boulevard to Bay City

Saginaw, Mich.—A project of exceptional attractiveness and much promise to the future is the plan to build a boulevard following the course of the river between Saginaw and Bay City. Its practicability lies in the river improvement which is about to be commenced by the federal government. In fact, it is to be made a feature of that improvement. The dredging operations will remove an immense quantity of earth from the bottom of the river which can be deposited without extra cost in the course of the boulevard, where it will make a first-class permanent bed for the road. Practically all of the right of way along the river has been secured, so that it will be seen that substantial progress toward the undertaking has been made. The government has signified its willingness to make its work conform to the enterprise, and will give the two cities reasonable time in which to complete contracts for ground over the complete route. The chief worth of this boulevard enterprise is the fact that it will create a river-side drive between Saginaw and Bay City.

Delaware River Boulevard Proposed

Wilmington, N. J.—If a bill introduced in the Assembly by Hon. J. Meyer, of Sussex County, shall become a law, and the position it involves shall be made a reality, the city of Wilmington will be the southerly terminus of a magnificent Delaware Valley boulevard, which will be a counterpart of the ocean boulevard, already being planned for Eastern Long Beach. The road is to be known as the Delaware River Boulevard. The bill appropriates \$15,000, or as much as may be needed for the expense of designating a route for a continuous improved highway commencing at the boundary between the states of New York and New Jersey in Montague Township, Sussex County, and continuing thence to this city, following, so far as practicable, the available convenient improved roads now constructed. The route is to be as near the Delaware River as practicable. The scenery along this proposed highway is notable for its beauty, and if it were constructed it would unquestionably become one of the most popular automobile roads in the State. It is believed that the increase in property values along it would in itself justify the expenditure. Certainly it would be a valuable addition to the fine road system of New Jersey.

SEWERAGE AND SANITATION

The Sewage Problem in Dallas

Dallas, Tex.—It seems very probable that the question of diverting the city's sewage from the Trinity River, or of otherwise disposing of it, will be made an issue in the approaching municipal campaign. Two of the regularly organized political clubs for the election of Dallas city officers have announced their platforms and in each of them is a plank demanding sewage diversion. The other political organization has not yet announced its platform. In April, 1910, the taxpayers of Dallas expressed their desire for sewage disposal by authorizing at the polls a bond issue of \$650,000 for that purpose. As yet no effort has been made by the present city administration to issue those bonds. Bonds in the same amount were issued for other purposes at the same time and have already been sold, the money now being used for the specified purposes.

Alarm System for Health Department

Milwaukee, Wis.—Extension of the use of fire and police alarm and telephone systems to the Health Department under the proposed consolidation is advocated by the Health Commissioner. He said that the 30 field men of the Department were required to pay every time they used a telephone to report and that this expense could be eliminated by extending the use of the telephone to inspectors. The Department has 15 sanitary, five factory, four milk and six meat inspectors.

Anti-Spitting Ordinance Will Be Enforced

Louisville, Ky.—Dr. W. Ed. Grant, Health Officer, has issued another statement dealing with the anti-spitting law and its enforcement. Dr. Grant's statement is as follows:

"Enforcing the anti-spitting ordinance at the present time is not a farce. The Board of Safety, recognizing the law as one pertaining to the health of the community, has requested the Department of Health to see to its enforcement, and has promised all the aid the Police Department can give in enforcing the ordinance."

"After consulting with the Chief of Police, it was deemed best to have policemen board the cars which carry the workmen from the shops every evening and announce to them that the anti-spitting ordinance was about to be rigidly enforced, in this way giving them an opportunity to avoid arrest. Policemen in plain clothes will be placed upon the cars and in public places to-day. This would have been done at the beginning of this week except for the fact that the end of the month was at hand, when a shift takes place in the police force, and for that reason it was delayed until after the first of the month."

"The Police Bulletin contains the announcement that the anti-spitting ordinance is to be rigidly enforced, and that it is the duty of every policeman on the force to arrest all who violate the law. It is the duty of every citizen of our town to aid us in enforcing this ordinance, and all they have to do is to call on the Chief of Police and give him the name of the offender and testify to the truth of their charge."

Rat-Proof Buildings Recommended

New Bedford, Mass.—The Board of Health, in their annual report for 1910, recommend that all buildings erected in the future in the city be of rat-proof construction. The recommendation to the Council reads as follows: "As rats are carriers of disease, and at times cause terrible plagues, the City Council is respectfully requested by the Board of Health to cause all buildings erected in the future to be of rat-proof construction."

For City Milk Licenses \$25

Albany, N. Y.—Assemblyman James A. Foley, chairman of the Assembly Codes Committee, has introduced in the Assembly a bill to regulate and control the milk traffic in the cities of New York, Buffalo and Rochester. The measure provides for the establishment of a milk commission, consisting of three members to be appointed by the Governor, to have general supervision of all milk dealers, with power to fix standards of quality and purity, together with the maximum prices that can be asked or demanded from consumers for milk of such standards, and also with power to order yearly reports from all milk dealers and to enter and inspect their plants and to examine their books and papers and to subpoena witnesses and take testimony. Every milk dealer would be required to obtain a license from the commission at a yearly fee of \$25, which, it is expected, would defray the expenses of the commission. These licenses can be revoked or canceled by the commission at any time for a violation of any order of the commission.

Water and Sewerage Under State Control

St. Paul, Minn.—A comprehensive bill, giving the State Board of Health supervision over public sewer and water systems has been introduced in the Senate by J. M. Hackney, of St. Paul. A duplicate of the bill was introduced in the House by E. G. Perry, of St. Paul, and Kerry Conley, of Rochester. The bill does not apply to the municipal water and sewer system of cities of more than 50,000, but applies to the systems in all smaller towns, whether owned by the municipality or by private parties. It also gives the board supervision over the plants owned by the State for its institutions. The bill requires every municipality, corporation or individual supplying water to the public to file within six months a certified copy of the plans and surveys of the system, showing the sources of the water supply. No other source of supply shall thereafter be adopted without the consent of the board, nor shall any new plant be constructed without the consent of the board nor shall any new plant be constructed without the consent of the board after the filing of the plans with the board and an inspection by its officers. Whenever written complaint is made that sewage is emptied into any stream, lake, pond or other place, so that it creates a public nuisance, the board, after a hearing, may order the sewer system changed to remedy the nuisance. When the local Board of Health or health officer or ten electors complain that the water supply is dangerous the State Board, after a hearing, may order that it be improved. If any water or sewage purification plant is not working properly the board may order an improvement, and if in five days the effluent is not improved it may employ a capable person to run the plant and charge the cost to the municipality. Whenever there is objection to any order made by the State Board the complainants and the board shall each appoint a sanitary engineer to consider the matter and decide. If they cannot agree they shall appoint a third person. The bill also makes provision for an appeal to the courts. The bill permits the municipality to issue bonds to make improvements made necessary by the order of the State Board, provided they shall not exceed 3 per cent of the assessed valuation of the city or village.

Typhoid May Not Be Due to Water

Wilkes-Barre, Pa.—The report of Health Commissioner Dixon to the Mayor and City Councils on the typhoid situation in the Wyoming valley during the summer of 1910 has been received. He says that there is no reason why water might not have been the vehicle for the transmission of the disease. The Susquehanna River water, the Wilkes-Barre Mountain supply, particularly that of Laurel Run, and the Toby Creek supply are considered dangerous because of the potentiality of these waters to become infected. However, the distribution of the typhoid fever cases does not to a careful observer warrant the conclusion that the public water supply was the absolute cause of the prevalence of the disease.

Typhoid Follows Use of Raw River Water

Bay City, Mich.—An epidemic of typhoid is prevailing. For several weeks raw river water has been turned into the city mains.

Local Health Board Congratulated for Good Report

Huntington, Ind.—Secretary R. F. Frost, of the city Board of Health, has received a letter from Dr. J. N. Hurty, Secretary of the State Board, congratulating the local board on their excellent report and the good sanitary conditions maintained. Dr. Hurty suggests that the city add an anti-fly provision to their sanitary ordinance. In the book of instructions issued by the State Board is a copy of an ordinance which has been found to be effective.

English Expert Likes Columbus System

Columbus, O.—That he had secured more information on municipal utilities in Columbus than any other city he had visited in America was the statement of W. Francis Goodrich of London, England, who spent an afternoon inspecting the sewage disposal plant on which work he is an expert, the light plant, the garbage loading station and the reduction plant. "I am more favorably impressed with the sanitary system here," said Mr. Goodrich, "than I have been by that of any other American city, including even New York and Boston."

WATER SUPPLY

Cuero Has New Water Supply

Cuero, Tex.—The city is rejoicing over the completion of the electric power pumping plant for use in pumping the two recently finished fine artesian wells and now this water fills both the reservoir and standpipe with a combined capacity of nearly 500,000 gallons. It is believed that the city's water problem is now solved for years to come.

Dodge City Water Is Pure

Dodge City, Kan.—The new Dodge City water plant was given a test this week to try out its capacity and power to throw water. Four streams were thrown at the same time in the business district and the force surprised those who witnessed the test. Water was thrown much higher than the business houses and the force so great that the men had difficulty in handling the nozzles. Dodge City now has better fire protection than ever before. In the test, wells were closely watched to note the effect on the supply and it was imperceptible. The water has been analyzed by State chemists and is pronounced pure. The new power house, new machinery, new pipes and mains and other new equipment makes the Dodge City plant one of the very best in the State.

Town Has Profitable Water Works

Kingman, Kan.—Kingman claims to have the best water in the State, and plenty of it. Moreover, the operation of the plant shows a good profit. The receipts for the year were \$6,146; expenses, \$1,878. The number of gallons of water pumped was 47,423,000. The cost of pumping was 4c. per 1,000 gallons. The population of Kingman is about 3,000.

Rush Hudson Water Tunnel

New York, N. Y.—The Board of Water Supply, as constituted by Commissioners Galvin and Chadwick, has passed a resolution authorizing the Chief Engineer, J. Walter Smith, to prepare a contract for the completion of the pressure tunnel under the Hudson at Storm King, which is to bring the new Catskill water supply to the east bank of the river. For five years test borings have been made in search of bed rock, and this means that the commission feels that it has at last found a means of crossing the river. Commissioner Galvin stated that this resolution was prompted by the discovery that the work on the Hudson River pressure tunnel has so far cost the city \$376 per running foot, whereas investigations made by him convinced him that this work done by contract could be completed at a cost not to exceed \$150 per foot. It is expected that the change will save the city over \$600,000. The work of driving the lateral shafts, making experimental borings of the river bed, etc., has already cost the city \$831,390. In order to have the tunnel built as speedily as possible it is planned to have the contract awarded at once.

Cut in Water Rates Will Benefit 12,000

Providence, R. I.—The water rate to the small user will be reduced on Jan. 1, 1912, from a minimum of \$10 to \$5 the first reduction that has ever been made in this city on the meter service. This will affect 12,000 water users in Providence. There will be no change in the rate on the faucet service nor will there be any change in the scales as now charged to large users, manufacturers and business houses.

Storm Supplies Water for Two Years

San Francisco, Cal.—According to an estimate made by G. A. Elliott, superintendent of maintenance for the Spring Valley Water Company, the storm in January has stored up in the company's reservoirs enough water to supply San Francisco for the next two years. Over 2,164,000,000 gallons of water has been added to the company's supply and the water which otherwise would sweep over and flood the valley towns have been stored away for future use in San Francisco.

State Board Orders Water Treated

Edinburg, Ind.—The State Board of Health has ordered the water supply to be treated with copper sulphate. In the meantime residents have been ordered not to use the raw water for drinking purposes.

STREET LIGHTING AND POWER

Tungsten Preferred to Arc Lighting

Eugene, Ore.—The city has decided to adopt tungsten street lighting instead of a system of arc lights. The figures which the decision was based were supplied by Prof. H. Dearborn, and are as follows:

Comparative cost of installation:		
	Arcs.	Incandescent.
Street lines	\$3,103.58	\$3,851.97
Wires and fixtures	6,835.00	10,226.00
Tools and equipment	9,750.00	3,062.00
Engineering	1,630.20	998.26
	639.56	544.15
	\$21,958.34	\$18,682.38

Comparative cost of maintenance per year on basis of per kilowatt hour for electrical energy:

	Arcs.	Incandescent.
Repairs and trimming	\$1,219.00	\$1,636.00
Energy consumed	5,520.00	3,200.00
Totals	\$6,739.00	\$4,836.00

For the city as a whole the ratio of light furnished by arcs is to that given by the incandescents as .0011 is to .0024.

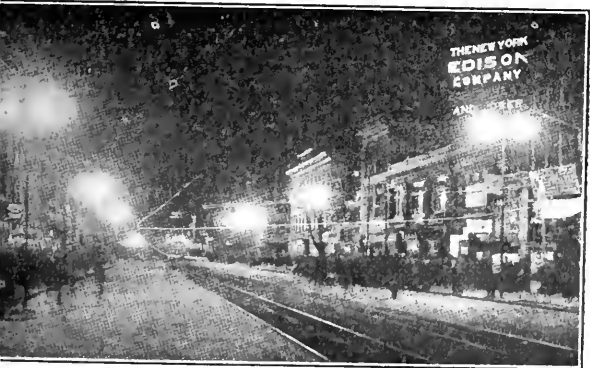
Edison Company Would Purchase Surplus Power

Los Angeles, Cal.—John B. Miller, president of the Southern California Edison Company, in an address before the City Club, outlined a tentative proposition for the purchase of the surplus power from the Los Angeles aqueduct by the California Edison Company. He would have the acceptance of the offer submitted to popular vote.

"I believe that we can offer the city, on a rental of this power, per kilowatt per annum at a consumer's base rate of 7 cents, and per kilowatt per annum if the retail base rate is 8 cents, and investment of the city would be only about \$3,000,000 instead of \$6,500,000; and I believe that Mr. Scattergood, were he to go through these figures carefully, would tell you that this would result as much profit to the city as the city would get if it distributed the electricity itself."

Illumination of 125th Street, New York

New York, N. Y.—The main retail thoroughfare of upper New York, 125th street, will soon be illuminated with a system of twin-lamp white-carbon lighting. The posts will be placed 140 feet apart and the lighting will cost \$3.50 a foot for every foot of frontage. An association will be



VIEW OF SEVERAL SYSTEMS OF ILLUMINATION, 125TH STREET, NEW YORK CITY

formed which will contract with the Edison Company for the lighting, and with the individual storekeepers and owners of real estate for the payment of the assessments. The decision is the result of an exhibition of different systems of lighting made two months ago by the Edison Company. Six different kinds of arc lighting were demonstrated, and Edison men in attendance explained to all questioners the advantages of each. From time to time the lights were shut off, so that the visitors could compare the illumination supplied by the city with the various other lighting arrangements shown. Automobiles were at hand, and that groups of interested individuals could be taken off to various blocks to view the effects from a distance.

Electric Meters to Be Examined

Paterson, N. J.—The Public Utility Commissioners have directed their electrical inspector to make an inspection of the meter departments of electric lighting companies.

Gas Company Voluntarily Reduces Price

Petersburg, Va.—The Petersburg Gas Company, through its manager, R. A. Goudy, has promised consumers of the city a 10-cent reduction in the price of gas, a 5-cent reduction, January, 1912, and an equal reduction January, 1913. In order to show the relation between prices and per capita sales he submits the following figures:

Town.	Population.	Sales.	Sales per Capita.	Price (net) Per M.
Lynchburg	36,000	40,000,000	1,300	\$1.25
Portsmouth	20,000	56,000,000	2,800	1.15
Richmond	112,000	405,878,000	4,000	.90
Roanoke	22,000	57,216,000	2,800	1.12 1/2
Norfolk	45,000	254,000,000	5,000	1.00
Newport News	27,000	37,102,900	1,500	1.35
Petersburg	23,400	38,400,000	1,700	1.25

Discussing the general question of cost of gas, he says: "It is often stated by people unfamiliar with the cost of manufacturing gas is very low. These people lose sight of the fact that the cost of manufacturing gas in a holder is only one of the four principal divisions that enter into the cost of gas delivered at the consumer's burner. The other three items are distribution of gas, the expenses of the office, and, to perhaps a less extent, the educational or public relations department of the company—the object of the latter department being to teach the people how to get the most out of the gas, how to use it economically in their appliances, and to adjust their appliances and keep them in repair. The use of these four items added together make the cost of gas, and each one of them bears very nearly its proportion of the cost. The sums must be put aside for depreciation and maintenance, and care of the very condition of the Petersburg Gas Company finds itself into-day. This last item that we are engaged to supply in actual cash should have been taken from earnings in the past."

City to Ask for Conduits

Waterbury, Conn.—Waterbury is to renew its fight in the Legislature this winter for the right to establish conduits under the streets of the city and place the tangled mass of wires now overhead underground, removing the ever-present danger to firemen and also greatly improving the appearance of the center of the city. The bill will be introduced by Senator Lawlor. The satisfactory reports of the working of a system recently installed in New Britain, is furnishing arguments in favor of the measure.

FIRE AND POLICE

Tenants Must Keep Fire Escapes Clear

Atlanta, Ga.—Investigation in consequence of a fire at which twelve women were prevented from getting out of the building by the fire escape because access to it was blocked has developed the fact that the law does not make the tenant responsible for keeping the way clear. The ordinance cites the owner of the building, which is manifestly unfair, as he cannot be expected to be on the premises all the time. Chief Cummins, of the Fire Department, will request the City Attorney to draw up an ordinance placing the responsibility where it belongs, on the tenant.

Fire Protection to Outside Factories

Bridgeport, Conn.—The Fire Commissioners are puzzling over the question of affording fire protection to factories and business concerns just outside the city lines. President Wheeler has asked the City Attorney to define the Board's legal duties in the matter. As a practical question there is much to be said on both sides. Call boxes have been installed for some time in some of the factories, and it would not seem right to withdraw the protection without notice. Then if protection is given one factory how can it be denied to another? A citizen, on the other hand, can argue what protection has his property in the city in case the apparatus is responding to an alarm beyond the limits. The practical answer would seem to be to enlarge the Fire Department and charge the factories for the protection.

Cost of Maintenance of Horse-Drawn and Auto Apparatus

Lynn, Mass.—During the month of January, Chief Harris has kept a strict account of the cost of maintenance of the two combination wagons, one horse-drawn and the other a motor, and also the work done by each. The result of account is: Automobile combination chemical—Number of alarms answered, 21; mileage covered, 683.5; cost of maintenance for the month of January, gasoline, \$4.26; batteries and connections, \$1.88; oil, 8c.; total cost, \$6.88. Horse-drawn combination (three horses)—Number of alarms answered, 2; mileage covered, 4; cost of maintenance, hay, \$15.81; oats, \$9.90; straw, \$1.70; shorts, \$2.15; horseshoeing, \$4.09; medicine for horses, 50c.; total, \$34.15.

Auto Engine Protects District of Low Pressure

Yonkers, N. Y.—The new 90-horsepower, six-cylinder auto engine has been received from the Webb Motor Fire Engine Company. The engine will be housed on Shonnard Terrace, and will serve a large hilly district in which the water pressure is low.

Asks for More Firemen

Troy, N. Y.—Chief Byron, of the Fire Department, in his annual report to Commissioner of Public Safety Mann, recommends ten additional hosemen and two more ladder-men for the paid department. He also recommended that the pay of the paid department be increased and suggested that the salaries be fixed at \$60, \$65 and \$70 a month for first, second and third grades.

Want City to Name Fire Chief

Wilmington, Del.—Wilmington firemen are interested in the proposed legislation, which, if passed, would make the position of Fire Chief and his assistants appointive offices under the control of City Council. Some of the older members of the companies agree that the service might benefit should Councils have control of the appointment of a Chief who in their opinion should be given absolute control of the department. They, however, are not prepared to accept the plan that places both assistants under Council, but think that the assistants should be chosen by the organizations, as is the rule at the present time.

GOVERNMENT AND FINANCE

Municipal Ownership Bill

Albany, N. Y.—Municipal ownership of public utilities is provided for in a bill introduced by Assemblyman O'Connor. It provides that any city by the adoption of a proposition therefor may acquire and operate municipal gas and electric light, heat and power plants and railways. The local legislative body of the city is given full power to make regulations regarding the operation of such plants, including the fixing of rates. The local legislative body may also lease a municipal plant to private parties for not exceeding 20 years.

Five Elections in Two Months

Oklahoma City, Okla.—There will be five elections in Oklahoma City in a period of two months, according to Bob Parman, City Clerk, and the total expense of the five elections will be approximately \$5,000, or \$1,000 each. The first will be February 14, when the voting taxpayers of the city will vote on the question of issuing bonds to the amount of \$1,500,000 for an improved water works system. The second election will be in March, to determine whether Oklahoma City shall have commission form of government or not. The next election will be the regular spring primaries, March 21, when both parties will select candidates for city offices. The fourth will be the regular city election about April 4, and on or about May 20 the charter election will occur. Should the charter carry and the people elect their commissioners in May the newly elected city officials will have served just about a week.

Uniform Accounting for Cities Urged

Providence, R. I.—The Commissioner of Industrial Statistics, in his annual report, recommends the passage of the following law in respect to a uniform system of municipal accounting:

The Commissioner of the Bureau of Industrial Statistics shall annually furnish to the auditor or other accounting officer of each city and town in the State blank forms or schedules, so arranged as to provide for uniform returns giving detailed statements of all receipts classified by sources and all payments classified by objects for its last fiscal year, a statement of the public debt showing the purpose for which each item of the debt was created and the provision made for the payment thereof, and a statement of assets and liabilities at the close of the fiscal year.

The commissioner may prescribe standard forms intended to promote the systematic accounting of financial transactions and the publication of the same in the city and town reports. The commissioner is also authorized to collect from the proper local authorities and to compile and publish such other information pertaining to municipal affairs as in his judgment may be of public interest; and it shall be the duty of all accounting and other officials and custodians of public moneys of cities and towns to fill out properly and return promptly to the said commissioner all schedules transmitted by him to them.

Bill to Protect Civil Service Employees

Albany, N. Y.—Final touches to a bill to extend to State, municipal and county civil service employees the same privileges which are at present enjoyed by veterans are being given by the New York State Competitive Civil Service Employees' Association. This association has been in conference with the civil service organization, covering the employees who are at work in State departments other than those at the capital, and who are holding positions in Greater New York, and an agreement has been reached whereby the forthcoming bill will be endorsed by both organizations, which have a joint membership of over 9,000 persons. The bill in question is expected shortly, and if passed will prohibit the removal of a civil service employee unless as the result of the sustaining of charges presented against such employee.

Grand Rapids' Proposed Charter

Grand Rapids, Mich.—The new Grand Rapids charter, as described by Robert L. Irwin, president of the Charter Commission, at a meeting of representatives of ten Michigan cities who recently met at Lansing to discuss charter reform and commission government, attracted much favorable comment. The government will be divided into administrative and legislative departments. The Council, composed of one man from each ward, will be purely legislative in its functions. The administrative branch will consist of a Mayor, who will be elected, and four chiefs of departments appointed by him. The four departments will be: Public Works; Health and Safety; Finance and Accounting; Parks and Public Property. A comptroller will be elected, who will be responsible for seeing that no fund is overdrawn.

Milwaukee's Socialistic Bills

Milwaukee, Wis.—The city government has sent to the Legislature 36 bills, covering measures which they would like to see enacted. Among those of most general interest are the following:

To authorize the city to establish municipal slaughtering houses.

To empower the city to purchase real estate and to construct and maintain dwellings to be sold or rented.

To enable the city to secure and operate lodging houses.

To permit the city to build and maintain lavatories and rent out the privileges.

To authorize the city to establish a municipal loan bureau.

To permit the city to purchase, lease or acquire or manufacture plumbing apparatus and do plumbing.

To authorize the city to fix rates for wharfage and docks and collect charges.

To provide for the exemption from taxation of village, town, city and county and school bonds.

To enable the city to sell, convey, lease or otherwise dispose of any city-owned property.

To authorize the city to borrow money to purchase park lands by cash payment, and to secure such loans by mortgage.

To enable the city to raise the assessments from \$2.50 to \$3.50 a square yard for street improvements.

To enable the city to exact a municipal license fee for automobiles.

To make second offenses of violations of the automobile speed laws punishable by imprisonment.

To amend the statutes to enable cities to charge license fees for street cars from time to time.

To enable the city to grant franchises through parks and parked ways.

To authorize the city to purchase plants and manufacture and sell ice.

To permit the city to levy assessments for street oiling as well as sprinkling.

To strike out the exclusive clause in the Milwaukee Gas Light Company franchise.

To amend the charters of all cities to legalize compensation for special privileges.

To provide for the forfeiture of street car franchises after two years of non-usage.

Proposed Charter for St. Louis Defeated

St. Louis, Mo.—The proposed charter for the city of St. Louis was defeated at a special election, January 31, by a majority of 40,155. The total vote was 89,937, of which 24,891 were for the charter and 65,046 against. About half of the total registered vote in the city was polled.

The proposed charter provided for a single legislative body, elected at large by all voters, civil service through the merit system and concentrating all executive and administrative power and responsibility in a few officers, answerable directly to the people. It called for a referendum on franchises and would enable the citizens to recall any elective officer after 18 months' trial. The charter would deprive the Mayor of the power to control 7,000 appointments.

Women Help Recall Seattle's Mayor

Seattle, Wash.—Mayor Hiram C. Gill, who was elected last March by a plurality of 3,500 votes, was recalled February 7 for alleged misconduct in office by a plurality estimated at 4,000. The votes of women, who were recently enfranchised in this State, were largely responsible for this result. The total vote was nearly 60,000 out of a registration of 71,000. Mayor Gill, elected for a term of two years, has been in office but little more than ten months. Women ruled absolutely in the election. It is the first time the women have had the privilege of the ballot in this State. The recall election was brought about by an attempt to oust Mayor Hiram C. Gill and to elect George W. Dilling. The women did not have the franchise when Gill was elected a little over a year ago, so that the shrewd politicians in the State, and in fact the whole Northwest, early recognized that the women held the deciding hand in to-day's election.

Bill Providing for Home Rule

Spokane, Wash.—The proposed statute which is intended to remove the last traces of doubt as to the legality of the new Spokane charter has been completed by Attorneys H. J. Stephens and J. T. Burcham. The new act is remarkable on account of its brevity. It repeals all laws relating to the form of organization of cities of the first class and gives them almost total power in drafting their basic law. The bill reads as follows:

An act relating to the form of organization of cities of the first class, and the exercise of the powers of such cities, declaring the provisions of this act, repealing all laws or parts of laws inconsistent therewith, and declaring an emergency.

Section 1. The form of the organization and the manner and mode in which cities of the first class shall exercise the powers, functions and duties which are or may be given by law to such cities, with respect to their own government, shall be as provided in the charters thereof.

Section 2. Any such city may provide in its charter for the recall of elective officers and for direct legislation by the people on any matter within the scope of such powers, functions or duties of any such city by the initiative and referendum.

Section 3. This act shall apply to any charter of any such city heretofore adopted or approved by the electors thereof at an election duly held.

Section 4. All laws or parts of laws inconsistent with this act are hereby repealed.

Section 5. An emergency exists and this act shall take effect immediately.

Chattanooga to Be Under Commission Government

Chattanooga, Tenn.—The Chattanooga commission charter bill has passed the Legislature and been signed by Governor Hooper.

Report on Finances of Rhode Island Cities

Providence, R. I.—According to the report of the Commissioner of Industrial Statistics on municipal finance the total current receipts for the 38 cities and towns of the State, including money received from loans and bonds, amounted to \$16,350,867.06. The current expenditures amounted to \$16,756,337.24. The cash on hand at the beginning of the year was \$1,307,918.70, and the cash on hand at the end of the year, \$932,448.52. The total property valuation of the 38 cities and towns amounted to \$536,544,943; 66,801,270 of which was real and \$129,743,673 personal property. Real estate valuations in 1910 increased \$16,854,499 over those of 1909. Personal increased \$8,465,448.

Municipal Savings Bank Planned

Milwaukee, Wis.—A municipal savings department in connection with the City Treasury may be established in Milwaukee if a bill which was introduced in the State Legislature by Assemblyman Max Binner, Milwaukee, is enacted into law. The plan is to discourage the practice of paying interest money on bonds to Eastern firms and to keep all municipal bonds in Milwaukee. If the law is passed the City Treasury will be placed under the jurisdiction of the State Bank Examiner, who will hold the city bonds as security for deposits made with the City Treasurer in the form of savings accounts. All people who care to open a savings account will be enabled to make deposits from \$5 to \$1,000 and to receive interest from the city. The rate probably will be 3 per cent. The depositors will have the same security as a bank, as the city will stand behind the accounts with the bonds. The entire savings are not to exceed the amount of bonds on deposit with the State.

Cincinnati Mayor Vetoes New Code

Cincinnati, O.—Deeming the increases in the salaries of city employees unnecessary and inadvisable in view of the limited tax rate and objecting to the elimination of the provisions of the old lighting ordinance, which compel electric lighting companies to permit other such companies to use its poles at a fair rental, Mayor Schwab has vetoed the new codification of city ordinances recently passed by council. Mayor Schwab has more than once of late declared his belief that the city soon would find itself hampered for funds to run the departments under the present tax limit, and in the event that Governor Harmon's ten-mill limit is passed by the legislature the question would become a serious one. The salary increases provided in the code amounted to over \$70,000 a year in the aggregate and affected many of the heads and chiefs of the principal subdepartments.

Ask Change in City Salaries

Cleveland, O.—Believing that the salaries of city employees need adjustment, a meeting was held last week at the office of the Civil Service Commission to outline a plan for bringing about the change. Representatives of the Chamber of Commerce joined in the conference.

Commission Government Elections

Pontiac, Mich.—Commission government was adopted January 30 by a vote of 824 to 494. Only about half the normal vote was polled.

Guthrie, Okla.—Commission government was adopted January 30 by a unanimous vote.

Jacksonville, Ill.—By a vote of 1,471 for to 837 against Jacksonville adopted the commission form of municipal government January 31. The total vote was about 75 per cent of the vote cast at the last city election.

STREET CLEANING AND REFUSE DISPOSAL

Cities Having Cleanest Streets

Albany, N. Y.—Albany, Poughkeepsie and Newark, N. J., according to a statement made by Gus H. Hanna, of Cleveland, Ohio, have the cleanest streets of the hundred cities which he has visited in the past few months. Mr. Hanna was superintendent of the Street Cleaning Department of Cleveland during the administrations of Tom L. Johnson, and transformed that city from one of the dirtiest to one of the cleanest in the country. He is now sales agent for the Tiffin Wagon Works and is introducing their street-flushing machines.

Clean-up Day for Lodi

Lodi, Cal.—At a near date "Clean-up Day" will be carried out by the Women's Improvement Club of Lodi. Scores of boys will be paid to pick up tin cans and other rubbish in the residential sections. A number of citizens have offered to donate the services of their teams to haul the debris away, and the general public is with the club in the progressive movement. On this day the club will have neglected palms and trees trimmed and mudholes in sidewalks filled. The surplus gravel which the city has on hand will be used at street crossings which have worn low.

Street Sweepers Organize

Pittsburg, Pa.—The 800 street sweepers of Pittsburg have organized. Their union is to be known as the Street Sweepers' Union No. 13,123, with headquarters at Union Labor Temple. The following officers have been elected to serve for the present year: President, Patrick Murphy; vice-president, William Robinson; secretary, George Haney; recording secretary, William H. Murray; treasurer, Joseph Waters.

Dr. Paul Franklin, chairman of the Finance Committee of Council, has asked Council to increase the street sweepers' wages from \$2 per day to \$2.25. It is contended that in other cities street sweepers are paid \$2.50 and \$3. Many of the street sweepers in this city get only three days' work out of the week, and say they are unable to support their families on this meager earning.

Using Flushing Machines in Winter

Albany, N. Y.—According to Mayor McEwan, Albany streets were cleaned for the first time this year in the middle of the winter. The occasion was a spell of warm weather. The flushing machines were called out and did effective work.

RAPID TRANSIT

Chicago Subway Plans About Ready

Chicago, Ill.—Plans are near completion by Bion J. Arnold which will give the city the most elaborate subway systems in the world. No authorized statement of details has been given out by Mr. Arnold, but he is quoted as saying: "I will say that I am in favor of a 'double decker' subway. The bottom of the subway, as I plan it, will be on two levels, so there will be no grade crossings below the ground. My plans are exceptionally comprehensive. They are prepared in such a way that the city can do exactly as it chooses in the matter of construction. If the city wishes to build itself my plans provide for that; if it wishes the traction companies to build my plans also contemplate that." Details to the effect that the bottom of the subway is to be forty feet below the street level, to extend from building line to building line rather than from curb to curb, and similar minutiae Mr. Arnold characterized as "guesswork." He intimated that certain details mentioned may be approximately correct, but stated that his plans are not ready for publicity as yet.

Railways Compelled to Pay for Culverts

Pasadena, Cal.—City Attorney William Carr has given an opinion to Council to the effect that street railroads should pay the entire cost of constructing culverts under their rights of way when the necessity for their construction depends upon the occupancy of the street by the railway. It is said that in the past the city has paid out many thousand dollars for the construction of culverts which should have been built at the expense of the street railway.

MISCELLANEOUS

Council Favors Home Union Labor

Cincinnati, O.—Council committee on track elevation has gone on record as favoring the employment of home labor at union wages in the construction of the grade crossing viaducts for which a recent bond issue provides. The committee directed Legal Clerk Buchwalter to incorporate the requirement as part of the enabling ordinance and specifications of the Ludlow avenue crossing viaduct.

Anti-Lunch Cart Agitation Started

Lynn, Mass.—Providing he has the support of the other members of the Municipal Council, Commissioner Bayrd intends to put every lunch cart within the fire limits of the city of Lynn out of commission. He started on this crusade by causing N. K. Hamel, who wanted to transfer a lunch cart from one location to another on Exchange street, to be given leave to withdraw. Not only does he intend that licenses shall be withheld from new petitioners but that as those lunch cart owners who have been enjoying this privilege for years come before the Municipal Council for the renewal of their licenses they will also be told to fold up and go out of business. Mr. Bayrd's point is that too much valuable land in the central part of the city is not serving its proper purpose. He asserts that the owners of this class of property ought to receive more stimulus to erect taxable buildings on the sites and thus provide a greater source of revenue for the city. From an esthetic standpoint also, Mr. Bayrd claims that the lunch carts are objectionable. He has the same feeling concerning billboards, against the erection of any more of which he proposes to interpose objections.

Start Municipal Vaudeville

Milwaukee, Wis.—Not satisfied with giving a weekly municipal Sunday afternoon concert in the city auditorium, at which a high-priced orchestra discourses classical music and ragtime melodies alternately, the Socialist administration has decided to inaugurate a series of Sunday afternoon professional vaudeville entertainments. The Socialists believe they have a better chance of making the vaudeville affair a success than they have with the concerts. The concerts are losing \$100 each. The vaudeville may meet opposition from the Theatrical Trust. Only a small admission fee will be charged.

Southern Cities Would Segregate Races

Baltimore, Md.—City Councilman Samuel L. West, on hearing the Court's decision against his segregation ordinance, said that he would immediately make plans for the introduction of a new segregation ordinance "that will hold water." "We have been shown the way in the trial of these test cases," he said, "and instead of being discouraged I feel much encouraged over the prospect of having adopted an ordinance that will meet the situation in every respect. With this object in view, I shall consult with the best constitutional lawyers in the city in a day or so, and we will draft an ordinance that will overcome the defects which, as the Court pointed out, prevail in the first ordinance." In all probability Mr. West will have incorporated in the new ordinance the provisions he had intended as an amendment to the present ordinance covering the cases of the mixed streets, leaving it discretionary with the residents in the mixed streets to decide whether or not a white man or a negro can occupy a vacant house, and the provisions of the ordinance will not affect such a street.

Birmingham, Ala.—Alderman George Huddleston's bill providing for segregation of the races has been approved by City Attorney Romaine. The bill provides that a negro shall be guilty of a misdemeanor and punished by a fine not exceeding \$100 and imprisonment of six months, one or both, if he shall hereafter move into or take up his residence in premises not now occupied by persons of the negro race, in any block in which the majority of persons then therein residing are of the white race, such residence being within 400 feet of the residence of any white persons, providing, however, that domestic servants residing on the premises of their employers shall be excepted from the provisions of the ordinance. It also provides the same punishment for any white person who shall move within 400 feet of a negro residence.

Richmond, Va.—The city of Richmond is to enact a color-line residential ordinance, which will be as rigid as the Baltimore ordinance. The demand for the law is due to the advance of negroes into what has for years been the center of the residential section for the whites. The result of this has been to reduce the value of the property to less than half its former value, causing losses to the owners. The ordinance will prohibit any white person from occupying any house on any block where the majority of the residents are colored people, and likewise the colored population is prohibited from moving into any premises on a block where the majority are white residents.

Art and Economy in Civic Beauty

Toledo, O.—"Toledo has an opportunity for a civic center surpassed by no other city in America, and the same may be said of the possibilities of beautifying her water front. Toledo's civic center must be not only American, but suitable to the needs of Toledo. Civic art is an asset to any city. With fine parks included, it builds up the health of a city, and this is a greater asset. In the building of a city it is a crime not to plan for the future. A scheme for the future means economy."

These were some of the thoughts advanced by Arnold W. Brunner, federal architect, of New York, before a representative body of business men and citizens in Memorial Hall Annex. Mr. Brunner spoke informally for half an hour, and then devoted the rest of his time to a display of stereopticon views dealing mainly with the civic plans of European cities, including Paris, Dresden, Vienna, Hamburg, Berlin and London, with just a glimpse of the architecture of old Toledo in Spain, and two or three views of Rome. His American views were limited to Cleveland's group plan, a similar plan of Baltimore and the beauties already existing and those planned in Washington. In all of these Mr. Brunner sought to show that the most beautiful and costly buildings would lose their value unless given the proper setting. Mr. Brunner pleaded for many small parks, showing how they not only added to the value of surrounding property, but contributed to the health and happiness of the community, and he showed how railroads could be brought into a city in a dignified way without hurting their business in the least. This he illustrated with views of European railways running directly through beautiful gardens.

Little Money for Parks This Year

Milwaukee, Wis.—The task of carrying out \$80,520 in improvements with but \$27,819 available, which amount may be reduced to \$15,819.90 when all parks and playgrounds placed under the jurisdiction of the park board by the Common Council, is the problem confronting that board announced when the tentative budget and 1911 improvement plan was submitted. While there is no hope of carrying out much improvement work this year with the limited funds on hand an attempt will be made to reach an agreement whereby the present year will show some progress in the park and recreation activity of the city. The reason the park board will be able to make but few improvements in 1911 is the action of the Council in forcing the board to pay \$15,712.98 for water in 1909; the probable payment of \$708 for water used in 1910 and the possible expenditure of \$12,000 when 14 smaller parks and playgrounds are taken from the control of the Department of Public Works and placed under the jurisdiction of the park board.

Ask for Compulsory Spraying Law

Columbus, O.—J. W. Rodgers, former park superintendent of Cincinnati, is in Columbus to urge the enactment of a law for compulsory spraying of ornamental and fruit trees. He conferred with officials of the State Board of Agriculture and Governor Harmon, and they approved of his idea. He will appear before the House and Senate agricultural committees to push the proposition. Mr. Rodgers says that the spraying process is the only salvation of the trees.

Most of the trees in cities are weakened by the sulphurous fumes, and are so badly devitalized by the pests which attack them that they do not recover," said Mr. Rodgers. "The trees are the greatest assets of the land and by spraying them they can be preserved. Spraying should be compulsory and the law should be so that if cities do not spray this could be done at a small expense by the State. People do not spray because they know little about it."

Lid Is on in Tacoma

Tacoma, Wash.—Henceforth Tacoma will be a "closed town" in all that the phrase implies. The municipal commission at its last session unanimously adopted a resolution instructing the police department to suppress all prize fights, gambling, the sale of liquor in any place without license and enforce the operation of a restricted district. Commissioner L. W. Roys of the Department of Public Safety announced that he would obey the resolution to the letter.

Can't Agree on Sharing Expense

Waterson, N. J.—At a conference between the members of the Board of Trade committee on grade crossing elimination and the members of the Boards of Finance and Public Works it developed that the Mayor and the Board of Finance, while favoring the elimination of grade crossings, are not willing to enter into any arrangement by which the city is to pay part of the cost of the work. This means that there is no immediate likelihood of the elimination of grade crossings in this city, unless the railroad companies decide that they are willing to do the work at their own expense, or unless there is legislation that will compel them to eliminate their grade crossings in cities on some basis as to cost to be fixed by the Legislature. General S. V. S. Muzzy was spokesman at the conference of the Board of Trade committee. He stated that the city had agreed to eliminate the crossings along its lines in this city, according to plans submitted, which it was estimated would cost \$1,200,000, provided the city would agree to pay one-third of the cost, the Erie to pay two-thirds. In addition to this the Erie wanted the city to guarantee the sale of the necessary bonds for the work.

To Muffle Motor Boat Noise

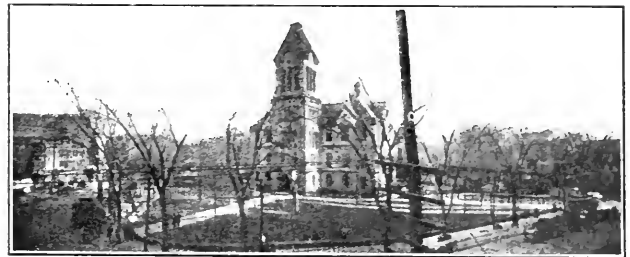
St. Augustine, Fla.—Alderman Usina has proposed the passing and passage of an ordinance requiring all launch owners to use mufflers on their boats, while plying the St. Johns river in front of the city. This action was suggested on account of numerous complaints received from residents and owners of property along the bay front about the noises caused by launches, especially at night.

Contractors Ask Interest on Certified Checks.

Spokane, Wash.—Eslick & Hartnett, contractors, have made a demand on the city for \$91.70 interest on a certified check for \$16,500 which accompanied their bid on the Lincoln Heights reservoir, and which has not been returned by the Board of Public Works. This is the first claim of the kind ever presented to the city. The contractors claim that the Board has no right to hold certified checks which accompany bids without paying interest on them, and have signified their intention of suing the city if their claim is not allowed. The Board of Public Works has been in the habit of receiving bids and delaying sometimes for months the awarding of the contract, retaining the checks for that length of time. If these contractors are successful it may mean that the Board will have in the future to either throw out all bids or award a contract immediately to save interest on the checks accompanying bids. The Board sometimes has as much as \$100,000 in certified checks on its hands.

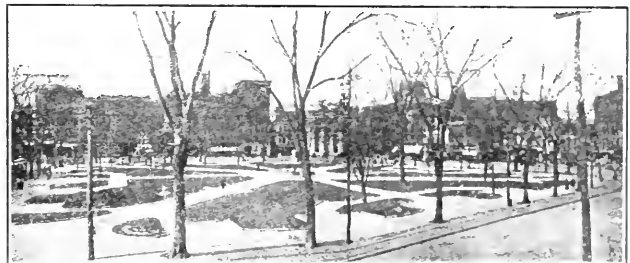
Transformation of Public Square

Wilkes-Barre, Pa.—About a year ago the Public Square was vacated by the County Commissioners, the old Court House removed and the ground reverted to the city. In planning the improvements to the grounds two factors had



PUBLIC SQUARE BEFORE REMODELING. OLD COURT HOUSE OBSTRUCTING PEDESTRIANS

to be considered, the preservation of the trees and the use of the park as a thoroughfare for the public. The work was completed just before winter set in. Within the limits of the park are 25,852 square feet of granolithic work. The footwalks around the park contain 4,994 square feet. The coloring of the walks, which is grayish brown, has been



PUBLIC SQUARE IMPROVED WITH CEMENT WALKS, COURT HOUSE REMOVED—TREES PRESERVED

the subject of much favorable comment. The work was done by Zeiser Bros. The plans and specifications were drawn by the Sturdevant Engineering Company.

Wilmington to Have Chief Forester

Wilmington, Del.—A bill which provides for the appointment of a chief forester and as many assistants as are deemed necessary, by the Street and Sewer Board, has been drafted by the municipal committee of the Board of Trade and is now ready for presentation to the Legislature. The proposed bill gives the Street and Sewer Department authority over all trees and tree planting in the streets, highways, lanes, alleys, parks or other public property of the city, and also specifies that the department is to have all authority over their care, removal, spraying and whatever else might be considered necessary for the care of the trees. The bill provides for a chief forester, to be appointed by the Street and Sewer Directors, who must be an expert in the work of training and culturing trees.

LEGAL NEWS

A Summary and Notes of Recent Decisions—Rulings of Interest to Municipalities

Illegal Ordinance—Refusal of Mayor to Sign

State ex rel. Case vs. Wilson et al.—The mayor of a city of the fourth class properly refused to sign an ordinance providing for a depository for the general funds of the city, where such depository had not been provided for by statute, so that his removal from office therefore was illegal, under the city charter providing that he cannot be removed by the council without cause.—Springfield Court of Appeals, 132 S. W. R., 625.

Limits of Indebtedness—Determination

Ex parte City of Newport.—Constitution limits the maximum indebtedness of cities of the first, second, and third class having a population exceeding 15,000 to 10 per cent of the value of their taxable property, to be estimated by the assessment next before the last assessment prior to the incurring of the indebtedness, provided that nothing shall prevent the issue of renewal bonds and bonds to refund the floating indebtedness of a city, etc. Held, that where a city included an independent school district, which was an independent corporation, the indebtedness of the school district was not to be treated as a part of the city's indebtedness in determining whether the city had reached its maximum constitutional debt limit, so as to preclude the issuance of further bonds.—Court of Appeals of Kentucky, 132 W. R., 580.

Paving Contract—Rock Excavation—Extra Work

Dunn vs. City of New York.—Plaintiff contracted with a city to pave certain streets, the contractor to excavate the subsoil to a specified depth, and if rock should be encountered, it was to be removed for at least 3 inches deeper. Several years before, the city had let contracts for grading the streets in question under which all rock was to be excavated to a depth of two feet below the curb line and the excavation then refilled with soft filling to the street level. Under such previous contracts, the contractors had received payment in full upon proper certificates that the work had been fully performed. Such contracts were on file as public records with the certificates showing the full performance of the work and payments therefor. When plaintiff undertook to excavate the streets, he found that the rock had, in fact, been removed to a depth of only about a foot below the curb instead of two feet and was required, over his protest, to remove the rock which should have been removed under the former contracts. Held, that the parties to the contract did not contemplate that the contractor would have to remove the rock which was supposedly removed under the former contracts, and the contractor being compelled to make such excavation to perform his contract, there could be a recovery therefor as for additional work.—New York Supreme Court, 126 N. Y. S., 61.

Defects in Streets—Evidence

Willard vs. City of Detroit.—In an action against a city for personal injuries received through an alleged defect in the sidewalk along the street, evidence held sufficient to go to the jury, on the question of plaintiff's contributory negligence.—Supreme Court of Michigan, 129 N. W. R., 32.

Care of Sidewalks—Delegation to Individuals

Severa vs. Village of Battle Creek.—A municipal corporation cannot delegate the construction and care of its sidewalks to a private individual or corporation and thereby evade its responsibility for such care and supervision and thus escape liability for any damage resulting from the failure of the person or corporation, to whom such care and supervision are delegated, to use that reasonable care and diligence to keep such sidewalks in a reasonably safe condition for travel which devolve primarily upon the municipal corporation itself.—Supreme Court of Nebraska, 129 N. W. R., 186.

Injury from Broken Electric Wire—Evidence

Johnson vs. Bay City.—In an action for personal injury sustained by a child of about five years of age, as a result of contact with a broken electric wire hanging from a pole constructed and maintained by defendant, and in which several theories of the cause of the broken wire were submitted to the jury, evidence held sufficient to sustain a verdict holding defendant liable.—Supreme Court of Michigan, 129 N. W. R., 29.

Polluted Water Supply—Liability

Keever vs. City of Mankato, Flanagan vs. Same.—Complaint charged that defendant city negligently allowed the supply in its water works system to become polluted with poisonous substances, and large quantities of filth and sewage to escape into and saturate its water supply, the reason whereof plaintiffs' intestates contracted typhoid fever and died as a consequence. On demurrer it is held:

(1) The municipality was liable for its negligence in its private or corporate capacity, and was not exempt because it was carrying out a governmental function.

(2) Under section 4503, Rev. Laws 1905, an administrative act of a person whose death was due to the wrongful act of a municipality may maintain an action for damages consequent thereon.—Supreme Court of Minnesota, 129 N. W. R., 158.

Water Works Contract—Validity

Savage vs. City of Tacoma.—A prior judgment in a suit to restrain a city and a contractor from proceeding with a contract made under an ordinance of the city for extension of a water works system on the ground of invalidity of the contract, which sustained its validity, is no bar to a later action by the contractor against the city for damages for breach of the contract, in which the city alleged the invalidity of the ordinance under which the contract was made.—Supreme Court of Washington, 112 P. R., 7.

Sewers—Overflow—City's Liability

Hayes vs. City of Vancouver.—A city, having permitted a sewer to become obstructed, attempted to remove the obstruction by turning a large and powerful stream of water into the sewer. The water did not flow through, but stopped at the obstruction, backed up into and overflowed water-closet connections in the basement of a building in which plaintiff had stored a large quantity of goods, resulting in injury thereto. The city's representatives were warned beforehand of the probable damages that would result from such act. Held, that the city in such operations did not act in a governmental capacity and was liable for the injuries sustained.—Supreme Court of Washington, 112 P. R., 498.

Street Paving—Liability for Intersections

O'Leary vs. City of Glens Falls.—Where a village, empowered by village law to apportion, between itself and the landowners, the cost of paving a street, assumed half the expense of paving the entire street, its half being in excess of the cost of paving street intersections, which such section prohibits being imposed on the landowners, should be deducted from the total cost of paving the street, and the balance should be assessed pro rata on the lands of the abutting owners according to the feet frontage of the respective lots.—Court of Appeals of New York, 93 N. Y. R., 513.

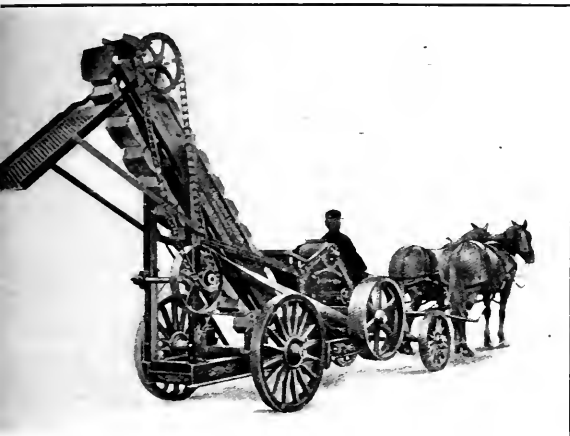
Transfers—Duty to Grant

City of Shreveport vs. Shreveport Traction Company.—It cannot be deduced, from the adjudged cases or from any other premise, that in the case of a contract with a municipality, which, though authorized or evidenced by an ordinance, involves mere conventional obligations, and does not involve the exercise by the municipality of its law-making power, a subcontractor can be held to have assumed the obligations of the contractor. The obligation to grant universal transfers could be imposed on a street railway company by the city of Shreveport only as a matter of contract; and as the defendant has not, either expressly or impliedly, given its consent to such contract, it cannot be compelled to grant the transfers.—Supreme Court of Louisiana, 53 S. R., 863.

MUNICIPAL APPLIANCES

Portable Crushing Plants

The illustration of a Champion portable crushing outfit made by the American Road Machine Company, Kennett Square, Pa., suggests to the contractor municipality doing its own work a good way of starting out the road building season, now almost upon us.

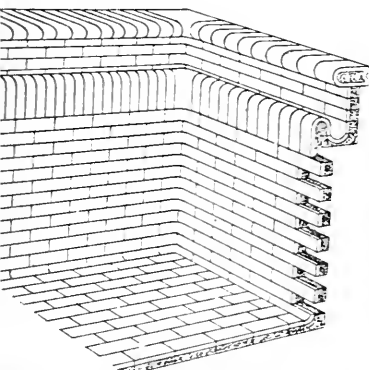


PORTABLE CRUSHING PLANT

The Champion mounted crushing outfits moved on the road exactly as shown in the illustration, without taking down either elevator or screen. The machine can be operated just as it is by blocking the wheels, these being made particularly heavy and strong for that purpose. A better plan, however, because it affords a more solid foundation, is to place two wooden blocks which should be kept with the outfit, under the I-beam sills to which the crusher is attached. The rear end of the machine is then lowered by slightly turning two screws with a light iron rod attached to screws for that purpose until the I-beam sills rest on the wooden blocks; the front end of the machine is then lowered by removing the front trucks, the whole operation requiring but very little time. When the crushing is finished and it is desired to move the machine, the operation is reversed, and the plant is on the road.

Glass Brick for Swimming Pools

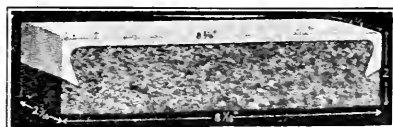
The glass-faced brick with filling of concrete which is suitable for use in the construction of swimming pools, for the lining of garbage crematories, fire houses and lining of tunnels and



SWIMMING POOL OF GLASS BRICK, SHOWING SCUM GUTTER

subways is made by the National Glass Brick Company, Connellsville, Pa. The use of these brick in a swimming pool is shown in the illustration. The ease with which special shapes are made aids materially in the design of the scum gutters. Fresh water in a swimming pool is let in from the bottom and the overflow is all round the basin at the top. The glass surface and close joints between the brick make the washing down process easy.

The construction of the brick is as follows: To a glass facing 1/4 inch thick at its thinnest part is attached a well-proportioned concrete back. The concrete backing is attached to the glass front by three separate means, each entirely sufficient to secure the union of the two materials: (1) The cement of the concrete adheres to the glass. (2) Both ends of the glass face are returned by greater than a right angle, thus imprisoning the concrete mass. (3) A dove-tailed rib of glass traverses the entire length of the back of the facing, at once strengthening the glass face and also securing it to the concrete body. The glass face is 1/16 of an inch larger all around than the concrete body, thus



GLASS FACED BRICK—CONCRETE BACKING

making possible a good mortar bond, notwithstanding that the mortar between the faces of the glass may be nearly entirely pressed out. The glass-faced brick is laid in exactly the same way as any finished brick. They are bonded to the wall, being faced in like manner also. A wise plan is to lay up four courses of two-inch depth brick and then one of four-inch depth. This will be an effective binder and preserve the symmetry of the courses exposed to view. All colors of which glass is capable can be produced in glass brick. White, however, is standard stock.

Willson Flare Light

The Willson Flare Light, manufactured by the International Marine Signal Company, Limited, No. 172 Broadway, New York, is an acetylene light specially adapted for use in all kinds of construction work. The light is brilliant and the cost is low. The candlepower is 8,000 and the cost of operation 5 cents an hour. The light is steady and wind does not extinguish it. The weight of the No. 1 light, shown in the illustration, is 95 pounds; it contains a carbide charge of 18 pounds and 112 pounds of water, making the total weight charged 225 pounds. A smaller

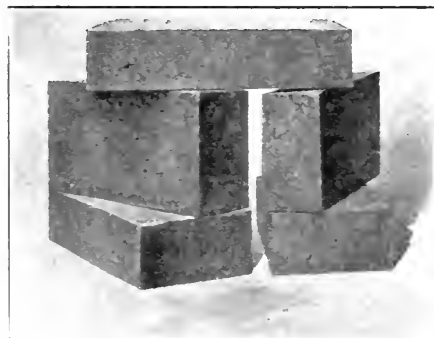
size has a candlepower of 1,000, weighs 225 pounds charged and is estimated to cost 2 cents per hour to operate. By



the use of a flexible hose an extension light may be obtained which can be put in places where it is impossible to locate the generator.

Cork Brick

Cork brick are recommended for the barn floors of sanitary dairies and for stall floors of fire houses by the manufacturers, the Armstrong Cork Company, Pittsburg, Pa. The brick consist of finely granulated cork and a special grade of tough asphalt, heated and thoroughly mixed, then molded into pressure into brick form. The bricks measure 9 by 4 by 2 inches and are laid flat so that four will cover one square foot of surface. The brick is the result of a number of years' efforts in selecting the best bitumen. The merits of the brick for use in sanitary dairies are that they are non-absorbent, easy to clean, are never uncomfortably cold for animals to stand or lie on, are



SAMPLES OF CORK BRICKS

easy on the feet, give a sure foothold and have long life in service.

The blocks are laid on any firm foundation, concrete, broken stone or wood, and are set in Portland cement mortar, in a thin layer of hot asphalt or pitch or in a bed of sand.

NEWS OF THE SOCIETIES

American Institute of Consulting Engineers.—An amended constitution was adopted at the annual meeting, January 17, at the Engineers' Club, New York City. The objects of the institute are stated to be the promotion of ethical standards and practical efficiency in all branches of engineering as a profession. The institution will not deal with technical papers and discussions, but with matters affecting the status of the engineer as a professional man, as legislation affecting practice of engineering, rules of professional conduct and standard charges for engineering service. The officers for the coming year are Alfred P. Boller, president; Gustav Lindenthal, vice-president; E. W. Stern, 103 Park avenue, New York, secretary and treasurer. Committees on legislation were appointed as follows: Gen. J. A. Bingham, S. O. Miller and S. Whinery; on professional practice and ethics: John F. Wallace, H. W. Hodge, F. A. Molitor, L. B. Stillwell, George F. Swain, W. J. Wilgus.

Western Society of Engineers.—At a meeting, Chicago, February 1, a paper on the "Public and the Public Service Corporation" was presented by John M. Ewen and A. Bement. At a meeting of the Hydraulic, Sanitary and Municipal Section, January 30, C. D. Hill presented a paper on the "Sewage System of Chicago." Langdon Pearse read a paper on the "Sewage Disposal Problem."

Municipal Engineers of the City of New York.—The following officers were elected, January 25: President, Henry W. Vogel; vice-presidents, Sidney W. Hoag, Jr., and Frederick C. Noble; secretary, C. D. Pollock; treasurer, Herman K. Endemann; directors, A. L. Schaeffer, E. M. Law, Jr., D. L. Turner, E. A. Miller and E. J. Fort.

Engineers Club of Philadelphia.—The club has elected the following officers for the coming year: President, James Christie; vice-president, W. L. Plack; secretary, W. Purves Taylor; treasurer, F. H. Stier.

International Municipal Congress and Exposition.—Definite plans for the international municipal congress and exposition to be held in Chicago from September 18 to September 30 of this year were announced by the Chicago Association of Commerce, upon the return of John MacVicar, commissioner-general of the affair, from a tour of observation and arrangement in the Eastern cities.

"Two distinct features—the congress and the exposition—will mark the event," explained H. F. Miller, business manager of the Chicago Association of Commerce. "Municipal exhibitions will be opened to the public inspection while the congress is in session. Delegates from cities all over the world will be present. Public bath, playgrounds, park systems and city plans generally will be shown at the exhibition, together with appliances made by manufacturers for sale to municipalities. Much of the space allotted to the latter has already been spoken for by the manufacturers."

The show will be held in the Coliseum, the First Regiment Armory and in some vacant lot already rented by the Chicago Association of Commerce, under whose auspices the event is to be held. The congress will be held in the Coliseum annex or wherever the committee on arrangement can find sufficient space.

County Road Engineers of West Virginia.—At the second convention of the organization, which ended January 28, at Charleston, the following resolution was adopted:

Be it Resolved, By the County Road Engineers' Society of West Virginia, here assembled, that after more than one year's experience with the new road laws, as enacted by the last Legislature, we express to the present Legislature our recognition of the superiority of the present laws over the old laws and approval of the present laws, in general, and recommend to the Honorable Legislature the amendments to said laws, as suggested by the Commissioner of Public Roads in his report.

The officers for the coming year are W. J. Alexander, of Wetzel County, president; Robert D. Hennen, of Monongalia County, vice-president, and Henry A. Gentry, of Fayette County, secretary-treasurer.

Virginia Peninsula Good Roads Association.—The meeting on January 24, which resulted in the formation of the association, was the largest, most representative and most enthusiastic gathering ever held on the peninsula in the interests of good roads. That a sand-clay highway along the peninsula from Newport News to Richmond will be built—and built before the coming Summer is over—seemed to be a certainty at the conclusion of the enthusiastic good roads rally held in the historic old court house. And while the new road is under construction a definite movement will be started looking to the establishment of an adequate ferry service across Hampton Roads to connect the Peninsula pike with the Jamestown boulevard between Sewall's Point and Norfolk. This organization begins its existence with a charter membership of about sixty, including representatives from Richmond, Williamsburg, Newport News, Hampton, Old Point, Norfolk and all of the counties of the peninsula, and has as its avowed object the construction of the Richmond-Newport News highway. The officers are as follows: President, F. W. Darling, Hampton; first vice-president, Henry T. Wood, president of the Richmond Chamber of Commerce; second vice-president, H. B. Goodridge, Norfolk; third vice-president, J. B. C. Spencer, Williamsburg; secretary, W. E. Cottrell, secretary of the Newport News Chamber of Commerce; treasurer, George F. Adams, Old Point Comfort.

League of Utah Municipalities.—At the annual meeting of the league in the city hall at Sandy, Utah, in January, the following resolutions were adopted:

Whereas, It now appears from bills introduced in the Legislature that there is a possibility of a law being enacted which will prohibit towns from granting liquor licenses and thus deprive them of a source of revenue heretofore obtainable; and

Whereas, The law now limits the power of taxation to two and one-half mills unless authorized by a vote of the people at a special election, in which event the tax levy shall not exceed five mills; and

Whereas, The revenue derived from such tax levy is insufficient to meet the necessary expenses incident to the indebtedness of a town corporation; therefore be it

Resolved, That we favor that in the pending legislation upon the liquor question there shall be no distinction in the powers and privileges to cities of any class and those granted to towns; and be it further

Resolved, Because of the insufficiency of the revenue derived by towns because of the small rate of tax levy as now prescribed by law, and the necessity being apparent for the authority to levy a higher rate of tax, that we favor an amendment to the present town charter empowering towns to levy a tax to the amount of one per cent of all assessable property within the town; and that upon a majority vote of the qualified taxpayers at a special election called to vote upon the question, the authority be conferred to levy an additional tax not to exceed five mills, or one-half of one per cent.

Among the speakers were James Anderson, "Good, Cheap and Economical Roadway;" Dr. A. N. Hanscock, "Sanitation and Public Health;" Joseph Ulmer, "Sewage and Sewage Disposition;" G. W. Goats, "Water Systems;" W. W. Wilson, "Sprinkling of Roads;" H. C. Maughan, "Municipal Lighting." Salina was selected as the 1912 meeting place and the following officers were elected: Mayor H. F. Jorgenson, Salina, president; W. D. Kuhre, Sandy, first vice-president; Mayor P. Bentz, Murray, second vice-president, and Mayor Heber Christensen, of Richfield, third vice-president.

The American Society for Testing Materials.—Announcement is made concerning the letter ballot on the manner of the organization of technical committees of the American Society for Testing Materials. The proposal that the chairman of such committees should be selected from representatives of consuming interests and unattached experts was carried by a vote of 189 to 67. The minority favored no restriction on this matter, so that producers as well as consumers and unattached experts might be eligible to committee chairmanships.

There has been some sentiment in favor of holding the annual meeting of the society at a farther Western point, but it was decided not to change this year, and the annual meeting will therefore be held at Atlantic City in the last week of June, 1911. As far as possible papers and committee reports will be printed in advance of the meeting. One of the features of the program already scheduled is a symposium on hardness tests.

Preparations will soon be started for the Sixth Congress of the International Association for Testing Materials, which will be held in New York in 1912. A nucleus for the Committee on Organization has been constituted in the Executive Committee of the American Society and the officers of its standing committees. They will hold their first meeting in New York in February. The American membership in the International Association is now 450, out of a total membership in the American Society of 1,325. It is expected that the American representation will be very considerably increased before next year.

New England Street Cleaning Conference.—The second annual meeting will be held in Springfield, Mass., during the second week in May. Among those who are to speak are Le Grand Powers, Chief Statistician, Census Bureau, Washington; Dr. Soper, President Metropolitan Sewerage Commission, New York; Edward T. Hartman, Boston, Secretary, Massachusetts Civic League, and Prof. Carl Aronovici, Bonn University, Providence, R. I. The subjects to be considered will include the following: "The Relation of Pavement to Street Cleaning," "Proper Sanitary Regulations for Refuse Disposal," "Accounting in Street Cleaning Work," "The Relation Between Street Cleaning and Other City Departments," "The City Slums and Clean Streets," "Dust Particles in the Air as Related to Street Pavements," "Efficiency of the Street Patrol System," and "Labor Questions in Street Cleaning Work." The conference will be open to the public, and in the evening there is to be an illustrated lecture by City Engineer F. L. Ford, of this city, on "Municipal Improvements in European Cities."

International Association of Chiefs of Police.—The president of the body has set out the following call: "Beginning on February 11, 1911, the International Police Association will hold its eighteenth annual convention in Rochester, N. Y., to continue five days. This association includes in its membership nearly 300 units of police forces of the United States and Canada, and its aims and purposes are to elevate the standard of police institutions generally, to improve the status of the police officer, to insure co-operation among the police organizations of the world, to make generally effective the modes of criminal investigation, to secure expeditious action on the part of the police generally, to devise reciprocity proceedings and to introduce modern facilities in the conduct of the service everywhere. In exchange of opinions, presentation of existing conditions, reading of police reports and discussions following the same we have all proved valuable heretofore, and it is proposed to extend the same work by enlisting commissioners of police, chiefs of police, superintendents of police and high constables to attend this convention.

You, or a representative of your department, are most earnestly and respectfully invited to attend, and if you do not do so to prepare and forward to the president of the association such views as you may be inclined to impart for the good of all on any topic of importance of the police work of the world. The principles of this organization, as set forth by its presiding officers, are to secure a closer official and personal relationship among police officials at home and abroad; to secure uniformity of action in police matters; to elevate the standard of police institutions by urging the elimination of police from their conduct; a tenure of office for those employed in the service; the maintenance of honorable men and women in the transaction of police business; the general adoption of pension and relief laws; the adoption of humane methods in the enforcement of laws; the provision of temporary relief for its worthy members and their families in certain emergencies; the advancement along all lines pertaining to the prevention and detection of crime and the reformation and treatment of prisoners."

Connecticut Society of Civil Engineers.—The 27th annual meeting will be held at New London, Conn., Feb. 14-15. Papers to be presented are as follows: Feb. 14—"The Catskill Water Works for New York," Alfred D. Allen, Department Engineer, New York Board of Water Supply; "Some features of Baltimore's \$10,000,000 Sewerage System," H. M. Knight, formerly Engineer with the Baltimore Sewerage Commission; "The Congress Street Bridge," R. F. Stoddard, Feb. 15—"Testing Water Wheels After Installation," Prof. Charles M. Allen, Worcester Polytechnic Institute; "The relation of Weather and Forestation to Stream Flow," W. L. Moore, Chief of U. S. Weather Bureau; "Actual field of a Typical Connecticut Watershed," R. A. Cairns, City Engineer of Waterbury, Conn.

International Association of Fire Engineers.—Secretary James McFall has issued the following notice: Every fire chief is invited to meet with us in Milwaukee. This will be the most interesting meeting for a fire chief. Many subjects of interest to the fire service will be discussed. Much apparatus will be on exhibition, the latest both in auto

and horse drawn will be there. Can the secretary help you in interesting your officials in having them authorize your attending this meeting and making an appropriation covering your expenses? If so, say the word; give me their names for we want to see you in Milwaukee.

Carolina Municipal Association.—The Legislative Committee, meeting at Raleigh, N. C., January 24, drew up a bill to present to the Legislature regarding the commission form of government.

South Dakota Association of Engineers and Surveyors.—At the meeting, Pierre, January 27, the following officers were elected: President, S. B. Powell, Sioux Falls; Vice-President, B. E. Lovejoy, Redfield; Secretary-Treasurer, R. E. Easton, Aberdeen. These three, with L. K. Mathers, of Mitchell, and B. H. Townsend, of Fort Pierre, make up the Executive Board.

Kansas Engineering Society.—The first annual meeting was held at the Commercial Club, Topeka, January 20-21. About one hundred members were in attendance. Governor W. R. Stubbs in his address of welcome spoke in favor of the construction of reservoirs as a means of preventing floods. Prof. W. C. Hoad, University of Kansas, responded. He also presented the report of the Committee on Stream Pollution and Sewerage. Speakers in the closing session were: N. T. Veatch, of the State University, who spoke on "The Improved State Fish Hatchery at Pratt"; V. R. Parkhurst, Topeka, "Drainage and Food Production"; Myron C. Bowerman, "Shop System of the Capital Iron Works"; E. F. A. Kenisch, "Tree Planting on Highways"; R. V. Leeson, Topeka, "Legislation."

Calendar of Meetings

- February 15-17. Iowa Engineering Society.—Annual Meeting, Des Moines, Ia.—S. M. Woodward, Secretary, Iowa City, Ia.
- February 16. Fourth Annual Chicago Cement Show, Coliseum, Chicago, Ill.
- February 16-18. Idaho Society of Engineers.—Second Annual Meeting, Twin Falls.—Gordon C. Smith, Secretary, Boise, Idaho.
- February 21-22. Illinois Water Supply Association.—Annual Meeting, University of Illinois, Urbana, Ill.—E. Barton, Secretary, Urbana, Ill.
- February 28-March 1. Northwestern Cement Products Association, West Hotel, Minneapolis, Minn.—Henry B. Smith, Secretary, 834 Security Bank Building, Minneapolis, Minn.
- March 1-3. Engineering Society of Wisconsin.—Annual Meeting, Madison, Wis.—W. G. Kirchoffer, Secretary, Vrooman Building, Madison, Wis.
- March 6-11. Canadian Cement and Concrete Association.—Annual Convention, Toronto, Ont.—Wm. Snaith, Secretary, 57 Adelaide street East, Toronto, Ont.
- May. City Commission Congress.—Meeting, Galveston, Tex.—Mayor Lewis Fisher, Chairman of Committee, Galveston, Tex.
- May 29-June 3. National Electric Light Association.—Annual Convention, Engineering Societies Building, New York, N. Y.
- June 6-10. American Water Works Association.—Thirty-first Annual Convention, Powers Hotel, Rochester, N. Y.—John M. Diven, Secretary, 14 George street, Charleston, S. C.
- June 11-16. International Association of Chiefs of Police.—Eighteenth Annual Convention, Rochester, N. Y.—Major Richard Sylvester, Superintendent of Police, Washington, D. C., President.
- June 13-18. New York State Association of Chiefs of Police.—Annual Convention, Rochester, N. Y.

PERSONALS

BACHELOR, W. L., Mayor of Hastings, Fla., was knocked down by a runaway team and seriously injured.

FANNING, JAMES J., Secretary to the Mayor of Dallas, Tex., has resigned to become associated with the Dallas Crosetted Pine Block Co.

FOSTER, HARRY E., chief engineer of Medford, Ore., will resign and devote himself to general work. S. E. Semon, assistant engineer, will probably be appointed to fill the vacancy.

FULTON, W. S., has resigned his position as chief engineer, Topeka, Kan., and will become engineering head of the Kaw Paving Co., a local concern.

GALBRAITH, J. L., has been elected Mayor of Henderson, Tenn.

GOVERN, EDWARD J., Rochester, N. Y., has been appointed by State Engineer Benschel division engineer for the western division; salary \$4,200.

GREBAUGH, RALPH W., has been appointed to take charge of the water and electric light plants, streets and sewers of Atlantic Highlands, N. J.

HODGE, H. W., of New York, with M. J. Butler, general manager of the Dominion Iron & Steel Company, has been chosen to settle the differences of opinion among the board of engineers in charge of the construction of the Quebec bridge as to the adoption of a design.

KINNICUTT, LEONARD P., a recognized authority on sewage disposal and water supply, died at Worcester, Mass., Feb. 6, aged fifty-six years.

MARSH, C. L., Cleveland, O., has been chosen to fill the position of city engineer. Gadsden, Ala., vacated by Wilburn Hill.

MCGRATH, GEO. B., is now representing the U. S. Wood Preserving Co. in New England.

MILHEIM, JOHN, of the Niagara Hose Company, succeeds Charles McCormick as Fire Chief at Tonawanda, N. Y.

MILLS, GEORGE C., of Rochester, has received appointment from State Engineer Benschel as resident engineer; salary \$3,000.

MORRIS, FRANK E., Cincinnati, has resigned the position of Assistant City Engineer and will engage in private business.

PANTON, JOHN W., of Norfolk, Va., has been appointed superintendent of the Street Cleaning Department of Washington, D. C.

SCHALK, OTTO B., succeeds James A. Rowe on the board of health, Newark, N. J.

STANLEY, ORRIN E., formerly City Engineer of Pierre, S. D., has opened an office for the practice of municipal, railway and topographical engineering in the Chamber of Commerce Building, Portland, Ore.

STEVENS, COL. EDWIN A., Hoboken, N. J., has been appointed Commissioner of Public Roads of New Jersey, succeeding Frederick Gilykson, whose term expired recently. He is an alumnus of Stevens Institute, founded by one of his ancestors, and is also an alumnus of Princeton University in the same class with Governor Wilson.

TRAMMELL, J. D., Fort Worth, Tex., has resigned his position as City Engineer to become chairman of the board to supervise construction of the new city reservoir. Frank J. vonZuber, assistant engineer, becomes acting chief engineer.

WOHLIUTER, A. F., succeeds W. C. Mitchell as chief of the fire department, Albert Lea, Minn.

ZACHARY, I. L., Atlanta, Ga., has been appointed City Engineer of Brunswick, Ga.

TRADE NOTES

Cast-Iron Pipe.—Chicago—January bookings were better than for January of last year and better than the average for that month. Quotations: 4-inch, \$25; 6 to 12-inch, \$24; 16-inch and up, \$23.50. Birmingham—Tonnage recently placed with Southern producers is large and prospects are considered very good. Prices have been advanced. Quotations: 4 to 6-inch, \$21; 8 to 12-inch, \$20; over 12-inch, average, \$19.

New York—Eastern foundries have much work booked for the spring months. Quotations: 6-inch, carload, \$21.50 to \$22.

Lead—Lead is easy. Quotations: New York, 4.45c.; St. Louis, 4.30c.

Vitrified Sewer Pipe.—The general quotation on first-class vitrified standard sewer pipe and fittings, 3 to 24 in., in carload lots, f. o. b. factory, is 88 per cent discount. The demand is comparatively light and the market is not very strong, owing to competition and a desire to move stocks.

Bitumens in Road Construction.—The Good Roads Improvement Company, Cincinnati, O., whose product—Asphaltoiene—is sold by Alden Spere's Sons Company, No. 253 Broadway, New York, publish a handsome booklet describing their product and explaining in a general way its manufacture and the scientific reason why it is better than asphalts which are merely byproducts of other processes. Asphaltoiene is distilled directly and primarily for road work. It is a straight-run material, so-called. That is to say, the distilling process is so conducted as to give the maximum of the grades of bitumen most valuable in road work. This is contrasted with a product of distillation where the main object is to obtain bitumen for other purposes, such as gas light oils and lubricating oils. Such products are too hard and are cut back with light oils. Both the very hard and the very light bitumens are unstable, the former chemically and the latter physically, as compared with the medium grade bitumens needed for road work.

Asphaltoiene is made in three grades—A, B and C, graded according to gravity, and each suited for a different method of application. A is applied at atmosphere temperature, B requires heating and C should be mixed with heated stone. The pamphlet contains illustrations and evidence going to prove the correctness of the theoretical argument in favor of Asphaltoiene.

Granite Blocks.—The Harris Granite Quarries Co., of Salisbury, N. C., has recently developed an extensive business in granite paving blocks, although originally it had no intention of entering this field. The company's stone dresses to unusually close joints, and this fact led a street railway company to suggest making blocks for use in street tracks. Other traction companies found the blocks satisfactory and the company is now prepared to furnish them for general paving purposes. The properties of the stone and some of the advantages of granite block pavements are explained in a pamphlet which also contains illustrations.

Concrete Dumping Car.—J. L. Blaker, Blaker Mills, W. Va., has placed on the market a combined bottom dumping bucket and car. The bucket forms the body of the car and rests upon cradles attached to the steel frame of the truck. The bucket dumps either directly down or on the side.

Electric Protection Company.—The New York Board of Estimate has granted a franchise to the Electric Protection Company to operate an automatic fire and burglar alarm service in the city. The matter has been before the Board for some time, and the Franchise Committee, which is composed of Mayor Gaynor, Controller Prendergast and President Mitchel, of the Aldermen, after investigating the new system, decided to allow its installation.

It was said that Daniel G. Reid, of Rock Island and Tin Plate fame, holds the controlling interest in the new company.

The Goodrich Picture.—The B. F. Goodrich Company is now sending out its annual souvenir picture, a portrait by Carroll Beckwith. This year the Goodrich girl's name is Beatrix. Her coming was announced by a note from the lady, accompanied by her miniature. The 1911 annual souvenir is the twenty-third issued by the company, the first one having been given out in 1880.

Troy Wagons.—The Troy Wagon Works Company, Troy, O., announce that their dumping wagons and boxes are now handled by the J. I. Case Threshing Machine Company, Racine, Wis. The Troy wagon is always easily recognized by the shaft placed along the outside of the box, by means of which the doors are raised and lowered. The shaft carries spiral drums around which the door lifting chains are wound. It is a simple, strong and effective device.

Construction Exhibit.—The trustees of Columbia University, New York City, announce an exhibition of illustrated books and prints showing the development of construction and transportation from the fifteenth to the nineteenth century, loaned by William Barclay Parsons, in the library of the university, February 1 to 25, from 2 until 5 each week day afternoon.

Technical Data.—A new publication called Data has recently been started by the Technical Data & Appliance Company, 92 La Salle street, Chicago, Ill. This magazine, which is published monthly, is devoted exclusively to engineering data and is intended to supplement the regular engineers' pocketbook by providing information on various subjects which can be readily filed either in a card index file or a small loose leaf pocket note book. With this object in view, the engineering data presented is in tabloid form, being printed on leaves measuring 3 x 5 inches, which can be readily detached from the binder for filing. A sample of one of the pages is shown herewith.

CENTRAL STATION STATISTICS

CITIES 2,000 TO 3,000 POPULATION IN THE STATE OF IOWA, YEAR 1909

Station Number.....	11	12	13	14	15	16	17	18	Av.
Population, thousands.....	2.2	2.5	2.5	2.7	2.8	3.0	3.0	3.0	2.71
Consumers per 100 pop.....	12.	6.	.....	11.	12.	9.	10.	10.	10.
Station Capacity									
Kilowatts.....	75.	80.	130.	110.	135.	175.	150.	120.	122.
Watts per capita.....	34.	32.	52.	41.	48.	58.	50.	40.	44.
Ratio trans. to sta. cap.....	0.7	.....	.....	1.2	0.9	1.2	D.C.	1.3	1.1
Load per kw. Sta. Cap.									
Lamps, ".....	kw. 2.3	1.3	2.1	1.6	2.2	1.3	1.2	1.8	1.7
Motors, ".....	0.4	0.0	0.0	0.5	0.0	0.0	0.0	0.8	0.2
Heat and miscellaneous, ".....	0.1	.....	0.0	0.4	0.5	0.0	0.0	0.3	0.2
Total connected, ".....	2.8	1.3	2.1	2.5	2.7	1.3	1.2	2.9	2.1
Yearly load factor.....	45.	.....	.....	24.	24.	23.	.....	25.	28.
Investment, Dollars									
Per kw. capacity.....	\$292.	[\$187.	\$138.	\$218.	\$200.	\$200.	\$167.	\$367.	\$221.
Per capita.....	10.	6.	7	9.	9.	11.	8.	15.	9.
Gross Income, Dollars									
Per kw. capacity.....	\$137.	\$69.	.....	\$94.	\$67.	\$101.	\$67.	\$132.	\$95.
Per consumer.....	40.	40	44.	36.	38.	65.	33.	50.	43.
Per capita.....	4.60	2.20	.....	3.80	3.20	5.90	3.30	3.30	3.80
Ratio expense to gross income	62%	73%	72%	79%	72%	53%	.....	32%	63%

Chicago, November, 1910.

DATA

Sheet No. 67

Long Handled Concrete Tools.—The Arrowsmith Concrete Tool Company, Arrowsmith, Ill., at their third annual exhibit at the Chicago Cement Show circulated a pamphlet in which the merits of their long handled concrete tools are condensed into five definite claims as follows:

1. The connections fasten right on the trowel blade.

2. The tools are adjustable to any position.

3. The tools are perfectly tight. There is no leverage to wear and get loose, and there is absolutely no danger of digging in the mortar.

4. The tools can be adjusted with the handle perfectly flat with the trowel or they can be adjusted with the handle at right angles or at any intermediate angle.

5. In making concrete sidewalks it is necessary to trowel float. To do this it is necessary to run the trowel across the walk perfectly flat, thereby causing a suction and drawing up the water. Then run the trowel back over it with the edge raised to prevent digging in mortar. Hence rigidity of the handle is necessary.

Sewer Pipe.—In his annual report to the stockholders of the American Sewer Pipe Company President George R. Hill has this to say: "Our efforts have been concentrated on increasing the physical value of our plants, operating them to the fullest capacity thereby enabling us to produce material at minimum cost, notwithstanding the deplorable conditions existing in the trade the past year—the low prices which prevailed—as well as the large increase in the cost of raw material and advance in wages. The physical condition of the properties has been kept up to the fullest extent during the past year by the expenditure of over \$170,000 for maintenance. We have also added approximately \$32,000 in permanent improvements by the purchase of additional real estate. The management has made a number of beneficial changes and is continuing to do so. We are doubling the capacity of our factory located at Brazil, Ind. so as to enable us to reach the Canadian markets; also changing one of the plants into a face brick factory for which material there is a large demand; and transforming one of the idle plants into a paving brick factory. The demand for brick pavements—both city and country—is rapidly increasing and we anticipate larger sales of this material in the immediate future. The company's balance sheet for the past year shows a profit of \$51,925.63.

THE WEEK'S CONTRACT NEWS

Relating to Municipal and Public Work—Street Improvements—Paving, Road Making, Cleaning and Sprinkling—Sewerage, Water Supply and Public Lighting—Fire Equipment and Supplies—Bridges and Concrete Work—Sanitation, Garbage and Waste Disposal—Police, Parks and Miscellaneous—Proposals and Awards

To be of value this matter must be printed in the number immediately following its receipt, which makes it impossible for us to verify it all. Our sources of information are believed to be reliable, but we cannot guarantee the correctness of all items. Parties in charge of proposed work are requested to send us information concerning it as early as possible; also corrections of any errors discovered

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREET IMPROVEMENTS				
Massachusetts	Westfield	Feb. 17, 2 p.m.	Repaving streets, including recutting and laying on concrete foundation about 11,647 sq. yd. old granite block and furn and lay 4,185 sq. yd. new	James R. Bryan, Chm. Com.
Massachusetts	Boston	Feb. 17	Furn. crushed stone and stone dust for year ending Feb. 1, 1912	J. Edw. Mullen, Supt. Supplies.
Illiana	Franklin	Feb. 18, 1 p.m.	Grad. gravel and otherwise improve highway	Wm. B. Jennings, County Auditor.
West Virginia	Huntington	Feb. 20, 1 p.m.	Paving two alleys	John Coon, Comr. of Streets.
Ohio	Defiance	Feb. 20	Stoning 1½ mile road, approximate cost, \$5,000	County Auditor
Massachusetts	Boston	Feb. 20, 1 p.m.	Constr. roads, walks, drains, etc. at Ft. Andrews	Capt. A. M. Miller, Constr. Q.M.
Michigan	Ludington	Feb. 20, 4 p.m.	Pave various streets	Dean Thompson, City Clerk.
New York	Mineola	Feb. 20, 10:30 a.m.	Constr. and impr. two county roads	W. E. Luyster, Clk. Bd. of Supvrs.
Washington	Adna	Feb. 20	Macad. about 16,000 ft. road	H. H. Swofford, County Auditor.
Ohio	Corning	Feb. 20, 8 p.m.	Curb, repair, grade and pave various streets	City Clerk.
Ohio	Columbus	Feb. 23	Grade and gravel road	F. M. Sayre, County Auditor.
Illinois	Portland	Feb. 23	Constructing pavement on Jersey st	J. W. Morris, City Engineer.
Illinois	St. Johns	Feb. 23	Constructing several hard service streets	A. M. Esson, City Representative.
Ohio	Cincinnati	Feb. 24, noon	Resurf. Independence st., also culvert and fill on Mt. Alverno rd	Fred Dreihls, Clk. Co. Comrs.
New York	Buffalo	Feb. 24, 11 a.m.	Paving various streets	Dept. of Pub. Works.
Ohio	Cincinnati	Feb. 24, noon	Impr. Loveland and Madeira road	Fred Dreihls, Clk. Bd. Co. Comrs.
Ohio	Wapakoneta	Feb. 25	Improv. Mechanic street	Fred A. Klipfel, Village Clerk.
Ohio	Lakewood	Feb. 27, noon	Pave Summit and repair brick pave. in other streets	B. M. Cook, Village Clerk.
New Jersey	Atlantic City	Feb. 27	Pave two streets	E. D. Rightmire, City Engr.
New York	Fort Niagara	Feb. 28	Construct coner. walks and macad. and clay roads	Lieut. E. H. Wagner, 29th Inf. U.S.A
New York	Sackett's Harbor	Mar. 1, 2 p.m.	Constr. approx. 28,800 sq. ft. macad. road. and 800 sq. ft. coner. walk at Madison Barracks.	Constructing Q.M.
Minnesota	Winnipeg	Mar. 1, 11 a.m.	Supply 1,000 to 1,500 tons asphalt for paving.	M. Peterson, Secy. B.1. of Control.
Illiana	Portland	Mar. 1, noon	Improving certain highways	W. Lea Smith, County Auditor.
Illiana	Sweetwater	Mar. 4	Constr. about 22,000 sq. yd. macad-asph. pave	L. S. Polk, Secy.
New Jersey	Plainfield	Mar. 6	Furnish crushed stone, culverts, etc.	City Clerk.
Virginia	Savannah	Mar. 9, noon	Furn. 5,000 cu. yd. cem. gravel or like material for imp. pub. rds.	County Commissioners
Mississippi	Jackson	Mar. 9	Constr. gravel and sand roads. \$100,000 bonds issued.	Mayes Cooper, Hwy. Engr.
Minnesota	Worthington	Mar. 13, 2 p.m.	Grade approx. 10,066 yards	E. C. Fannell, Co. Aud.
SEWERAGE				
West Virginia	Huntington	Feb. 20, 1 p.m.	Laying sewers in various streets	John Coon, Comr. of Streets.
North Carolina	Charleston	Feb. 20, noon	Constr. pump pits and appurtenances for sewer system	J. H. Dingle, City Engr.
Ohio	Mt. Vernon	Feb. 21, 4 p.m.	Constr. 7½ mile sanitary sewer, 6 to 15 in., pipe, with septic tank and filter beds	Wm. E. Gamble, Town Clerk
Ohio	Clarinda	Feb. 21	Furn. one mile of 6-in. sanitary sewer	C. W. Stuart, City Clerk.
Ohio	Clinton	Feb. 21, 8 p.m.	Constr. 26,000 ft. of 8-in. lateral sewers, vit. pipe, with man-holes, lampholes, etc.	C. C. Smith, City Clerk.
Minnesota	Melrose	Feb. 21	Constr. sewerage system	F. J. Weisser, City Clerk.
Minnesota	Paris	Feb. 23, 2:30 p.m.	Furn. and lay approx. 710 ft. 36-in. and 3,834 ft. of 60 in. reinf. concrete or brick sewers.	Granville Jenkins, Chm. Sewer. Com J. Sewell Thomas, City Reg.
Maryland	Baltimore	Feb. 23	Construct Pratt St. Trunk Sewer	Jos. E. Murphy, Clerk Bd. Trust.
New York	Hastings-on-Hud	Feb. 24	Construct sewers in various streets. About 16,000 feet	B. M. Cook, Village Clerk
Ohio	Lakewood	Feb. 27, noon	Construct sewer main in Riverside road	H. H. Canfield, 309 Beckman Bldg
Ohio	Cleveland	Feb. 28, noon	Construct sewers in Cleveland Heights	Comr. Ind. Affairs, Wash'n., D. C.
Ohio	Parker	Mar. 1, 2 p.m.	Construct sewer at Colorado River School	
New York	Watertown	Mar. 3, 8 p.m.	Constr. sanitary sewer, requiring approx. 1,800 ft. 20-in. tile; 300 ft. 18-in. tile; 300 ft. 15-in. tile; 1,200 ft. 12-in. tile; 1,200 ft. 10-in. tile	Board of Public Works, City Council.
Virginia	Atlanta	Mar. 14	Constr. intercepting sewer and disp. plant.	City Clerk.
New York	San Jose	July 3	Construct septic tank for County hospital.	
WATER SUPPLY				
Ohio	Nottingham	Feb. 17, noon	Constr. water mains in various streets	J. C. Steinicke, Village Clerk.
Wisconsin	North Bend	Feb. 17, 8 p.m.	Install pumping sta. includ. wells, pipes, engines, etc.	Frank D. Howe, City Clerk.
Illiana	Madera	Feb. 20, 8 p.m.	Constr. water system	City Clerk.
Minnesota	Fergus Falls	Feb. 20	Furn. 1,200 ft. of 6-in. and 500 ft. of 4-in. c.i. pipe, c.i. T's, etc.	S. E. Loverson, City Clerk.
Quebec, Can.	Mont. Laurier (P.O. Rapide de L'Original)	Feb. 20	Construct water supply	Anthime Dubreuil, Mayor.
Ohio	Marshalltown	Feb. 20, noon	Install waterwheels, pumps, etc. at dam	F. B. Wiley, City Clerk.
New York	Albany	Feb. 20, 2 p.m.	Furn. c. i. water pipe, tapping sleeves, oil, etc.	Isidor Wachsmann, Secy. B. C. & S
Washington	Colville	Feb. 21	Constructing 3,200 ft. of 10 in. wood pipe	City Clerk.
Ohio	Coshocton	Feb. 21	Furn. 4,000,000 gal. pump, eng. and two centrif. pump. units of 15,000,000 gal. capy. per day	Frank Good, City Aud.
West Virginia	Parkersburg	Feb. 23, 8 p.m.	Constr. water supply system incl. steel stand pipe	Henry Hohl, City Engr.
Wisconsin	Wymore	Feb. 23	Constr. water and elec. light plant, approx. cost \$57,000	F. H. Shoaff, Village Clerk.
Ohio	Euclid	Feb. 27, noon	Construct 6-in. water main	B. M. Cook, Village Clerk
Ohio	Lakewood	Feb. 27, noon	Construct water main in Franklin ave.	Capt. F. T. Arnold, Constr. Q. 1
New York	Fort Terry	Feb. 28, 11 a.m.	Constr. coner. reserv. and extend water main	U.S.A., New London, Conn.
Minnesota	Niles Center	Feb. 28, 8 p.m.	Constr. w. works, incl. bldgs., machy tower, reserv. and dp. well	Geo. H. Klehm, Pres. Bd. Trust
Ohio	Wooster	Feb. 31, noon	Constr. addition to waterworks system	S. L. Smith, Dir. Pub. Serv.
Missouri	Sikeston	Mar. 1, 8 p.m.	Constr. water supply system	H. C. Hester, City Clerk.
South Dakota	Bridgewater	Mar. 1, 8 p.m.	Constr. water tank and tower, cap. 50,000 gal. height 125 ft.	O. A. Rietz, City Auditor.
Monting.	Sheridan	Mar. 6, 3 p.m.	Constr. water supply main with approx. 7,934 ft. of 11-in. and 760 ft. of 10 in. c. i. pipe	Arnold Tschirgi, City Engr.
Pennsylvania	West Telford	April 1	Constr. water works; approx. cost \$30,000	H. Z. Walpole, Secy. Water Co
BRIDGES				
California	San Jose	Feb. 20	Construct concrete bridge, 54 ft. span	City Clerk.
Minnesota	Hallock	Feb. 20, 2 p.m.	Constr. 3 steel bridges, 22 large and 17 small culverts	Bd. Co. Comrs.
North Dakota	Hillsboro	Feb. 23, 3 p.m.	Constr. steel, wood and coner. bridges during 1911	Nels O. Lindoas, Co. Aud.
Ohio	Columbus	Feb. 23	Constr. floors on and grade for various bridges	County Commissioners.
Illiana	Indianapolis	Feb. 24, 10 a.m.	Constr. bridge over Crooked Creek	Albert Sahn, Co. Aud.
North Dakota	Yankton	Feb. 27, 7:30 p.m.	Constr. coner. bridge over Rhine Creek, 50-ft. span	John W. Summers, City Aud.
Florida	Jacksonville	Feb. 27	Constr. bridge over Hogans Creek	City Clerk.

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
BRIDGES (Continued)				
Ohio	Springfield	Feb. 28	Constr. 120 ft. bridge over Mad river	County Commissioners.
Virginia	Danville	Mar. 1	Constr. superstructure for bridge, est. cost \$40,000	J. O. Wayman, City Engr.
New York	Kingston	Mar. 2	Construct concrete bridge across creek at Eddyville	Jas. F. Loughran, Supt. Hwys.
California	Los Angeles	Mar. 6, 2 p.m.	Constr. concrete arches, graveled approaches, curbs, fences, hand-railing, pylons, etc., across Arroyo Seco and extension of Pasadena Ave.	H. T. Lelande, County Clerk.
California	South Pasadena	Mar. 6, 2 p.m.	Constr. 6 arch coner bridge 600 ft long	City Clerk.
Wisconsin	Janesville	Mar. 7, 2 p.m.	Constr. 2 bridges across Rock River, one 384 and one 264 ft long	W. F. Carle, Chm. St. Assess. Com.
LIGHTING AND POWER				
Ohio	Hamilton	Feb. 17, noon	Furn. 100 9-in. x 45 ft. poles, 150 8-in. x 40 and 75 8-in. x 35, all of Idaho white cedar	C. M. Robertson, Clerk.
Massachusetts	Westfield	Feb. 17, 2 p.m.	Install wiring for underground system of elec. light and pow. w.	Oren E. Parks, Town Engr.
Pennsylvania	Washington	Feb. 20, 7:30 p.m.	Light borough for five and ten years, commencing May 1	John Griffiths, Secretary.
West Virginia	Parkersburg	Feb. 23, 8 p.m.	Furn. and install elec. light plant	Frank Good, City Auditor.
Iowa	Atlantic	Mar. 1	Imp. Elec. Lt. and Power Plant, probable cost \$40,000	E. T. Nichols, City Clerk.
Mexico	Monterey, N. L.	Mar. 1	Erection of gas plant	Lewis Lukes, Apartado 58.
Alberta, Can.	Strathcona	Mar. 1	Install engines, boilers and generators	David Ewing, Ch. Engr.
Massachusetts	Boston	Mar. 1	Furn. street light; 12,000 gas lamps	Comr. Rourke, D. P. W.
Pennsylvania	Coraopolis	Mar. 1, 7 p.m.	Furn. one 1,500,000 gal. triplex pump; one 150 h.p. gas eng. for driving pump; two 225 h.p. gas engines, to be dir. con. to 175 K.V.A., 2,300 volts, 60 cycles, 3-phase alter. cur. gener.; one 75 h.p. gas engine to be dir. con. to 50 K.V.A.; two 175 K.V.A., 2,300 volts, 60 cycles, 3-phase alter. cur. gener., comp. with exciters; one 50 K.V.A.; one 5-panel switchboard, compl. one 50-light series, luminous or metallic flame arc lamp equipment complete	Borough Clerk.
FIRE EQUIPMENT				
Montana	Helena	Feb. 29, 8 p.m.	Furn. comb. auto. fire wagon, carry, 2,000 ft. hose and one 35 gallon chemical tank	J. A. Mattson, City Clerk.
Montana	Bozeman	Mar. 2, 5 p.m.	Furn. 80 to 90 h.p. A. L. A. M. rating auto, chem. gasoline wagon with speed of 45 mi., including 1,200 ft. of 2 1/2 hose, 40-gal. chemical tank, etc.	A. M. Brandenburg, City Clerk.
New Jersey	Princeton	July 5	Furn. auto pumping engine	E. M. Urdike, Chm. F. & W. Com.
MISCELLANEOUS				
Washington	Spokane	Feb. 17, 2 p.m.	Furn. five pass'gr. elec. auto	John Gifford, City Purch. Agt.
New York	New York	Feb. 20, noon	Dredging in various boroughs	Calvin Tomkins, Comr. of Docks
North Dakota	Grand Forks	Feb. 20, noon	Constr. city hall	T. J. Hagen, City Clerk.
New York	Rochester	Feb. 20, 11 a.m.	Constr. ten election houses	B. N. Chamberlain, Secy. Comrs. P.
Minnesota	Aitkin	Feb. 21, 8 p.m.	Constr. public library building	Mrs. B. L. Hollister, Secy.
Pennsylvania	Wilkes Barre	Feb. 24, noon	Constructing police station	Fred H. Gates, City Clerk.

STREET IMPROVEMENTS

Los Angeles, Cal.—Plans and specifications will be prepared for improving Blades and 7th sts.—H. J. Leland, City Clerk.

Yuba City, Cal.—Land owners in this county will ask Board of Supervisors to open new wagon road running north and south and connecting Franklin Corners road with Onstott road west of this city.

Colorado Springs, Col.—Colorado Springs Co., Gazette Bldg., is considering expenditure of \$25,000 on improvements in Prospect Lake, East End and Cheyenne additions to city.

Hartford, Conn.—Various division engineers have made following surveys: 11,800 lin. ft. on road from Roxbury Center to Washington Green, in the Town of Roxbury; 3,000 lin. ft. on Peck Hill, in the Town of Morris; the Town of Chatham, 17,100 lin. ft. on the Marlboro-Portland turnpike; 7,900 lin. ft. on Middletown ave.; 2,500 lin. ft. on Sunset st.

Freeport, Ill.—Property owners of Float, High and Jefferson Sts. have asked for macadam instead of brick paving.

Glencoe, Ill.—Village is considering constructing sidewalks at a cost of \$24,038.40.

Pekin, Ill.—Park ave. will be improved at cost of \$52,961.50; length 5,140 ft.

Rockford, Ill.—City is considering laying of brick pavement on West State st.

Waukegan, Ill.—Improvement Board has passed resolution for resurfacing Sheridan road from north line of Clayton st. to the city limits; cost \$18,500.—Fred. W. Buck, Mayor.

Brazil, Ind.—Commissioners of Clay and Park Counties will soon award a contract for constructing gravel road 10,560 ft. long on county line.

Muscataine, Ia.—Council Paving Committee has recommended improvement of more than a mile of streets.

Winchester, Ky.—Paving of Main St. will be considered in near future.

Baltimore, Md.—Ways and Means Committee of Council is considering \$5,000,000 expenditure for paving on the Buffalo plan.

Relay, Md.—Citizens are considering additional tax levy for laying sidewalks and making other improvements.

Malden, Mass.—Cost of paving Pleasant st. has been estimated at \$20,000; bids will soon be received.—George W. Stiles, Superintendent Paving; L. D. Holden, City Clerk.

Detroit, Mich.—Council will consider paving of Willis ave. with cedar or concrete; cost about \$17,000.—J. J. Haarer, Commissioner of Public Works.

Lucedale, Miss.—Board of Supervisors will consider straightening of public road.

St. Joseph, Mo.—Board of Public Works will ask for bids late in spring for two blocks of asphalt paving on 4th st., one block of asphalt paving on July st., resurfacing with asphalt on Charles st. and resurfacing with asphalt on brick and concrete foundations on various streets.—Dave Lawlor, City Engineer.

Bayonne, N. J.—Council has again passed ordinance for repaving Ave. E with asphalt.

Haddon Heights, N. J.—Citizens will vote Feb. 28 on \$60,000 bonds to improve highways.

New Brunswick, N. J.—Board of Freeholders will consider macadamizing of Bonhamton road.

Perth Amboy, N. J.—Board of Aldermen is considering extension of Jefferson st.

Trenton, N. J.—Board of Freeholders is considering improvement of two roads.

Trenton, N. J.—Council is considering ordinances providing that crushed stone be placed on Whittaker ave. and that Governor ave. be scraped and covered with stone screenings.

Binghamton, N. Y.—Construction of macadam road between Whitney Point and Glen Aubrey; length 5.34 miles; cost \$60,000.

Mount Vernon, N. Y.—Council is considering asking for bids for paving East Lincoln ave. with sheet asphalt and asphalt blocks; also paving two other streets.

Newburgh, N. Y.—Street Committee is planning paving of entire length of Grand st. with sheet asphalt, bitulithic, wooden block or brick.

Boonville, N. C.—Boonville Township is considering bond issue for road improvements.

Barberton, O.—Council has received estimates for paving following streets this summer: Fourth st., Creedmore to Moore, \$2,690.31; Wunderlich ave., \$5,799.78; Third st., Baird to Erie, \$19,204.58; Creedmore, 3rd to 4th, \$1,855.33.

Elyria, O.—City is considering 2,690 ft. of paving.—C. S. Butts, City Engineer.

Medina, O.—City is considering paving of one mile with brick.

Youngstown, O.—Council has passed ordinance for straightening and widening Erie st.

Zanesville, O.—Bids will be received in April for 29,477 sq. yds. of brick paving at cost of \$41,672.—Herbert Harris, City Engineer.

Sapulpa, Okla.—City Commissioners will enlarge paving district and will advertise for bids.

Hillsboro, Ore.—Louis C. Kelsey, Selling Bldg., Portland, will make survey and prepare plans for draining and paving of streets.

Erie, Pa.—Council is considering paving of 6th and 7th sts. and Park ave.

Franklin, Pa.—Council has decided pave six streets.

Wilkes Barre, Pa.—Council is considering paving of Sunset st. and Capouse ave.

Bartlett, Tex.—Williamson County Commissioners will consider calling election Precinct No. 3 on \$100,000 good road bond.

Columbus, Tex.—Colorado County will vote on \$250,000 of bonds for road construction.

Dallas, Tex.—Plans have been submitted to City by the interested property owners looking to paving of Forest from Centerville eastward to Arza St.; Boulevard, from Central to Arza, and for the opening and improving of Palm Ave., and finally improving of intersecting streets, between Grand and Forest Aves.

Fort Worth, Tex.—Paving of portion Taylor st. is being considered.

Bridgewater, Va.—Council is considering macadamizing East Commerce st.

Farmville, Va.—City is considering brick macadam, asphalt or asphalt block paving with granolithic sidewalks and curbing.

W. E. Anderson, Chairman Street Committee.

Newport News, Va.—Council will consider \$3,120 appropriation to pave 30th st. with asphalt block.

Pulaski, Va.—Pulaski District has \$70,000 good roads bonds to Weil, Roth Co., Cincinnati, O.

Wytheville, Va.—City is considering improvements to streets.—G. S. Sexton, Mayor.

Bellingham, Wash.—Bids will be asked spring for laying sidewalks in five different districts. Address City Engineer Whitman.

Burlington, Wash.—Council is considering paving of streets.

Seattle, Wash.—Board of Public Works considering following estimates: Paving Olympic way, \$59,300; Ellicott ave., \$6, University st., \$8,600; bridge roadway 23d ave. West, \$6,025.

Seattle, Wash.—Bids have been rejected by Board of Public Works for plank north half of Grand Blvd.; new bids will be asked.

Spokane, Wash.—Plans have been completed by City Engineer Morton Macarthy for grade separation along entire right-of-way through city of Northern Pacific Railway.

Parkersburg, W. Va.—County Engineer C. Skidmore and State Road Engineer E. Baker, associated, County Bldg., have prepared plans for vit. brick paving on concrete base, and storm sewers; cost \$180,000.

CONTRACTS AWARDED

Denver, Col.—Improving Capitol Hill Improvement District No. 7, including grade-streets to their full width, constructing concrete curb and gutter, surfacing roadways with smelter slag and disintegrated granite, constructing concrete sidewalk and other incidentals, to Municipal Construction Co., \$37,442; other bidders: Westcott-Doan Investment Co., \$38,826; Commonwealth Construction Co., \$39,784; Denver and Pueblo Construction Co., \$40,978; J. Fred Berts, \$41,593; Anderson, Ord & Swope, \$46,096; Gaffy & Keefe Construction Co., \$54.

Palatka, Fla.—Construction of upwards of 1,700 yds. of granolithic sidewalks, to S. Saudon Engineering Co., Savannah, Ga., \$6-6-10c. per sq. yd.

Peru, Ill.—To Peter Trompeter for paving Center st. with tarvia, \$7,273.

Porte, Ind.—Construction of macadam road in Scipio Township, to Jacob Ackerman, city, \$21,530.

Marion, Ind.—To Jacob Drook and Williams for constructing the Alvin B. Hill mile and a sixth of stone road in the town of Fairmount, \$4,042; other bidders: William Yates, \$4,500; J. H. Hardin & Co., \$9,217; Omer Mackey, \$4,184.97.

Richmond, Ind.—To D. G. Burkhardt for paving South 4th St. W. 1st and Kinsey to J. L. Horning.

South Bend, Ind.—To Hoban & Roach, to pave first alley west of Michigan st., South Monroe st., \$1,255.20; Nelsonville block lot be used.

Vincennes, Ind.—Construction of the Williams gravel road in Vincennes Township, to William Bobe, city, \$9,200.

Muncie, Ind.—Construction of 10,560 ft. brick road in Delaware County, to William Birch, city, \$42,000.

Wabash, Ind.—Construction of two macadam roads in Wabash County, to George Sewell, Laketon, \$9,200.

Vashington, Ind.—Constructing three miles of gravel road in Daviess County, to H. Wilson, Montgomery, \$10,201.

Nedar Rapids, Ia.—Paving various streets, to M. Ford, \$64,030 for east side and \$18,535 for west side; curbing to Cedar Rapids Construction Co., \$10,414.64; other bidders: Smith Bros., \$10,466.98; Barnorn & Jackson, \$10,661.40; Concrete Construction Co., \$10,623.79; contract calls for 12,820 lin. ft. of curbing, 6x20 in.; 6,756 lb. curb and gutter around center park; 5,380 ft. comb. curb and gutter along property parking and 4,480 ft. of 2-in. gutter.

Baltimore, Md.—Grading and paving four streets with cobblestone, to McLean Contracting Co., Maryland Trust Bldg., \$14,900.

Boston, Mass.—To B. & R. J. Lombard teaming edgestones and flagging from the End Paving Yard, between Feb. 1, 1911, and Jan. 31, 1912, 8c. per lin. ft.; to Green Bros. Co. for repairing asphalt pavements, as ordered by Commissioner, between Feb. 1, 1911, and Jan. 31, 1912, \$37.

Alpine, N. J.—Building stone road, to W. English, Englewood, \$7,144.

Buffalo, N. Y.—Street work: Oak st., add to Carlton, repaving with asphalt, to German Rock Co., \$10,800; Milton st., add to Pennsylvania Railroad, brick, to Mastantine Construction Co., \$8,000; Krupp Broadway to Ashley, brick, to H. P. Ward Co., \$5,600; Sanford st., Dewey to Coy, asphalt, to German Rock Co., \$5,118.

Elizabeth City, N. C.—Street paving, to Green Bros., \$1.62 per sq. yd. for Obesbet paving asphalt.

Kron, O.—To Peters & Palmer, Mansfield, for construction of section 6 of Con-Hudson road, \$69,560.

Cleveland, O.—Brick paving, to C. F. Kelley for E. 36th pl., \$1,888, and Sowinski, \$7,783; to Roehl Bros. for W. 61st st., \$22, W. 54th st., \$13,443, Hurley ave. \$3.- and W. 83d st., \$13,101; to Baldwin Bros., for Woodhill road No. 1, \$7,429, Woodroad No. 3, \$31,069, and Hoffman ave. \$48; to the Cleveland Trinidad Paving Co. for Woodhill road No. 2, \$31,489, and Sel road \$23,936; to M. E. Kavanagh, for Sel road \$14,113, E. 125th st., \$8,294, Ackerson \$18,628, and Kennedy ave., \$12,849.

Youngstown, O.—Building Loveland Hill rd., to Coy Bros., Cal'a., \$5,216.52.

Portsmouth, Va.—Building macadam roadway in Upper Glasgow st., to Dalby-thingham Co., \$4,700; Great Bridge roadway, to Mr. Denby, \$11,890.92.

Montesano, Wash.—To Contractors Tuttle & Maloney for planing 4,000 ft. of road running east from South Montesano.

BIDS RECEIVED

Tuscaloosa, Ala.—Paving streets: Alabama Paving Co., Birmingham, vit. brick, \$4 per sq. yd.; Southern Paving and Construction Co., Chattanooga, vit. brick, \$6; Barber Asphalt Co., Atlanta, sheet asphalt, \$2.08; Southern Asphalt and Con-

struction Co., \$1.97; Creosoted Wood Block Paving Co., \$2.40; Tuscaloosa Concrete and Supply Co., wood block, \$2.25; Tuscaloosa Concrete and Supply Co., vit. brick, \$1.85.

Michigan City, Ind.—Building sidewalks: W. H. Bell & Co., 8c. per sq. ft., grading 25c. per cu. yd., filling 25c. per cu. yd.; Vincent Milcarek, cement 8 3/4c. per sq. ft., brick 9c. per sq. ft., grading 21c. per cu. yd.; Swan Magnuson, brick or cement 8 1/2c., filling 17c.; J. E. Southard & Co., cement 8c., grading 25c., filling 25c.

Boston, Mass.—Construction of a part of the highway in Melrose known as the Lynn Falls road: Henry C. Carter, Middleton, \$15,452.20; Luigi C. Carchia, Boston, \$13,-146.60; Fred E. Ellis, Melrose, \$12,908.16; Grant Conspaction Co., Boston, \$12,831.96; Coleman Bros., Boston, \$12,515.20; Thomas E. Fitzgibbon, Beverly, \$12,966; Richmond B. Hudson, Wilmington, \$11,595; C. T. Sgrocannini, Boston, \$11,558.80; Martin M. Condon, Watertown, \$11,131.90; Ciriaco & Cursetta, Bezilacqua, Boston, \$11,178.60; James H. Fannon, Somerville, \$11,067.90; Rowe Contracting Co., Brighton, \$10,166.10.

Brooklyn, N. Y.—Regulating and paving with asphalt on a concrete foundation Gravesend ave. from Ave. C to Foster ave., Cranford Co., 52 9th St., lowest bidder, as follows: 19,228 sq. yds. asphalt pavement, 5 years' maintenance, 87c., and 2,744 cu. yds. concrete for pavement foundation, \$5.15; total, \$30,860.; totals of other bids: Barber Asphalt Paving Co., 30 Church st., New York, N. Y., \$33,813; Uvalde Asphalt Co., 1 Broadway, New York, N. Y., \$32,948; Brooklyn Alcatraz Asphalt Co., 407 Hamilton ave., Brooklyn, \$31,685, and Borough Asphalt Co., Metropolitan ave. and Newtown Creek, city, \$31,987.

Seattle, Wash.—Grading 45th ave., S. W., A. Peterson & Co., \$80,658.50; Mouglin & Price, 333 Burke Block, \$75,581.80; West Coast Construction Co., \$88,913.50; McKinnon, \$81,916.40; West Oregon st., A. Peterson & Co., Montera P. O., \$47,922.

SEWERAGE

Mobile, Ala.—Chief Engineer Smith has completed plans for extending sewer system into northern section of city.

Ashdown, Ark.—City has decided to construct sewer system.

Concord, Cal.—Spalding, Sloan & Robson, San Francisco, are preparing plans for sewer system.—E. P. Jackson, Town Clerk.

Denver, Col.—New bids for construction of sewers in the district of Park Hill, Denver, will be asked; work was originally awarded to the Municipal Construction Co. for \$17,596, but owing to a clerical error specifications only called for 65 manholes and 25 flush tanks instead of 90 manholes and 50 flush tanks.—Henry Read, President Board of Public Works.

Colorado Springs, Col.—Bids will soon be received for construction of storm sewers in District No. 1; estimated cost \$40,448.30.—T. L. Waggener, City Engineer.

Waterbury, Conn.—Board of Aldermen has decided to increase to \$300,000 bond issue available for construction of sewers.

Palm Beach, Fla.—Council has decided to issue \$55,000 bonds for sewer and other improvements.

Atlanta, Ga.—City is considering laying about 50 miles of sewers during year.

Chicago, Ill.—City is considering spending \$770,000 on two sewers in the southwest section of the city.—Chas. A. V. Standish, Secretary Board of Local Improvements.

Hoopeston, Ill.—Council has passed ordinance looking to construction of sewerage system; cost about \$70,000.

Danville, Ind.—Construction of a system of sanitary sewers is being considered; cost about \$25,000.

Richmond, Ind.—Board of Public Works has adopted resolutions for the construction of two sanitary sewers.—H. M. Hammond, President Board of Public Works.

Cascade, Ia.—City is having plans made for a \$30,000 sewer system.—Iowa Engineering Co., Clinton, Engineers.

Clinton, Ia.—City Engineer Hart has estimated cost of constructing sewers in District No. 4 at \$133,067.90.

Mansfield, La.—City is prepared to grant franchise for sewerage system.—W. E. Singleton, City Clerk.

Baltimore, Md.—Council is considering ordinance calling for election on \$10,000,000 sewerage loan to complete sewerage system.

Cambridge, Md.—Council is considering improvements of water works. Address Superintendent Jordan.

Owatonna, Minn.—Plans are being prepared by City Engineer Harvey Dartt for storm sewers; cost \$14,000.

St. Paul, Minn.—City will construct one mile of concrete and four miles of pipe sewer at St. Anthony Park; cost \$140,000.—L. W. Rundett, City Engineer.

Beverly, N. J.—Construction of sewerage system is being considered.

Montclair, N. J.—Municipalities of Essex County, Montclair, Orange, East Orange, Bloomfield and Glen Ridge contemplate entering a joint project for disposal of sewage.

Ocean City, N. J.—State Board of Health is considering plans prepared for proposed sewage disposal plant.

New Hartford, N. Y.—Village Board has decided to construct sewerage system and disposal plant.—A. M. Scripture, Consulting Engineer.

Houngneepsie, N. Y.—Board of Aldermen has decided to construct sewer on North Clinton st.

Edenton, N. C.—Town is considering \$20,000 bond issue for construction of sewer.

Ada, O.—State Board of Health has ordered installation of sewage disposal plant.

Chardon, O.—Council is considering plans by Engineer L. F. Hewitt, Geneva, for construction of sewer system.

Cincinnati, O.—City Engineer Shipley has estimated cost of constructing a sewer in McKee, Schiff and Lewis sts. at \$34,379.

Elyria, O.—City is considering construction of 916 ft. of 12 and 400 ft. of 10-in. pipe sewer, and four manholes with 2-ft. covers.—C. S. Butts, City Engineer.

Forest City, Ore.—Council has decided to employ engineer to make survey and estimate for trunk sewer.

Gresham, Ore.—Consulting Engineer Louis C. Kelsey, Selling Building, Portland, has recommended construction of sanitary sewerage system at cost of \$23,503.—Lewis Shattuck, Mayor.

Lebanon, Ore.—City will sell \$70,000 bonds for sewer construction.—Walker & Meagher, Engineers.

Parnassus, Pa.—Boroughs of Parnassus, New Kensington and Arnold are planning to construct joint sewage disposal plant.

Cuero, Tex.—Installation of sewerage system is being considered.

Burlington, Wash.—Plans will be prepared by Engineer Fred Oeterman for installation of storm sewers.

Seattle, Wash.—Bids have been rejected for constructing sewer in Virginia st.

Port Washington, Wis.—City is considering \$35,000 bond issue for construction of sewerage system.

CONTRACTS AWARDED

Lawrence, Kan.—Constructing sewers in Haskell Place and Maple Lawn addition, to Kennedy Plumbing Co.

Newburgh, N. Y.—Building sewer on Fulerton ave. double strength tile pipe, to Michael Spino, \$14,280.70.

Walters, Okla.—Contract for the construction of sewers and water works has been sublet to Ries & Ries, who have commenced work; expect to complete the contract in 90 days.

Altoona, Pa.—To W. W. Sapp for construction of 8-in. sewer in 5th ave., 61c. per ft.

Timmonsville, S. C.—To Abec & Hart, Hickory, N. C., for construction of storm and sanitary sewers, \$14,185; work includes 3,250 ft. of 30-in. terra cotta sewer, 1,000 ft. of 24-in. terra cotta sewer, 1,550 ft. of 18-in. terra cotta sewer, 500 ft. of 15-in. terra cotta sewer and 2,050 ft. of 12-in. terra cotta sewer, 20 manholes, 16 catch-basins and 3 6-in. siphons.—J. Newton Johnston, Florence, Engineer.

BIDS RECEIVED

Wilmington, Cal.—Sewering Canal st. and other streets, F. R. Fulmris, \$23,000 for sewer complete; Peter Gihovach, \$19,999; Krist Radich, \$21,970; John Balch, \$24,000; Joseph Chutuk, \$18,670; J. Zarubich, \$16,350; W. N. Hendricks, \$16,100; M. N. Mlagenovich, \$18,800.

WATER SUPPLY

Alabama City, Ala.—Council has decided to construct municipal water plant to supplement system owned and operated by Dwight Manufacturing Co.

Dothan, Ala.—City will expend \$60,000 to construct water works and electric light plant; will erect brick building and brick stack, construct \$5,000 reinforced concrete reservoir, install 2,000,000-gal. pump, 500-kw. electric unit, 500-h.p. steam boilers and 1,000-ft. air compressor.—E. R. Pilcher, Engineer in Charge.

Mobile, Ala.—Chief Engineer Smith has completed plans for extending water system into northern part of city.

Ashdown, Ark.—City has decided to construct water works.

Susanville, Cal.—Election on purchase of Cady Susanville water system is being considered.

Valparaiso, Ind.—Installation of filtration plant is being considered.

Emporia, Kan.—City proposes to install water works; cost \$13,000.—Matthew

Brown, city, Engineer; F. H. Smith, City Clerk.

Mulberry, Kan.—City is considering election on installation of water works and electric light plant; cost \$20,000.

Newport, Ky.—Board of Water Works Commissioners is considering laying of 1,400 ft. of pipe in Linder st.

Mansfield, La.—City is prepared to grant franchise for installation of system of water works.—W. E. Singleton, City Clerk.

Cambridge, Mass.—Board of Aldermen has passed order appropriating \$5,000 for comprehensive study by the Water Board in conjunction with the Mayor on future development of water supply of city.

Holyoke, Mass.—Surveys have been completed for proposed storage reservoir for former.—T. J. MacCarthy, City Engineer.

Detroit, Mich.—Engineers Smith, Hinckman & Grylls, Washington Arcade, have recommended high pressure system of fire protection.

Vicksburg, Miss.—Council has adopted resolution authorizing purchase of Vicksburg water works plant.

Marionville, Mo.—Lawrence County Water, Light and Cold Storage Co. has been granted water works and electric light franchise.

Albany, N. Y.—Board of Contract and Supply has instructed Secretary Wachsmann to advertise for c.-i. pipe, taps, sleeves and valves for water works; lubricating oil bids will also be invited as well as road oil for Bureau of Parks.

Hornell, N. Y.—Bids will be asked at once for installation of proposed storage reservoir and improvement to water system.—Chas. C. Hopkins, Rome, Consulting Engineer.

New York, N. Y.—Board of Water Supply has directed its Chief Engineer to prepare forms of contract for completion of the pressure tunnel under Hudson River at Storm King, and advertisements for bids on work will be made as soon as possible.

Rochester, N. Y.—Board of Contract and Supply will at once ask for bids for furnishing Water Works Department with valve boxes and steel bands.—F. X. Pifer, Secretary.

Mandan, N. D.—Improvements in the water works, which will cost about \$65,000, are planned for early spring.

Benwood, O.—Benwood and McMechen Consolidated Water Co. has been incorporated to supply town with water.—E. Gates and G. Gelwicks, Steelton, Pa.; W. D. Shaefer, F. W. Kendig and W. J. Happle, Mechanicsburg, Pa., Incorporators.

Cambridge, O.—State Board of Health has ordered city to install purification plant for water system.

Chardon, O.—Plans for water works system have been submitted to Council; they provide for water from Aquila Lake or spring near Bass Lake.—B. F. Hewitt, Geneva, Engineer.

Cincinnati, O.—Director Sundmaker will ask Council for authority to enter into contract to supply the village of Silverton with water.

Lodi, O.—Village has voted \$21,600 bonds to install water system.

Cherokee, Okla.—City will receive bids about Feb. 25, through Engineers Burns & McDowell, Searritt Bldg., Kansas City, Mo., for furnishing standard water pipe.

Muskogee, Okla.—Citizens will vote Feb. 16 on \$390,000 bonds for improvements to water system, new intake of not less than 48 inches in diameter, one 6,000,000-gal. low lift pump, one 6,000,000-gal. high service pump, one 6,000,000-gal. purification plant, 4,000,000-gal. reservoir on top of Agency hill, 11,700 ft. of 24-in. c.-i. mains and 9,500 ft. 16-in. c.-i. mains.—A. F. McGarr, Mayor.

Gresham, Ore.—Consulting Engineer Louis C. Kelsey, Selling Bldg., Portland, has recommended construction of gravity water works system at cost of \$22,913.—Lewis Shattuck, Mayor.

Juniata, Pa.—Citizens have voted \$10,000 loan to extend water system.

Caldwell, Tex.—Citizens will vote Feb. 21 on \$5,000 bonds for erection of steel stand-pipe or water tower.

Lubbock, Tex.—Plans have been prepared by Engineer E. L. Dalton, Dallas, for system of water works and sewerage; cost \$80,000.—F. E. Wheeler, Mayor.

Marlin, Tex.—Council has granted the water works franchise asked by J. E. Brown and W. D. Kysar.

Logan, Utah.—K. C. Schaub has estimated cost of improving water system at \$12,250 if cement is used and \$93,000 if conduits of wood are used.

Park City, Utah.—Plans and specifications have been prepared and bids will soon be asked for constructing water system.—J. W. Thompson, President of Council.

Bridgewater, Va.—Committee has been appointed to investigate probable cost and the ways and means of securing amount necessary to install first-class water system.

Richmond, Va.—Subcommittee of Water Committee of Council has recommended installation of two centrifugal electric pumps with capacity of 4,000,000 gals. for stand-pipe in Byrd Park; cost \$12,000.—Charles E. Bolling, City Engineer.

Wytheville, Va.—City is considering extension to water works.—G. S. Sexton, Mayor.

Spokane, Wash.—City Purchasing Agent John Gifford will ask for bids for furnishing Kalamein iron pipe.

CONTRACTS AWARDED

Long Beach, Cal.—Construction of reinforced concrete reservoir on Signal Hill, for Alamitas Water Co., to Edwin Ralphs, Long Beach, about \$12,000; capacity, 4,000,000 gals.

Atlanta, Ga.—Furnishing water pipe for year, to General Pipe and Foundry Co., city, about \$25,000.

Chicago, Ill.—Furnishing c.-i. water pipe, to U. S. Cast Iron Pipe Co., Hookery Bldg., \$23.75 per ton; total about \$80,000.

Holyoke, Mass.—Furn. 5 tons of pig lead for caulking to Chadwick Boston Lead Co., \$147.3¢ per 100 lb. f. o. b. Holyoke.

Grand Rapids, Mich.—Furnishing the structural iron to be used in construction of filtration plant, to Grand Rapids Structural Co., \$1,785; other bidders were the Toledo Iron and Wire Works, \$2,880; Bush Manufacturing Co., \$1,990; Leitell Iron Works, \$2,030; and M. Braudy & Son, \$3,000.

Fairbault, Minn.—Drilling artesian wells, to S. Severson Artesian Well Co., Minneapolis, \$5.95 per ft.

Two Harbors, Minn.—To Fairbanks-Morse Co., Chicago, Ill., for furnishing a pump of 3,000,000-gal. daily capacity for about \$10,000.

Rochester, N. Y.—Furnishing of 1,300 corporation cocks for Water Works Department, to the Henry Mueller Manufacturing Co., New York, \$757.70.

Portland, Ore.—To Dunham Carrigan & Hayden Co., San Francisco, Cal., for furnishing and delivering gate valves at \$12,332; contract includes the following: 20 4-in., 150 6-in. and 250 8-in. valves, 15 10-in. valves, one 32-in. valve, and one 52-in. valve, to operate horizontally with bevel gear and indicator.—D. D. Clark, Engineer Water Board.

Lonsdale, Tenn.—Citizens are urging \$29,000 bond issue; portion will be used to pay for having mains of Knoxville Water Comm. extended to this city.

Ballinger, Tex.—Council has closed contract with American Water Softener Co., Philadelphia, for filtering plant for Ballinger Water-Works; plant will supply 750,000 gal. of water per day.

BIDS RECEIVED

Jacksonville, Fla.—Furnishing 12-in. centrifugal pump, Morris Machine Works, Baldwinville, N. Y., \$1,245; Worthington Pumping Engines, Atlanta, \$1,846.50; Buffalo Steam Pump Co., Buffalo, N. Y., \$1,100; Erie Pump and Engine Works, Erie, Pa., \$1,158; Allis-Chalmers Co., Atlanta, \$1,080; 14-in. pump, \$1,340; 15-in. pump, \$1,495.

Perrth Amboy, N. J.—Engine and blower for water works at Runyon: American Blower Co., \$787; J. F. Canady, \$750; B. F. Sturtevant, \$790; B. Franklin Hart, 680; alternate bid, \$601; the Engineer Co., \$775; supplementary bid with additional equipment, \$1,254.50.

Georgetown, Tex.—Furnishing approximately 300 tons of class "B" c.-i. water pipe, (a) 4-in., (b) 6-in., (c) 8-in., (d) specials, price given per ton: American Cast Iron Pipe Co., (a) \$27, (b) and (c) \$25.45, (d) \$55; Dimmick Pipe Co., (a) (b) and (c) \$28; (d) \$28; R. D. Wood & Co., (a) (b) and (c) \$29; U. S. Cast Iron Pipe Co., (a) \$29, (b) and (c) \$26, (d) \$55; Blum Hardware Co., (a) (b) and (c) \$30.15, (d) \$56.15.—F. H. Lancashire, Dallas, Engineer.

Seattle, Wash.—Laying water mains in 25th ave., N. E., J. T. Donaldson, \$2,930.80; Best Construction Co., \$2,639.40; Ferguson-Coit Co., \$3,039.81; Will Kopta, \$2,920.80.

LIGHTING AND POWER

Albertville, Ala.—City has postponed election to Feb. 20 on \$7,000 of bonds for construction of electric plant.

Ashdown, Ark.—City has decided to construct electric light plant.

Gilroy, Cal.—Coast Counties Power Co., Santa Cruz, has submitted plan to the Council to make several extensions to the lines of the municipal plant and operate it on percentage basis.—S. W. Coleman, Santa Cruz, Manager.

Fort Morgan, Col.—City will purchase a 250-h.p. boiler for municipal water and light plant.—George L. Cox, Superintendent.

Washington, D. C.—Plans have been pre-

pared for improving the street lighting system on several streets; cost about \$12,000.

Canton, Ga.—City is considering enlargement of municipal electric light plant during year.—J. W. Alford, Superintendent.

Moscow, Ida.—Mayor Byrns and Council have visited Co. tax to examine electric light system.

Coal City, Ill.—Economy Light and Power Co., Joliet, is considering the construction of a new power plant in Coal City.—J. R. Staley, Joliet, Superintendent.

Lincoln, Ill.—Council is considering installation of lighting plant.

Nashville, Ill.—Nashville Electric Light Co. is considering changing the entire system, adding 20 additional lights and installing steam turbine.—K. A. Steinhäuser, Manager.

Sandoval, Ill.—Village Board has voted to accept proposition offered them by Greenville, Ill., people for franchise.

Columbia City, Ind.—Council is about to install day current and bids for same will be received about March 13; work to begin July 1.

Logansport, Ind.—Central Station Engineering Co., 164 Dearborn st., Chicago, is preparing plans for enlarging lighting system and power plant.

Central City, Ia.—Council is considering granting franchise to Fred J. Cross to install electric light plant.

Newton, Ia.—Installation of municipal gas plant is being considered; cost \$40,000.—E. C. Finch, City Clerk.

Mulberry, Kan.—City is considering election on installation of electric light and water works plant; cost \$20,000.

Williamsburg, Kan.—City is negotiating to secure electricity from the municipal electric light plant in Ottawa.—W. O. Myers, Ottawa, Manager.

Lexington, Ky.—Lexington & Interurban Railway Co. will expend \$1,000,000 for various improvements, including erection of \$500,000 power plant.

Paintsville, Ky.—H. La Vier, Clarence W. Howes, H. M. Stafford and D. J. Wheeler are organizing company to install electric light system.

Richmond, Ky.—Richmond Electric and Power Co. has issued \$20,000 of bonds to provide for future extensions and improvements to system.—L. B. Herrington, President.

Vandalia, Mich.—Citizens have voted to grant Milling and Power Co., Cassopolis, a franchise to light city for 30 years.

International Falls, Minn.—Minnesota Ontario Power Co., Minneapolis, is considering construction of dam to develop power at Kettle Falls.

Minneapolis, Minn.—Bids for maintain electric street lamps and for lighting gas street lamps will be received by Council about Feb. 21, and contracts for at least one year will be entered into by city.

Burlington, Mo.—Citizens have voted \$8,500 electric light bonds.

Omaha, Neb.—Tentative plans for beautifying the city by special lighting district have been drawn in the City Engineer's office and are practically ready to be presented to the Council for approval should proposed bill for revision of city charter pass Legislature.

Trenton, N. J.—Lamp Committee of Council is about to advertise for bids for electric street lights and for illumination of municipal buildings, as contract made five years ago with the Public Service Corp. will soon expire; bids will be asked for one three and five years' contracts.

Union, N. J.—Lighting of township with electric lights is being considered.

Elmira, N. Y.—Elmira Water, Light and Railroad Co. has been authorized by Public Service Commission to issue \$243,995 of bonds for extensions of service and improvements to plant.

Iilon, N. Y.—Town Board of Herkimer has decided to ask for bids for franchise for furnishing North Iilon with electric light.

Niagara Falls, N. Y.—Mayor P. T. Keller has recommended decorative lighting of Falls, Third and North Main sts.

Arlington, O.—Boiler and water softener will be installed in the municipal lighting plant.—R. E. Dillon, Superintendent.

Sandusky, O.—Council has adopted resolution providing for an investigation of municipal ownership question with view to submitting it to vote of people at special election.

Cherokee, Okla.—City will receive bid about Feb. 25, through Engineers, Burr & McDowell, Searritt Bldg., Kansas City, Mo., for installation of direct-connected 75-kw., 2,300 60-cycle generator.

Heavener, Okla.—Denna-McConnell Co., Wilburton, has applied for franchise to construct and operate electric light plant.

Ebensburg, Pa.—Installation of two new generators is being considered by the Ebensburg Light, Heat and Power Co.—E. P. Craver, General Manager.

W. Berlinville, Pa.—Town will install street lights, getting current from town Co.
Iden, Utah.—Davis County Telephone Electric Light Co. has asked for franchise for electric light.
averly, Va.—Town Council has voted \$100 for installation of additional electric lights and street improvements.
oughton, Wis.—Council has decided to advertise for bids on bonds amounting to \$100 for purchase of additional water meter for its municipal electric light and sewer system.
nticton, B. C., Can.—Council is about to install municipal electric light and sewer plant.

CONTRACTS AWARDED

St. Louis, Mo.—By La Clede Gas Light for gas holder, to Ritter-Conley Mfg. Pittsburg, Pa., about \$40,000.
innipeg, Man., Can.—Furnishing two kw. generators to Siemens Bros. Dynamo Works, Toronto, Ont., \$16,410.

BIDS RECEIVED

New Bedford, Mass.—Furnishing and installing a 50-kw. engine and generator, for operation, in municipal building; Wilkinson Co., city, \$3,877; William P. Eggs, city, \$4,000; Eastern Electric Co., \$4,301; M. B. Foster Electric Co., Boston, \$4,376.
Albany, N. Y.—Board of Contract and bids received only one bid for lighting city's streets with electric lights, from Municipal Gas Co., which offered to light arc light for 25c. per night if it is permitted to maintain overhead wires or per night if it must put the wires in conduits; furnishing incandescent lights, 1c. per lamp per night.

FIRE EQUIPMENT

arigold, Cal.—Volunteer fire department been organized.—W. E. Plantz, Chief.
Illinois, Cal.—City Trustees will sell \$100,000 bonds, recently voted, on March 1; fire apparatus will be purchased as soon as possible after sale.
ew Britain, Conn.—Erection of fire station in southwestern part of city is being started.
ampa, Fla.—Bids will be asked for erection of fire station at Zack and Jefferson streets.
ard, Ill.—Town will vote on \$3,000 bonds for purchase of fire engine.
ndoval, Ill.—Village Board has decided to purchase fire engine; cost about \$1,800.
Indianapolis, Ind.—Fire Chief C. E. Coats recommended erection of three engine houses, purchase of combination hose and mechanical engine, also engine and equipment for Hose Co. No. 26.
ew Castle, Ind.—Council has purchased building site in the Industrial addition for erection of fire house; company will be organized and equipment purchased this spring.
Waterloo, Ia.—City is considering purchase of auto car for Chief Ashley Dunlop.
aton Rouge, La.—Fire Department will issue new bids for furnishing hose.
nnapolis, Md.—Purchase of fire engine, steam or gas, is being considered. Address Mayor Strange.
elay, Md.—Reay Volunteer Fire Co. will issue and erect \$2,500 station on Arlington street.—Henry J. Truley, Baltimore, Architect.
liffondale, Mass.—Purchase of auto combination chemical and hose wagon, cost \$1,000, is being considered.
outhbridge, Mass.—Fire Department is installing installation of fire alarm system and purchase of auto truck.
scanaba, Mich.—Citizens have defeated proposition to issue \$15,000 bonds to erect equip fire station in North Escanaba; bids of light plant may be used to erect engine.
erson, Neb.—Citizens will vote on \$5,000 bonds to purchase engine, hook and ladder truck and other appliances.
lorence, Neb.—City is considering \$5,000 bond issue for purchase of equipment for fire department.
ordentown, N. J.—Fire Chief Chas. E. Truse has recommended purchase of 500 ft. hose and \$2,000 modern hook and ladder truck.
radley Beach, N. J.—Architect C. W. Czer, 1188 Broadway, New York City, has prepared plans for erection of \$5,000 fire house.—Jacob Doll, Borough Clerk.
utley, N. J.—Purchase of \$6,000 auto truck has been authorized.—Councilman A. Carr, Chairman Fire Committee.
erth Amboy, N. J.—Board of Aldermen has authorized Fire Committee to secure estimates for third-class steam fire engine for combination chemical and hose wagon.

Corning, N. Y.—Mayor F. E. Ellison has recommended purchase of combination chemical auto for fire department.
Foungkeepsie, N. Y.—Council has decided to appoint committee to investigate purchase of hose.
Freeport, L. I., N. Y.—Village Board of Trustees has decided to hold special election on \$6,000 bonds for purchase of additional fire apparatus.
Troy, N. Y.—Installation of fire alarm system is being considered.
Watervliet, N. Y.—Fire Chief Sadlemire has recommended purchase of engine and combination hose and chemical engine.
Hamilton, O.—City is considering equipping of two engine houses.—A. W. Margefont, Director of Public Safety.
Martin's Ferry, O.—City Solicitor David James has decided that it would be necessary to advertise for bids for automobile truck for Fire Department in order to comply with law.
Klamath Falls, Ore.—Bids will be received Feb. 20 for \$8,000 fire apparatus bonds.
Chester, Pa.—Mayor D. M. Johnson has recommended installation of fire alarm system.
Chester, Pa.—Purchase of steamer for Good Will Fire Co. is being considered.
Darby, Pa.—Fire Company has been organized to be known as Fire Patrol No. 2.
Hatboro, Pa.—Independent Fire Co. will purchase auto fire engine.
Lebanon, Pa.—Union Fire Co. has decided to purchase steam fire engine.—G. E. Kleiser, President.
Sharon, Pa.—Fire Chief Fred Vanderholt has recommended erection of two fire stations and installation of fire alarm system.
Williamsport, Pa.—Council is considering purchase of auto combination fire wagon.
Olneyville, R. I.—Residents of Thornton are interested in plan to secure chemical engine.
Summerton, S. C.—Town has organized fire department.—W. M. Mood, Chief.
Colton, S. D.—Volunteer fire department has been organized.—C. S. Juve, Chief.
Corpus Christi, Tex.—Need of better fire fighting apparatus is being urged.
Fort Worth, Tex.—Site at Jones and 16th sts. has been selected for erection of fire hall and repair shops.
Madison, Wis.—Claude & Starck, Architects, Badger Block, have prepared plans for erection of \$10,000 engine house at N. Broom and W. Johnson sts.

CONTRACTS AWARDED

Indianapolis, Ind.—Furnishing wire and cable for Gamewell fire alarm telegraph system, aggregating about \$5,000; to Western Electric Co. for 20 miles of wire, and to National India Rubber Co., New York City, for 6,000 ft. of cable.
Mishawaka, Ind.—Council has decided to install the Signalphone police alarm system in this city; alarm is made by Signalphone Co., Milwaukee, Wis.
Woodbury, N. J.—Furnishing steam fire engine, to Ahrens-Fox Fire Engine Co., Cincinnati, O., manufacturers of Continental engine, \$5,150.
Lockport, N. Y.—Furnishing fire hose, to Eureka Fire Hose Co., Syracuse, 500 ft., \$1.10 per ft.; to Boston Bell Co., Buffalo, 250 ft., 65c.; to Empire Mfg. Co., Lockport, 250 ft. 80c.
New York, N. Y.—To the Webb Motor Fire Apparatus Co., St. Louis, Mo., for two 75-ft. self-propelling hook and ladder trucks, \$19,900. and two gasoline pumping engines, \$16,500.

BIDS RECEIVED

Birmingham, Ala.—Furnishing auto apparatus to cost between \$60,000 and \$70,000; American La France, \$82,500; Webb Motor Car Company, for 50-horsepower, \$1,050 each; for 70-horsepower, \$1,150 each; Knox Automobile Company, \$76,200; White Automobile Company, \$59,695.50; Joseph Boyd & Bro., \$3,950 each; Robinson Fire Apparatus Company, \$1,480 each; Speedwell Company, \$1,500 each; Seagraves Company, \$1,333.33 each.
Texarkana, Ark.—Webb cars, 90-h.p., with regulation tire department equipment, \$6,500; No. 2 60-h.p., \$5,500; Seagraves cars, 54-h.p., \$1,850; American-La France cars, 60-h.p., \$5,500; Kanawha cars, 50-h.p., \$4,412.50; Northern cars, 30-h.p., \$1,000; Knox cars, 56-h.p., \$5,600; Peters cars, 51-h.p., \$4,136.
Jacksonville, Fla.—Erecting engine house on the King's road, Florida Contracting Co., \$5,500; R. Lee Sevil, \$5,735; J. B. Marshall, \$5,933; N. L. Snelson, \$5,810; Seaton & Seaton, \$5,189.90; all bidders of city.
New Bedford, Mass.—Furnishing hose; only two were in accordance with specifications; American-La France Fire Engine Co., 93 1/2c. per ft. and the New York Royal Co., 97 1/2c. per ft.; Combination Ladder Co.,

Providence, which supplied the hose bought last year, returned specifications, stating that they would submit no bid under them, but submitting price of 61 1/2c., the same price as last year, for hose of same quality; Boston Helling Co. submitted three samples of hose, one for 80c. per ft., another for 90c. per ft. and a third for 80c. per ft.; neither conformed to the specifications; U. C. C. Fire Hose and Rubber Co. submitted three samples, and prices of 89c., 79c., 51 1/2c., per ft.; Voorhees Rubber Manufacturing Co. submitted seven bids down to 70c.

East Providence, R. I.—Furnishing fire truck; Knox, \$5,200; Kanawha, \$5,000; Combination Ladder Co., \$4,350 and \$4,450; American-La France, \$5,500; American Locomotive Works, \$4,675; Monahan Vehicle Co., \$4,000; Prayer Miller, \$4,500.
Seattle, Wash.—Construction of Fire Station No. 28 in Hillman City Addition; Rounds-Hurston Co., \$7,350; C. Kuppler, \$6,000; N. P. Olsen, \$5,485; A. C. Walter, \$7,990; Woock & Behrens, \$5,950; S. Schults, \$7,500; Finne & Gjarde, \$6,152.
Seattle, Wash.—Construction of fire station No. 26, South Park, E. B. Davis, 1012 Donovan st., \$950; Sundberg & Lindstrom, \$2,825; C. Kuppler, \$1,375; G. C. Lingenfelter, \$1,795; Woock & Behrens, \$1,850; construction of fire station No. 28, Hillman City, C. Kuppler, \$5,147; Woock & Behrens, \$4,811; N. P. Olsen, \$4,890; Finne & Gjarde, Northern Bank Bldg., \$1,783.
Seattle, Wash.—Furnishing two autos: I. D. Lundy & Co., Inc., one Stoddard-Dayton car, \$2,000; Metropolitan Motor Car Co., two Pullman cars, \$3,750; M. S. Brigham Motor Car Co., two Cadillac cars, \$3,810; Racine O. & A. Co., two cars, \$3,800; Osen & Hunter Auto Co., two Mitchell cars, \$4,000; Polson Implement Co., one American car, \$2,350, P. H. Bardshar, one Stevens-Duryea car, \$2,500, and one Marion car, \$1,750, or both cars for \$4,000; Winton Motor Car Co., two cars, \$4,000; J. T. Keena & Co., one Pullman car \$1,800, one Cadillac car \$1,000, one Packard car \$2,500, one Winton car \$1,500, one Packard car \$2,000, one Packard car \$2,000, one Packard car \$3,000, one Fope-Hartford car \$1,000.
Spokane, Wash.—Furnishing four-passenger roadster for Assistant Chief of the Fire Department; American Automobile Company, Stoddard-Dayton 43-horsepower car, \$2,900; Columbia Motor Car Company, of Hartford, Conn., by John M. Bell, local agent, Columbia car, 39-horsepower car, \$3,500; Pacific Car Company, Tacoma, 50-horsepower Kissel Kar, \$2,110; for automobile aerial truck; Seagrave Company, of Cincinnati, \$10,725; Webb Motor Fire Apparatus Company, St. Louis, \$10,200; for combination chemical engine and hose wagon; Seagrave Company, \$5,600; Knox Automobile Company, by John M. Bell, \$5,910 for solid tires, \$6,160 for pneumatic tires; Webb Motor Fire Apparatus Company, \$6,200; Pacific Coast Fire Supply Company, of San Francisco, \$6,250; Emerson Coupling and Fire Supply Company, Kansas City, Kan., \$5,700.

BRIDGES

Ansonia, Conn.—City is considering construction of bridge across Naugatuck River at Bridge st.—V. B. Clarke, City Engineer.
Jacksonville, Fla.—Board of Public Works has rejected all bids received for erection of bridge over East Bay st.
Wateka, Ill.—Board of Supervisors has decided to build bridge in Pigeon Grove Township.
Elkhart, Ind.—County Commissioners have agreed to spend \$5,500 for two bridges to take place of three bridges for extension of East Beardsley ave., for which \$27,000 was originally asked last summer.
Indianapolis, Ind.—Detailed estimate of cost of erecting and repairing bridges has been submitted to Board of Public Works by City Engineer Klausmann, as follows: State ave. and Pleasant Run, \$11,466; Highland ave. and Pogues Run, \$7,736; Roache ave. and the canal, \$8,586; 25th st. and the canal, \$8,186; East Michigan st. and Pogues Run, repairs, \$880; and Ohio st. and Pogues Run, repairs, \$350; total \$37,404.
Fort Scott, Kan.—County Commissioners are considering erection of bridge across Mill Creek.
Holyoke, Mass.—City Engineering Department will be called upon this year to furnish plans for new second level canal bridge in Cabot st. for retaining wall on Railroad st.—T. J. MacCarthy, City Engineer.
Meridian, Miss.—Meridian Street Railway Co. will construct concrete double track bridge over stream near 8th st.; cost about \$4,600.
Allentown, N. J.—County Commissioners have adopted resolution to repair and raise to standard of class A following county bridges; Furnace bridge, in Sixth Ward; Bogert's bridge, over the Little Lehigh River; Scheicher's bridge and Geiger's bridge, over the Jordan River.—Charles D. Weirbach, City Engineer.

Trenton, N. J.—County Engineer Eppele has about completed plans for proposed Stockton st. bridge.

New Brunswick, N. J.—Board of Freeholders will erect bridge over Woodbridge Creek.

Auburn, N. Y.—Erection of additional bridge over Owasco outlet is being considered by Council.

Erwin, N. Y.—Town has defeated proposition to expend \$7,000 for erection of bridge over Couchton River near Coopers.

Charlotte, N. C.—Mecklenburg and Gaston County Commissioners are considering construction of bridge across Catawba River at Sloan's Ferry; cost about \$35,000.

Sandusky, O.—Bids are being received by the County Auditor for construction of six bridges in various parts of the county.

Youngstown, O.—Plans have been prepared for construction of bridge across reservoir of Commercial Water Co. in Coitsville Township.—Geo. Montgomery, County Surveyor.

Guthrie, Okla.—Citizens have voted \$45,000 viaduct bonds.

Muskogee, Okla.—Board of County Commissioners has instructed County Engineer Pitts to begin work of making surveys for proposed new bridge to be built across Arkansas River near Haskell; also to make new surveys, plans and specifications for all of the 33 bridges to be erected in various parts of the county.

Pendleton, Ore.—City is considering construction of bridge across the Umatilla at Main st.

Hanover, Pa.—County Commissioners have decided to erect concrete bridge across Furnace Creek, which separates Penn and Manheim Townships; work will be commenced about April 1.—Adam E. Kohr, City Engineer.

Knoxville, Tenn.—Plans have been prepared for erection of reinforced concrete bridge at Sixth Ave.—J. E. Thompson, City Engr.

Fredericksburg, Va.—Board of Supervisors of Spotsylvania County has decided to erect concrete or steel bridges over Hazen and Massapouox Run.

Richmond, Va.—Charles E. Bolling has asked Council Committee on Finance for appropriation of \$12,000 to repair free bridge across James River.

Walla Walla, Wash.—Plans have been completed by City Engineer E. B. Shipley for erection of reinforced concrete bridge across Mill Creek; cost \$11,000.

Fairmont, W. Va.—Marion County Court is considering erection of bridge near Paw Paw Creek at Rivesville.

Milwaukee, Wis.—Plans and specifications have been completed for construction of concrete bridge over the Kinnickinnic River at Chicago st.

CONTRACTS AWARDED

Selma, Ala.—Construction of 23 bridges in various parts of country to the Converse Bridge Co., Chatanooga, by Court of County Commissioners.

San José, Cal.—Building reinforced concrete bridge on Lincoln ave., to John McReynolds, \$3,979.

Michigan City, Ind.—Reconstructing Franklin st. bridge, to Thos. Phee Construction Co., \$14,800.

Kansas City, Mo.—By Board of Public Works, for construction of reinforced concrete bridge over the Blue River at 15th st., to William P. Carmichael Co., St. Louis, \$60,318; other bidders were: S. M. Kerns, Kansas City and Denver, \$66,510; Freeborn Engineering and Construction Co., \$66,893.70; Kansas City Bridge Co., \$81,926; Midland Bridge Co., \$91,114.50; A. M. Blodgett Construction Co., \$98,150.—Waddell & Harrington, Leslie-Orear Bldg., Kansas City, Mo., Engineers.

Woodstown, N. J.—Erecting concrete and iron bridge over Salem Creek, to Owego Bridge Co., \$3,645.

Poteau, Okla.—By the County Commissioners of LeFlore County, for construction of the bridge in District No. 1, to Missouri Valley Bridge Co., \$9,670; to Kansas City Bridge Co., for bridges in Districts Nos. 2 and 3, \$8,176 and \$1,857, respectively.

Petersburg, Va.—Building Walnut Hill viaduct, to Roanoke Iron & Bridge Co., \$41,000.

Superior, Wis.—Building wooden trestle across Nemadji River at E Fourth St. at present grade to Interstate Dredge & Dock Co.

BIDS RECEIVED

Washington, D. C.—Strengthening the Calvert st. bridge: Snare & Triest Co., 143 Liberty st., New York (proposition A) \$20,980, (B1) \$16,200, (B2) \$4,780; Penn Bridge Co., Beaver Falls, Pa., (A) \$19,789, (B1) \$16,280, (B2) \$3,409; Baltimore Bridge Co., Baltimore, Md., (A) \$23,250, (B1) \$19,280, (B2) \$3,870; Plerson & Goodrich, Inc., 30 West st., New York, (A) \$28,890, (B1) \$21,940, (B2) \$6,950; Oscar Daniels, 38 Park Row, New York, (A) \$22,514, (B1) \$18,000, (B2) \$4,900; McClintick-Marshall Construction Co., Pottsdam, Pa., (A) \$23,400, (B1) \$17,875, (B2) \$6,150.

Peoria, Ill.—Building bridge: Toledo-Massillon Bridge Co., \$212,276; Midland Bridge Co., Kansas City, \$217,153; the Milwaukee Bridge Co., \$166,896.50; the Cullen Friestedt Co., Chicago, \$206,715.67; Johst Bridge and Iron Co., \$248,000; Kansas City Bridge Co., \$233,000; the Pennsylvania Steel Co., Steelton, Pa., \$205,825.

Indianapolis, Ind.—Building bridge over Lick Creek, in Warren Township: L. Darrah, \$2,000; Volpp & Fritz, \$1,697; American Construction Co., \$1,975; Charles Hoover, \$1,635; Hy Tickling, \$1,888; A. W. Moore Co., \$1,807; King & Heaton, \$1,879.

Kalamazoo, Mich.—Constructing concrete Gull st. bridge: Herman Tapp Construction Co., Fort Wayne, Ind., \$21,500 and \$21,000; Carpenter & Anderson, Grand Rapids, \$19,959; Richard Hestek, city, \$20,645; Huron Bridge and Iron Co., Port Huron, \$19,850, \$18,600 and \$16,900; La Fayette Engineering Co., La Fayette, Ind., \$18,500, \$18,050 and \$22,071; Henry L. Vanderhorst, city, arch bridge \$23,600, girder bridge \$21,000; C. Marsman, Grand Rapids, \$21,480 (\$100 less if iron rail is used); E. W. Seamans, Grand Rapids, \$23,444; Illinois Bridge Co., Chicago, Ill., 10 plans, ranging from \$17,888 to \$20,537; Wynkoop-McCormley Co., \$19,900 and \$18,990.

Southampton, L. I., N. Y.—Canton Bridge Co., Canton, O., only bidder for construction of the Quoogue bridge, \$8,871.

Richmond, Va.—Plans and proposals for erecting reinforced concrete bridge over James River, to replace old Mayo's bridge: McLean Contracting Co., Baltimore, \$261,000, alternate bid with different plan of reinforcement, \$252,000; railway tracks, \$900; Southern Ferro Concrete Co., Atlanta, Ga., \$222,000; I. J. Smith & Co., Richmond, seven designs and proposals as follows: \$210,275, \$195,000, \$205,563, \$192,370, \$216,737, \$224,774 and \$211,048; H. M. Alport & Sons, Richmond, \$233,548.90; Thomas Phee Construction Co., Chicago, \$215,800; Charles B. Clark & Co., Baltimore, \$179,400; paving, \$20,650; tracks, \$10,800; Carolina Concrete Co., Greensboro, N. C., eight designs, \$244,300, \$238,900, \$224,500, \$220,600, \$212,700, \$205,300, \$193,600, \$187,000; time 240 working days; Snare & Triest Co., New York, \$225,000; Fruin & Conlon Contracting Co., St. Louis, \$213,750; McKay Engineering Co., Baltimore, \$216,477; deduct for creosote wood paving, \$900; for vit. brick paving, \$5,000; add for railway tracks, \$7,000; Piedmont Construction Co., Atlanta, \$224,000; tracks, \$9,750; Hennebique Construction Co., New York, \$168,000, \$222,000 and \$225,000; James Corse, Racine, Wis., \$222,470; Cumming Structural Concrete Co., \$221,000; Stamper Harland & Co., Richmond, \$227,712.

Superior, Wis.—Pill to be made at Nemadji River and wooden bridge at East 4th st., Whitney Bros., as Interstate Dredge and Dock Co., lowest bidders, \$41,840.37; Ed Gallagher, \$42,500; E. A. Dahl & Co., \$44,490; John Shea and Wm. Walsh, \$42,000; Barnett & Record, \$44,475; using a different kind of lumber than timber specified the Whiteys filed bid of \$46,603.07.

MISCELLANEOUS

Benton, Ark.—Saline County is considering erection of jail.—M. D. Kinkead, County Clerk.

Willows, Cal.—City Trustees have decided that on March 1 the bonds recently voted for municipal improvements will be sold; immediately after disposal work will be commenced on city hall, which is to cost about \$25,000.

Washington, Ga.—Architect G. Lloyd Preacher, Augusta, is preparing plans for erection of \$20,000 jail for Wilkes County.

Goshen, Ind.—Council has ordered purchase of site for erection of city hall.

Indianapolis, Ind.—Superintendent of Police Hyland has recommended purchase of \$5,000 auto patrol wagon.

Salina, Kan.—Contract will be let about Mar. 20 for erection of proposed city building. Address Mayor Kirtland.

Winchester, Ky.—City has sold \$40,000 city hall bonds.

Boyce, La.—City is considering erection of jail.

Baltimore, Md.—Mayor Mahool has recommended that city should spend at least \$50,000 a year for playgrounds and recreation places for children.

Fall River, Mass.—Board of Health has decided to ask for new bids for removal of garbage.

Nahant, Mass.—Town is considering erection of municipal building at Nahant road and Pleasant st.

Worcester, Mass.—Council has decided to purchase site on Waldo st. for erection of police headquarters.

Muskegon, Mich.—Erection of city hall is being urged.

St. Paul, Minn.—Police Board will advertise for bids for remodeling Benz building to be used as temporary quarters for Central police station.

Loup City, Neb.—Election on bonds for erection of court house is being considered.

Manchester, N. H.—Council is considering erection of comfort station.

Logota, N. J.—Council will transfer school on Larch ave. into borough hall.

Elizabeth, N. J.—Preliminary plans are being prepared by Architect C. W. Oakley for proposed tuberculosis hospital in Newark Providence Township.

Hightstown, N. J.—Borough will erect \$7,000 town hall. Address Mayor Blauvelt.

Perth Amboy, N. J.—Mayor A. Bollchweiler has recommended establishment of public playgrounds.

Trenton, N. J.—Sanitary Committee Council will ascertain cost of installing comfort station at State and Broad sts.

Albany, N. Y.—Council is considering municipal system of ash and garbage collection and disposal.

Albany, N. Y.—Board of Contract and Supply will at once ask bids for removal street dirt and dead animals.

Corning, N. Y.—Mayor F. A. Ellison has recommended purchase of combination ambulance and police patrol.

Dunkirk, N. Y.—Council has passed over the veto of Mayor James a resolution to buy Kimball dock site at expenditure of \$10,000.

Niagara Falls, N. Y.—Mayor P. J. Kelley has recommended collection of garbage contract and establishment of first-class city market.

Syracuse, N. Y.—City will soon let contract for sprinkling streets.—Geo. J. McCarty, City Clerk.

Cherryville, N. C.—Wheeler & Stone, Charlotte, have prepared plans for erection of city hall.—A. H. Heiss, Mayor.

Brewster, O.—Village has rejected bid for erection of proposed jail; lowest price on purchase of four cells from city of Mansion will be secured.

Cincinnati, O.—County Commissioners have selected Architect A. C. Kuball, Lincoln Court Inn, to prepare plans for erection of \$750,000 jail.

Lowellville, O.—Mayor Robert Erskine has recommended erection of municipal building and establishment of small hospital.

Port Clinton, O.—Citizens have voted \$25,000 bonds to erect city hall.

Ashley, Pa.—Town hall and police station has been destroyed by fire.

Chester, Pa.—Engineering Department of city has completed the plans and specifications for two of the proposed new wharves provided under terms of the bill which carried aggregate appropriation of \$55,000.

Pittsburg, Pa.—New and beautiful entrance to Schenley Park and construction of a Parkway blvd running across city along present roadbed of the Baltimore & Ohio Railroad are improvements advocated in two plans set forth by Frederick L. Olmsted, city planning expert, employed by Pittsburg Civic Commission.

Trumbauersville, Pa.—Citizens will vote Feb. 28 on \$4,000 bonds for town improvements.

Newport, R. I.—Need of police station being considered.

Providence, R. I.—Council has adopted resolution to spend \$150,000 for purchase and improvement of playgrounds.

Jonesboro, Tenn.—Washington County considering \$50,000 bond issue for erection of court house.

Dallas, Tex.—Proposed city hall will be erected at Commerce and Howard sts.; plans prepared as yet.

Fort Worth, Tex.—City has decided locate new east side police station at corner of Missouri ave. and Slater st.

Mount Pleasant, Tex.—Site at Depot and Kauffman ave. has been selected for erection of combined city hall and fire station.

Nacogdoches, Tex.—Another election for erection of \$125,000 court house and jail being considered.

Paris, Tex.—Citizens will vote March on \$50,000 bonds to erect comfort station.

Hampton, Va.—Council is considering erection of city hall and stables on Court Norfolk, Va.—Board of Control has asked City Council for appropriation of \$3,500 to build waiting house at Forest Lawn Cemetery.

Norfolk, Va.—B. F. Mitchell, Architect, a City Engr. Brooke has prepared estimate upon public lavatories showing that to build one underground on Commercial would cost \$4,500 and another above ground at the city market, \$3,000.

Spokane, Wash.—Chief of Police Doyle has recommended purchase of electric automobile for Police Department emergency machine authorized by Council.

Richland Center, Wis.—Plans have been accepted for erection of \$30,000 city hall.

TOO LATE FOR CLASSIFICATION

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREET IMPROVEMENTS				
York	Albany	Feb. 20, 3 p.m.	Furnishing road oil for Bureau of Parks	Isidore Wachsman, Secy. Bd. C & S.
Indiana	Elkhart	Feb. 20, 10 a.m.	Constructing 21,000 sq. yds. of street paving.	B. J. Bixler, City Clerk.
Jersey	Irvington	Feb. 20, 8 p.m.	Constructing Telford pavement in two streets	M. Stockton, Town Clerk.
York	Long Island City	Feb. 20, 11 a.m.	Deliver to Bu. of H'ways, Boro. of Queens, broken stone and screenings of trap rock, 3,000 cu. yds. of sand and 210,000 gals. asph. road oil, & pave, cur and lay sidewalks in var. sts.	Lawrence Gresser, Boro. Pres
	Bowling Green	Feb. 20	Grade, drain, curb, macad. and oil Wallace ave	Wm. Manner, Dir. Pub. Serv.
	Ft. Madison	Feb. 20	Constr. roads	N. J. Huebner, Twp. Clerk.
Michigan	Saginaw	Feb. 21, 2 p.m.	Furnishing crushed stone, gravel and Portland cement	J. W. Ederer, County Rd. Comr.
Ohio	Columbia	Feb. 21	Approx. 11,750 sq. yd. brick pave.	J. S. Bicknell, City Clerk.
Ohio	St. Louis	Feb. 21	Impr. various streets with vit. brick	Maxime Rober, Pres. B. P. J.
Jersey	Atlantic City	Feb. 27	Pave. Pennsylvania and Albany aves.	E. D. Rightmire, City Engr.
York	Albany	Feb. 27	Construct various highways in Oneida County	Chas. E. Treman, Supt. Pub. Wks.
North Carolina	New Bern	Feb. 28, 8 p.m.	Approx. 40,000 sq. yd. paving.	F. T. Patterson, City Clerk.
	Lorain	Mar. 7, noon	Constructing sidewalks, cross-walks and repairing.	L. B. Johnston, Clerk
SEWERAGE				
Indiana	Elkhart	Feb. 20, 10 a.m.	Constructing 1 mile vitrified pipe sewers	B. I. Bixler, City Clerk.
Wisconsin	St. Paul	Feb. 20	Constructing St. Anthony Park North Sewer System, Cost \$130,000.	Board of Public Works.
Ohio	Columbus	Feb. 21	Constr. dry cut off sewer	H. S. Houlton, Dir. Pub. Ser.
Colorado	Colorado Springs	Feb. 24	Constr. brick sewers, incl. 1,255 lin. ft. 48-in., 3,975 ft. 36, 30 and 27 in. and 15,408 ft. 24, 21, 18, 12 and 10 in. clay or concrete pipe.	City Clerk.
	Akron	Feb. 24, noon	Constructing sanitary sewer	J. W. Gauthier, Dir. Pub. Ser.
	Oakley	Feb. 27	Constr. sewer in Taylor ave.	Oscar Kosche, Village Clerk
	Corydon	Feb. 28, 3 p.m.	Constructing three miles of sewers and a disposal plant	City Clerk.
Michigan	Niles	Mar. 1, 8 p.m.	Constructing main trunk sewer	Herman Roebeck, City Clerk
WATER SUPPLY				
	Nottingham	Feb. 17	Constr. water mains in various streets.	J. C. Steinicke, Village Clerk
York	Albany	Feb. 20, 3 p.m.	Furnishing cast iron water pipe, standard special castings, tapping sleeves and valves.	Isidore Wachsman, Secy. Bd. C & S.
	Corydon	Feb. 28, 3 p.m.	Constructing 6 miles 4 to 8-in. water mains, 70,000 gal. steel tank on 100 ft. tower, pump-house, reservoir, valves, pumps, motors.	City Clerk.
Ohio	St. Catherines	Feb. 28	Furn. c. i. pipe and special cast. for 36-in. gate val. 4 to 36 in.	Chm. W Wks. Com.
Indiana	Harlowtown	March 2	Constr. reservoir, cap. 250,000 gals., and lay. 3,550 ft of 8-in. and 400 ft. of 6-in. main, with hydrants, etc.	S. K. Campbell, Town Clerk.
South Carolina	Victoria	March 3	Furn. 250 4-in., 100 6-in. and 10 12-in. double gate valves, and 15 tons best blue pig lead.	Wm. H. Northeott, Purch. Agt.
York	Ogdensturg	March 7	Constr. covered sand filters, pipe lines, steam and elec. pump, machinery, etc.	Jas. M. Wells, Chm. Bd. W. Com.
Mississippi	Macomb City	March 7	Sinking artesian well.	J. D. Harrell, City Clerk
Virginia	Dauphin	Feb. 25, 8 p.m.	Constructing 2 reinforced concrete highway bridges.	J. W. Johnston, Town Clerk.
LIGHTING AND POWER				
British Columbia	Calgary	Feb. 20	Furnishing 200 five light ornamental lamp-posts.	A. G. Graves, City Comr.
Pennsylvania	Marcus Hook	Feb. 20, 7:30 p.m.	Furnishing street lighting for three years.	Wm. O'Donnell, Chm. Lt. Com.
York	Gloversville	Feb. 21, 5 p.m.	Lighting streets by elec. with not less than 132 arcs and 194 incandescents for five or ten years.	Morrell Vrooman, City Engr.
FIRE EQUIPMENT				
York	Albany	Feb. 20, 3 p.m.	Furnishing set of rubber tires for steam fire engine.	Isidore Wachsman, Secy. Bd. C & S.
Ohio	Louisville	Feb. 23	Furn. 150 firemen's uniforms.	R. B. Green, City Buyer
MISCELLANEOUS				
Pennsylvania	Chester	Feb. 20, 7:30 p.m.	Constructing pier and bulkhead.	Z. T. Bartleson, Chm. Pub. Prop. C.

STREET IMPROVEMENTS

Los Angeles, Cal.—Contracts for finish the grading of Harbor boulevard and paving it, together with short stretch Main ave., which will join boulevard Gardena, will be let by Supervisors' own sections, if specifications prepared highway Commission are adopted.

Stockton, Cal.—Bids will be received by Board of County Supervisors, March 6, 10 for \$500,000 good road bonds.

St. Mary, Fla.—Baker County has decided to build hard surfaced road.

Rocksville, Fla.—Bids will be asked by City Engineer for bids for completion, cement, of road on Lincoln ave., away ave. to Enterprise st.; also for completion of grading of Mandarin road.

Worm Beach, Fla.—Council has decided authorize issue of \$55,000 of bonds for street, dock and sewer improvements.

Augustine, Fla.—Residents of Carrara are urging paving of the thoroughfare brick.

Wishard, Ind.—Council has ordered paving of N. Main st.

Indianapolis, Ind.—Marion County Commissioners have appropriated \$108,891 for air of gravel roads during year.

Madellville, Ind.—Council has decided to North Main st.

Union, Ind.—Board of Works has decided to pave East Adams st. with brick.

Hampton, Ia.—City is considering paving a blocks of streets with brick and three blocks of alleys with concrete.

Winchester, Kan.—Bids have been received for brick paving in six blocks of streets.

Sterling, Ky.—Council is considering paving of streets with brick.

Northampton, Mass.—Town has appropriated \$11,000 to complete circuit of good streets.

Attapoisett, Mass.—Town has appropriated \$1,500 to continue macadamizing of street road to Tinkham's Corner, a dis-

tance of nine-tenths of a mile; also \$1,000 to macadamize Hammond st. and repair sidewalk.

Grand Rapids, Mich.—Following estimates for grading and graveling the following: for grading and graveling have been submitted by City Engineer Cutcheon: Windsor ave., Fifth ave. to Alexander ave., \$8,370; Reynolds ave., Jefferson ave. to Madison ave., \$7,020; Oak Hill ave., East st. to Kalamazoo ave., \$6,639; Clancy st., Michigan ave. to Cedar st., \$15,940, and Cole st., from Marietta st. to Sweet st., \$3,710.

Kansas City, Mo.—City is considering paving portions of five streets.

Atlantic City, N. J.—Beacon-front hotel men are urging paving of board walk with wooden blocks.

Wildwood, N. J.—Citizens have voted \$20,000 bonds to build 50-ft. board walk.

Rochester, N. Y.—Board of Contract and Supply will at once ask for bids for repairs to cement walks and asphalt during year.—F. N. Lifer, Secretary.

Pittsboro, N. C.—Town will vote March 11 on \$5,000 bonds for street improvements.

Yadkinville, N. C.—Yadkin County is considering construction of macadam road from Yadkinville to East Leno, to the Forsyth county line.

Cleveland, O.—City is considering paving 95 city streets, covering in all about 13 miles, this year; larger paving jobs include stretches of Bolivar and Jennings roads and West 117th st.; total cost, about \$501,000.

Cincinnati, O.—City Engineer Shipley has completed new paving specifications, comprising specifications for wood block, granite, brick, asphalt and macadam, and will submit them to Service Director Sundmeyer.

Memphis, Tenn.—City has decided to pave Bellevue Blvd., Autumn to Jackson ave., with tar macadam; cost, \$15,225.

Brownsville, Tex.—Citizens will vote March 11 on \$80,000 bonds to pave streets.

Dallas, Tex.—Bids will be asked for paving Jefferson st.; estimated cost, \$11,201.02.

Dallas, Tex.—Municipal Commissioners have instructed the City Secretary to advertise for bids for paving Jefferson st., Tenth to Tyler.

Paris, Tex.—Citizens will vote March 7 on \$50,000 bonds for paving square with creosoted blocks on concrete base, etc.—E. H. McCuistion, Mayor.

Waverly, Va.—Town Council has voted \$7,000 for street improvements and installation of additional electric lights.

Puyallup, Wash.—Council has decided to pave Walnut st.; cost, \$5,400.

Neenah, Wis.—Bids will be received by J. P. Keating, City Clerk, for laying 7,500 sq. yds. pavement; material to be tar macadam, concrete, sarcolithic or creosote block; bids opened March 1, at 2 o'clock p.m.—John Le Tournoux, Engineer.

Platteville, Wis.—Council has passed resolution for paving with brick at cost of \$30,000.

CONTRACTS AWARDED

Richvale, Cal.—Building cement sidewalks to Helmer & Lawrence, 10 1/2c. per sq. ft.

Augusta, Ga.—Laying cement sidewalks during year to A. A. Hett & Co.

Dallas, Tex.—Grading Beckley Ave. to B. C. Doty, 2 1/2c. per cu. yd. and dirt; resurfacing South Lamar st. to Municipal Paving Co., 75c. per sq. yd.

SEWERAGE

Dixon, Cal.—Sewer system will be installed in spring. W. J. Weyland and John M. McDermott, Town Trustees.

Orland, Cal.—Citizens will vote on \$27,000 bonds for sewer system.

Syracuse, N. Y.—Specifications have been prepared for construction of number of sewers; bids will soon be asked. John J. Halloran, Clerk, Board of Contract and Supply.

North Wales, Pa.—Council is considering plans for system of sewage.

Oakville, Ont. Can.—T. Aird W. Murray, Toronto, has prepared preliminary plans for sewer system. Chas. A. Bradbury, Town Clerk.

CONTRACT AWARDED

Richvale, Cal.—Building sewer system to C. D. Vincent Construction Co., \$9,361.

WATER SUPPLY

Orland, Cal.—Citizens will vote on \$23,000 bonds for water works.

Afton, Ia.—Election on installation of water works system is being considered.

Clara City, Minn.—Citizens will vote on installation of water works system.

Greenfield, Mo.—City is considering \$15,000 bond issue to install water works. Fred L. Shuter can be addressed.

Brady, Tex.—Citizens will vote Mar. 25 on \$10,000 bonds to secure ample water supply.

Brownsville, Tex.—Citizens will vote March 11 on \$35,000 bonds to extend water system.

CONTRACTS AWARDED

Richvale, Cal.—Building water system to Pacific Tank & Pipe Co., \$7,662.

Daytona, Fla.—Building rein. concrete water softening plant, city water works, to A. Van de Vord, D. D. and C. M. Rogers, City Engineers.

Seattle, Wash.—Laying water mains on Twenty-fifth ave. N. E. to Best Construction Co., \$2,659.40.

Fort William, Ont. Can.—To Canadian Iron Corporation for supplying pipe for summer; prices, \$37.50 a ton for ordinary pipe and \$60 a ton for special pipe; to The Kerr Engine Co. and Canadian Fairbanks Co. for the valves.

Point Grey, B. C., Can.—Supplying piping for the water works system to Robertson, Godson & Co.

Strathcona, Alta., Can.—Installing new 18-in. intake pipe, etc., to M. S. Caine \$4,200.

LIGHTING AND POWER

Auburn, Cal.—Placer County Board of Supervisors has approved plans of Pacific Gas & Electric Company for lighting of the Newcastle Lighting District.

San Bernardino, Cal.—City Council has ordered a call for bids on new street lighting contract for the coming year, starting March 1.

Afton, Ia.—Citizens will vote on installation of electric lighting plant.

Humeston, Ia.—Citizens are considering election on establishment of electric light plant.

Cortland, N. Y.—Mayor Lewis has vetoed resolution of Council, passed last August, granting to gas company new 25-year franchise.

Brownsville, Tex.—Citizens will vote March 14 on \$15,000 bonds to extend light system.

Miles, Tex.—Electric light plant owned and operated by S. M. and T. J. Farmer has been destroyed by fire.

CONTRACTS AWARDED

Cape May, N. J.—By County Board of Freeholders to Sea Isle City Electric Light Company three-year contract to illuminate the turnpike leading from Sea Isle City to mainland.

FIRE EQUIPMENT

Baltimore, Md.—Fire Chief Horan has recommended equipping of fire company at Forest Park with auto engine; also purchase of auto supply wagon.

Minneapolis, Minn.—Fire Chief Ringer has recommended purchase of chief's auto and auto fire engine.

Long Branch, N. J.—Budget for year includes \$4,550 appropriation for auto hose wagon for Independent Co. and \$4,550 for fire engine.

Union Hill, N. J.—Pioneer Hose Co. is urging erection of home.

Cincinnati, O.—Advisability of purchasing one or two auto horse trucks for rapid "first-water" service for use in suburbs is being considered by Director Small and Fire Chief Archibald.

Conshohocken, Pa.—Washington Fire Co. has decided to purchase auto fire engine.

Galveston, Tex.—Fire Chief Gemand has recommended purchase of extra fire size steam fire engine, small truck and practice tower, also erection of \$18,000 fire station.

Pecos, Tex.—Council has made \$500 appropriation for additional horse.

Milwaukee, Wis.—Council is considering resolution to have plans prepared for erection of fire house at Third and Hayes aves.

CONTRACTS AWARDED

Sherman, Tex.—Furnishing hose; 1,000 ft. to Eureka Hose Co.; 500 ft. to Voorhees Hose Co.

Texarkana, Tex.—Furnishing auto fire wagon to Kanawha Fire Engine Co., 71 Cortlandt st., New York City, \$4,125.

Seattle, Wash.—Erecting fire station No. 28, Hillman City, to Kinne & Gjarde, \$4,783.

BRIDGES

Pasadena, Cal.—County and city have arranged to build bridge to cost \$250,000, and will span the Arroyo Seco at western edge of Pasadena.

Jacksonville, Fla.—Bids will be asked by County Commissioners for erection of concrete bridge over Deep Bottom Creek near Mandarin.

Perth Amboy, N. J.—Middlesex county Board of Freeholders is now making arrangements to have bridge erected over Woodbridge Creek, between Maurer and Sewaren.

Portland, Ore.—Plans for Woodward ave.-Meade st. bridge across the Willamette River in South Portland have been approved by Street Committee.

Menard, Tex.—Menard County has voted to build \$20,000 bridge across San Sabu River.

MISCELLANEOUS

Markle, Ind.—Town has decided to erect town hall.

Topeka, Kan.—Bids will be asked for furnishing 12 steel dumping wagons. Address City Clerk Burge. Frank Snyder, Street Commissioner.

Annapolis, Md.—Annapolis Banking and Trust Co. has purchased \$4,000 improvement bonds.

New Bedford, Mass.—Plans have been prepared for erection of brick addition to workshop of city stables.—E. G. Bullard, Architect.

Grand Rapids, Mich.—Bids will be received Feb. 20, 4 p.m., for \$100,000 park and playground bonds.—Jas. Schurer, City Clerk.

Chatham, N. J.—Public Library Commission is considering erection of public library.

Manchester, N. Y.—Board of Aldermen is considering \$10,000 appropriation for erection of addition to city hall.

Warren, O.—Citizens have voted \$30,000 park bonds.

Muskogee, Okla.—Citizens will vote Feb. 16 on \$35,000 bonds to construct garbage disposal plant.

Brownsville, Tex.—Citizens will vote March 14 on \$12,000 bonds to repair city hall and market place and \$3,000 to repair city's slaughter house.

Columbus, Wis.—Claude & Starek, Architects, Badger Block, Madison, have prepared plans for erection of \$12,000 public library building.

Milwaukee, Wis.—Committee on Streets and Alleys has recommended purchase of four flushing machines at cost of \$1,000 each for trial purposes.

CONTRACTS AWARDED

Daytona, Fla.—Bldg. rein. concrete sea wall along Hillaboro River, to Hough & Bond, city, for 1st sect., 3,000 ft.; dredge fill, 75,000 cu. yds. back of wall still to be let. auction dredge work.—D. D. and C. M. Rogers, City Engineers.

Augusta, Ga.—Erecting brick stockade building to T. O. Brown & Son, \$12,670; plumbing and heating to E. J. Erbeling, \$2,645.

Boston, Mass.—Furnishing single and double teams and extra men: District No. 1, South Boston and Dorchester North, to J. H. Winslow Contracting Co.; District No. 2, East Boston and Breed's Island, to John H. Carter; District No. 3, Charlestown, to B. E. Grant; District No. 4, Brighton, to Joseph McGreevey; District No. 5, West Roxbury, No. 6 and No. 8, Dorchester and Ashmont, No. 7, Roxbury South and Jamaica Plain, to J. H. Winslow Contracting Co.; District No. 8, Roxbury, North and South End, to Edward A. Janse; District No. 10, North and West Ends and Back Bay, to B. E. Grant.

Buffalo, N. Y.—Rebuilding and enlarging city refuse utilization plant on Hamburg Canal strip; recommended for contracts: Masonry, Eastern Concrete Steel Co., \$18,519; iron work, C. F. Ernst's Sons, \$21,719; carpenter work, Christian Fierl, \$6,671; roofing, Martin Reiber, \$4,039; plumbing, Shaddock & Patton, \$2,744; total, \$63,692.

Lockport, N. Y.—Cleaning and sprinkling streets for one year, to Stainthorpe & Co., \$4,000.

Syracuse, N. Y.—Building comfort station, to John J. Sherlock, \$2,150.

NEW INCORPORATIONS

Union Sanitary Ash Co., Albany, N. Y.; collecting and disposing of ashes, e. trucking business; capital, \$10,000. Incorporators: Chas. H. Minch, 126 Hudson av.; Bernard L. Patterson, 21 Grand st.; Steph. C. Voelcker, 93 North Pearl st.—all of Albany, N. Y.

Humphrey Gas Pump Co., Syracuse, N. Y.; manufacture and sell internal combustion engines, air and gas compressors, etc. capital, \$1,500,000. Incorporators: Edward N. Trump, Edward L. Pierce, Wm. Cogswell, Syracuse, N. Y.

Buffalo Receptacle Manufacturing Co., Buffalo, N. Y.; manufacture and deal garbage and refuse receptacles, etc.; capital, \$150,000. Incorporators: Gustave Steinhach, Mamie Steinhach, Bertha Ambrose all of Buffalo, N. Y.

Hancock-Howell Electrical Engineer Co., Buffalo, N. Y.; general contract business; electrical and mechanical engineers; capital, \$5,000. Incorporators: Wheeler W. Hancock, Herbert H. How Geo. C. Hillman, all of Buffalo, N. Y.

Cincinnati Wood Preserving Co., Cincinnati, O., has been incorporated with \$200,000 capital stock. The company owns a plot in the western part of the city, to which some extensive additions are planned next summer. Its officers are: H. H. Be President; F. W. Cherrington, General Manager, and J. M. Stirnkorb, Secretary and Treasurer.

Illinois Shale Tile Co., Coal City, Ill., been incorporated with a capital stock of \$75,000. The incorporators are: D. A. Herger, John K. Newhall and John M. R. Mond. The company will engage in manufacture of brick, tile and other products. Construction will begin at once.

PROPOSALS

AUTO FIRE TRUCK

City of Bozeman, Gallatin County, Mont.

Notice is hereby given that sealed proposals will be received by the undersigned up to 5 o'clock p. m., March 2, 1911, for Auto Combination Chemical and Hose Wagon, according to following specifications:

H. P.—80 to 90—A. L. A. M. Rating; speed 45 miles per hour; partition body; 1,200 2½-in. hose; 40 gallon steel chemical tank and basket for 250 feet ¾-in. chemical hose; two short extension ladders; Bosch motor; electric lights and revolving search light on dashboard; with or without 6 tires; capacity eight men. Complete specifications to be furnished with each proposal.

A. M. BRANDENBURG,
City Clerk

HELP WANTED

STATE OF NEW JERSEY.
CIVIL SERVICE COMMISSION.

NEW JERSEY CIVIL SERVICE EXAMINATION FOR INSPECTOR OF GAS AND METEOROLOGICAL PUBLIC UTILITY COMMISSIONER FOR THE STATE OF NEW JERSEY. Salary, \$125 per Month. On MONDAY, March 13th, 1911. For particulars address Civil Service Commission, Trenton, New Jersey. (7-8)

ENGINEER—Wanted, position as engineer or assistant in municipal work, or management of water works. Can give first class references. Will be open for engagement Feb. 15. 5-A, care Municipal Jour-

WANTED TO BUY Transits With Arcs

Send full description

THE ENGINEERING AGENCY, Inc.

(Supply Dept.)

Monadnock Block, Chicago

Est. 1893

6th

Municipal Journal

And Engineer

VOLUME XXX

NEW YORK, FEBRUARY 22, 1911

No. 8

COMMISSION GOVERNMENT

Cities Which Have Adopted It to Date—What is Meant by This Term—Essential Features—Non-Essential Features of the Several Charters and State Laws—Number of Commissioners—Length of Term

Commission government, as that term is generally understood, began just ten years ago when the city of Galveston, Texas, wrecked both physically and financially by a tidal wave, faced the herculean task of reconstructing its streets, buildings and finances in the hands of a commission of five men appointed by the governor of the State. No great notice was attracted by this form of government at first, but the excellent results obtained were soon appreciated and four years later Houston, in the same State, adopted practically the same form of government, following which, in 1907, five other cities of the same State placed their governments in the hands of commissions. By that time, six years after Galveston had inaugurated commission government, what seemed to some like a craze swept over the Central and Northwestern part of the country and general laws permitting the adoption of commission government by their cities were passed by the States of Iowa, Kansas, North and South Dakota in 1907, Mississippi in 1908, Minnesota, Texas and Wisconsin in 1909 and Illinois in 1910, in addition to special charters granted to cities in other States.

While the forms adopted or provided for in all these States were called commission government, there were a number of variations introduced by the different States and cities, some of which were so favorably received and adopted by other cities that the name of the originator was given to those particular variations. The best known of these was the so-called Des Moines plan. In fact, so numerous were the differentiations between the various charters and State laws under which commissioner governments were established that there are probably no two of them just alike, and it has come to be a question of some dispute as to what is and what is not commission government.

During the past two or three years considerable study has been given to the essential features and operation of the various forms of commission government, and books, pamphlets and articles, both popular and technical, have been published on the subject. One of the latest of these is a paper read by Mr. Ernest S. Bradford before the National Municipal League at Buffalo last November, in which an attempt was made to study the charters of all the cities which were claimed to have commission government and analyze the various features which they had in common and those which differentiated them from each other. The Short Ballot Organization, of which Mr. Richard S. Childs is secretary, has probably gone into the matter even more thoroughly and is endeavoring to keep its records and its knowledge of the subject up to date by obtain-

ing copies of all the new charters as they are adopted and also studying reports of commission-governed cities to learn the results of the adoption of this form of government. This organization is publishing a "Digest of Short Ballot Charters," edited by Prof. Chas. A. Beard, in which is given a definition of municipal government which is perhaps as good a one as has been evolved. This definition is as follows:

The phrase "Commission Government" has, of course, been a misnomer ever since the Galveston Commission ceased to be appointive by the Governor and became elective. The word "commission" implies appointment, and in the strict sense of the word there have been no cities in the country "governed by Commission" except Washington, D. C., and Chelsea, Mass. The phrase, however, has been applied in the popular mind to all the new city charters that have been modeled on Galveston and Des Moines. These charters vary from almost exact copies through a twilight zone to charters that are essentially unlike the Galveston plan in all but name. One city changed the title of its Council to "Commission," and proceeded to call itself "Commission Governed" and is still included in most lists on that slender basis!

"Commission Plan," to the average American, means a new plan of city government that seems to be bringing about a substantial and permanent reform in cities where it has been tried. There exists in the popular mind, however, no little confusion as to the precise nature of this new plan, and a variety of definitions are given. Nevertheless, when all incidental features are eliminated, the essential element which accounts for the success thus far achieved is simply this: Conspicuous responsibility—and hence accountability—of all elected officials to the people.

Another way of expressing it is that a true Commission Plan is one which conforms to the Short Ballot principle which is defined by the Short Ballot Organization as follows:

First: That only those offices should be elective which are important enough to attract (and deserve) public examination.

Second: That very few offices should be filled by election at one time, so as to permit adequate and unconfused public examination of the candidates.

This excludes Boston, for instance. Under its recent amended charter, Boston has only six names on the ballot, but all except the mayor are of insignificant authority and uninteresting character, so that they are dangerously obscure. Waco, Texas, is likewise excluded, for although it has the "Commission" of five members, there are a number of obscure, independently elected officials to get in their way. In neither city should complete popular control be expected to ensue.

Accordingly a Commission Governed City means to us one that has a "Short Ballot" according to the Short Ballot principle, which results in popular supremacy with efficient government as a probable by-product.

The above definition possibly places undue emphasis on the short ballot idea, and draws the limits too close to suit some, but in general it presents the principles which we believe have

FEATURES OF VARIOUS COMMISSION GOVERNMENTS

City.	No. of Com-mis-sion-ers.	Allotment of Departments (See Foot Note A).	Term of Of-fice, Years.	Give all or Part Time.	CHECKS ON COMMISSION						Organized Under State Law or Special Charter.	Date of Begin-ning Opera-tion.
					Publicity	Refer-endum.	Initia-tive.	Recall.	Non-partisan Prim-aries.	Civil Service Com-mission.		
California												
Berkeley.....	5		4‡	Not specified	×	×	×	×	×	—	Home Rule Charter	1909
Modesto.....				Part	×	×	×	×	×	×	" " "	1911
Oakland.....				Not specified	×	—	—	×	×	×	" " "	1911
San Diego.....		a, ghr, pb, ts, w			×	×	×	×	×	×	" " "	1909
Colorado												
Colorado Springs.....	5		4	Part	×	×	×	×	×	×	" " "	1909
Grand Junction.....	5		4	All	×	×	×	×	×	×	" " "	1909
Idaho.....												
Lewiston.....	7		2	Not specified	×	×	×	×	—	—	Charter	1907
Illinois												
Carbondale.....	5		4		×	×	×	×	×	††	State Law	1911
Decatur.....	5		4		×	×	×	×	×	††	" " "	1911
E Dixon.....	5		4		×	×	×	×	×	††	" " "	1911
Elgin.....	5		4		×	×	×	×	×	††	" " "	1911
Kewanee.....	5		4		×	×	×	×	×	††	" " "	1911
Moline.....	5		4		×	×	×	×	×	††	" " "	1911
Ottawa.....	5		4		×	×	×	×	×	††	" " "	1911
Pekin.....	5		4		×	×	×	×	×	††	" " "	1911
Rochelle.....	5		4		×	×	×	×	×	††	" " "	1911
Rock Island.....	5		4		×	×	×	×	×	††	" " "	1911
Springfield.....	5		4		×	×	×	×	×	††	" " "	1911
Iowa												
Burlington.....	3		2	All	×	×	×	×	×	×	" " "	1910
Cedar Rapids.....	5	m, a, e, bc, kp	2	"	×	×	×	×	×	×	" " "	1908
Davenport.....	5	"	2	"	×	×	×	×	×	×	" " "	"
Des Moines.....	5	"	2	"	×	×	×	×	×	×	" " "	"
Fort Dodge.....	3	"	2	"	×	×	×	×	×	×	" " "	1908
Keokuk.....	3	"	2	"	×	×	×	×	×	×	" " "	1910
Marshalltown.....	3	"	2	"	×	×	×	×	×	×	" " "	1910
Sioux City.....	5	m, a, e, bc, kp	2	"	×	×	×	×	×	×	" " "	1910
Kansas												
Abilene.....	3	fgh, a, kp	3	Not specified	×	×	×	—	—	—	" " "	1910
Anthony.....	3	"	3	"	×	×	×	—	—	—	" " "	1909
Coffeyville.....	3	"	3	"	×	×	×	—	—	—	" " "	"
Cherryvale.....	3	"	3	"	×	×	×	—	—	—	" " "	"
Caldwell.....	3	"	3	"	×	×	×	—	—	—	" " "	"
Council Grove.....	3	"	3	"	×	×	×	—	—	—	" " "	1909
Dodge City.....	3	"	3	"	×	×	×	—	—	—	" " "	1910
Emporia.....	3	"	3	All	×	×	×	—	—	—	" " "	1910
Eureka.....	3	"	3	"	×	×	×	—	—	—	" " "	"
Girard.....	3	"	3	Not specified	×	×	×	—	—	—	" " "	"
Hutchinson.....	5	"	2	All	×	×	×	×	×	×	" " "	1909
Independence.....	3	a, fgh, kp,	3	Not specified	×	×	×	×	×	×	" " "	1909
Iola.....	3	"	3	"	×	×	×	×	×	×	" " "	1910
Kansas City.....	5	"	2	All	×	×	×	×	×	×	" " "	1910
Leavenworth.....	5	"	2	"	×	×	×	×	×	×	" " "	1908
Marion.....	3	a, fgh, kp,	3	Not specified	×	×	×	×	×	×	" " "	1910
Newton.....	3	"	3	"	×	×	×	—	—	—	" " "	1910
Neodesha.....	3	"	3	"	×	×	×	—	—	—	" " "	1910
Parsons.....	3	"	3	"	×	×	×	—	—	—	" " "	1910
Pittsburg.....	5	"	2	All	×	×	×	×	×	×	" " "	1910
Topeka.....	5	"	2	"	×	×	×	×	×	×	" " "	1910
Wichita.....	5	"	2	"	×	×	×	×	×	×	" " "	1909
Wellington.....	3	a, fgh, kp	3	Not specified	×	×	×	—	—	—	" " "	1910
Kentucky												
Newport.....	5	m, a, e, k, b	2§		×	×	×	—	×	—	" " "	Not yet
Louisiana												
Shreveport.....				Not specified	×	×	×	×	—	—	" " "	Not yet
Massachusetts												
Gloucester.....	5		2	Not specified	×	×	×	×	×	—	Charter	1909
Haverhill.....	5			"	×	×	×	×	×	—	"	1909
Lynn.....	5			"	×	×	×	×	×	—	"	1911
Taunton.....												
Michigan												
Harbor Beach.....												
Pontiac.....												
Port Huron.....												
Minnesota												
Mankato.....				Not specified	×	×	×	×	×	—	Home Rule Charter	
Faribault.....					×	×	×	×	×	—	Home rule charter under state law	1910
Mississippi												
Clarksdale.....				Not specified	×	×	—	—	—	—	State Law	1910
Hattiesburg.....					×	×	—	—	—	—	" " "	"
New Mexico												
Roswell.....				All	×	×	—	—	—	—	" " "	"
North Carolina												
High Point.....	9	a, fg, p, sw	2	Part	×	×	—	—	—	—	Charter	1910
Greensboro.....		b, l, n, o										
North Dakota												
Bismark.....	5	a, fg, bp, sw	4	Not specified	×	×	—	—	—	—	State Law	1909
Mandan.....	5	"	4	"	×	×	—	—	—	—	" " "	1909
Minot.....	5	"	4	"	×	×	—	—	—	—	" " "	1909
Oklahoma												
Ardmore.....					×	×	×	×	††	—	Home Rule Charter	1909
Bartlesville.....	3				×	×	×	×	††	×	" " "	"
Duncan.....	3				×	×	×	×	††	—	" " "	"
Enid.....	4				×	×	×	×	††	—	" " "	1909
Guthrie.....					×	×	×	×	††	—	" " "	1910
Miami.....	3				×	×	×	×	††	—	" " "	"
McAlester.....	3			All	×	×	—	×	††	—	" " "	1910
Muskogee.....	5			Part	×	×	×	×	††	—	" " "	"
Purcell.....					×	×	×	×	††	—	" " "	"
Sapulpa.....	4				×	×	×	×	††	—	" " "	"
Tulsa.....					×	×	×	×	††	—	" " "	"
Wagoner.....					×	×	×	×	††	—	" " "	1909
South Carolina												
Columbia.....	5		4	Part	×	×	×	×	—	×	State Law	1910
South Dakota												
Dell Rapids.....	5	a, fg, bp, sw	5	Not specified	×	×	×	×	×	—	" " "	1909
Huron.....	5	"	5	"	×	×	×	×	×	—	" " "	1909
Pierre.....	5	"	5	"	×	×	×	×	×	—	" " "	1909

*Modified. †Six years for mayor. ††Two years for mayor. §Four years for mayor. †††Permitted by state constitution.

(A) Departments are indicated by the following letters: a, finances; b, public property; c, parks and public grounds; e, public safety; f, fire; g, police; h, health; k, public improvements; l, light; m, public affairs; n, purchaser; o, auditor; p, streets and pavements; r, morals; s, sewers; w, water

FEATURES OF VARIOUS COMMISSION GOVERNMENTS—(Concluded)

City.	No. of Commissioners.	Allotment of Departments (See Foot Note A).	Term of Office, Years.	Give all or Part Time.	Publicity	CHECKS ON COMMISSION					Organized Under State Law or Special Charter.	Date of Beginning Operation.
						Referendum.	Initiative.	Recall.	Non-partisan Primaries.	Civil Service Commission.		
Rapid City.....	5	a, tg, bp, sw	5	Not specified	×	×	×	×	×	—		
Sioux Falls.....	5	"	5	"	×	×	×	×	×	—		1909
Vermillion.....	5	"	5	"	×	×	×	×	×	—		1909
Yankton.....	5	"	5	"	×	×	×	×	×	—		1909
Tennessee												
Memphis.....	5		4	Not specified	×	×	—	—	—	×	Charter	1910
Texas												
Aransas Pass.....											Charter	1909
Austin.....	5		2	Not specified	×	×	×	×	×	—	Charter	1909
Beaumont.....	2		2		×	×	×	×	×	—	"	1909
Corpus Christi.....	5		2	Part	×	×	—	×	—	—	"	1907
Dallas.....	5	a, fg, bp, sw	2	All	×	×	×	×	×	—	"	1907
Denison.....	3		2	Part	×	×	×	×	×	—	"	1907
Fort Worth.....	6	a, fg, bp, sw	2	All	×	×	×	×	×	—	"	1907
Galveston.....	5		2	Part	×	×	—	—	—	—	"	1901
Greenville.....	3		2	All	×	×	—	—	—	—	"	1907
Houston.....	5		2	"	×	×	—	—	—	—	"	1905
Kennedy.....	3	a, fg, cp, hlw	2		×	×	—	—	—	—	State Law	1910
Lymford.....	3		2		×	×	—	—	—	—	"	1910
Marshall.....	3		2	Part	×	×	×	×	×	—	Charter	1909
Marble Falls.....	3		2		×	×	—	—	—	—	State Law	1910
Palestine.....	4		2	Not specified	×	×	—	×	—	—	Charter	1909
Port Lavaca.....	3		2		×	×	—	—	—	—	State Law	1910
Sherman.....			2		×	×	—	—	—	—		
Washington												
Spokane.....											Home Rule Charter	1911
Tacoma*.....	5	hm, a, e, bckp, lw	4	Part	×	×	×	×	×	×	Home Rule Charter	1910
West Virginia												
Bluefield.....	4		4	Part	×	×	—	×	—	—	Charter	1909
Huntington.....	4		3	"	×	×	—	×	—	—	"	1909
Wisconsin												
Appleton.....												
Eau Claire.....	3		4†	All	×	×	—	—	×	—	State Law	1910

**Exercised by "Citizen's Board."

been responsible for the success of commission government—the placing of complete power and responsibility to the people in the hands of a few officials.

We would ourselves add, not to the definition of commission government, perhaps, but to the essentials for its continued success, the "recall"; while the "initiative" and "referendum" are also valuable checks.

It should be clearly understood that the name applied to the governing body, as "council" or "board," has no bearing upon the question of whether or not the government is of the commission form; but rather whether in a few officials, elected at large, are lodged all the functions of the government, legislative, administrative and appointive.

On the preceding page is given a table prepared from such data as we have been able to collect, a large part of it being that contained in Mr. Bradford's paper, the balance from the Short Ballot Organization and from other sources which were apparently reliable. This table shows that at least 111 cities have already adopted the commission form of government, and the number is being added to every month. Among the cities included in some lists, but apparently not covered by the above definition (in most cases because of the incompleteness of the power placed in the hands of the commission), are the following: Oakland and San Diego, Cal.; El Reno, Okla.; Baker, Ore.; Chamberlain, S. D.; Barry, Elkhart, Harlingen, Terrell and Waco, Texas; and Spokane, Wash.

An effort has been made to present in this table also the more important features of the form of government adopted in the several cities, it being thought that in this way a comparison of these could be made more intelligible than by describing, city by city, the features of the several charters or State laws, in addition to which the latter would have occupied an impossible amount of space. The data here tabulated are by no means complete, as it has seemed to be impossible for any one to obtain full information from a number of the cities more distant from the center of inquiry. So far as we know, however, this is the most complete table of the kind which has yet been published and should be of great service to those who are investigating the matter with a view to adapting this general form of government to their local conditions and requirements.

Considering the general idea of commission government

somewhat more in detail, we find the most evident features to be the comparatively small number of officials elected; election of all officials at large and not by wards or districts; conferring of all the powers of the government upon the council as a body, and assigning to each individual certain well-defined portions of this power, with the attached personal responsibility for the proper exercise of it.

The most apparent danger inherent in this form of government is the possibility that the great powers conferred upon these few officials may be used for selfish ends and against the interests of the people, or at least in a grossly arbitrary way. To meet this, many States and cities have adopted the recall, by which an official can be removed from office by popular vote. The initiative has been adopted by still more and the referendum by all but a few of the California and Texas cities.

It will be seen from the table that in about half the cities the Board contains five members, while three also is quite common. Five cities have four commissioners; and six, seven and nine are each found in one city. In several States five is the number provided for first-class cities, all smaller ones having three only, as their municipal functions are less extensive and complicated. The general idea is to focus popular attention before election, and concentrate responsibility afterward, in as small a number as possible. Another advantage of smallness of number is the probability of more prompt transaction of business. Still another is the possibility of paying salaries adequate to secure competent men.

There are all sorts of conditions as to term of office, the length varying from two to five years. In some cases the entire board is changed at each election; in others a single member or one-half or one-third of the members are elected each year, while in still others the mayor or head of the board serves for a longer or a shorter time than the other members.

In some cities the members of the board are required to give their entire efforts to the city's affairs, and are paid accordingly. In others they are supposed to give "as much time as necessary"; while in several the mayor gives his entire time and the others an hour a day or such time as is necessary.

The powers and duties of the board are generally all those conferred by State law or special charter upon the city and previously or commonly exercised by the mayor and council or aldermen, in some cases increased by additional appointing

power. Among the powers is authority to levy taxes, vote appropriations and control the finances generally; to appoint and remove all subordinate officers and employees, create or discontinue offices and fix salaries; and to have full control and supervision over all departments. In most, but not all, cases the mayor has no veto; but this is in some cases transferred to the voters, to be exercised through the referendum.

The control exercised through the recall is really the right reserved by the people to elect a new official sooner than usual. "Another method is to allow the people to vote directly on measures as well as on men; heretofore the two ideas have been tied together, and the only way to secure one or two needed laws was to vote for the men who stood for these laws but who also possibly stood for others not so desirable." (Ernest S. Bradford).

All the charters and State laws, except those of New Mexico, provide for full publicity of the proceedings of the board, of ordinances (including franchises) and of the general and financial conditions of the city. The extent to which the other forms of control which the voters may exercise over the board—referendum, initiative, recall, etc.—have been embodied in charters and State laws is shown in the table. The recall has been criticised as subjecting officials too much to the whims of the voters; but experience in this country has not shown that this power will be used in any but extreme cases, largely owing to the large percentage of voters who must appeal for the recall. One of the most recent instances is Tacoma, where a movement is on foot to recall the entire board.

In addition to the cities and States named, there is agitation for commission government in several others. New Jersey cities are organizing to ask for a State law; and twenty-two of the New York cities organized at Rochester for that purpose on February 3.

A modified plan is being advocated for cities of under 50,000 population by the Board of Trade of Lockport, N. Y., which provides for five councilmen acting under the commission plan, nominated by petition, and subject to recall; with double election except for candidates who get a majority at the first election. The initiative and referendum are provided for. The peculiarity of the plan lies in the employment by the council of a city manager, who appoints all other city employees under civil service rules, prepares the budget, is responsible to the council for all the work of the city except the schools and for the execution of its ordinances and resolutions. In general the city manager idea is that adopted at Staunton, Va. (See MUNICIPAL JOURNAL & ENGINEER for Dec. 29, 1909). Roswell, N. M., also has a manager.

DAYTON WATER WORKS

The Water Department of Dayton, Ohio, in 1910 laid a little over six miles of mains, bringing the total amount of mains in the system up to a little over 180 miles. A large percentage of the new pipe was 6-inch, although 4, 8, 12 and 20-inch pipe was laid. Six new wells were added, making a total of 100 wells at present in use. The additional wells are said to yield from 1,500,000 to 2,000,000 gallons of water per day; but even this is entirely insufficient to meet the requirements of the city, and it is stated that some definite action must be taken in the very near future to materially increase the amount of water supply to provide for increasing population.

In the maintenance of these 180 miles, 16 valves of various sizes, from 3-inch to 20-inch, were found out of order and repaired and 40 were repacked, and two valves were taken out and replaced with new ones. Forty-nine leaks were repaired; 21 of these were believed to have been caused by electrolysis, 14 of which were on main lines and the others on valves, service branches, etc.

During the year 1549 additional meters were placed, making the total number now in use 18,826. There were reported out of order and repaired during the year 2861 meters, or about 15 per cent of the total number. The total number of service connections is 23,697, showing that about 80 per cent are metered.

SEWAGE PUMPING IN NEW ORLEANS

Operation of Six Electric Automatic Stations—Descriptions and Cost of Plants and Cable Lines—Efficient and Absolutely Reliable

The development of the newer, outlying portions of the Long Island section of Greater New York has introduced a number of problems in sewerage which had not previously entered into the designing of sewerage for that city, among these being the necessity for local sewage pumping stations. In connection with the study of this problem, Assistant Engineer John E. Hill visited and reported upon the pumping plants at New Orleans, and his report forms an instructive review of the operation of these plants, the general construction of which has already been described by us. Mr. Hill's report was as follows:

New Orleans being built on very flat ground, with the highest elevations at the mandatory points of outfall, it is impracticable to install any sewerage system which will deliver the sewage flow of all sections of the city to the necessary points of outfall by uninterrupted gravity. Consequently, automatic pumping stations, electrically connected with central stations, have been designed along the lines of the main interceptors and their principal tributaries. Of the thirteen designed automatic sewage pumping stations, but six are at present built, of which four, Nos. 1, 6, 8 and 9, are primary low-lifts, and two, Nos. 14 and 15, are intermediate low-lifts; the principal elements of these six stations are shown in the following table:

Station.	Size of Pump.	Capacity of Pump in Cubic Feet per Minute.	Total Head.	Diameter of Inlet Sewer.	Diameter of Outlet Sewer.	Number of Pumps.
1.....	8"	210	7'	27"	27"	1
6.....	8"	170	6'	24"	24"	1
8.....	8"	170	8'.4	24"	24"	1
9.....	8"	270	8'.6	30"	30"	1
14.....	15"	710	8'.4	54"	53"	2
15.....	12"	450	13'	33"	24"	2

The pumps are all centrifugal pumps directly and vertically connected to induction motors, and all friction bearings and working parts are smothered in oil. An ultimate installation of three units at the primary stations and of four units at the intermediate stations is planned. Each inlet sewer discharges into a shallow suction pit having extended vertical walls.



SUB-STATION NO. 14, SEWAGE PUMPING

All these six substations are built of reinforced concrete and have their pumps set in a dry well with the center of the pump casing below the level of the center line of the inlet sewer. They are provided with automatic regulating devices connected with float-chambers and so arranged that the pumps will go into operation at their full-rated capacity when the inlet sewer is seven-tenths full, and will cease when that sewer has been pumped dry at the suction-pit end. They are also provided with secondary float-chambers and cable devices used for automatically sounding signal alarms at the central station. Each chamber is connected with the primary duct, and, when the water in the sewer rises above the seven-tenths full level, lugs

on the cable throw a connecting arm into the circuit and a continuous alarm is rung and an annunciator falls at the central station. An emergency by-pass leading from the suction pit to the discharge sewer is also provided and this comes into operation when severe storms flood the streets and surcharge the sewers, or when a sudden breakage either to machinery or to cable, or when a prolonged suspension of power renders the plant for a time inoperative.

Besides these installations, each station is provided with a set of incandescent lights, a ventilating fan, an automatic gauge for recording sewage height, a transformer, a switchboard, an hydraulic-siphon sump pump and a compound inlet-outlet ventilating stack with hooded cowl. The lights, the ventilating fans and the pressure pumps operate to keep the stations dry, warm and fit for electrical apparatus. They have been found necessary, even though such apparatus is well encased and protected. The transformer reduces the main 3,000-volt line potential to the designed 220-volt motor potential. The switchboards are provided with the necessary switches, meters, safety-plugs and short-circuit alarms.

All of these substations are connected with the central station by armored and insulated triple-conductor power transmission and telephonic-signal cables carried in ducts laid on the sewer crowns; the length of each set of cables is about 12.3 miles.

The intermediate stations are provided with superstructures, while the primary stations are entirely underground.

The cost of the unfinished structures of Stations 1, 6, 8, 9, 14 and 15 was, respectively, \$4,600, \$4,200, \$4,600, \$4,500, \$12,300 and \$7,800. The cost of furnishing assembling and erecting the machinery of these six stations (together with an additional non-automatically operated station of the type of No. 14) was \$42,000. The cost of furnishing, laying, assembling and connecting the cable lines was \$38,500. The cost of maintenance, which consists of attendance, transportation and engine supplies, is about \$200 per month. The cost of operation, being solely the cost of the power transmitted, is said to be about 3/4-cent per kilowatt hour. The cost of repairs, so far, has been less than \$60.

The general construction and the character of the materials of these stations are admirable. There is very little leakage about the machinery. The impellers are well encased, but are easy of access. All bearings are self-lubricating and the lubricating oil is returnable. On the other hand, the thrust-bearings seemed over-slight and the absence of slip-couplings was noticeable, while the oil-feed of the sump pumps did not appear to be all it should be.

Each station is visited once each day and receives a careful inspection and attention, lasting, normally, about fifteen minutes in each station.

During each and every one of my visits all of these stations were working with entire efficiency and uninterrupted service. The intelligence devoted to the general superintendence and to the daily inspections was strictly high grade and had resulted, apparently, in maintaining absolute reliability in the automatism of the starting devices and in the precision of the operating machinery, and it is claimed that, except during floods and two isolated occasions, this perfect automatism and precise operation had continued without interruption, damage or significant cost of repairs twenty-four hours a day, every day of the last three years.

There were absolutely no disagreeable odors about the stations. The only suspicion of any form of nuisance noticeable was the humming of the ventilating fans, which could distinctly be heard outside and fifty feet away from the two intermediate stations.

My general impression is that these stations at New Orleans do, undoubtedly, work efficiently and reliably and with perfect automatism, month in and month out. And I see no reason why they should not work practically as well here. Still, there is a variable factor which should not be lost to mind and which, perhaps, might produce local failure. I refer to the normally excessive dilution of all New Orleans sewage.

Not only is there a slow but continuous seepage of ground water which in normal cases constitutes a ground water excess, but it must not be forgotten that the New Orleans sewerage system is new and no large percentage of house connections as yet feed these sewers. Whether the pumps would work as efficiently and with as absolute freedom of clogging or stoppage were the sewage heavy and strong and the flow and velocity increasingly greater is a question that cannot be answered with positive certainty. Personally, from my inspection and examination, I believe that, with the methods of installation as practiced at New Orleans, and with as precise an accompanying intelligent, trustworthy and careful inspection as is employed there, practically perfect and reliable automatism, efficiency and duty can be obtained.

In conclusion, I would direct your attention to the factors which seemed to me to constitute the saliently admirable features of the New Orleans sewage pumping stations:

(a) Broad and generous design, fortified by splendid construction and hair-line inspections.

(b) Intelligent and methodic watchfulness over both daily routine and working machinery.

(c) Shallow suction pits instead of receiving wells and the combined alternating and supplementary character of all pumping units.

(d) The use of emergency by-passes and the design for the installation of normally silent pumping units.

(e) Short runs and small lifts, with the avoidance of the necessity for screening.

(f) The use of a drum as an essential part of the starting device and the cut-in of the power by means of a triple engagement.

SEWER CLEANING IN NEW ORLEANS

In cleaning small sewers in New Orleans a rope is passed through from manhole to manhole by use of the Healy adjustable rod. A ball, one inch less in diameter than the sewer, is then attached to the rope by means of an eyebolt passing through the ball. Another rope is fastened to the other end of the eyebolt and the ball then dragged through the sewer with a head of water behind it, the sand and sediment being caught by baffle boards in the manhole at the lower end of the line. This method has provide very effective. Where the sand or sediment has hardened in the pipe and will not let the ball pass, a chain and wire brush are dragged through to disintegrate it.

This method is followed for all sizes of sewer up to and including 21-inch pipe. Sewers larger than 21 inches are cleaned by laborers crawling through and placing the sediment by hand on sleds on which it is hauled to the manholes.

TOLEDO WATER WORKS NOTES

CERTAIN items of interest concerning the water-works plant at Toledo, Ohio, were recently made public by Mr. D. H. Goodwillie, chief chemist of the department. The cost of filtration, he stated, is \$1.75 per 1,000,000 gallons for coal and electricity, \$3.00 for chemicals, \$1.95 for labor and about 4 cts. per 1,000,000 gallons for repairs, supplies and maintenance; or about \$6.74 per million gallons total cost of filtration. About 15,500,000 gallons per day are being pumped and filtered at the present time.

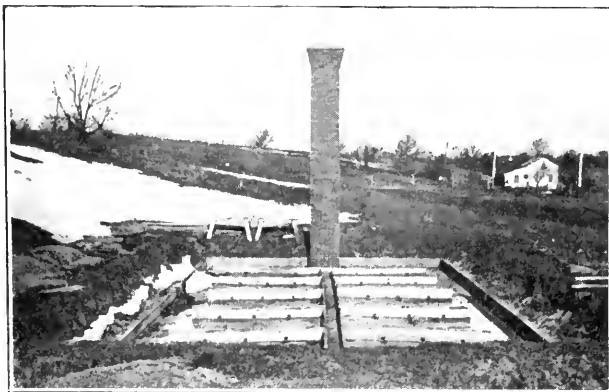
In keeping track of the operation of the filter an average of nearly 600 samples of water a month are being taken, or practically twenty a day. During the past ten months the turbidity of the raw water has run up to 2,200 parts per 1,000,000, with an average of 105, and the bacteria have averaged 10,000 per c. c. In the filtered water the turbidity and color have been practically zero and the bacteria have averaged 110 per c. c., colon bacilli having been found in 40 per cent of the samples of raw water but in none of the filtered water samples.

Producer gas is used in the low-service pumping station, and here a horse-power is produced by the use of 1.15 pounds of coal as against 4.92 pounds of coal in the steam plant.

CHIMNEY FOR VENTILATING FILTER

THE artificial ventilation of sewer beds is by no means a new idea, many patents having been obtained in England for devices and arrangements for securing either forced ventilation or a greater amount than is obtained by the ordinary construction of sewage filters. In this country Colonel Waring built several plants in the early 90's in which air was forced into the bed through pipes introduced especially for this purpose. Experiments in forced ventilation were also tried some years ago by the experiment station of the Massachusetts State Board of Health. During the present decade, however, little was heard of the use of any devices for increasing the ventilation or aeration of beds until within the past two or three years.

A Chicago engineer, Mr. Burton J. Ashley, believes that he was among the earliest, if not the earliest, of the engineers in this country to attempt to secure what may be called artificial continuous aeration of sewage beds without the use of special pipes or methods of introducing air under pressure. Several methods have been employed by him for a number of years past with the idea of introducing the maximum amount of air into a filter bed without the expense or trouble of operating machinery of any kind. Among these methods has been the use of chimneys, a small plant provided with a chimney



VIEW OF FILTER BED FROM TANK

having been built for the State Sanatorium for Tuberculosis at Howell, Mich., in 1908, and another in 1909 at the Madison, S. D., Normal School, in which he connected the collecting drains of a filter bed with the chimney stack of the boiler house.

The Howell plant consists of a tank, dosing chamber and filter bed; the first two being roofed over and the second uncovered. The former are shown in the lower of the two illustrations and the filter bed with its chimney in the upper illustration. The tank is a plain sedimentation tank and is located under the three nearer manholes in the lower illustration, the farthest manhole giving access to the dosing chamber, in which there is a 5 x 36-inch Miller siphon.

The siphon discharges upon a filter bed about 30 feet by 60 feet, in the bottom of which are collecting drains surrounded and covered by coarse crushed stone. On this was placed well-screened clinker and cinders, and these in turn were

covered with a top layer of 6 inches of well-screened and graded torpedo sand. The distribution of the sewage over the bed is effected by a main trough and several branch troughs laid upon the surface of the bed, small holes being placed at intervals along the sides of each trough to permit the sewage to escape upon the filter surface. The grade or "fall" of these troughs was adjusted by trial after the plant was put into operation so as to produce uniform distribution. The underdrains run from the near end to the further end of the bed, where they are connected to a main collecting duct or drain which runs across the further end of the bed. The chimney is connected to this main drain, the idea being that the draft created by the chimney would induce air into the bed from the surface, down through the filtering material and into the collecting drains. Mr. Shunway, secretary of the Michigan State Board of Health, stated recently that they had at first been very doubtful whether the chimney would create any draft in cold weather unless heat were applied to it. It appears, however, that a draft is created in winter, as Mr. C. G. Jewett, the contracting engineer who built the plant, states that on cold days the moisture in the air which issues from the top of the chimney condenses into a visible mist. This we would consider quite probable, owing to the fact that sewage is generally quite a little warmer than the outer air in winter. In fact, we would think the chimney would be less liable to create a draft in summer when the outer air is warmer than the sewage than it would in the winter time.

How much additional aeration this may effect, or what its value may be in either the oxidation of the sewage passing through the filter or in preventing the clogging of the pores of the filter, we are unable to say and do not know that any analyses have been made which would throw any light on this subject. Other methods of producing forced ventilation, in which the air is introduced through the subdrains and passes upward through the filter bed, have been reported to have been of considerable assistance in the aeration of the bed.

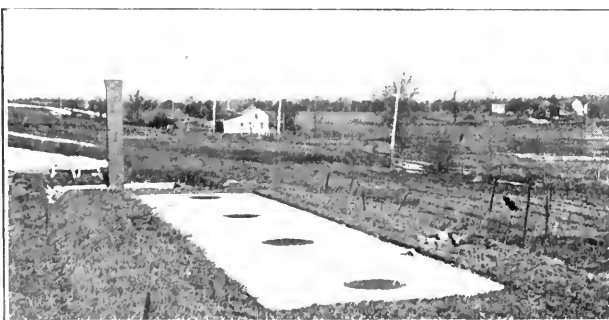
COVERED SPRINKLER FILTER

WHILE practically if not quite all of the sprinkling filters built in this country have employed fixed sprinkler heads, there is being constructed at Regina, Sask., a filter using revolving arms of the Adams patent. This plant possesses the additional novelty that, on account of the coldness of the climate, it is believed to be necessary to roof it over, this requiring a roof circular in plan and with a span of 120 feet, which is the diameter of the filter bed.

The sewage on reaching the plant first enters a grit chamber from which it flows to a septic or liquifying tank. The effluent from the septic tank flows by gravity through a 4-inch pipe to the center of the filter bed (the overflow level of the septic tank being a few feet higher than the surface of the filter bed). Here it rises to the level of the sprinkler arms and flows through these and is sprayed from orifices in their sides, the reaction of the sewage causing the arms to revolve.

The roof is composed of 16 steel trusses 59 feet long, which radiate from a central steel ring to the circumference, where each is supported on a steel column. The circular ring at the center is constructed of a 12 x 3/4-inch plate with a 4 x 4-inch angle at top and bottom, the enclosed space being filled by a diaphragm of 3/8-inch plate stiffened with 2 1/2 x 2 1/2-inch angles. This ring, which forms the crown of the arched roof, is 14 feet above the top of the columns which support the trusses, which columns are 8 feet high from the top of the foundations and are composed of I-beams, with a bracing of channels and angles between them. The 16 trusses are built up of angles and plates. The purlins are of steel channels and angles. The roof covering is of one-inch shiplap and galvanized-corrugated iron.

From the center of the lower chords of the roof trusses run horizontal tie angles, which are all connected to an octagonal plate in the center of the filter. This gives a free headroom for the distributor of about 7 feet from filter to tie rods.



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A. PRESCOTT FOLWELL, Editor

F. E. PUFFER, Assistant Editor

Business Department

S. W. HUME, President

J. T. MORRIS, Manager. A. PRESCOTT FOLWELL, Secretary

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FEBRUARY 22, 1911.

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Odors From Sprinkling Filters

On another page of this issue there is described a comparatively small sprinkling filter which has been roofed over and enclosed, partly, it is true, because of the severely cold climate, but partly, also, because of the possible odors which might arise. About three years ago this journal called attention to the probability that the spraying of septic sewage onto sprinkling filters would give rise to considerable nuisance in the case of large plants. The largest at present in operation in this country is that at Columbus, Ohio, and it might be interesting to know to what extent the odors from this plant may be considered as a nuisance. In connection with investigations of sewage disposal for the city of New York, Mr. John E. Hill visited the Columbus plant and reported to the Board of Estimate and Apportionment upon its condition. This visit was made in November, and Mr. Hill reported that in approaching the purification works he caught the odor of them suddenly and strong while three-fourths of a mile from the plant. "For the distance of about three-eighths of a mile this odor was dully sickening; from this point it decreased in intensity and

intolerability until a point to the windward of the septic tank and in the vicinity of the filter beds was reached, where it was not so intensely offensive. * * * That disagreeable odors emanated from the filter bed, however, was plainly evident and that the intensity of these odors was increased during the operation of spraying was also evident." No disagreeable odor was noticeable to the leeward of the plant. Residents, market gardeners and hunters, and frequenters of the marshes and lands surrounding the disposal works all testified that under certain conditions intolerable odors were appreciable to a distance of three-fourths of a mile to 1½ miles from the plant.

Mr. Hill reported that Chief Chemist Hoover believed that there would be much less nuisance from the plant if septic sewage were not sprayed upon the bed, which belief Mr. Hill shared in. Mr. Theo. S. Oxholm, engineer of construction for the Borough of Richmond, who visited the plant in October, also corroborated the report of Mr. Hill and joined in the belief that if the sewage were not septicized the nuisance would be much less.

We have given more or less extensive notice to two or three sprinkling plants which have been roofed over, and if we may judge from this report concerning the Columbus plant it would seem necessary under many conditions to provide an enclosing structure and methods of ventilation and possibly deodorization of the gases, especially if the sewage passes through a septic tank before being sprayed upon the sprinkler. If in truth the septic action is almost wholly responsible for the odor, it would certainly seem worth serious consideration whether or not preliminary septic treatment does not present more disadvantages than advantages for use in connection with sprinkling filters.

Liability For Impure Water

IN our issue of January 25 reference was made to the apparent divergence of opinions concerning the liability of cities for damages, including death, resulting from impurities in water supplied by them. Further investigation of the matter has confirmed the existence of this difference of opinion between the courts of the several States.

The two views are illustrated by two decisions, one by the Supreme Court of the State of New York and the other by that of the State of Minnesota. The former, in a decision handed down a few weeks ago, stated:

The relation between the general public and a municipality maintaining a system of water supply has been the subject of much discussion in reported decisions. Whatever expressions may appear to the contrary in textbooks and in judicial opinions elsewhere, it is the settled law of this state that in maintaining a water supply system for general public use the municipality is acting as a governmental agency in the work of the State itself, and not as proprietor engaged in a service for its own purposes and profit. This rule was adopted after careful consideration and a thorough review of the previous case law on the subject, not only of this State, but of the country at large and of England as well. As a necessary corollary from this holding it was further held that a municipal corporation was not liable for negligence for nonuser, or misuser, in the maintenance of the water supply system, so far as the furnishing of water itself was concerned.

In applying this rule of non-liability, recourse was had to a general principle many times applied theretofore and since. This principle, as repeatedly recognized and applied, is that a municipal corporation is not liable, unless made so by statute, for the negligence of its public officers in carrying out or omitting an exercise of the governmental power of the State itself, because in such agency the corporation acts, not for itself, but for the State, and has the same exemption from liability as has the State itself.

A decision of the Supreme Court of Minnesota, rendered December 23, 1910, contains the following:

It is obvious that a sound public policy holds a city to a high degree of faithfulness in providing an adequate supply of pure water. Nor does it appear why the citizens should be deprived of the stimulating effects of the fear of liability on the energy and care of its officials; nor why a city should be exempt from liability while a private corporation under the same circumstances should be held responsible for its conduct and made to contribute to the innocent persons it may have damaged

As Elliott J., said in *East Grand Forks v. Luck*: "When the municipality enters the field of ordinary private business it does not exercise governmental powers. Its purpose is, not to govern the inhabitants, but to make for them and itself private benefit. As far as the nature of the powers exercised is concerned, it is immaterial whether the city owns the plant and sells the water, or contracts with a private corporation to supply the water. It is not in either case exercising a municipal function. . . . When a municipality engages in a private enterprise for profit, it should have the same rights and be subject to the same liabilities as private corporations or individuals." Thus in *Wiltse v. Red Wing* a city operating the water works was held liable for water escaping from an embankment under the rule in *Rylands v. Fletcher*; "for," said *Start, C. J.*, "although a municipal corporation, it was engaged in the business of supplying water to its inhabitants for profit, an undertaking of a private nature."

It is apparent from the above that the point upon which both these opinions hinge is the exact position which the city occupies in its operation of a water plant; or, as it is stated in legal parlance, whether it is using mandatory or discretionary powers. In *McQuillin's Law of Municipal Ordinances* these are described as follows:

Imperative or mandatory duties imposed on the municipality imply no discretion and may be compulsorily required. Whether the duty is discretionary or mandatory is also a question of charter or legislative intention, and each case must be decided largely on its own circumstances and the intention gathered from the nature of the power and the whole law relating to the subject. . . . The Supreme Court of Nebraska well says . . . "It is a familiar principle that statutes relating merely to matters of convenience, or to the orderly and prompt conduct of business, and not to the essence of the thing to be done, are generally considered as directory only." . . . Where the law imposes the duty and gives the means of performing it, ordinarily its performance is compulsory. It has often been judicially declared that what a public corporation or officer is empowered to do, and it is beneficial to them to have it done, the law holds it should be done.

It, therefore, appears that the non-uniformity of decisions on this subject is due to the difference of opinions of the several courts as to whether or not the municipal operation of a water-distribution system is mandatory or discretionary. A somewhat different angle of the subject is presented by a decision of the Supreme Court of the United States handed down in December, 1910, in which the court states, "No higher police duty rests upon municipal authority than that of furnishing an ample supply of pure and wholesome water for public and domestic uses," thus classing the furnishing of a water supply among the police duties of a city.

It would appear that no general statement can be made concerning the responsibility of cities for serving typhoid bacteria with the water, but that the decision in the case of any city will depend upon the view taken by the Supreme Court of the particular State in which it is located as to whether the law under which the city acts confers mandatory or discretionary powers.

RELIABILITY OF ESTIMATES

It was, a few years ago, a common impression that an engineer's estimate was always greatly exceeded in actual construction—an idea not altogether without foundation. It is now recognized that there is much greater reliability in the estimates of experienced engineers. A recent report of the Board of Estimate and Apportionment of New York gives the estimated and actual costs of 321 pieces of public work in the five boroughs, totaling \$29,434,059 in cost. Between 1902 and 1909, inclusive, the totals of all estimates showed a gradual change from an excess of actual over estimated cost of 2 per cent. to an excess of estimated over actual of 9½ per cent. Taking the totals by boroughs, and averaging the eight years, we find that in Manhattan the actual cost was 100.4 per cent of the estimated: in Brooklyn it was 86.5 per cent; in the Bronx, 93.2 per cent; in Queens, 89.4 per cent, and in Richmond, 113.9 per cent.

An interesting feature presents itself when we inspect the items under the heads of sewerage, grading and paving respectively. In every case the percentage of actual to estimated cost is higher for sewers than for either of the other two. The

estimates for paving, on the other hand, were higher than the cost in every year for every borough, except in one instance. The grading estimates were sometimes too low and again too high. It would appear from this that even the experience of years has been insufficient to prepare the engineers of the sewer departments to make sufficient provision for the unforeseen difficulties in the way of sewer construction which are so generally encountered and are increasing every year.

POLLUTION OF WATER IN PUBLIC BATHS

Investigations in Hamburg, Germany—Pollution of Water After Various Intervals of Use—Sand Filtration Effective—Aeration Unnecessary

DETAILED investigations have been conducted for several years at the Hamburg (Germany) public baths and swimming tanks to determine what increase in the impurity of water may be occasioned by its use for bathing, the object being to determine just how long the same water could be used with safety. The tests were divided into two series, the first dealing with bath water not artificially purified, the second with water purified continuously by aeration and filtration. The results of these investigations are described in an article by Drs. Kister and Fromme in the December 17th issue of *Gesundheits-Ingenieur*.

Drs. Fürth and Schwarz began these investigations in 1905. Chemical and bacteriological analyses were made when the swimming tanks were first filled and at regular intervals thereafter. There were two baths from which samples were taken. Bath A had two tanks, the one for men being 40 by 75 feet and from 2.4 to 10 feet deep, with a capacity of 20,000 cubic feet; and the women's tank being 40 by 62 feet and from 2.4 to 9 feet in depth, and containing 14,000 cubic feet. In bath B the men's tank was 39 by 75 feet and from 2.4 to 10 feet deep, holding 14,600 cubic feet. Bath C was from 7 to 9 feet deep and had a capacity of only 10,000 cubic feet.

These tanks were filled with reservoir water raised to a temperature of 72 degrees Fahr. by means of steam coils. In winter the water was entirely renewed three or four times a week; in summer, daily or as often as the number of bathers made it necessary. During the bathing hours in bath C, fresh water flowed into the tank continuously from supply pipes above the water level, about 1,050 cubic feet of fresh water being admitted every 12 hours. In the other two baths there was no continuous flow of water, but the surface layer of dirty water was removed by allowing the water to overflow for one-half hour both morning and evening, the water being drawn off at the deepest places, fresh water being at the same time delivered to the tank by pulsometers. This produced a circulation of the water twice in each 12-hour period.

In bath C the supply pipe is at the shallowest part of the bath. This is considered important, as sediment might be stirred up if the supply pipe were near the bottom of the tank. The inflow is at the upper edge of the tank, while the outlet opening is a little above the opening provided for draining off dirty water at the deepest part of the tank. In cleaning the tanks they were emptied and scrubbed and then rinsed off with fresh water. In some cases the tank was flushed with a solution of HCl in the proportion of one to four, and then scrubbed. All the baths have showers in which all bathers must take shower baths before being allowed to enter the swimming tank.

The analyses of water in bath A were made both summer and winter. During December and January the fresh supply of water showed 57 germs ("keime"). With 10 c.c. of water at 99 degrees F. no B. coli or other bacteria were discovered. Tests for oxygen absorption gave 32 mmg. (parts per million) of permanganate; chlorine, 88 mmg.; ammonia, no traces. After 74 persons had bathed, the germs were found to have increased to 1,800 and B. coli were found in 10 c.c. of water. After 206 persons had bathed the number of germs remained constant,

the number of bacteria growing at 99 degrees, including B. coli, increased. The afternoon of the first day, after persons had bathed, the number of germs rose to 64,400, the number of B. coli found at 99 degrees was the same. At the end of the first day, after 820 persons had bathed, the number of germs was only 15,400, but the number of those growing at 99 degrees had increased. Traces of ammonia also were found.

On the second day, after an initial increase of germs to 36,700, the number decreased to 6,500, although a considerable number of persons had bathed in the meantime. The number of bacteria developing at 99 degrees acted similarly. The surface of the water was purified by the overflow method described. Following this the number of germs rose again to 101,000 and on the third day fell to 2,900. The deposit at the bottom of the tank, when analyzed, was found to be a grayish blue, finely divided mass, consisting of iron flakes, hairs, small dark brown particles, microscopic wool and cotton threads, sand, detritus and many protozoa. Investigations of the women's tank showed a similar deposit, but the number of germs was higher. Four hours later, after 855 persons had bathed, the number of germs averaged 61,050 in the women's baths as against 43,950 in the men's. During the night the germs in the men's bath increased to 185,850, and that in the women's baths to 160,500. After 959 men had bathed during a second fourteen-hour period, the number of germs averaged 125,000; while the number in the women's baths, after 381 women had bathed, was 350.

In both B similar conditions were found, the overflowing method of renewing the water being found to decrease the number of germs from 123,200 to 46,600 and 28,000. Chemical analysis at the end of the first bathing day showed ammonia amounting to 0.5 to .11 parts per million. The percentage of oxygen saturation varied between 90.7 and 95.6 in summer and between 89.8 and 104 per cent in winter.

In both C the water before admission was found to contain 10 to 46 germs, but after flowing into the basin this number rose from 600 to 1,700. At the beginning of the second day of bathing the number rose to from 14,250 to 40,000 and fell again to 1,900 to 5,400. B. coli were found only after several days of bathing.

These results apparently demonstrate that germs do not increase in water in proportion with the number of persons bathed, but the number is subject to sudden increases and just as sudden decreases. The increase in the number of 99-degree bacteria and of coli is more gradual, but the former in some cases decrease after the second day. This decrease would seem to be similar to the self-purification of rivers and is due to physical, chemical and biological processes. There was little change in the water from a chemical standpoint, even after a great number of persons had bathed. Oxygen consumed and ammonia, however, increased. In most cases after the water had been bathed in the number of germs was high, but B. coli were found only in 10 c.c. or more of water, although in some cases they were found in .1 and in some cases even in .01 c.c.

The purification plant used in these investigations, which was operated night and day, consisted of eight coke beds seven feet thick, over which water was sprayed, and two sand filters. The purpose of the coke beds was to aerate the water and remove the coarse suspended matter. Later a 24-inch bed of gravel was substituted for the coke. Under these aerators were two sand filters 20 and 40 inches thick respectively, and each seven feet in area. Water was filtered through these at the rate of 1,050 cubic feet per hour, or about one and one-half times the capacity of the tank in 24 hours. The filtered water was conveyed back to the tank by a pulsometer during the earlier part of the test, and later by centrifugal pumps. Tests were made during 7, 14 and 21-day periods. Examination was made of the turbidity of the water, the bacterial contents of the water before and after application to the coke aerators and sand filters, and also of the water in the tank. Both number and kind of germs were investigated, and the water was tested for

oxygen contents, ammonia, nitric acid, chlorine, oxygen consumed, residue on evaporation, loss on ignition and total nitrogen.

After twenty-one days of use the water was transparent down to a depth of 10 feet and the bottom was plainly visible. In fact the color became even better as the original yellow color disappeared.

The sediment contained from 864,000 to 1,360,000 germs, and B. coli were found in .001 c.c.; the loss on ignition was 8.6 per cent and the matter insoluble in HCl was 95 per cent. The water which had not been filtered contained a finely flaked deposit, which contained from 2,740,000 to 3,980,000 bacteria per c.c., 64.2 per cent loss on ignition and 22 per cent insoluble in HCl. Also a large number of protozoa.

The top layer of the coke aerator was fairly clean, but the under layers contained hairs glued together by a brownish mass of amorphous plant-like growths, with numerous infusoria, anguillula and bacteria. Numerous worms and larvæ also were found.

The effect of filtration in the elimination of bacteria is indicated by four tests made three days apart, which showed the bacteria in the raw and in the filtered water respectively to be as follows for each of the four tests: 35,025 and 1,300; 30,750 and 744; 58,530 and 558½; 10,475 and 392½. Tests made at periods of 2, 7 and 14 days showed a great decrease in bacteria after the third or fourth day, after which the number in the effluent remained low. During seven-day runs the average elimination of germs was 66.23 per cent, and during 14-day runs the average decrease was 81.93 per cent. The actual figures for the first case were as follows:

GERMS DURING SEVEN-DAY TESTS

	Tank water	Supply water	Decrease
Average of all tests.....	11,683	3,945	66.23 per cent
Average first three days..	24,075	8,307	65.49 " "
Average last four days..	1,061	206	80.58 " "

GERMS DURING TWENTY-ONE-DAY TESTS

	Tank water	Supply water	Decrease
General average for tests..	1,296	234	81.93 per cent
Average first three days..	3,727	598	83.94 " "
Average last four days...	385	78	79.71 " "

At times there was no great difference between the tank and the supply waters as to B. coli contained. Even after 21 days, during which 13,155 baths had been taken, there was no marked increase in bacteria. In comparing water analyses at morning and evening of the same day, it was found that in the evening, after an average of 776 baths had been taken, the number of germs was greater than in the morning.

During the tests the filters were changed often so as to get different results. In the case of each filter, treating the water with the coke and spraying it over 40 inches of sand gave better results than when 20-inch layers were used. When the 40-inch sand layers were used, without previous aeration on the coke beds, better results were obtained than with filtration through 20-inch layers preceded by such aeration. When the coke spraying was omitted entirely and the tank water passed through a 24-inch gravel layer, the 21-day tests showed the treated water to be equivalent to drinking water so far as bacteria were concerned. The experiments apparently demonstrated that aeration by the coke filter is unnecessary and that a 40-inch sand filter is sufficient for all purposes. Chemical tests showed no difference between the two methods. The tests also showed no great deterioration of the bathing water on the basis of soluble matter. After 3,476 baths had been taken analysis showed the following:

	First day		After four days	
	Supply	Tank	Supply	Tank
Residue on evaporation.....	436	432	440	445
Loss on ignition.....	28	52	55	60
Ammonia.....	0	0	0	trace
Nitrites.....	0	0	0	0
Nitrates.....	4.6	5.7	10	8.3
Chlorine.....	121	124	124	124
Oxygen absorbed.....	14.56	15.24	12.64	15.17

These tests led to the conclusion that tank water, if filtered continuously on plain sand filters, can be kept hygienically clean for three weeks. But a constant supply of fresh water must be added in addition to the water coming from the filters.

NEWS OF THE MUNICIPALITIES

Current Subjects of General Interest, Under Consideration by City Councils and Department Heads—Streets Water Works, Lighting and Sanitary Matters—Fire and Police Items—Government and Finance

ROADS AND PAVEMENTS

The Good Roads Special Train Popular

Harrisburg, Pa.—So great has been the interest shown by the farmers and others in the Good Roads Train being operated by the Pennsylvania Railroad that it has been necessary for the company to add another lecture coach to the train. This will make a train of five cars. The fact that this is the first Good Roads Special Train ever operated by a railroad any where, has caused the farmers and road supervisors in the various towns along the Pennsylvania Railroad to attend the lectures and witness the demonstrations which are being given. From the first afternoon meeting at Harrisburg when Governor Tener made his address, and all along the line of the Pennsylvania from Harrisburg to Altoona, the lecture coaches of the special have been crowded to such an extent that it was impossible for all to hear the talks on Good Roads.

Commissioner Makes Comparison of Costs

Mount Vernon, N. Y.—Owing to complaints from some property owners regarding the alleged high cost of street improvements, Commissioner Beresford of the Public Works Department prepared the following statement comparing Mount Vernon costs with those of neighboring municipalities:

Division of Expense

Mount Vernon—City pays: Macadam, one-third; brick pavement, one-third; curbing, none; flagging, none. Owners pay: Macadam, two-thirds; brick pavement, two-thirds; curbing, all; flagging, all.

New Rochelle—City pays: Macadam, one-third; brick pavement, none; curbing, none; flagging, none. Owners pay: Macadam, two-thirds; brick pavement, all; curbing, all; flagging, all.

Yonkers—City pays: Macadam, none; brick pavement, none; curbing, none; flagging, none. Owners pay: Macadam, all; brick pavement, all; curbing, all; flagging, all.

Borough Bronx—City pays: Macadam, none; brick pavement, none; curbing, none; flagging, none. Owners pay: Macadam, all; brick pavement, all; curbing, all; flagging, all.

In New Rochelle, Yonkers and Borough of Bronx excavation is extra; in Mount Vernon price includes excavation.

Unit Costs

Mount Vernon—Macadam, 8-inch, 98 cents square yard; brick gutters on sand, \$1.64 square yard; brick on 4-inch concrete, \$2.28 square yard; new curbing, 47 cents foot; curbing set in concrete, 70 cents foot; flagwalks, 65 cents foot.

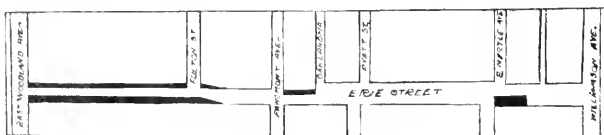
New Rochelle—Macadam, 6-inch, 75 cents square yard; brick gutters on sand, \$1.75 square yard; new curbing, 47 to 55 cents; flagwalks, 68½ cents foot.

Yonkers—Macadam, 8-inch, \$1 square yard; brick on 6-inch concrete, \$2.50 square yard; curbing set in concrete, 1 foot; (16x5") flagwalks, 64 to 80 cents.

Borough Bronx—Macadam, 8-inch, \$1 to \$1.25; curbing set in concrete, \$1 foot; flagwalks, \$1, approximately 3-inch.

Street Widened and Straightened

Youngstown, O.—Through Councilman Fred. Weimer and Assistant Solicitor Clyde Osborn success has finally crowned the efforts of Erie street residents to have that street widened and straightened. An ordinance authorizing this improvement has passed council. In the plate the blackened portions show the land bought by the city. With the exception of several pieces the deeds have been signed and the land turned over to the city. Twenty-five parcels of land have been bought by the city for the sum of \$4,987.70. Erie street at present is 15 feet wide from



PLAN OF STRAIGHTENED STREET

Woodland to Fulton. By acquiring a 10 foot strip of land on the west between these two streets, and a five foot strip on the opposite side, the street will be widened to 30 feet, which will be the average width to the intersection of Fairmount avenue. From Fairmount to Oklahoma street, Erie street falls to 15 feet again. A 35 foot strip from a lot on the north will make the street 40 feet wide here. From Oklahoma to East Myrtle avenue Erie is at present 50 feet wide, and for a short distance south of Myrtle a jog makes the street 35 feet wide. This will be straightened by the purchase of another 25 foot strip on the west.

Brick Road Proves Very Satisfactory

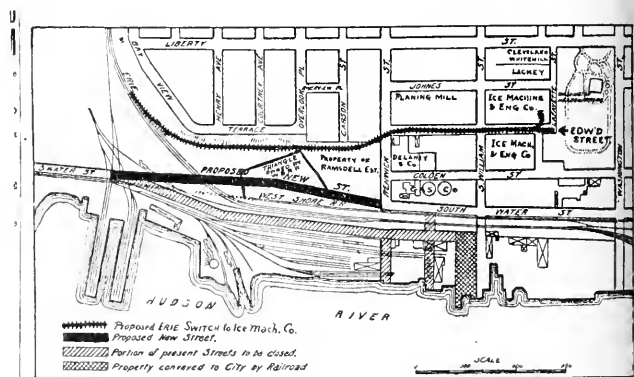
Washington, Pa.—For the period of a year a stretch of brick road, connecting the boroughs of Canonsburg and Houston, the first ever constructed by the county commissioners under the Flinn law, has been thoroughly tested and so far has proven highly satisfactory. Teamsters who have occasion to travel between Canonsburg and Houston are delighted when, after mud inches deep, they reach this brick section, which remains as solid as the best paved street. The commissioners figure that this section of brick road should last a half century with comparatively little repair.

Oil Sprinkling May Be Tested

Syracuse, N. Y.—There is strong sentiment favoring a trial this year of oils, calcium chloride or some other dust allaying material on the unpaved city streets in place of water sprinkling. Sprinkling is done by contract as a local improvement and is paid for by sprinkling tax levied on the frontage, but there is no charter provision for oiling. If a test is made this year, decision will have to be reached at an early date, as the City Clerk is preparing the sprinkling ordinances to be introduced in the Common Council.

Advantages of Relocating Street

Newburg, N. Y.—The above map shows the proposed location of South Water street, the portion of the present street to be abandoned, and with the ends of Renwick and Kemp streets, exchanged by the city, for the strip to be occupied by the new street and the 150 feet adjoining the foot of South William street, the city thereby obtaining a frontage on the river of 200 feet, which is ample for a public pier. The proposed change of route and the properties to be exchanged are clearly indicated. In addition to the above, the map shows the proposed route of the switch connecting the Erie Railroad with the Newburg Ice Machine & Engine Co. and several other important manu-



MAP SHOWING RE-LOCATION OF STREET AT NEWBURGH, N. Y. CITY GAINS A PUBLIC DOCK

factories in that neighborhood. It will be seen that this switch branches off from the Erie tracks at the foot of Bay View Terrace, continuing along the bottom of "the bluff" in almost a straight line to Renwick street, which it crosses at grade and curves into Edward street, passing the boiler works of P. Delaney & Co. At the foot of Overlook Place the route passes between the famous "triangle," owned by the West Shore Railroad Co., and "the bluff," just squeezing past the former, which has been an obstacle to the building of the switch for years because its owners refused to give a right of way. The only other property it is necessary to traverse aside from city streets, is owned by the Erie itself and the Ramsdell Estate, so that no difficulty is anticipated in securing the entire right of way. The route shown is said to be perfectly feasible and to present no difficult or costly construction problems.

SEWERAGE AND SANITATION

Epidemic of Diphtheria

Northburg, Mass.—The re-organization of the Health Department has been determined upon as a result of the appearance of nearly 700 cases of diphtheria in the city. The epidemic is costing the city between \$500 and \$1,000 weekly and is the worst outbreak of disease in any city in the State. Most of the cases so far reported are light.

Screening Foods Against Flies to Be Rigidly Enforced

Jacksonville, Fla.—In furtherance of sanitary conditions, an ordinance has been passed compelling all dealers in fruits, vegetables, meats, etc., as well as restaurants, to screen their places of business against flies. The city Board of Health is going to enforce the ordinance rigidly and all violations of the law will be punished.

Medical Society Against Free Medical Inspection of Schools

Madison, Ind.—The Jefferson County Medical Society has asked Representative Cravens to oppose the bill providing for medical inspection of public schools at State expense.

Peril in Public Water Cup

New York, N. Y.—“Beware the public drinking cup as it would poison,” said Dr. Jacolyn V. V. Manning, answering a question in regard to infantile paralysis, upon which she read a paper at the Academy of Medicine last week. She illustrated the danger by telling of a case where the members of a thrashing crew were made ill by living in a family where a child was suffering with it. One of the nine died, she said.

Investigation of the Milk Supply

St. Louis, Mo.—An exhaustive investigation of the milk supply of St. Louis is being made by the Housing and Sanitation Committee, under the direction of a sub-committee composed of Dr. B. S. Warren, of the United States Marine Hospital, chairman, Mr. Wm. S. Bedal, attorney, and Prof. S. M. Coulter, of Washington University. A large amount of work has already been done through the Milk Commission and the School of Social Economy, and the committee will avail itself of all the material which it can secure. The report is to cover the dairies which supply St. Louis, whether located in Missouri or Illinois, and will carry with it definite recommendations as to the proper inspection of the milk supply of the whole city.

Investigation of Water Supply Discloses Impurities

Yonkers, N. Y.—Permanent residents along Lake Keuka who are allowing conditions to exist on their premises in opposition to the special sanitary rules issued in September, 1906, as well as owners of cottages that are occupied in the summer, immediately have to set about obeying the law or be fined the full penalty, according to orders issued by the State Board of Health. Representatives of the State Board have been inspecting sanitary conditions along Lake Keuka for some time. They made their identity known to no one, and not even the local Board of Health and other towns knew that an inspection was being made. The inspectors went the entire length of the lake on both shores, and what they found was not surprising to them.

War for Health and Pure Water

Washington, D. C.—Dr. Walter Wyman, surgeon general of the Public Health and Marine Hospital Service, in a report to Congress, makes a plea for a better understanding of the relation that should exist between the nation and the State in the matter of public health. He points out that it should be the object of all the forces engaged with the public health problem to diminish the death rate, to extend the period of life, to decrease physical suffering and to increase physical and mental stamina. Dr. Wyman is of the opinion that the problem presented by water pollution is the biggest one now confronting the nation who are dealing with the public health matter. He says that the legal problem involved is much more difficult to solve than the sanitary one and that the legal problem presented, so far as national action is concerned, is now being met by the careful thought of men eminent in the legal as well as the medical profession.

WATER SUPPLY

Water Purification Plant Installed

Erie, Pa.—In view of the epidemic of typhoid which has broken out in this city, a permanent purification plant will be operated in connection with the water system. Expert Engineer C. A. Jennings, of Chicago, has been called to Erie for the purpose of establishing a temporary plant to be used until a permanent plant is built.

Municipal Treatment of Water Supply Driving Out Typhoid

Minneapolis, Minn.—Dr. J. Frank Corbett, City Bacteriologist, told the Council Waterworks Committee recently that the absence of typhoid fever in Minneapolis this winter is due to the hypochlorite treatment of city water. There was but one death from typhoid fever in January, and that was due to impure well water, according to Dr. Corbett.

High Pressure Fire Service in Operation

Oklahoma City, Okla.—Announcement has been made that in a few days the new high pressure fire service will be placed in operation. Oklahoma City will be the only city in the Southwest with such equipment. Only cities of over 200,000 population are using pressure service.

Find Underground Lake Supplied by Rivers

Yonkers, N. Y.—Mayor Lennon has made public a letter from Woodson K. Oglesby in which he proposes to supply the city with a wholesome supply of water amounting to about 5,000,000 gallons daily. Mr. Oglesby, who has had engineers at work for some time, states that a large underground body of water exists in the low land south of Crestwood which is supplied in part from Troublesome River and Bronx River. Five million gallons a day would be adequate for the city needs for the next ten or fifteen years.

Municipal Water Data Now Sought

Long Beach, Cal.—Discussion of municipal ownership of water works has been taken up by the First Ward Civic Improvement Club, which has decided to collect all the information on the subject possible, and then decide upon what course of procedure will be best to acquire public ownership of the water service. There is a strong sentiment manifested among the residents of the ward and members of the club against buying the Long Beach and Alamitos water companies unless there is a reduction in the figures that were discussed at the last submission of the proposition. A committee of eleven members has been appointed to obtain data as to the value of the two privately owned water plants and also as to the probable cost of an independent system. It is asserted that the 20 acres of water-bearing land owned by the city in the vicinity of Willows is ample to supply the entire city with aqua pura, although there is no authoritative basis given in support of this claim.

STREET LIGHTING AND POWER

Mayor Says Electric Plant Saves Much Money

Burlington, Vt.—In his annual message, Mayor James E. Burke, speaking of the municipal electric plant, says that it has been shamefully treated by misrepresentation of every imaginable kind. It should be gratifying to the people of the city that the plant for the year 1910, after paying all operating expenses, including interest on bonds and charging up depreciation on the same, as 24 of the 27 municipal plants of Massachusetts, also charging off \$1,200 of uncollected bills of doubtful character, should show net earnings for the year of \$68,611. The Mayor points to the fact that we are paying but \$65 per year per lamp for street lighting as compared with \$95 per lamp, the average price of over one hundred towns and cities of Massachusetts, and the price here for commercial current is 10 cents per kilowatt hour as against 14 cents in Massachusetts. The Mayor asserts that the installation of the municipal plant here has resulted in a saving of \$40,000 a year to the citizens of Burlington on account as the reduction is rated for electricity and gas.

City Holds Up Light Bill

Burlington, N. J.—The city has adopted a "show us" policy toward the Public Service Corporation, which recently purchased the Burlington Electric Light Company's plant, by refusing to pay the monthly bill for light until investigation can be made of charges that the company is charging for lamps that do not exist. Councilmen also demand that a deduction be made for all nights when lamps were not lit. Expert evidence will also be sought as to whether the city is getting the candle-power per street lamp for which it pays.

Municipal Lighting Plant Inaugurated

Pasadena, Cal.—Ready for the last payment upon the last big boiler to be installed, the municipal light plant as it is housed on Glenarm street represents an investment of \$165,000 and has a capacity of 1,900 kilowatts, thanks to first-class machinery and careful arrangement. One of the most interesting things connected with municipal ownership of the light plant is the street lighting. To-day the city plant furnishes 319 arc lamps, 1,049 tungsten lamps of 40 candlepower each, 17 tungstens of 60 candles each, 55 tungstens of 80 candles each, 30 tungstens of 200 candles each and 57 alley lights which are each 32 candle carbons. This is said to make Pasadena the best lighted city of anything like its size and territory in the country, and the cost to the citizens is regarded as remarkably reasonable.

Sacrifice \$100,000 to Get Light for City

Pocatello, Idaho, Feb. 5.—Through the voluntary sacrifice of property valued at \$100,000, former Governor Brady has furnished electric lights to Pocatello, which had been in darkness since the substation and transformer house of Brady's power company was destroyed by flood water. By dynamiting the power company's dam, Gov. Brady, who personally superintended the work of redeeming Pocatello from darkness, was able to reach the company's transformers, buried deep below the surface of a flood in the Portneuf River and connect them again with the company's high tension transmission line from the plant at Ann Falls. Three hundred pounds of dynamite were used in blowing out the company's dam to reduce the level of the flood water around the wrecked transformer house.

Plan for Illuminating Business Street of Leavenworth, Kan.

Leavenworth, Kan.—A commercial club has started a movement to make Delaware street from Union Station to Sixth street a "White Way." The movement took tangible form at a largely attended business meeting held in the Greater Leavenworth Club rooms. The scheme calls for one 60-Watt Tungsten lamp every twenty-five feet from the Union Station to Sixth street, thereby placing one light before each store frontage of twenty-five feet. The lamps are to be provided with metal shades and hung from a cable stretched from arms attached to the trolley poles and extending into the street over the curbing. The cable will be used to prevent sagging. The light company proposes to instal these lights complete and erect suitable poles between Fifth and Sixth streets where there are no trolley poles, and to charge \$1 per month per lamp for the first two years and 80 cents per month per lamp the third year, the contract to be for three years. The light company agrees to burn the lights from the usual hour for lighting until 11 o'clock on six days of the week and until midnight on Saturday night. The scheme will make the street a more traveled thoroughfare, bring the people out and be a good advertisement for the city, especially to strangers coming from Union Station or who alight from the Third street cars. It will give the city a modern appearance and cannot but result in good. The club is to devise the plans for furthering the scheme and then a hard-working committee of perhaps five will take the matter in charge and push it through to completion.

City Lighting Plant Successfully Financed

Pasadena, Cal.—General Manager C. W. Koimer, of the municipal light department, was given the last of the \$25,000 loan from the general fund, promised his department when the campaign for 4,000 users commenced, this morning. He stated in a written report that his department will begin paying back this loan after the present month out of the earnings of the city department and at the same time preserving the five-cent rate.

FIRE AND POLICE

New Fire Engine Destroyed by Fire

Ashley, Pa.—While their valiant firemen slept, while the chief of police and his men roamed the street in search for burglars, Ashley's lone fire house, used as a town hall and lock-up, was burned to the ground this morning. Firemen looked on helplessly as their home was in the power of flames. The men who protect the homes of the inhabitants of that progressive borough were unable to lift a finger to save their own place. Assistance was called from Wilkes-Barre and the fire fighting apparatus of the Central Railroad shops was used but not until the flames had finished their work. The total damage is placed at \$20,000. A car which won a prize in the Centennial parade in Philadelphia in 1876, was stored in the building and was destroyed.

Plan for River Front Protection

Astoria, Ore.—Chief C. E. Foster, of the Fire Department, reports that in 1910 the department responded to 8 alarms. The causes of fires were: Burning flues, 34; sparks, 15; matches, 4; overheated, 2; clothing near stove, 3; gasoline, 4; bonfire, 2; rubbish, 1; cigars, 3; burning flue, 1; brush, 2; combustion, 2; unknown, 2; stove pipe, 2; false alarms, 6. The number of feet of hose laid out was 9,000 gallons of chemical used 1,700. The total cost of maintenance of the department was \$14,157. The value of apparatus, hose, etc., \$23,150; buildings, \$25,000. Total fire loss was \$64,500.

Regarding water front protection Chief Foster says:

"I believe it would be a good investment for the city to buy a steam pump of about 600 gallons per minute capacity, place it on a low wagon, equip it with flexible suction and the proper steam connections, then in case of a water front fire it might be run aboard one of the small steamers, one of which is always at one of the wharfs. This apparatus complete would not cost over \$1000. If we had this and the two government boats equipped with pumps of like capacity it would be a great advantage in water front fires."

Street Car Upsets Fire Truck

Brooklyn, N. Y.—Twelve firemen were thrown to the roadway at Broadway and Moffatt street recently when a surface car of the Broadway line, bound downtown, crashed into Truck 57. The truck was being swung out of Broadway into Moffatt street when the car struck it just back of the forward wheels, and hurled it against an elevated railroad pillar. One of the wheels was broken and Capt. Patrick Kelly and his eleven men thrown off. The three horses were thrown from their feet and dragged along. All the firemen were badly shaken up, but none was seriously injured.

Cost of Fire in Canada

Halifax, Canada.—In the last two years Canada has lost \$47,000,000 by fire. Consul General James W. Ragsdale, of Halifax, says that this means a per capita tax equal to \$3.30 per annum for every man, woman and child, and if the census ratio of one adult man for every five of population is considered, then it means an annual loss equal to \$16.75 for every Canadian family. This is a loss far greater than that of any other country. In Austria the per capita loss during the same years was 29 cents; Denmark, 26 cents; France, 30 cents; Germany, 49 cents; Italy, 12 cents, and Switzerland, 30 cents.

Motorcycle for the Police.

Iola, Kan.—The City Commission has ordered a motorcycle for the use of the Police Department. It will be used by the officers to answer all hurry-up calls and to make trips to the outlying districts of the city. The motor is of the Indian type and is regarded as one of the best made.

Fire Captain Suspended on Novel Charge.

New York, N. Y.—Captain Edward F. O'Connor, of Engine Company No. 72, has been suspended pending trial on a charge that is the first of its kind to be preferred against a company commander. The charge is Captain O'Connor, without authority and without notifying the Fire Alarm Telegraph Bureau of his department, took out of service apparatus intrusted to his charge, and took it from the engine house for the purpose of exhibiting it on the streets; thus leaving without proper fire protection portion of the city supposed to be protected by this apparatus.

Finger Prints of New Policemen Taken for Identification

New York, N. Y.—Applicants for patrolman were somewhat surprised when required to register on the medical book an imprint of their finger tips of both hands. This is a new safeguard adopted by the Municipal Civil Service Commission against the dishonest practice of sending a substitute to take the mental examination. Applicants are not given the medical test. Those who fail proceed no further. The successful candidate is directed to place his thumbs side by side, palms down, and then to press the tips of the four fingers of each hand on a stone slab coated with black ink. He is next told to make an imprint of his finger tips at a certain place on the back of his medical book and the operation is over for the time being. When the candidate appears for the mental examination he will be required to make a second imprint, and if the two do not correspond that will be accepted as conclusive proof that it is not the man who passed the medical examination. A third imprint will be taken when the candidate appears at Police Headquarters before appointment.

Annual Report of Providence Police Department

Providence, R. I.—According to the report of the Board of Police Commissioners, the cost of maintenance of the department in 1910 was \$439,418, a per capita cost of \$1.96. The report of Superintendent of Police Patrick Egan shows that the department now numbers 347 officers and men, an increase of 26 over the previous year. The total number of arrests last year was 11,635, an increase of 333 over the previous year, and the total amount of stolen property recovered was \$48,173.77. The report states that the new ordinance has done much toward eliminating blockades in the city streets. In all 113 arrests were made for violation of the ordinance. The auto squad made 284 arrests.

Mounted Police in Reading, Pa.

Reading, Pa.—The experiment this city has made in the last four months with mounted police has proved a success, and the two men promoted to this rank have made a number of arrests of persons who otherwise would have escaped from even the fleetest-footed officers. This branch of the police force is still limited to the two men. That Reading has mounted police is due chiefly to the fact that the old police patrol wagon was succeeded by an automobile police patrol apparatus, and Chief of Police Levan wanted to utilize the two horses that had trotted over Reading's streets, carrying wrong-doers to cells for so many years.

Pennsylvania Fire Marshal Bill

Harrisburg, Pa.—Creation of the office of State Fire Marshal is provided for in a bill presented by Senator Stinson, of Philadelphia, the legislation excluding Philadelphia. Every four years the Governor is to appoint a fire marshal, at an annual salary of \$5,000, who is to name a first and second deputy and a chief assistant. The assistant is to receive \$4,000 and each of the deputies \$3,500. The fire marshal can also appoint additional deputies and police assistants and name uncompensated inspectors to report to the marshal any faulty or dangerous conditions and. The marshal will have his office in Harrisburg and the chief of every fire department or the Mayor or Township Clerk, where there is no fire department, shall investigate the cause and origin of every fire. Where the marshal believes that a crime has been committed he can cause an arrest. The marshal or his assistants or the chief of any fire department would have the right if they find a structure especially liable to fire and to endanger other property to order its removal. The same power is given concerning inflammables and explosives. For the purpose of maintaining the office every fire insurance company and all individuals, firms, corporations, associations or aggregations of underwriters doing business in the State are to be taxed not exceeding one-fourth of 1 per cent of the gross premium receipts on all business done in the State for the preceding period. Chiefs of fire departments and fire wardens and clerks of townships, who do not receive any compensation, are to receive 50 cents for each fire reported to the satisfaction of the marshal, and mileage at the rate of 15 cents a mile traveled to the place of the fire.

Automobiles a Cause of Increased Fire Damage

St. Petersburg, Russia.—Attention has been called by the city authorities to the large number of fires occurring in connection with motor cars. About one hundred and fifty more or less important fires have taken place of late entirely owing to the evil practice of combining the machine and the chauffeur as joint residents of the garages, on the pattern, doubtless, of the average Russian stable, which does for man and beast.

New Features of Fire Department Report

New York, N. Y.—The annual report of the Fire Department is in the hands of the printer and will be ready for distribution in about ten days. This year's report will contain a number of improvements over other reports. It also will be illustrated. In previous years the annual report was not ready until July, but this year the Commissioner has left no stone unturned to get it out promptly. The Commissioner has also made provisions to give every deputy chief, chief of battalion and foreman one of the reports.

Auto Patrol Given Trial

Paterson, N. J.—A new automobile patrol wagon was recently given a trial. Police Commissioners together with police officials and newspaper men occupied the wagon which was taken over the rough hills and as a second test climbed Clay street to Mill street from a standing start. The machine worked admirably and will be accepted by the Board of Fire and Police Commissioners.

Fire Alarm Systems at Electrical Show

Philadelphia, Pa.—The Auxiliary Fire Alarm Company, of Philadelphia, exhibited at the Electrical Show their system of sending in fire alarms. The Municipal Electrical Bureau demonstrated the system used by the firemen and policemen in summoning the apparatus and patrol, together with the system of receiving reports at the police districts.

GOVERNMENT AND FINANCE

Legislation Regarding Commission Government

Nashville, Tenn.—By a vote of 14 to 10 the House Committee on Municipal Affairs decided to recommend for rejection the Nashville charter bill.

Eugene, Ore.—The City Council, sitting in committee of the whole, rejected the commission charter prepared by a committee authorized by a citizens' massmeeting called by the Council.

Jackson, Mich.—By a vote of 9 to 7, the Common Council in a special session refused to order a special election for submitting the new charter, which provides for the commission form of government, to a vote of the people.

Cities Favor or Reject Commission Form of Government

Pekin, Ill.—Pekin adopted February 8 the commission form of government by a vote of 817 to 557.

Appleton, Wis.—This city has voted in favor of establishing the commission form of government by a majority of about 200.

Council Grove, Kan.—A commission form of city government was adopted here by a vote of 376 to 159.

Greensboro, S. C.—By a vote of almost 2 to 1 Greensboro decided February 7 to adopt the new charter which provides for a commission form of government. For the new charter 693 votes were cast; against it 353 votes were cast.

Faribault, Minn.—At the election February 7 to determine whether or not the city should adopt a new charter, the commission plan of government was adopted by a majority of 88 votes.

Galesburg, Ill.—Commission government was rejected in an election February 8, by a vote of 586 to 2,193.

Broad Terms of Franchise Clause in Charter

St. Louis, Mo.—The introductory franchise clause of the city charter as it stands now reads as follows:

The Council shall have power to grant the right to construct, purchase, lease or operate any public utility, subject to the right to amend, alter or repeal the same in whole or in part, and to forfeit the same at any time for misuse or nonuse, and subject always to the city's power of taxation, etc.

City Demands Interest on Deposits

Burlington, N. J.—Council went on record last week against a custom of many years' standing of permitting municipal funds to remain in local banks without drawing interest. At the close of the reading of the City Treasurer's report, showing a balance of \$38,000 on hand, Councilman Craft, a new member, asked if this money was drawing interest. President Smith referred the question to former President I. Snowden Haines, who is also cashier of the Mechanics' National Bank. "No, the city is not entitled to it" was Mr. Haines' answer. A majority of Councilmen took a different view of the matter and adopted a resolution offered by Mr. Craft directing the Treasurer to demand interest on city deposits.

Pittsburg Mayor to Speak in Milwaukee

Milwaukee, Wis.—George W. Guthrie, former Mayor of Pittsburg, spoke in the Pabst Theater last week on "The Efficiency of City Government." This is the fourth lecture in the series given under the auspices of the Milwaukee Lecture Service League.

Value of Public Service Commission

Albany, N. Y.—The Public Service Commission reports that the village of Fort Edward has obtained a reduction in the price of street arc lights from \$80 a lamp to \$63.87 a lamp a year. A reduction from \$72 a lamp to \$63.87 also has been effected in South Glens Falls.

STREET CLEANING AND REFUSE DISPOSAL

Committee to Consider Extensive Street Flushing Plan

New York, N. Y.—Mayor Gaynor has appointed Borough President McAneny, President of the Aldermen; Commissioner Thompson, of the Department of Water, Gas and Electricity, and Commissioner Edwards, of the Department of Street Cleaning, as a committee to pass on the practicability of cleaning the streets on a large scale by means of flushing and squeegee machines. Commissioner Edwards would do away with the broom method, on account of its dust raising propensities, as far as possible. He figures that 75 machines, some of each kind, would go far toward washing off the pavements, at least those that need it most. There are at present in all boroughs about 24,000,000 square yards of pavement, from which a daily average of 500 tons is removed. The question of where the water is to come from is an important one and the possibility of using water from the Hudson and East Rivers may be considered.

Syracuse Used Thirty-Four Snow Plows

Syracuse, N. Y.—After the recent snowstorm, the city put in commission all of its thirty-four snow plows for cleaning sidewalks. In addition two gutter plows were used. The man in charge of each furnishes his own horse and is paid \$2.50 a day.

The Garbage Plant Question

Racine, Wis.—In view of the intention of the city to purchase a garbage burning plant, W. S. Goodland, of the Racine Times, has directed inquiries to several cities where incinerators have been operated. A reply from City Solicitor Theo. A. Hunt, of Winnipeg, Manitoba, where litigation is still pending regarding the installation for Decarie incinerators, ended with the following advice:

Under no conditions, however, can you afford to install a machine without absolute guarantee of proper incineration and freedom from nuisance, and no money should be paid to any company until the machine has been installed and in proper working order, and operated for at least 90 days, under the varying weather conditions.

Chief W. J. Bailey, Department of Sanitation, where a 100-ton Dixon crematory has been operated for a short time—with the aid of convict labor, by the way—says in part:

From the first of the month to the present date we have consumed on an estimated average of from 6 to 75 tons of mixed refuse daily, all loads being dumped into the machine, and all non-combustible refuse, etc., being hauled from the machine the following morning with the ashes. We are burning coal in this machine, for which we pay the sum of \$3.65 per ton in lots as we require it. We have two paid men at work, all other labor being furnished by the city prisoners, they being worked by this department. Our highest rate of operation per ton of garbage, etc., consumed, thus far, has been \$0.219. The percentage of ashes, tin cans, etc., is about 15 to the 100 loads.

RAPID TRANSIT

Street Railway Outlines a Franchise

Des Moines, Ia.—The Des Moines Street Railway Company has presented to the City Council a proposal for a franchise to be submitted to the people of the city, in settlement of the long standing trouble over street railway matters. The proposal includes an indeterminate franchise as to time of ending, with 5 cent fares, and when dividends reach a certain sum that six tickets will be sold for a quarter. Other provisions are:

Both the street railway and interurban systems offered to the city for a gross price of \$6,659,000 or city can assume \$2,575,000 street railway bonds and \$1,160,000 interurban bonds, and take the two properties—154 miles of railway and 177 acres of city real estate—for \$2,575,000.

Option to purchase may be exercised at any time before October 1, 1911, or on October 1, 1921. If purchased in future, later additions to investments to be included.

Provision made for full publicity and for arbitration of labor troubles.

Company to pay for seven feet of paving.

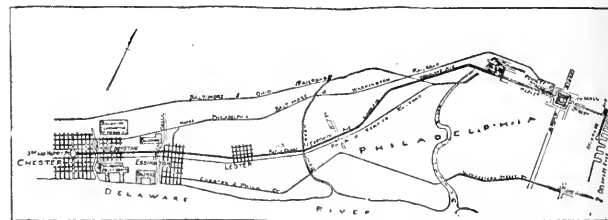
Will relinquish all rights claimed under the other ordinances if proposals now submitted are accepted by the city and validated by legislature.

Subway Traffic Rivals "L"

New York, N. Y.—According to the figures compiled by the Public Service Commission the Interborough Rapid Transit Company carried a total of 569,636,807 passengers on its combined subway and elevated lines during the year 1910. Of this total, 299,415,317 passengers were carried by the four elevated lines, as against 270,221,490 for the subway. Total collection of fares for 1910 was \$28,481,839, as compared with the total for 1909 of \$27,158,588, an increase of \$1,323,251. The daily average of passengers carried works out, according to the Commission's count of the ticket sales, as 820,317 for the elevated lines and 740,335 for the subway. This shows that the single subway line carries only 79,984 fewer passengers daily than all four of the elevated lines put together. The ratio of increase on the elevated lines was 4.54 per cent. The ratio of increase on the subway was a little more, the increase having been 13,452,509, or 5.24 per cent. The Third Avenue Elevated line carries by far the heaviest traffic of any of the elevated roads, having a credit of 137,452,443. The heaviest subway increase was in the section comprising the Brooklyn stations, which showed an increase of 10.44 per cent. According to estimates made at the City Hall, the ticket sale receipts gave a profit of about 20 per cent on the subway for 1910.

City Officials Attend Opening of New Route

Chester, Pa.—The city officials of Philadelphia, Lester, Essington, Eddystone and Chester made an inspection of the new line of the Philadelphia Rapid Transit Company running from the subway station at Market and Juniper streets to Chester. This new route has been made feasible



QUICK ROUTE FROM CHESTER TO PHILADELPHIA

by the construction of a short line from Eighty-seventh street, connecting with the existing line of the Chester & Philadelphia Railway and passing through Lester, Essington and other points on to Chester. Cars will leave both ends every 15 minutes. Among the advantages claimed for the new route are that it will be the only through line to Chester, that there will be a big saving over the fare charged by the steam roads and that the time saved over the present trolley route will be 20 minutes.

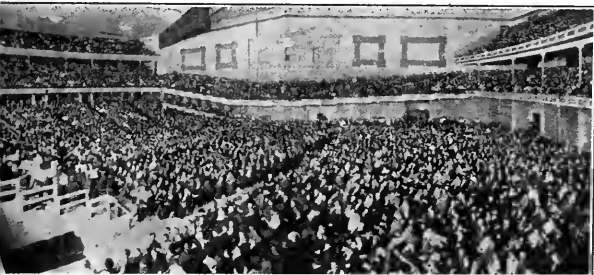
MISCELLANEOUS

No Inventory of Art Works

Boston, Mass.—Though most of the city property is properly inventoried, there is no catalogue of the municipal art works, according to the Art Commission, which has omitted its annual report to the Mayor. The Commission therefore has begun the preparation of a catalogue which will contain not only a complete list of the monuments and pictures of the city, but a sketch of each.

Popularity of Municipal Concerts Is Unbounded

Denver, Col.—Sunday concerts at the Auditorium February 5 were attended by 22,000 people. Manager Collins' estimates are 11,500 for the afternoon and 10,500 for the evening. This is about the size of the crowds that have been going for the preceding five Sundays. The afternoon musical program consisted of the masterpieces of Austrian, Hungarian and Bohemian composers. The piano solos by Miss Frances Boardman proved a feature. The evening concert consisted of the patriotic airs of the different nations. The vocal soloist, Miss Alice Howard, sang two selections, which were highly appreciated. The cornet solo, "Der Wasserfall," rendered by Band Leader Herman Alstedt, was enthusiastically encored. The motion pictures were among the best yet, and included logging machines, the making of steel rails and mica mining, all subjects of an educational nature, and which the entire audience seemed to enjoy. Just before the house was darkened for



DENVER MUNICIPAL AUDITORIUM—FREE SUNDAY AFTERNOON CONCERT

motion pictures the audience sat quiet for a flash-light photograph for Municipal Facts. It is said to be one of the most wonderful ever taken of such a large audience. The original size of the picture is 25 inches wide by 11 inches deep.

The municipal concerts are free to the public. They were inaugurated by Mayor Speer two years ago for amusement of the people during the winter months. Their popularity is unbounded, as is demonstrated by the crowds which attend every concert.

Theater Ticket Speculation to Cease in New York

New York, N. Y.—Speculation in theater tickets in the city of New York has been ordered abolished by the Board of Aldermen in an ordinance adopted unanimously, after years of agitation of the question. The ordinance was passed after advice had been received from the Corporation Counsel that such a measure would be constitutional. It is provided that violation is punishable by a fine not exceeding \$10 or a prison term of ten days.

Ordinance Provides for Lights for All Vehicles

Sacramento, Cal.—Provision for lights on all vehicles on Sacramento streets after dark, except those carrying explosives such as benzine, and for mufflers on motorcycles and automobiles, are made in two ordinances introduced by City Trustee Carraghar at the instance of the City Board of Health. In introducing the muffler ordinance Carraghar said that it is to suppress intoxicated owners of motorcycles who turn loose the exhaust of their machines on the streets, frequently frightening horses driven by women.

Lansing, Mich., to Have a City Market

Lansing, Mich.—A movement is on foot to establish a city market in Lansing. It is thought a market in a central location will do away with peddling to a great extent, and though licenses to hucksters will not be done away with entirely.

Spraying Saved Many Trees from Ravages of Moths

Lynn, Mass.—The annual report of the Park Commissioners, which has just been issued, contains an interesting review of the work performed by that Board during the year 1910, and contains many valuable suggestions for the preservation of Lynn's system of parks and woods. In reference to the moth work, the Commissioners declare that adequate spraying machines are now as essential a part of the city property as stone crushers and rollers. Hitherto the Park Department has had to use borrowed spraying machines. An inspection of the woods from Mount Gilead Tower, says the report, furnished an object lesson in gypsy moth work and afforded a striking comparison of two methods of fighting the pest. Every point on the roads and as far back as the powerful sprayer could touch revealed the foliage as green and brilliant as it ever was after a summer shower. Every road was as shaded as before the advent of the moth blight. This was the result of the spraying method of treatment. Under the tanglefoot and spraying method with sufficient money the woods can be saved and kept as a thing of beauty forever, and a memorial of the public spirit of the people of Lynn.

Alabama Bill for Registration of Engineers

Montgomery, Ala.—A bill to establish a board of registration and examination for civil engineers, mining engineers and surveyors, and to regulate the practice of such engineers, has been introduced in the Legislature. This bill was prepared by a committee of the Alabama section of the Engineering Association of the South, the committee being composed of Prof. E. B. Kay of the University of Alabama, and E. Francis McCrossin and C. H. Ohme of Birmingham. "Our bill relates only to engineers occupying official positions, State, county or municipal," said Mr. McCrossin, "and is, therefore, of no direct concern to industrial companies or mine operators. But it is nevertheless a very important measure and should be enacted into law."

Perth Amboy Will Have Public Playgrounds

Perth Amboy, N. J.—Announcement has been made by Mayor Bollschweiler that he would appoint a Public Playgrounds Commission, and that he was considering names for the positions. In the Mayor's mind the playground movement is a good one and in answer to the popular demand that such a Commission should be named he will announce the personnel of the playground body in a communication to the Board of Aldermen either at the next or the following meeting. To get the best results out of such a movement the Mayor feels that the board should be a congenial one, in sympathy with the movement and ready to work for its success. He is selecting his appointees with this in mind.

Park Boards Have Right to Tax for Park Improvements

Indianapolis, Ind.—Judge Remster, of the Circuit Court, has handed down a decision as to the constitutionality of the law giving the Park Board and the Council the right to divide the city into park districts and levy assessments on real estate valuations to cover the cost of park improvements. The constitutionality of the law was upheld as far as it is affected by the questions raised in the case tried. The Judge said that if there had been any inequalities in the assessments, they were not caused by the law but by the administration of it.

Municipal Drug Store Suggested

Boston, Mass.—At a hearing in City Hall recently before Mayor Fitzgerald and members of the City Council the most necessary improvements in the various wards were discussed by the citizens. The desirability of a drug store under municipal control at which medicine might be obtained at all hours was suggested. It was approved by the Mayor, who declared, however, that it was not within the province of the city government to do anything about the matter, and urged that it be carried before the State Board of Pharmacy.

Municipal Ice Plants

Boston, Mass.—There is a bill pending in the Massachusetts Legislature providing for municipal ownership of ice plants. The City Council of Salem has already voted in favor of a municipal ice plant.

LEGAL NEWS

A Summary and Notes of Recent Decisions—Rulings of Interest to Municipalities

Change of Grade—Claim for Damages

Stillman vs. Village of North Olean.—Where, when a petition for paving a street was presented to the Trustees of a village, the plans therefore had not been made, and one signing the petition was told by the Trustees that the construction of the pavement would cause no appreciable change in the grade of the street that would damage his property, and signed in reliance on such statement, and it did not appear that the paving could be done without making so great a change, petitioner was not estopped from claiming damages for changing the grade. Under the Village Law requiring a claim against a village for change of grade of a street to be presented within 60 days after such change of grade is effected, where the cutting down of a street and the laying of a brick pavement was one entire piece of work, the change of grade was effected when the work was completed.—New York Supreme Court, 126 N. Y. S.

Defective Streets—Negligence

Suchovalsky vs. City of New York.—Where a city did not have actual knowledge of a defect in a street made by an excavation, and it had not existed long enough to impute knowledge thereof to it, the city was not liable for injuries caused by falling into the excavation.—New York Supreme Court, 126 N. Y. S., 699.

Defective Streets—Evidence—Questions for Jury

Murphy vs. City of New York.—A plaintiff, who testified, in her action for injuries on a defective sidewalk, that she stepped into a hole in a cement sidewalk, and that the hole was so large that her entire foot went into it up to her ankle, was entitled to go to the jury on the issue whether the hole was of sufficient size to charge the city with liability for its continuance, notwithstanding the testimony, on cross-examination of her witness, that the hole was about six inches in circumference and an inch or an inch and a half deep. Where, in an action for injuries to a pedestrian by stepping into a hole in a sidewalk, a witness for plaintiff testified that she had occupied abutting premises for four months, and that every time she went out to sweep the sidewalk she saw the hole, but could not tell how many times she saw it, plaintiff was entitled to have her fix one or more of the times she had seen the hole, to determine whether the city was chargeable with notice of the defect.—New York Supreme Court, 126 N. Y. S., 707.

Defective Sidewalk—Question for Jury

Page vs. Inhabitants of Weymouth.—The fact that plaintiff, who was injured by falling into a hole in sidewalk, had passed over the hole before and knew of its existence, does not as a matter of law preclude her from recovering, as it was a question for the jury, under the evidence, whether at the time of the accident plaintiff was using due care.—Supreme Judicial Court of Massachusetts, 93 N. E. R., 644.

Regulating Car Service—Police Power

City of Tacoma vs. Boutelle.—The police power reserved to a city in a street railway franchise stipulating that the city may adopt ordinances necessary for the protection of the interests of the city vests in the city the power to determine the frequency of street car service, having in mind the general welfare of the traveling public, and the health and safety of the citizens. Under constitution authorizing any city to make local, police and sanitary regulations, and Rem. & Bal. Code, authorizing any city to regulate the operation of street railroads within its limits, and to provide for the punishment of all practices dangerous to the public safety, a city empowered by its charter to regulate the operation of street railroads within its limits may adopt an ordinance requiring a five-minute street car service between designated hours of each day.—Supreme Court of Washington, 112 P. R., 661.

Action for Services—Superintending Water Works

Laut vs. Village of Oakdale.—If one agrees to perform a certain service for a village gratuitously, he may withdraw such promise any time before the same is performed, and notice of such action is sufficient, if duly given to one member of a committee of the village board in charge of the improvement upon which the services are performed, and if the committee then continues his employment, the village will be liable for the value of the services thereafter rendered.—Supreme Court of Nebraska, 129 N. W. R., 257.

Excluding Territory from Municipal Corporations

Chapin et al. vs. Village of College View et al.—A judgment of the district court in a proceeding prosecuted under Comp. St. 1909, to exclude territory from the boundaries of a municipal corporation, will not be set aside on appeal, unless it is made to appear that the trial court committed an important mistake of fact, or made an erroneous inference of fact or of law. And this rule applies with peculiar force where the trial judge inspected the premises before rendering judgment.—Supreme Court of Nebraska, 129 N. W. R., 297.

Reopening Vacated Street

Atchison, T. & S. F. Ry. Co. vs. City of Shawnee et al.—A resolution of a city council, ordering a railroad company to open and put in condition for public travel a street through its station yards, previously vacated by an ordinance which constituted a contract with the company, where disobedience of such order subjected the railroad company to a penalty under the laws of the State, is a legislative act, which impairs the obligation of the contract and entitles the company to relief by injunction in a federal court of equity.—United States Circuit Court of Appeals, 183 F. R., 85.

Street Improvements—Procedure—Method of Payment

City of Bluefield vs. Johnson.—A city ordinance, passed in pursuance of charter authority, is not invalid because it omits some of the details of the method of procedure mentioned in the charter, unless the charter further provides that such omission shall render it invalid. Where a city, under authority of its charter, provides by ordinance for the improvement of a certain street and for assessing two-thirds of the cost thereof on the abutting lots, and later provides by another ordinance for raising a fund by the sale of bonds for the improvement of the same street, the city may apply the whole of such fund to the payment of its one-third of the cost of the improvement.—Supreme Court of Appeals of West Virginia, 69 S. E. R., 847.

Streets—Injuries—Negligence

Dempsey vs. City of New York.—A piece of flagstone was removed from the middle of a sidewalk, forming a hole from three inches deep on the sides to six inches deep in the middle, which remained in that condition for 11 months, when plaintiff stepped into it on a dark night and was injured. It appeared that similar accidents occurred almost daily. Held that, even if the city were not negligent as a matter of law in permitting the sidewalk to remain in such condition, the question of its negligence was for the jury.—New York Supreme Court, 126 N. Y. S., 290.

Village of Prairie du Rocher vs. Schoening-Koenigsmark Milling Co.—In proceedings by a village to condemn land to change a water course, no direct evidence was given as to any benefit to the land not taken, because of the establishment of the new water course. The jury viewed the premises. An instruction was given on behalf of the petitioners that benefits should be offset against damages. Defendant claimed this was error, but failed to show that the amount of the verdict was not fully justified by the evidence. Held harmless error.—Supreme Court of Illinois, 93 N. E. R., 425.

Assessment—Judgment

City of Alton vs. Heidrick et al.—While a judgment is not required to be in any particular form, it is necessary that the entry should contain the essential elements of the judgment, and that it should show that the court finally disposed of the cause.—Supreme Court of Illinois, 93 N. E. R., 386.

Acquisition of Lands for Streets—Assessments—Validity

Austin et al. vs. City of Everett.—Where, in a condemnation proceeding by a city for streets, the court admitted on records that he openly declined in advance to appoint assessors to assess benefits any one who would not adopt a plan by which unplatted property should be assessed more than platted property, irrespective of its relation to the streets or to the benefits derived therefrom, arbitrarily assuming that, because the property was unassessed, the benefit was greater than the benefit to platted property, so that the assessment should be proportionately greater, on the theory that the taking of land for streets was a benefit to unplatted property, since, to get the most benefit of the property, it was necessary to plat it, the assessment of benefits was invalid for want of the impartial exercise of the judgment of the commissioners and a confirmation of the assessment by an unbiased judge, to both of which the property owners were entitled.—Supreme Court of Washington, 112 P. R., 658.

Discharge of Sewage—Prescriptive Right

Olmen vs. Town of Mount Angel.—A city constructed an underground tile drain that collected surface water and drainage from houses, which ran from the drain into an open ditch and thence into a gully near the corner of plaintiff's residence property, which was low ground. The water in plaintiff's well, which was within 16 feet of the gully, was affected by the condition of the water in the ditch. Held, that water is sewage, and the city may be enjoined from discharging it into the gully, although the water in plaintiff's well at its best is not good. The convenience of the public will not authorize a city to direct surface or other waters in a public sewer or drain and empty them upon the land of an individual to his injury and the right to do so cannot be acquired by prescription.—Supreme Court of Oregon, 112 P. R., 529.

Police Regulations—Validity

City of Richmond vs. Model Steam Laundry.—An ordinance prescribing a penalty for using a furnace for melting metals or glass, or for using a stationary steam engine, in which fuel other than anthracite coal is used, without a permit from the City Council, fixing the location, height of chimneys, etc., is invalid, as violating Const. U. S. Amend. 14, in that it vests in the City Council arbitrary power and unreasonable power; no conditions upon which the permit may be granted or rules securing impartial exercise of the power being prescribed. A municipal ordinance which permits exercise of arbitrary and unreasonable power will be held invalid, without awaiting actual exercise of such power.—Supreme Court of Appeals of Virginia, 69 S. E. R., 931.

Streets—Abandonment—Railway Crossing

New York Cent. & H. R. R. Co. vs. City of Buffalo.—A Highway Law providing that every highway that shall not have been opened and worked within six years from the date it shall have been laid out shall cease to be a highway and every public right of way that shall not have been used for such period shall be deemed abandoned as a right of way applies only to unused easements, and where a city acquires title to land in fee for a street, there is no limitation on its ownership of the land and its right to open the street as a highway. Under Railroad Law, providing that when a new street shall be constructed across a steam railroad the street shall pass over or under the railroad or at grade as the board of railroad commissioners may direct, where a city condemned land for a street over a railroad right of way in 1867, but has not opened the street, when it decides to open it to the use of the public, the construction across the railroad must conform to the termination of the public service commission.—Court of Appeals of New York, 93 N. E. R., 520.

Defective Street—Notice

Couhey vs. City of Decatur.—Under Burns' Annotated Statutes, requiring notice of claim for injuries from defective streets to be given within a certain time, the right of action is to be determined from the sufficiency of the notice given to the plaintiff, and not by the fact that the city had actual notice from a published account in the daily newspapers.—Supreme Court of Indiana, 93 N. E. R., 540.

Municipal Employment—Cemetery Sexton

Holley vs. City of Mt. Vernon.—Where plaintiff was employed as sexton of a cemetery at \$25 a month, and also authorized to retain fees for digging graves, under a resolution merely authorizing his employment at a salary not to exceed \$25 a month, the payment of bills for his services for several years at \$25 a month was not a ratification of such contract by the city; there being no evidence that the city was notified of the variance between the contract as made and the resolution of authority. Where a cemetery was not owned by a city and lay beyond its limits, the city had no authority to employ a sexton therefor, under Constitution, article 8, section 10, providing that no county, city, town or village shall give any money or property or loan money or credit to or in aid of any individual, association or corporation.—Supreme Court of New York, 120 N. Y. S., 460.

Promotion of Police Captain—Liability of Commissioner

Hodgins vs. Bingham.—A complaint by a police captain against a police commissioner of the city of New York, which alleged that, according to the rules of the police commission, defendant was required to keep record as to the efficiency of police captains and to certify the same to the commission in advance of examinations for promotion, and that defendant "wantonly, willfully, maliciously and untruthfully" certified to the police commission concerning plaintiff, "On his (plaintiff's) record—poor; has not the qualities for inspector's command; stupid," to plaintiff's damage in a stated sum, did not state a cause of action, since the police commission was not bound by the facts stated in the certificate, and it was merely the expression of the defendant's opinion as to plaintiff's qualifications. In an action by a police captain against a police commissioner of the city of New York to recover damages for a false certification of plaintiff's qualifications in advance of an examination for promotion, an allegation that, by reason of the falsity of the certificate, the police commission gave plaintiff a rating lower than it otherwise would have given him, was a mere conclusion of the pleader. The mere fact that a police captain of the city of New York is rated higher under the civil service rules than other applicants for promotion does not in and of itself entitle him to priority of appointment.—Supreme Court of New York, 126 N. Y. S., 493.

Sewer Overflow—Liability

Beyer vs. City of New York.—A city was not liable for the overflowing of a sewer into plaintiff's premises, where the backing up of the sewage was caused by a stoppage of sticks used by children playing in the street, where it did not appear how long the stoppage had existed, so that any reasonable inspection would have revealed the obstruction.—Supreme Court of New York, 126 N. Y. S., 455.

Paving Contract—Performance

Snouffer & Ford vs. City of Tipton.—In an action by a paving contractor on quantum meruit, for the reasonable value of paving, where the defense was defective construction, and it appeared that in a former action in equity to restrain collection of an assessment for the same paving, the contractor had an opportunity to offer to reconstruct and repair, but failed to do so, the question of offering to repair and reconstruct is res judicata.—Supreme Court of Iowa, 129 N. W. R., 345.

Powers—Ultra Vires—Injunction

Hill Dredging Company vs. Ventnor City.—A municipal corporation is not bound by an engagement which it has no power to make, and the defense of ultra vires is available to it. A city governed by P. L. 1897, providing for the government of cities containing a population of less than 12,000 inhabitants, has no power to grant for the benefit of a company the privilege of laying pipes in the streets to pump sand to the beach front. Where plaintiff obtained permission from a city to lay pipes in the streets to pump sand to the beach front, and used them to pump mud and sewer filth, and thereby endangered the public health, equity would not grant a preliminary injunction restraining the city from interfering with such acts, though it be assumed that the city had power to grant the privilege.—Court of Chancery of New Jersey, 78 A. R., 677.

MUNICIPAL APPLIANCES

New Auto Steam Fire Engine

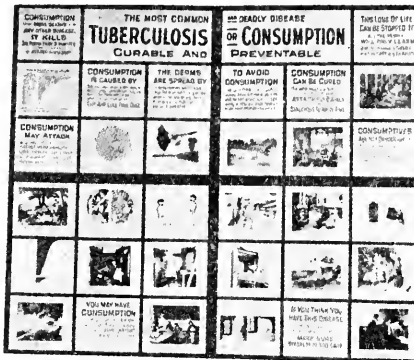
A gasoline-propelled steam fire engine, shown in the illustration, has been placed on the market by the Nott Fire Engine Company. The engine was entirely new throughout, but the motor attachment can be put on any engine now in service in fire departments. New running gear with rubber tires of special design will, however, have to be provided. At a recent trial in Minneapolis with five men on the machine, making a total weight of over 15,000 pounds, when the streets were covered with slush and ice, the machine easily made a speed of 30 miles an hour. The capacity of this engine is 700 gallons a minute. The whole apparatus is built very heavy and massive. The motor has four cylinders of the long-stroke design and developed on test 110 brake horsepower at 1,350 revolutions a minute. The crankshaft to the cylinders was cut from a solid ingot of vanadium steel which weighed 625 pounds and weighed when finished 185. All the differential gears, transmissions, etc., are cut from solid block chrome nickel steel and there are no forgings in any of the gears. The engine was built entirely by the Nott Company, who state that it was the most perfect success that they have ever brought out in their experience in building fire apparatus.

Small Tuberculosis Exhibit

At the suggestion of the National Association for the Study and Prevention of Tuberculosis the Educational Exhibition Company, 70 Waterman street, Providence, R. I., have prepared a small and inexpensive tuberculosis exhibit, a cut of which as it appears when set up is shown herewith.

The exhibit when spread out is about 7 feet long by 6 feet high. It can be made to occupy a less horizontal space

or can be set in a corner. It contains 32 units or spaces 10 by 12 inches in size and a heading or top sign 10 inches high and 4 feet long. Twenty-two of the spaces are occupied by 8 by 10-inch photographs. The 10 remaining spaces are occupied by mottoes or aphorisms. Each photograph is a black and white contact print with suitable descriptive title inserted beneath in plain, neat black lettering on white ground. These photographs are all bright, clear views, all the plates having been made specially for this exhibit.



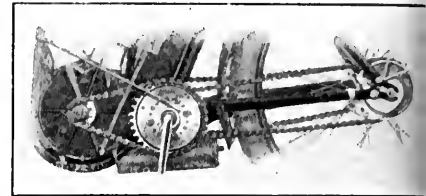
SMALL HEALTH EXHIBIT

A list of these is appended. The mottoes or short sayings in regard to tuberculosis have been designed with great care. Each is complete in itself and arranged so as to catch the eye of the spectator, and the set of 10 gives a complete popular treatment of the subject.

Motor Cycle Improvement

An improvement in construction announced by the Hendee Manufacturing Company, Springfield, Mass., should be of interest to police and other city de-

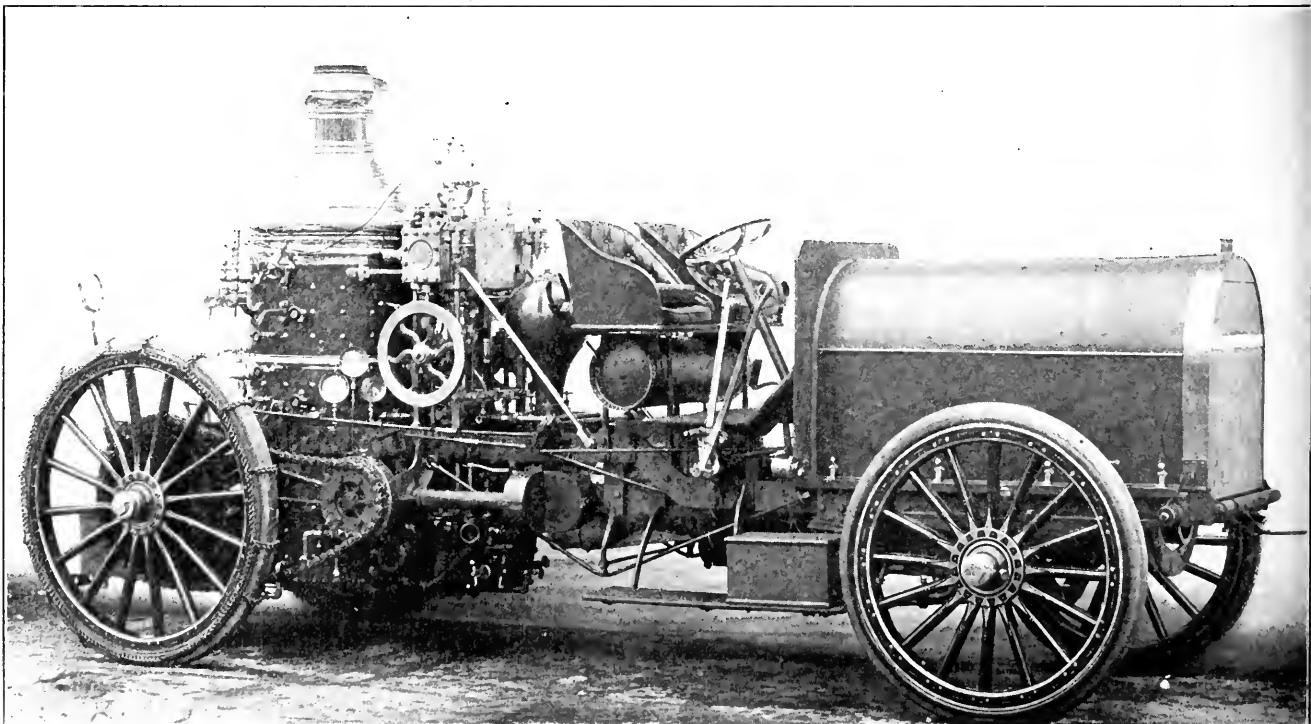
partments which employ men mounted on motor cycles. The 1911 model Indian embodies a feature which, it is claimed, revolutionizes the construction of motor cycles and solves the



NEW FRICTION CLUTCH OF INDIAN MOTOR CYCLE

problem of the transmission of the motor to the driving wheel. The new feature is a positively acting free engine clutch which makes starting the machine easy under every condition. The rider can with ease and certainty run his machine at a walking pace in a crowded street, stop and start again without stopping his motor. The new clutch gives any range of speed desired. The clutch is of the disc type, in which the various friction discs are held in adjustable contact by compressed coil springs, and the release is operated by a lever conveniently placed for the left hand of the rider which operates a quick acting screw that opens the clutch against the compression of the springs. This lever moves smoothly backward and forward, and remains fixed wherever placed without the necessity of any stop or ratchet. When the clutch is released the sprocket ring rides free on roller bearings, and as the inner circumference of the ring, which bears on the rollers, is armed with a hard steel wire sprung into a groove in its edge there is little wear at this point, and when necessary this wire can be readily replaced.

The 1911 Indians will all be of the handsome and convenient drop loop frame model same as those made last year.

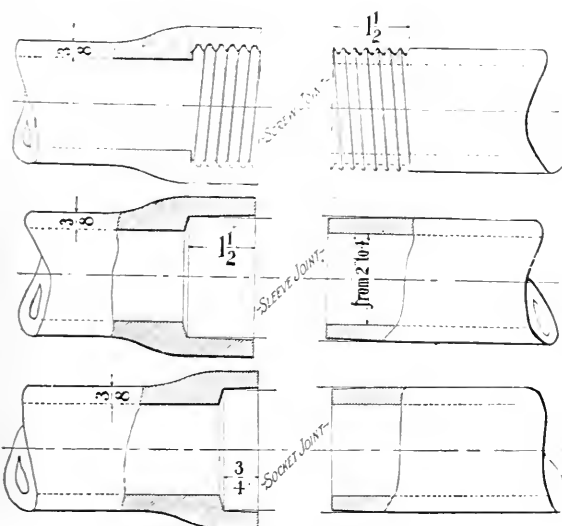


NOTT GASOLINE-PROPELLED STEAM FIRE ENGINE. MOTOR SECTION CAPABLE OF BEING ATTACHED TO ANY FIRE ENGINE

J-M Fibre Conduit

ASBESTOS fibre conduits which are pressed into shape under high pressure and manufactured by the W. H. Johnsonville Company, 100 William street, New York. Each length has a solid wall three-eighths of an inch thick, all one piece, homogeneous and without joints. Ordinary fibre conduit is of laminated or layer construction. The layers are apt to split and come apart. On account of the great strength of the molded wall the J-M fibre conduit, when laid without concrete or other protection, will withstand compression without that would crush other conduits. The conduit is furnished with a jacket, sleeve and screw joints, and all joints are molded bell shape. Molding is the only process that will permit of a bell-shaped joint, and it is only with a bell joint that the wall of each section can be as thick and strong at the joint as at any other point in its length. In laminated fibre conduit half the wall of the ends of each length must be cut away in order that one length may fit screw into the other. J-M conduit joints may be made practically air tight, and gas shut out not only water, but gas. The inside of the bore is smooth so that the work of pulling cables through is easy. A No. 6 wire can be pushed through each duct from manhole to manhole and the use of rods is unnecessary.

The smooth bore of the J-M system is claimed to add greatly to the life of a cable, as it eliminates the cause of the trouble—seams and raw edges at joints which abrade the lead casing. Water insulating efficiency is claimed for the J-M fibre conduit as compared with stoneware or clay on account of the nature of the materials and as compared with laminated fibre conduit, because in time the layers are apt to separate and then currents pass through. Tests of this conduit with standard 3/8-inch thickness of wall which indicate an average puncture voltage of 40,800 dry and 33,000 volts for 40 hours' immersion in water. Lightness in weight aids in economy in laying the fibre, weighing about one-sixth as much as stoneware or vitrified clay. The alignment of the connected conduit is automatically taken care of, so true are the joints made at the factory. The matter of breakage in stoneware or clay conduits is sometimes serious, whereas with fibre conduits it is practically nothing.

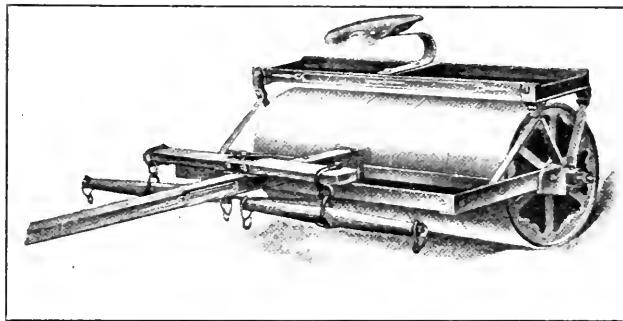


J-M FIBRE CONDUIT JOINTS

Easy-Running Rollers

The Dunham Company, Berea, O., are said to be the largest manufacturers of rollers in the world. Their products are made of all weights between the light hand roller weighing 150 pounds to the heavy two-horse roller weighing 12,000 pounds, provided with boxes for overweights. Ease in running is the important feature of a roller, and this is attained in the Dunham hand roller by roller bearings, high carbon steel and perfectly round and smooth axles, as used in automobile construction. The construction is claimed to be different from all others, having much less friction surface than any other.

The two-horse land roller shown in the illustration suitable for park and road use is claimed to be the lightest draft roller in the market. It pulls directly from the axle and is so perfectly balanced that there is no weight on the team. It is equipped with two all-steel weight boxes at top and in front of rolls. The 3,000-pound roller shown is 32 inches in diameter, 72 inches long, made up of six sections of even width. A still heavier roller, suitable for road work, has front and rear weight boxes and the framework connecting them through the axles all of steel. The bearings are 8-inch, noiseless, dust-proof, with brass oil cups holding a teaspoon of oil each.

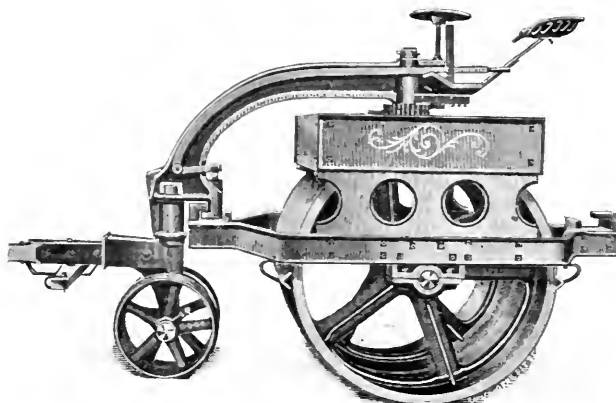


HORSE ROLLER FOR ROADS OR PARKS

Reversible Street Roller

A horse roller of simple design and rigid construction is made by the Enterprise Manufacturing Company, Columbus, O. The front end of the frame is carried by a two-wheeled truck, to which the tongue is attached. This makes the roller run steady, causing no jarring of the team or side switching of the tongue when striking any obstruction, and gives the team perfect control to guide and turn the roller at the will of the operator. This truck also takes all weight off the horse's neck. The reversible feature is extremely simple. The tongue and front truck can be turned at full right angles

turning off to a side street. This is of further advantage when using the roller as a non-reversible roller when so desired, thus moving the roller sideways just the width of the lap in turning. With a roller that has both the rolls stationary on the shaft, and bearings on the outside frame, one roll will have to slip in turning, thus making it extremely stiff and difficult for the horses to turn, due to this extra friction. Balancing the roller so as to make it heavier can be done, enough room being provided on top that another ton can be added to each roller when so desired. When this is done it is not advisable to reverse the roller in the usual manner, but to turn the roller as a non-reversible. An effective brake is provided which is operated by a hand wheel within easy reach of the operator. The main frame is made of steel channels and projects but 3 inches on the side of main rolls, thus permitting the operator to work up close to wire poles, trees, buildings and curbing. These rollers are built in sizes of 3, 4, 5 and 6 tons. Dimensions, 3-ton 52-inch diameter rolls, 4-ton 56-inch diameter rolls, 5-ton 58-inch diameter rolls, 6-ton 60-inch diameter rolls. All rollers 52 inches wide on rolling surface.



REVERSIBLE HORSE ROLLER FOR ROAD AND PAVING CONSTRUCTION

NEWS OF THE SOCIETIES

Indiana Sanitary and Water Supply Association.—The fourth annual meeting was held at the Claypool Hotel, Indianapolis, February 7-10.

The object of the association is the study of the sources of water supply in the state and their conservation and purification. All residents of the state who are interested in what Mr. Barnard termed the "greatest economical problem of the state" are eligible to membership, and there were engineers and capitalists who control water plants in many Indiana cities, mingling with municipal officers who are intrusted with the same kinds of property.

Mr. Barnard opened his annual address with a brief statement of the manner in which the streams of the state have been polluted. He said that if Tecumseh or William Henry Harrison could speak at the meeting either would say that "you have taken the beautiful Ohio and the limpid Wabash for sewers, turned lakes into cesspools and destroped pure, crystal springs." The activity of the association and the manner in which it has interested officials of cities and water companies is a guarantee of a better water supply for a longer period, said the president.

"The Successful Treatment of White River by Mechanical Filtration" was the subject of a paper in which Henry Drach, superintendent of the Anderson Water Company, described in detail the manner in which the citizens of Anderson got pure water from the polluted White river. The history of the plant from the time it was installed to the present period was reviewed by Mr. Drach, who stated that chemical tests for a long period showed that an average of 98 per cent. of the impurities of the water were removed by the filtration process.

J. H. Simonds, superintendent of the state laboratory of hygiene, addressed the meeting on "Some Typhoid Epidemics in Indiana." He referred specifically to the epidemic at Bloomington, and the State university last July, and to a previous outbreak of typhoid at the Indiana Boys' school at Plainfield. The epidemic at Bloomington he attributed to flies, which were permitted to breed in a vault located near the rear doors of four eating places. By an extensive process of deduction he proved that this was the only source of the disease on which this epidemic could be laid.

Professor R. L. Sackatt, of Purdue, spoke on the French ozone water purification plants, which he studied during a recent tour of Europe. Superintendent Joseph W. Ellms, of Cincinnati, described the filtration plants which are used by that city to supply pure water to Cincinnati. Both these lectures were illustrated.

Vice-President Fairbanks, who spoke after a luncheon, said that every city and town in the United States should provide and maintain a forest of its own.

George W. Fuller, New York, N. Y., entertained the association for an hour with stories of his experiences in tracing the sources of pollution of water supplies that were evidenced by epidemics of diseases. He advised the water works men that the first thing to do is to provide a supply of good, wholesome water. "Let the matter of rates go," he said. "The rates will take care of themselves when you supply the water."

National Paving Brick Manufacturers' Association.—The sixth annual convention of the association was held at the Seelbach, Louisville, February 6-9. The following officers were elected for the ensuing year: Charles J. Deckman, Cleveland, President; J. W. Robb, Clinton, Ind., Vice-President; C. C. Barr, Streator, Ill., Treasurer; Will P. Blair, re-elected Secretary.

At the first day's session reports of officers and committees were heard and committees were appointed. At the public session on the following day Merle Sidener, Indianapolis, and Spencer M. Duty, Cleveland, spoke on the Relation of the Association to the Public. A general discussion followed these addresses.

A resolution was adopted moving the headquarters from Indianapolis to Cleveland. The change will be made by March 15. The chief reason advanced for moving the headquarters is that Cleveland has several hundred miles of properly constructed brick streets which may be utilized as an exhibit of the methods of construction advocated by the association, while Indianapolis is declared to possess some of the worst streets in the country. A year ago Will P. Blair, Secretary, went before the Indianapolis Commercial Club and asserted that he was having difficulty in holding the headquarters for that city because the directors felt that they were put at a disadvantage by the bad brick streets of the city.

It has been customary for the association to take parties of city officials and of property owners to Cleveland to show them the kind of streets that may be produced with brick when proper construction is utilized, and it is believed that with the national headquarters in that city the general influence will be greater. Another reason for moving is that the newly elected President, C. J. Deckman, lives there, and several of the directors are Ohio men.

The first on the list of the topics for general discussion was "Is the Use of Two-Inch Vitrified Cubes Practical in Constructing or Resurfacing Wornout State Roads." Reference was made to roads laid in the last two years in the vicinity of Rochester, N. Y., and in the past year at Minneapolis. Also to the German pavement called "klein-pflaster."

The amount of brick paving laid in 1911, according to W. P. Blair, was approximately 2,000,000 yards more than that laid in 1909. The number of yards laid in 1910 was estimated at 12,000,000.

Jesse Taylor, Secretary of the Ohio Good Roads Federation, made an address favoring brick for country roads. He said that the cost of building and maintaining roads should be shared by the Federal Government, the State, the county and the adjoining land owners. The high cost of living, he said, is partly due to bad roads, the farmer being obliged to rush their products to market when the roads are in good condition.

In the course of a discussion of the question of testing brick, R. D. Culner, Veedsburg, Ind., urged a system of inspection at the manufacturing plant, thus obviating the possibility of loss of expense of transportation on brick rejected at the point of delivery. Other manufacturers agreed with him, but John Minwegen, of the Board of Local Improvements, Chicago, said he did not think it practicable.

Specifications were adopted for standard rattler for testing paving brick. This is the result of two year study and experiments. In connection with the discussion of brick tests, the association adopted a resolution criticizing the organization of city officials for standardizing paving specifications in arbitrarily naming a specific increase in the permitted loss by abrasion in the rattler test to meet the greater loss caused by the new standard rattler, as compared with the old machine.

National Brick Manufacturers' Association.—The twenty-fifth anniversary of the association was held in Louisville February 8-9. Three affiliated organizations held their conventions at the same time. They are the National Paving Brick Manufacturers' Association, the Building Brick Association of America and the National Clay Machinery Association. The meetings of each of these bodies was held at the Seelbach. The general association followed its usual custom in selecting officers for the ensuing year by promoting its vice-presidents on step. The officers are: Charles M. Crook, Youngstown, O., President; Charles A. Bloomfield, Metuchen, N. J., First Vice-President; W. H. H. Rogers, Rochester, N. Y., Second Vice-President; E. Rogers, Alton, Ill., Third Vice-President; Theodore A. Randall, Indianapolis, Ind., was re-elected Secretary, and John W. Sibley, Birmingham, Ala., Treasurer. On the first day of the meeting Mayor W. O. Head made an address of welcome, to which G. W. McNeese, Kittanning, Pa., responded. Will P. Blair made the annual presidential address. On Wednesday evening a paper illustrated by the stereopticon on vitrified sewer and culvert pipe was delivered by George H. Tefft, Secretary and sales manager of the W. S. Dickey Clay Manufacturing Company. Most of the papers presented were regarding various manufacturing processes of comparatively little interest to the public.

The association adopted a resolution empowering the directors to fix the place of the next meeting, with the recommendation that it be in Chicago.

California State Association of County Surveyors.—The annual meeting was held at Sacramento January 20. Superintendent of Streets Irvine, Sacramento, speaking on Good Roads mentioned that California had the care of roads varying in level from below that of the sea to 8,000 feet above. He advocated the oiled macadam road. It had the advantage of being freer from dust than other roads, and stood the wear and tear best. He liked asphalt for street work, but it has the disadvantage of being very dirty unless given constant attention. Marsden Manson, City Engineer, San Francisco, was the principal speaker of the evening. He said that California possessed the best material in the world for road building, asphaltic oil. He advised placing a heavy export duty on the material in order that it may be kept at home where it is needed. Mr. Manson favored the division of State roads into three classes according to importance. County Surveyor J. G. McMillan, San Jose, read a paper on bridges.

Engineers' Club of St. Louis.—At the regular meeting of Feb. 15, A. O. Cunningham, Chief Engineer of the Wabash R. R., presented a paper on "Strengthening the Columns of the Approaches of the St. Charles Bridge."

Calendar of Meetings

Illinois Clay Products Association.—The recent Middle West clay convention it was decided to hold under auspices of the society in 1912, a National Brick and Clay Products Convention. In the convention a resolution was offered as prepared by a special committee consisting of W. P. Blair, President of the National Brick Manufacturers' Association and Secretary of the National Paving Brick Manufacturers' Association; R. C. Penfield, President of the American Clay Machinery Company, and E. Bognild. This resolution required that a committee should be appointed by the President of the association to take charge of the matter, and last week a committee was appointed by the President Gates as follows: William Blake, President Illinois Brick Company; R. C. Penfield, President American Clay Machinery Company; Roger Coombs, Vice-President Thomas Building Company; Albert L. Leach, Brick and Clay Record. This committee has power to extend its scope and has already prepared plans of a practical nature for furthering the project and for providing ways and means.

Municipal Engineers of the City of New York.—At the meeting February 15 in the Engineering Societies Building, 29 West Twenty-ninth street, New York City, a paper entitled "The Geology of New York City in Its Relation to Engineering Problems" will be presented by Charles P. Berkey, professor of geology, Columbia University, and by R. Healy, M. M. E. N. Y. The paper will be illustrated by lantern slides.

Columbia University Civil Engineering Society.—At a meeting January 23 Elson P. Lewis, Chief Engineer of the Board of Estimate and Apportionment, spoke on "The Planning of a Modern City." He said New York City had lagged in this respect in Richmond and Queens, especially in providing park facilities. The policy of New York City, said Mr. Lewis is "Don't buy park land until the necessity is apparent," with the result that the sum of \$1,000,000 was paid for Seward Park, which amount would have provided an entire park system for Queens. In Germany, France and England, declared Mr. Lewis, the cities are required to plan properly. In the United States, Cleveland, Chicago and Washington present pleasing exceptions to the general rule. The speaker criticized New York's rectangular street system. Because of this defect, Mr. Lewis said, the beauty of many noble buildings is lost. In the matter of parks, the speaker thought New York did not compare favorably with Paris, Boston and the District of Columbia.

New York State Police Association.—The State Police association, represented by John W. Griffin, has just completed a house to house canvass of Albany and Troy, for the purpose of obtaining the names of voters on a petition to the legislature, asking that the three platoon police bill introduced recently by Assemblyman Jackson, of Buffalo, be passed. The same bill passed both houses of the legislature last year, but was vetoed on the grounds that the people of Albany and Troy had protested against it. Mr. Griffin said last night that he had obtained the names of more than four-fifths of the voters to present to the legislature. The bill provides a three platoon police system for all second class cities of the state.

Association of Sealers of Weights and Measures, New York State.—Mayor James B. McEwan welcomed the 175 city and county sealers of weights and measures who attended the annual session of their State association in Albany, February 7. President Fritz Reichmann, of Albany, gave his annual address and during the morning the sealers had a talk with Governor Dix, who received them in a short speech and said that they stood between the producer and seller to see that all got fair and square treatment. The sealers were then introduced to the Governor by President Reichmann.

During the afternoon addresses on matters of interest to the sealers were discussed by John L. Walsh, of New York City, on "Weights and Measures in New York City;" L. A. Fischer, of Washington, D. C., on "What the Federal Government is Doing in Weights and Measures;" C. C. Blood, of Orleans county, on "Beans." Messrs. A. Pettis, of the New York Central, and A. W. Epright, of the Pennsylvania railroad, told about "Testing of Railroad Track Scales." Mrs. E. Blair, of Albany, gave a paper on "Weights and Measures of the Housekeeper."

An interesting synopsis of letters discussing weights and measures from the standpoint of the grower, the commission man, the manufacturer, wholesaler, retail grocer, department store, retail butcher, steward, housekeeper and the scale manufacturer were read and discussed.

Canadian Cement and Concrete Association.—At the third annual convention, March 7-9, at Toronto, Ont., papers will be presented as follows: "Cement Concrete in Highway Construction," W. A. McLean, Provincial Engineer of Highways; "Cement Surfaces and Finishes," Robt. Cathcart, Glidden Varnish Co., Cleveland, Ohio; "Concrete Blocks," R. F. Havlick, Ideal Concrete Machinery Co., South Bend, Ind.; "The White and the Gray," Joseph M. Carrene, Blanc Stainless Cement Co., Allentown, Pa.; "Prevention of Corrosion in Metal Lath," C. W. Noble, consulting engineer, Toronto, Ont.; "Adaptation of Concrete for Long Span Bridges," F. Barber, Barber & Young, Bridge and Structural Engineers, Toronto, Ont.; "Manufacture of Portland Cement," W. M. Kinney, Assistant Inspecting Engineer, Universal Portland Cement Co., Pittsburg, Pa.; "The Necessity of Inspection in Concrete Work," E. A. James, Editor "Canadian Engineer," Toronto, Ont. Richard L. Humphrey, Director of the United States Structural Materials Testing Laboratories, Pittsburg, Pa., and several others have consented to read papers, but their subjects have not yet been chosen.

The third annual Cement Show will be held at the St. Lawrence Arena, Toronto, Ont., March 6-11. William Snaith, Secretary of the Association, is also Manager of the Cement Show.

Mayors' Annual Conference of the State of New York.—The advisory committee at a meeting in Troy made arrangements for the second annual convention, to be held this year in Poughkeepsie the latter part of May or the first part of June. Those present included Mayor Mann, of Troy; Mayor C. C. Duryee, of Schenectady, and Superintendent of Public Works R. J. Harding, of Poughkeepsie, the last named representing Mayor John K. Sague, who was unable to be present.

- February 21-22. Illinois Water Supply Association.—Annual Meeting, University of Illinois, Urbana, Ill.—E. Barton, Secretary, Urbana, Ill.
- February 28-March 1. Northwestern Cement Products Association, West Hotel, Minneapolis, Minn.—Henry B. Smith, Secretary, 834 Security Bank Building, Minneapolis, Minn.
- March 1-3. Engineering Society of Wisconsin.—Annual Meeting, Madison, Wis.—W. G. Kirchoffer, Secretary, Vrooman Building, Madison, Wis.
- March 6-11. Canadian Cement and Concrete Association.—Annual Convention, Toronto, Ont.—Wm. Snaith, Secretary, 57 Adelaide street East, Toronto, Ont.
- May. City Commission Congress.—Meeting, Galveston, Tex.—Mayor Lewis Fisher, Chairman of Committee, Galveston, Tex.
- May 29-June 3. National Electric Light Association.—Annual Convention, Engineering Societies Building, New York, N. Y.
- June 6-10. American Water Works Association.—Thirty-first Annual Convention, Powers Hotel, Rochester, N. Y.—John M. Diven, Secretary, 14 George street, Charleston, S. C.
- June 11-16. International Association of Chiefs of Police.—Eighteenth Annual Convention, Rochester, N. Y.—Major Richard Sylvester, Superintendent of Police, Washington, D. C., President.
- June 13-18. New York State Association of Chiefs of Police.—Annual Convention, Rochester, N. Y.

PERSONALS

- DONOVAN, GEO., has been appointed resident engineer of the New York State Barge Canal at Oswego, N. Y.
- FINNEGAN, EDWARD J., has been chosen Mayor of Norwalk, Conn., to succeed Mayor Brundage, deceased.
- FORD, FREDERICK, has been reappointed Superintendent of Streets of Hartford, Conn.
- HIGGINS, M. E., Fire Chief of Albany, N. Y., died on the 11th inst. During the illness of the Chief, Asst. Engineer Bridgeford was in charge of the department, and it seems to be the general opinion that he will be the next chief.
- HOKE, J. J., has been elected Street Superintendent of Rock Hill, S. C.
- LAKE, FORREST, has been re-elected Mayor of Sanford, Fla., after a warily contested election.
- NEEL, J. J., Gettysburg, Pa., has been appointed County Engineer.
- NIXON, C. N., has been elected Mayor of Amite City, La.
- OWEN, JAMES, Montclair, N. J., has been named as Essex County Engineer to prepare, with Alexander Hamill, of Hudson County, plans for rebuilding Bridge Street Bridge.
- RICHARD, C. BRENT, has been re-elected Mayor of Lake Charles, La.
- ROLAND, CHARLES, has been elected Mayor of Tower, Minn.
- STRAUSE, CHARLES, Secretary of the New York County Lawyers' Association, who was appointed by Mayor Gaynor to the Board of Water Supply, has been elected President to succeed John A. Bense, now State Engineer and Surveyor.
- TAYLOR, CHAS. E., has been elected Mayor of Little Rock, Ark.
- TEMPLE, EDWARD S., City Treasurer of Taunton, Mass., has been removed from office by the Mayor.
- TITUS, HENRY T., has been elected Mayor of Daytona, Fla.
- VAN CLEVE, A. H., City Engineer of London, Ont., has resigned.
- WOODBURY, F. WALTER, has been appointed Chief of Police of Beverly, Mass.
- YOUNG, A. R., of Chanute, has been appointed City Engineer of Topeka, Kan.

TRADE NOTES

Cast Iron Pipe.—Chicago: Good lettings are expected soon from several large cities. Prices are reported 50 cents a ton higher. Quotations: 4-inch, \$25.50; 6 to 12-inch, \$24.50; 16-inch and up, \$24. Birmingham: There has been no change in the rate of production, but the outlook is such that a normal producing capacity at all plants will soon be warranted. San Francisco: Business continues active, as it is generally believed that prices will be advanced. New York: Private water and gas companies are still active in the market. Competition is keen, as pipe foundries are anxious to fill their order books. Quotations: 6-inch, carloads, \$21.50 to \$22. Lead.—Market is weak. Quotations: St. Louis, 4.30c.; New York, 4.45c.

Auto Chemical Wagons.—The first of the two new fire automobile combination chemical and hose wagons for the Tampa Fire Department arrived last week from the factory of the Webb Motor Car Company, at St. Louis, Mo. The second machine of this type is on the way and is expected any day. Then the department will have three auto chemicals of substantially the same pattern.

Paving Company Reorganized.—Reorganization of the Oregon Hassam Paving Company, Portland, Ore., has been effected and Miller & Bauer, who held the controlling interest, have been superseded by Alexander McLaren and J. H. Whittall, the former, however, retaining an interest in the firm. The capital stock has been increased from \$25,000 to \$150,000. Mr. McLaren has been chosen President and Mr. Whittall Vice-President. These men, who are members of the parent Hassam Paving Company, of Worcester, Mass., have the controlling interest in the reorganized concern. George M. Hyland has been retained as local manager, W. A. Lucy, Treasurer, and B. Assman, secretary. This company has approximately \$500,000 in paving contracts in this city at the present time, and it was found necessary to reorganize and increase the capital stock to handle the business.

Lighting Franchise.—The Public Service Commission has denied the application of the receivers of the Hudson River Electric Company to exercise a franchise granted it by the village of South Glens Falls. The field, which is a small one, is now occupied by the United Gas, Electric Light & Fuel Company of Sandy Hill and Fort Edward. At the hearing it was shown that this company has a plant sufficient to supply proper service to the village of South Glens Falls, and that no reason appears why a new company should be allowed to enter this village for the purpose of furnishing electric lights.

Autos for Chiefs.—Commissioner Waldo's plan for eliminating horsepower from the Fire Department of New York City progressed another step when the Board of Estimate appropriated \$7,500 for the purchase of ten small automobiles for the use of battalion chiefs.

Crude Oil Gas Burner.—Thomas O. Hegg, Madison, Wis., has invented an oil burner for lighting and heating, which operates in connection with a generator using crude oil. The claim is that the use of the device will greatly reduce the cost of lights.

Loan to Aqueduct Builder.—Through the filing of a bill of sale in the City Clerk's office, Yonkers, N. Y., February 10, it became known that the "George W. Jackson, Incorporated," contractors on the Catskill water works and Valentine hill had disposed of their plant to Congressman John E. Andrus for \$115,000. The Jackson Company is a Chicago firm and had secured a contract, under bid, from the New York Board of Water Supply to construct a pipe line, by tunnel under the summit of Valentine hill from the new Hill View reservoir to a point north of Palmer avenue. The work involves three shafts and a portal. About 200 men have been employed by the company. The contract represents \$1,450,000, and will require three years to complete. At the work it was said that the bill of sale was merely security for a loan and that the money was required for some contract work in the West by the Jackson Company. Other rumors had it that the money was to be used on the Yonkers work which is behind schedule. It was said that Mr. Andrus has had business relations with the Jackson interests in Western matters. Some weeks ago the Congressman went over the works at Valentine's Hill from end to end, inspecting it, and at that time rumors became rife of the probability of his becoming financially interested in it. That the contract is to be continued by the Jackson people is in part borne out by the bill of sale which provides for the conveyance of the entire working plant of the company, excepting its offices, and has no reference to the contract.

The officers of the Jackson company concerned in the transaction are: Mr. George J. Jackson, president, and Mr. Albert G. Wheeler, assistant secretary, whose names appear attached to the bill of sale.

Large Pumping Engine.—The William Tod Company, of Youngstown, O., is completing for a South Carolina waterworks one of the largest engines ever built in Youngstown. The bed-plate weighs 130 tons and was cast in one piece. The cylinders are so large that a tall man may walk into them without stooping. The feed pipe which will convey the steam from the boiler to the engine is 2 feet in diameter. It is reported that a number of other engine builders, after learning the specifications, refused to bid for its construction, claiming that it was impossible to build an engine of such size. It is expected that shipment will be made shortly.

Receiver to Finish Work.—The work of completing the laying of the 30-inch water main from Washington Lake to Newburgh, N. Y., is to be done by Colin W. Mac Lennan, receiver in bankruptcy of the Hudson Terminal Construction Co., which failed some time ago and went into bankruptcy. This was decided at a meeting of the Board of Water Commissioners when Mr. Mac Lennan came up from New York for the meeting, accompanied by E. F. Kitson, the former engineer in charge of the work of the Hudson Terminal Construction Co.

Lighting Company Consolidation.—By taking over the Monroe Electric company, Everett, Wash., H. M. Bylesby & Co. now control the gas business in Everett and Snohomish and the electric lighting in Monroe and Snohomish. The business of the three companies will be conducted from the Everett office.

Steam Engines.—The Wisconsin Engine Company, Corliss, Wis., is installing in its machine shop an erecting floor of massive concrete construction with a wood block surface, which will be of material assistance in erecting the heavy machinery which constitute the greater part of the output of the company.

Bridge Company Reorganization.—The Des Moines Bridge & Iron Works, Des Moines, Iowa, has elected E. W. Crellin, president; G. A. Smith, vice president, and W. H. Jackson, secretary and treasurer. B. N. Moss, the former secretary and treasurer, has disposed of his interest in the company to Messrs. Crellin and Jackson, with whom he has been associated for 15 years.

Chicago Cement Show.—It is announced that exhibitors' half-rate tickets may now be ordered. These will be sold in lots of a hundred at 2 cents each. After the first purchase of one hundred they may be obtained in quantities of twenty at 25 cents each. The purpose of these tickets is to enable exhibitors to provide complimentary admission tickets to their friends and customers.

Sand Dryer.—Hyde Bros. & Company, Commonwealth Building, Pittsburgh, Pa., have issued a circular describing the Steel City sand dryer which is made in two sizes having capacities of approximately 10 and 5 tons per day, respectively. In use the wet sand is shoveled into the top of the dryer and as it dries runs out through holes in the bottom.

Underground Cables.—The annual meeting of the stockholders of the Standard Underground Cable Company was held in Pittsburgh January 24 and the retiring Board of Directors was re-elected as follows: L. W. Dalzell, John Moorehead, Jr., J. N. Davidson, B. F. Jones, Jr., A. H. Childs, J. W. Marsh, W. A. Conner, F. A. Rinehart and Joseph Wood. It is understood that the business of the company the past year was most satisfactory.

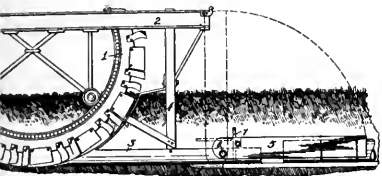
New Bridge Company.—The Detroit Bridge & Steel Works, Detroit, Mich., which was organized some months ago, has completed its plant at Delray, a few miles south of Detroit. The plant has a capacity of 12,000 to 18,000 tons of fabricated steel a year. Considerable work is now going through the shop, several local building and bridge contracts having been recently secured, the latest being the steel work for the addition to the Pingree Building, Detroit. The officers of the company are as follows: Max J. L. Fowler, president; W. E. Brinkerhoff, secretary; Richard P. Joy, treasurer; C. A. McLees, assistant treasurer. All the active officials of the company were formerly identified with the old Detroit Bridge & Iron Works.

New Paving Brick Plant.—The Salina Vitrified Brick Company, Salina, Kan., has announced that their plant is undergoing reconstruction with a view to the manufacture of paving bricks which will be put on the market this season. The new departure is made possible the company says by the discovery of a large deposit of pure soft blue shale located under the strata that have been worked hitherto. The shale has been tested and pronounced of good quality.

Crushing Plant.—A granite crushing plant is to be installed at the granite quarries near Llano, Tex., by C. C. Baker and associates.

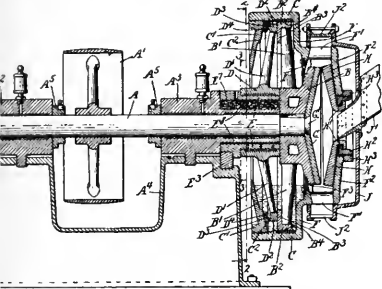
PATENT CLAIMS

81. ATTACHMENT FOR DITCH-DIGGING MACHINES. William Arps, Malinta, Ohio. Serial No. 561,590.
 A trench excavating machine, the combination with a scoop-like shoe capable of digging on a trench bottom, of a pair of bars trailing from such shoe, said bars being spaced from each other and from the



each wall and a member forming a partition transversely between said bars adjacent their inner ends and fitting down into the shoe to prevent the passage of water there through into the space between the members.

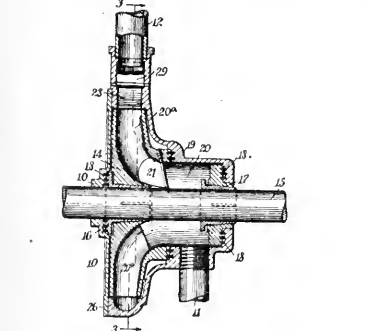
99. CRUSHING-MACHINE. Josiah E. Symons, Chicago, Ill. Serial No. 550,563.
 A crushing machine comprising two op-



posed rotating crushing members at an angle one with the other, mounted upon a common shaft.

137. CENTRIFUGAL PUMP. John L. Seald, Alamogordo, N. Mex. Serial No. 4,914.

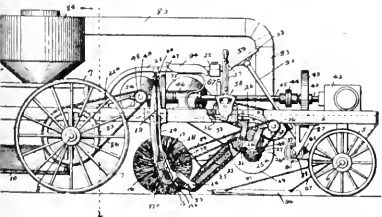
A centrifugal pump comprising a casing, a peripheral chamber in the casing, a rotor



mounted to rotate in the casing, blades pivotedly mounted on the rotor, and actuating wings secured on the rotor.

405. STREET-SWEEPING MACHINE. Henry R. Scheidler and Oscar A. Scheidler, Newark, O. Serial No. 539,283.

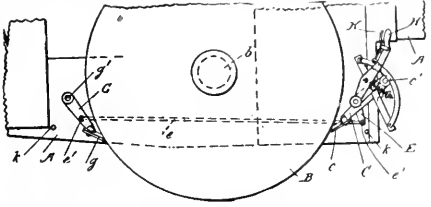
A machine of the character described, in combination with a truck body comprising a framework and ground wheels, a scraper body journaled in the frame and a rotor carried by said frame, of a dirt elevator supported in front of said sweeping body, a fan casing and fan therein, a conveyer leading from said elevator to said fan casing, a dirt receptacle carried



to the machine frame, pipe connections between said dirt receptacle and fan casing, means for imparting motion to the motor shaft to the sweeping body, the elevator, the conveyor, the fan and the ground wheels of the machine and independent means for changing the speed of the ground wheels and the speed of the

983,196. SCRAPER FOR ROAD-ENGINE WHEELS. Gustaf Arvid Anderson, Waynesboro, Pa., assignor to The Geisler Manufacturing Co., Waynesboro, Pa. Serial No. 534,042.

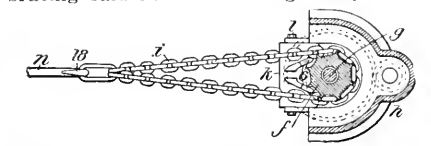
The combination, with a support, and a road-wheel, of a scraper-holder pivoted to the said support and provided with a scraper-blade, a shaft journaled in the said



scraper-holder and having two arms secured on it, means for coupling one of the said arms with the said support, and an operating-lever mounted loose on the said shaft and operatively connected with the other arm.

983,041. SAFETY-BRAKE FOR STREET CARS. Charles E. Gierding, Belleville, N. J., assignor to Sterling-Meaker Company, Newark, N. J., a Corporation of New Jersey. Serial No. 555,771.

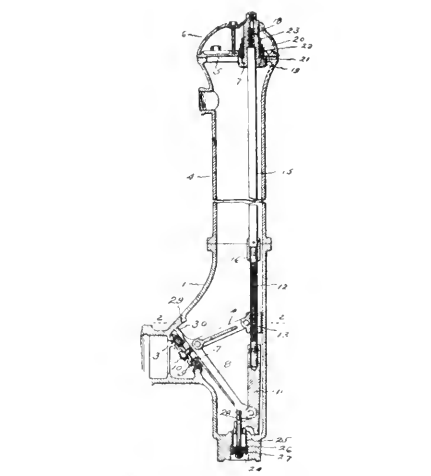
The combination, in a street-car brake, of a sprocket hub having a vertical axis, means for rotating said hub, a chain interacting with said hub, a housing partly embracing said hub and having an open side



through which the chain enters and escapes, a chain guide having rigid fingers constructed and arranged to project between the entering and escaping portions of the chain so that neither of them can "carry around," and means for fastening said chain guide within said open side of the housing.

983,279. HYDRANT. George W. Hayden, Hartford, Conn., assignor to The Pratt & Cady Company, Hartford, Conn., a Corporation of Connecticut. Serial No. 566,594.

A hydrant having a case with an inlet port and a drain opening, a block resting on the case in the interior near the bottom, an arm pivoted to said block, a valve attached to the free end of said arm and adapted to open and close the inlet port, a spindle having a threaded section rotarily



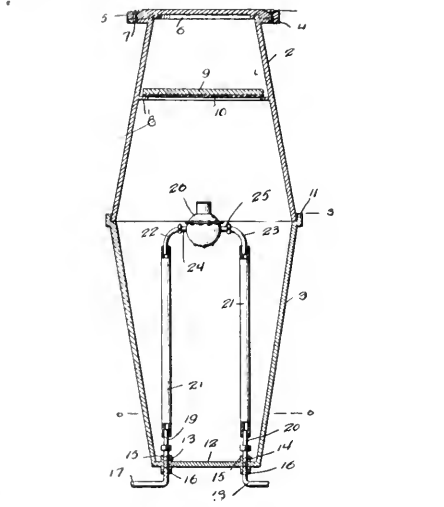
attached to said block, a nut fitting said threaded section of the spindle, a link connecting the nut and the valve arm, a stem hinged to said arm near the block, and a drain valve attached to the free end of said stem, whereby the drain valve is opened and closed by the swinging of said arm.

983,851. PROCESS OF TREATING BITUMINOUS SAND-ROCK. Henry F. Williams, San Francisco, Cal. Serial No. 575,394.

The method of treating bituminous sand rock which consists in mixing it with lime-sludge and subjecting it to a heat only sufficient to dry it without volatilizing any of the hydro-carbon constituents thereof, and then pressing it into the desired form, substantially as described.

983,311. METER-BOX. Edward J. McCreehy and Frank A. Phillips, Mount Clemens, Mich. Serial No. 562,482.

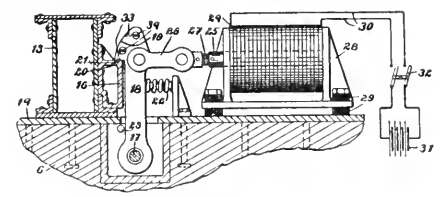
A water meter box composed of two vertical sections each of a frusto-conical formation, one of said sections having both of its ends open, a lead calk connection between the sections, the second section having a closed bottom, said bottom being provided with a pair of spaced threaded openings, an inlet pipe connected with one



of the threaded openings, an outlet pipe connected with the opposite threaded opening, a vertically extending bendable pipe connected with each of the openings, a coupling connected with the free ends of both of the pipes, the open top of the upper section having a cover, the said upper section being approximately centrally provided with a continuous offset, a closure positioned upon this offset, and said closure having its under face provided with a coating of non-heating conductive material.

983,194. LOCKING DEVICE FOR DRAW-BRIDGES. Roe Manning Agnew, Chesaning, Mich. Serial No. 461,592.

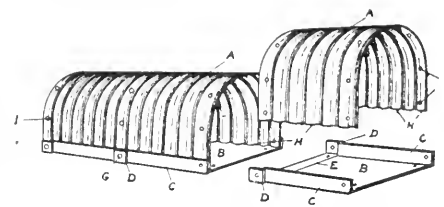
The combination with a pier and a movable bridge structure mounted independently of said pier and adapted to strike



thereon as the bridge closes, of an automatic locking device mounted on said pier, and adapted to engage and hold said structure to the pier, and a solenoid connected with said locking device to withdraw the same from such engagement.

983,623. METAL CULVERT. James B. Jarmin, Spokane, Wash., assignor to one-half to John S. Beall, Portland, Ore. Serial No. 476,779.

In a culvert, a lower section of plate form having upturned side flanges with lateral offsets at one end and a depressed flange between said offsets designed to receive the opposite end of a mating section and so constructed that when the opposite end of the mating section is placed upon said depressed end flange and between



said lateral offsets the upper portions of the bottoms of the two sections will be substantially in alignment with each other as well as the inner surfaces of the upturned side flanges, curved corrugated top sections designed to be secured together at their adjacent ends and also secured to the up-turned flanges of the bases, and means for securing the bases together.

THE WEEK'S CONTRACT NEWS

Relating to Municipal and Public Work—Street Improvements—Paving, Road Making, Cleaning and Sprinkling—Sewerage
Water Supply and Public Lighting—Fire Equipment and Supplies—Bridges and Concrete Work—Sanitation,
Garbage and Waste Disposal—Police, Parks and Miscellaneous—Proposals and Awards

To be of value this matter should be printed in the number immediately following its receipt, which makes it impossible for us to verify it all. Our sources of information are believed to be reliable, but we cannot guarantee the correctness of all items. Parties in charge of proposed work are requested to send us information concerning it as early as possible; also corrections of any errors discovered.

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREET IMPROVEMENTS				
Ohio	Cincinnati	Feb. 24, noon	Resurf. Independence st., also culvert and fill on Mt. Alverno rd; Impr. Loveland and Madeira road	Fred Dreihls, Clk. Co. Comrs. Dept. of Pub. Works.
New York	Buffalo	Feb. 24, 11 a.m.	Paving various streets	
Florida	Jacksonville	Feb. 24, 9:30 a.m.	Pave por. of Lincoln ave. and grad. unfinished portion of Mandarin road	C. W. Ellis, Chm. Co. Comrs. Fred A. Klipfel, Village Clerk.
Ohio	Wapakoneta	Feb. 25	Improv. Mechanic street	B. M. Cook, Village Clerk.
Ohio	Lakewood	Feb. 27, noon	Pave Summit and repair brick pave. in other streets	E. D. Rightmire, City Engr.
New Jersey	Atlantic City	Feb. 27	Pave. Pennsylvania and Albany aves.	Chas. E. Treman, Supt. Pub. Wks.
New York	Albany	Feb. 27	Construct various highways in Oneida County	Jos. B. Harrington, Clk. Talbot C.
Maryland	Easton	Feb. 27, noon	Grading and macadamiz. about .83 mile Dover Bridge road	
Alabama	Eutaw	Feb. 27, 2 p.m.	Constructing 8,500 sq. yds. tar cap macadam street paving; 2,850 linear ft. cement curbing; 2,150 sq. yds. cem. sidewalks	John W. Cook, Mayor. F. M. Abbott, Mayor.
Kansas	Chanute	Feb. 27, noon	Constructing one-half mile macadam road	H. I. Maclay, Boro. Secretary.
Pennsylvania	Munhall	Feb. 28, 5 p.m.	Paving 1,100 ft. of Eighth ave.	F. T. Patterson, City Clerk.
North Carolina	New Bern	Feb. 28, 8 p.m.	Approx. 40,000 sq. yd. paving	Lieut. E. H. Wagner, 29th Inf. U.S.
New York	Fort Niagara	Feb. 28	Construct concr. walks and macad. and clay roads	
New York	Sackett's Harbor	Mar. 1, 2 p.m.	Constr. approx. 28,800 sq. ft. macad. road. and 800 sq. ft. concr. walk at Madison Barracks	Constructing Q.M. M. Peterson, Secy. Bd. of Control.
Manitoba, Can.	Winnipeg	Mar. 1, 11 a.m.	Supply 1,000 to 1,500 tons asphalt for paving	W. Lea Smith, County Auditor.
Indiana	Portland	Mar. 1, noon	Improving certain highways	W. T. Brooks, Engineer.
Virginia	Norfolk	Mar. 1, 12:30 p.m.	Regulating and paving about 4,125 sq. yds.	County Clerk.
Kentucky	Louisville	Mar. 1, 2 p.m.	Paving various streets with asphalt	L. S. Polk, Secy. City Clerk.
Texas	Sweetwater	Mar. 4	Constr. about 22,000 sq. yd. macad-asph. pave.	W. A. Harris, Secy. Bd. Pub. Wks.
New Jersey	Plainfield	Mar. 6	Furnish crushed stone, culverts, etc.	B. I. Bizler, City Clerk.
Virginia	Spottsylvania	Mar. 6	Constructing 1 1/4 miles macadam road	John W. Weaver, County Auditor
Indiana	Fowler	Mar. 6, 1 p.m.	Constructing three stone roads	M. Stockman, Town Clerk.
Indiana	Huntington	Mar. 6	Constructing gravel road	
New Jersey	Irvington	Mar. 6, 8 p.m.	Constructing telford pavement in Myrtle ave. and Park place	
New Jersey	Belleville	Mar. 7, 9 p.m.	Furn. five-inch bottom stone, two and one-half inch and one and one-half inch broken stone and screenings, first quality Orange Mountain traprock	C. Lyman Denison, Chm. Twp. Com.
Ohio	Wooster	Mar. 7, 1 p.m.	Grading and paving 0.71 mile of road	J. H. Villard, Chm. Bd. C. Comrs.
Ohio	Lorain	Mar. 7, noon	Constructing sidewalks, cross-walks and repairing	L. B. Johnston, Clerk.
Georgia	Savannah	Mar. 9, noon	Furn. 5,000 cu. yd. cem. gravel or like material for imp. pub. rds.	County Commissioners.
Mississippi	Jackson	Mar. 9	Constr. gravel and sand roads. \$100,000 bonds issued	Mayes Cooper, Hwy. Engr.
Minnesota	Worthington	Mar. 13, 2 p.m.	Grade approx. 10,066 yards	E. C. Pannell, Co. Aud.
SEWERAGE				
New York	Hastings-on-Hud	Feb. 24	Construct sewers in various streets. About 16,000 feet	Jos. E. Murphy, Clerk Bd. Trust.
Ohio	Toledo	Feb. 24, noon	Constructing local sewer	Fred Shane, Secy. Bd. Pub. Serv.
Missouri	St. Louis	Feb. 24, noon	Constructing Baden public sewer	Board of Public Improvements.
Colorado	Colorado Springs	Feb. 24	Constr. brick sewers, incl. 1,255 lin. ft. 48-in., 3,975 ft. 36, 30 and 27 in. and 15,408 ft. 24, 21, 18, 12 and 10 in. clay or concrete pipe	I. S. Nichols, City Clerk.
Ohio	Akron	Feb. 24, noon	Constructing sanitary sewer	J. W. Gauthier, Dir. Pub. Serv.
Ohio	Oakley	Feb. 27	Constr. sewer in Taylor ave.	Oscar Kosche, Village Clerk.
Ohio	Lakewood	Feb. 27, noon	Construct sewer main in Riverside road	B. M. Cook, Village Clerk.
Ohio	Cleveland	Feb. 28, noon	Construct sewers in Cleveland Heights	H. H. Canfield, 309 Beckman Bld.
Iowa	Corydon	Feb. 28, 3 p.m.	Constructing three miles of sewers and a disposal plant	City Clerk.
Michigan	Niles	Mar. 1, 8 p.m.	Constructing main trunk sewer	Herman Roebbeck, City Clerk.
Arizona	Parker	Mar. 1, 2 p.m.	Construct sewer at Colorado River School	Comr. Ind. Affairs, Wash'n., D. C.
New York	Watertown	Mar. 3, 8 p.m.	Constr. sanitary sewer, requiring approx. 1,800 ft. 20-in. tile; 300 ft. 18-in. tile; 300 ft. 16-in. tile; 1,200 ft. 12-in. tile; 1,200 ft. 10-in. tile	Board of Public Works.
Illinois	Bement	Mar. 3, 1 p.m.	Furnishing material and constructing system of storm sewers and outflow drain	W. I. Day, Pres. Bd. Loc. Imp.
Wisconsin	Stoughton	Mar. 3, noon	Constructing sewerage system	J. C. Currier, City Clerk.
New Jersey	Bridgeton	Mar. 7, 8 p.m.	Construction of disposal works and pumping station	D. B. Jones, City Clerk.
Idaho	Pocatello	Mar. 9, 8 p.m.	Constructing trunk sewers	W. W. Church, Mayor.
Georgia	Atlanta	Mar. 14	Constr. intercepting sewer and disp. plant	R. M. Clayton, Com. Pub. Wks.
California	San Jose	July 3	Construct septic tank for County hospital	City Clerk.
WATER SUPPLY				
Nebraska	Battle Creek	Feb. 25 noon	Constructing water works	C. T. Richardson, Village Clerk.
Pennsylvania	Akron	Feb. 27, 8 p.m.	Constructing water plant	P. D. Getz, Clerk of the Council.
Georgia	Gainsville	Feb. 27	Improving and extending water works system	J. W. Barnett, Cons. Engr. Athens, G.
Ohio	Euclid	Feb. 27, noon	Construct 6-in. water main	F. H. Shoaff, Village Clerk.
Ohio	Lakewood	Feb. 27, noon	Construct water main in Franklin ave.	B. M. Cook, Village Clerk.
New York	Fort Terry	Feb. 28, 11 a.m.	Constr. concr. reserv. and extend water main	Capt. F. T. Arnold, Constr. Q. M. U.S.A., New London, Conn.
Illinois	Niles Center	Feb. 28, 8 p.m.	Constr. w. works, incl. bldgs., machy. tower, reserv. and dp. well	Geo. H. Klehm, Pres. Bd. Trust
Iowa	Corydon	Feb. 28, 3 p.m.	Constructing 6 miles 4 to 8-in. water mains, 70,000 gal. steel tank on 100 ft. tower, pump-house, reservoir, valves, pumps, motors	City Clerk.
Ontario, Can.	St. Catherines	Feb. 28	Furn. c. i. pipe and special cast. for 36-in. gate val. 4 to 3 1/2 in.	Chm. W. Wks. Com.
Missouri	Sikeston	Mar. 1, 8 p.m.	Constr. water supply system	H. C. Hester, City Clerk.
Illinois	Apple	Mar. 1	Constructing water works	George Guy, City Clerk.
Pennsylvania	Coraopolis	Mar. 1, 7 p.m.	Furn. million and a half triplex pump; 150 H.P. gas engine; 2 two hundred and twenty five H.p. gas engines dir. con. to A.C. generators; two 175 KVA generators; 1 fifty KVA generator; switch board etc.	S. B. Martin, Cons. Eng. Boro. Clk.
New York	New York	Mar. 1	Laying water mains, etc., in various streets, and removing existing water mains	Henry S. Thompson, Comr. W. Sup.
Montana	Harlowtown	March 2	Constr. reservoir, cap. 250,000 gals., and lay. 3,550 ft. of 8-in. and 400 ft. of 6-in. main, with hydrants, etc.	S. K. Campbell, Town Clerk.
British Col., Can	Victoria	March 3	Furn. 250 4-in., 100 6-in. and 10 12-in. double gate valves, and 15 tons best blue pig lead.	Wm. H. Northcott, Purch. Agt.
Michigan	Mt. Clemens	Mar. 3	Furn. a 3,000,000-gal. pumping engine for water works	Winfred Ferrin, Deputy City Clk.
Illinois	Wheaton	Mar. 6	Furn. 60 h.p. gas engine, gas producer, pumps; 100,000 gal. concrete reservoir, etc.	Louis Ellsworth, City Clerk.
South Dakota	Bridgewater	Mar. 6, 8 p.m.	Constr. water tank and tower, cap. 50,000 gal. height 125 ft.	O. A. Rietz, City Auditor.
Wyoming	Sheridan	Mar. 6, 3 p.m.	Constr. water supply main with approx. 7,934 ft. of 14-in. and 760 ft. of 10-in. c. i. pipe	Arnold Tschirgi, City Engr.

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
WATER SUPPLY (Continued)				
New York	Ogdensburg	March 7	Constr. covered sand filters, pipe lines, steam and elec. pump machinery, etc.	Jas. M. Wells, Chm. Bd. W. Com.
Mississippi	Macomb City	March 7	Sinking artesian well	J. D. Harrell, City Clerk.
Georgia	Rockmart	Mar. 7, 2 p.m.	Furn. mach. mat. and construct. w. w. and sewerage system	Mayor, Rockmart, wa.
North Dakota	Vermillion	Mar. 10, 2 p.m.	Drilling Artesian well	Irwin D. Aldrich, Secy. Re. Educa.
New Jersey	Spring Lake	Mar. 10, 2 p.m.	Furn. and install artesian water works plant	E. V. Patterson, Boro. Clerk.
Kentucky	Owensboro	Mar. 10, noon	Constructing water softening plant	E. B. Anderson, Chm. Elec. Lt. Com.
Massachusetts	Ft. Andrews	Mar. 10	Extending water mains and changing sewers	Ct. A. M. Miller, 263 Summer st. Bos.
Ohio	Troy	Mar. 11, 10 a.m.	Constructing water mains	A. E. Sinks, County Auditor.
Pennsylvania	Bristol	Mar. 20	Constructing water works and filtration plant	Jos. R. Grundy, Chm. Com.
Pennsylvania	West Telford	April 1	Constr. water works; approx. cost \$30,000	H. Z. Walpole, Secy. Water Co
BRIDGES				
Indiana	Indianapolis	Feb. 24, 10 a.m.	Constr. bridge over Crooked Creek	Albert Sahn, Co. Aud.
Florida	Jacksonville	Feb. 24, 9:30 a.m.	Constructing reinforced concrete culvert 15 ft. span	C. W. Ellis, Chm. Board.
Illinois	Clinton	Feb. 25, 1 p.m.	Constructing ten farm bridges	Frank Withers County Com.
Minnesota	Dauphin	Feb. 25, 8 p.m.	Constructing 2 reinforced concrete highway bridges	J. W. Johnston, Town Clerk.
Rhode Island	Providence	Feb. 25, 10 a.m.	Repairing Crawford Street Bridge	Wm. C. Pelkey, Clk. Bd. C. & S.
North Dakota	Yankton	Feb. 27, 7:30 p.m.	Constr. concr. bridge over Rhine Creek, 50-ft. span	John W. Summers, City Aud.
Florida	Jacksonville	Feb. 27	Constr. bridge over Hogans Creek	City Clerk.
Ohio	Springfield	Feb. 28	Constr. 120 ft. bridge over Mad river	County Commissioners.
Ohio	Urbana	Feb. 28, 10 a.m.	Rebuilding joint county bridge over Mad river	Joint Board of Comrs. Clark and Champaign Counties.
Virginia	Danville	Mar. 1	Constr. superstructure for bridge; est. cost \$40,000	J. O. Wayman, City Engr.
New York	Kingston	Mar. 2	Construct concrete bridge across creek at Eddyville	Jas. F. Loughran, Supt. Hwys.
Ohio	Lanark	Mar. 4, 6 p.m.	Bldg. rein. conc. single span bridge 70 ft. long	J. Boyd Caldwell, Chm. R. & B. Com.
Ohio	Port Clinton	Mar. 6	Constructing a draw bridge	W. H. Mylander, County Auditor.
New York	White Plains	Mar. 6, 10 a.m.	Rebuilding two bridges	E. A. Forsyth, Chm. Bd. Super.
California	Los Angeles	Mar. 6, 2 p.m.	Constr. concrete arches, graveled approaches, curbs, fences, hand-railing, pylons, etc., across Arroyo Seco and extension of Pasadena Ave.	H. T. Lelande, County Clerk.
California	South Pasadena	Mar. 6, 2 p.m.	Constr. 6 arch concr. bridge, 600 ft. long	Wm. L. Cox, City Clerk.
Wisconsin	Janesville	Mar. 7, 2 p.m.	Constr. 2 bridges across Rock River, one 384 and one 264 ft. long	W. F. Carle, Chm. St. Assess. Com.
Wisconsin	Hamilton	Mar. 11, 10 a.m.	Construction of bridge and road fill	J. E. Brate, County Auditor.
LIGHTING AND POWER				
Nebraska	Omaha	Feb. 28, 8 p.m.	Furn. street lighting with incandescent street lamps, includ. lighting, extinguishing, cleaning, repairing, maintaining, painting posts, for period of 3 years	Dan B. Butler, City Clerk.
Ohio	Cincinnati	Feb. 28	Lighting by electricity streets and squares for ten years	John J. Wenner, Clk. Bd. Pub. Serv.
Ohio	Atlantic	Mar. 1	Imp. Elec. Lt. and Power Plant, probable cost \$40,000	E. T. Nichols, City Clerk.
Ohio	Monterey, N. L.	Mar. 1	Erection of gas plant	Lewis Lukes, Apartado 58.
Ohio	Strathcona	Mar. 1	Install engines, boilers and generators	David Ewing, Ch. Engr.
Pennsylvania	Coraopolis	Mar. 1, 7 p.m.	Furn. one 1,500,000 gal. triplex pump; one 150 h.p. gas eng. for driving pump; two 225 h.p. gas engines, to be dir. con. to 175 K.V.A., 2,300 volts, 60 cycles, 3-phase alter. cur. gener.; one 75 h.p. gas engine to be dir. con. to 50 K.V.A.; two 175 K.V.A., 2,300 volts, 60 cycles, 3-phase alter. cur. gener. comp. with exciters; one 50 K.V.A.; one 5-panel switchboard, compl. one 50-light series, luminous or metallic flame arc lamp equipment complete.	E. C. Harper, Borough Clerk.
Massachusetts	Boston	Mar. 4	Furn. and install approximately 11,000 gas lamps with incandescent mantel burners; additional alternative bids for automatic lighting devices; special post extensions; and furnishing additional parts and repairs; also maintaining 11,000 gas lamps for period of ten years; city to have option of installing automatic lighting device at any time	Louis K. Rourke, Comr. Pub. Wks.
FIRE EQUIPMENT				
New York	New York	Feb. 27, 10:30 a.m.	Furn. two automobile hose wagons; also two 1½ ton mot. tr.	R. Waldo Fire Comr.
Minnesota	Helena	Feb. 29, 8 p.m.	Furn. comb. auto. fire wagon, carry, 2,000 ft. hose and one 35 gallon chemical tank	J. A. Mattson, City Clerk.
Minnesota	Bozeman	Mar. 2, 5 p.m.	Furn. 80 to 90 h.p. A. L. A.M. rating auto, chem. gasoline wagon with speed of 45 mi., including 1,200 ft. of 2½ hose, 40-gal. chemical, tank, etc.	A. M. Brandenburg, City Clerk.
Ontario, Can.	Ottawa	Mar. 14, noon	Furn. comb. automobile fire engine of pump, capacity of 700 to 800 gallons a minute	John Henderson, City Clerk.
New Jersey	Princeton	July 5	Furn. auto pumping engine	E. M. Updike, Chm. F. & W. Com.
MISCELLANEOUS				
Pennsylvania	Wilkes Barre	Feb. 24, noon	Constructing police station	Fred H. Gatten, City Clerk.
Alabama	Gadsden	Feb. 25	Constructing county jail	Judge Herzberg, Probate Judge.
Michigan	Escanaba	Feb. 25, noon	Constructing public bath house	Geo. M. Mashek, Pres. Bd. Pk. Comrs
Missouri	Topeka	Feb. 27, noon	Furnishing 12 dump wagons with two-yard beds	C. B. Burge, City Clerk.
California	Sacramento	Feb. 27	Improving South Side Park	M. J. Desmond, City Clerk.
Indiana	Logansport	Feb. 28	Two boilers and resetting old ones	Wm. Pickett, City Clerk.
Minnesota	Minneapolis	Mar. 1, noon	Furnishing and delivering one ton motor truck; 4 motor cycles; 1 gasoline launch; twelve 16 ft. cedar row boats; 50 canoes with wood sponsons 16 to 18 ft.; 500 park settees	J. A. Ridgway, Secy. Park Com.

STREET IMPROVEMENTS

Helena, Ark.—City has decided to pave number of streets.

Phoenix, Ariz.—Bids will soon be asked proposed paving of streets; pavement consist of hydraulic concrete base covered with asphalt, from specifications by engineer A. P. Campbell, Riverside, Cal.—P. Turney, City Engineer.

Los Angeles, Cal.—Plans are being prepared for the improvement of Alhambra from Mission road to the city limits; distance about 16 blocks; the roadway will 50 ft. wide, paved with asphaltum, and 25-ft. parkways.—Homer Hamlin, City Engineer.

San José, Cal.—Surveys and plans have been prepared for street improvements; cost \$40,000.

New Britain, Conn.—Board of Public Works is considering resurfacing of West st. at cost of \$7,000.

New Castle, Del.—Citizens have voted \$10,000 bonds for improvement of streets.

Wilmington, Del.—Highway Commissioner Price has been instructed to advertise for bids for building road from Lower Brandywine Church to Pennsylvania State line.

Waycross, Ga.—City is considering paving of sidewalks on principal streets; bids for about 10,000 yds. of concrete walk will be invited at once.

Batavia, Ill.—Board of Local Improvements has adopted plans for paving Main st.; macadam and tarvia to be used; cost about \$9,071.50.

Belvidere, Ill.—Board of Local Improvements has approved project to macadamize one mile of street near City Park.

Glencoe, Ill.—Plans are being prepared by Engineers Windes & Marsh, Winnetka, for five or six miles of pavement and five to six miles of concrete walks.

Evansville, Ind.—Board of Works is considering improvement of Virginia st.

Michigan City, Ind.—County Commissioners have ordered building of proposed McBride macadam road.

Muncie, Ind.—Board of Public Works will at once order paving of four streets.

Richmond, Ind.—Bids will be received by the Board of Public Works about March 5 for 15,000 sq. yds. of paving, with concrete curb and gutter, on North D and North E sts.—F. R. Charles, City Engineer.

Hampton, Ia.—City proposes to pave four blocks with brick and three alleys with cement.—Hall & Adams, Centerville, Engineers; W. H. Lackey, City Clerk.

Topeka, Kan.—City will pave about 70 blocks this spring, 24 with brick and the balance with asphaltic concrete.—W. Fulton, City Engineer.

Annapolis, Md.—County Commissioners have appointed President Smith and County Engineer Hayman to confer with State Roads Commission as to advisability of turning over to County to build about a mile and a half of road in Fifth District, running southerly from Shapley Station.

Chestertown, Md.—Town Commissioners have decided to pave streets with stone or slag.

Detroit, Mich.—Cost of paving Brandon ave. with cedar block has been estimated at \$3,173 if Berea curbstone is used and \$3,621 for Medina curb.—J. J. Haarer, Commissioner of Public Works.

Duluth, Minn.—City is considering \$300,000 expenditure for pavements.

Kansas City, Mo.—Board of Public Works is considering repaving of 15th st.—Wm. Buchholz, President.

Bogota, N. J.—Bids have been asked by Borough Clerk Ross for grading and macadamizing Fallsdale ave.

Trenton, N. J.—County Commissioners are considering macadamizing Yardville, Newtown and Windsor and White Horse to Hamilton Square roads.

Trenton, N. J.—Council's Street Committee will ask for \$60,000 appropriation in the municipal budget for next fiscal year.

Buffalo, N. Y.—Bids will soon be received for paving with asphalt and brick Lamont st., 26 ft. wide, Ontario and Heyward sts., and Northrop pl., 20 ft. wide, Main and Winspeare sts.

Lancaster, N. Y.—Citizens have voted \$43,650 bonds to pave four streets.

Mamaroneck, N. Y.—Village is considering a special election on raising of \$200,000 to pave Boston Post road and Mamaroneck ave. entire length of village, improve Halstead ave. and old White Plains road, and make other improvements.

Niagara Falls, N. Y.—Council is urging resurfacing of Falls st.

Port Washington, L. I., N. Y.—Sixth, Bay View and Mackey aves. are to be macadamized at cost of about \$8,000.

Poughkeepsie, N. Y.—Board of Public Works has ordered improvement of Mill, Washington and Cannon sts.

Asheville, N. C.—Buncombe County is considering election on \$100,000 bonds for improvement of roads.

Elizabeth City, N. C.—Board of Control has unanimously rejected contract as it had been awarded to Peters Paving Co. by Board of Aldermen on Feb. 7.

Pittsboro, N. C.—Citizens will vote March 11 on \$5,000 of bonds for street improvements.

Barberton, O.—Bids will be received about March 1 for street paving; cost \$31,000.—H. W. Alcorn, City Engineer.

Beach City, O.—Plans have been prepared by Engineer L. E. Chapin, Central Trust Bldg., Canton, for brick paving, curbing and sewerage to cost about \$15,000.

Canton, O.—City has decided to construct seven miles of paving this year.—B. F. Faust, City Clerk.

Cincinnati, O.—Estimated cost of proposed new pavement on Oak st., from the east line of Highland avenue to west line of Reading road, has been filed with Director of Public Service Sundmaker; proposed improvement of State ave., 6th st. to Harrison ave., also handed in, is \$148,452.

Cincinnati, O.—City Engineer Shipley has submitted approximate estimate for improving of Ravine st. with macadam, from Warner st. to its northern terminus, at cost of \$30,971.

East Liverpool, O.—Council is considering improvement of 21st st. at cost of \$100,000.—C. V. Beatty, Director Public Service.

Hamilton, O.—Plans are being prepared by City Engineer F. E. Weaver for paving eight squares on Chestnut and Charles sts.; vit. brick, wood block, asphalt or bitulithic pavement will be used.—C. M. Robertson, City Clerk.

Hamilton, O.—L. A. Dillon, Surveyor, Butler County, is preparing preliminary plans for three miles of macadam improvement of Lower River road.—J. E. Brate, County Auditor.

Middletown, O.—City Engineer G. B. Hall is preparing plans for about 1½ miles of paving; vit. brick, wood block, asphalt or bitulithic paving.—John Kuntz, City Clerk.

Montpelier, O.—Citizens have voted \$22,000 to pay village's portion of the expense of paving Main and Empire sts.; total cost of the improvement is \$64,700.

Orrville, O.—Plans are being prepared by Engineer L. E. Chapin, Central Trust Bldg., Canton, for 1½ miles of brick paving.

Springfield, O.—Estimates have been made for macadamizing Summit ave. and grading two streets.

Woodsfield, O.—Monroe County is considering construction of number of roads.

Sapulpa, Okla.—Additional paving to extent of 40 blocks to cost about \$150,000 has been ordered by Commissioners; bids will be received.

Forest Grove, Ore.—Spannard & Richardson, Portland, will make a survey of streets in the business section of this city which will be paved this summer.

Hood River, Ore.—City is planning to begin street paving as soon as weather conditions will permit; specifications and estimates of the cost of different kinds of paving have been submitted to Council by the City Engineer.

Carbondale, Pa.—Plans have been prepared for paving Mill st.

York, Pa.—Paving of South Queen, East and West Philadelphia and King sts. is being considered.

Corpus Christi, Tex.—Council will ask new bids for furnishing cement during year.

Dallas, Tex.—Bids will be asked for paving 10 thoroughfares in South Dallas with either brick, bitulithic or creosoted wood block; specifications have been approved for paving about 32 miles of streets.

Eagle Lake, Tex.—Citizens will vote March 7 on \$250,000 bonds for construction of roads.

Grapeland, Tex.—Precinct No. 5 has voted bonds for construction of good roads.

Houston, Tex.—Residents of Webster ave. are urging paving of that thoroughfare with brick.

Graham, Va.—Citizens will vote on \$10,000 bonds for street improvements and sewer construction.—V. L. Sexton, Mayor.

Harrisonburg, Va.—Tazewell County will vote March 11 on \$750,000 bonds to build permanent roads.

Auburn, Wash.—Paving of one mile of streets is being considered.

Pasco, Wash.—Council is considering system of cement sidewalks, curbs and parking in three additions to city; cost about \$40,000.

Seattle, Wash.—Bids will be readvertised for grading and curbing Oregon st.

South Bend, Wash.—City is considering laying of about three miles of paving.—V. M. Eager, Bellingham, Engineer.

Marinette, Wis.—Council has decided to pave six blocks with cement and one with macadam this year.

Superior, Wis.—To build three miles of permanent road on Bardon ave. road and three miles on 18th st. road, to improve all other roads in county which are in need of repair and to construct four bridges, is work planned for coming year by the Roads and Bridges Committee of County Board.

Calgary, Alta., Can.—Citizens will vote on \$20,000 by-law for street paving plant.—A. G. Graves, City Commissioner.

CONTRACTS AWARDED

Chico, Cal.—To Ernest F. Graessler for building 50 concrete street crossings, more or less, by Board of City Trustees, 22½c. per sq. ft.

Riverside, Cal.—Macadamizing 1¼ miles of the Box Spring Canyon road, to Oscar Ford, \$15,275.

Atlanta, Ga.—Street and sidewalk work for the year, to R. O. Campbell Coal Co., for cement \$1.36 per bbl.; to Birmingham Chert Co., Gate City chert, \$1 per ton; to Southern Tile and Stone Co., concrete curbing, 30c. per ft.; to Southern Tile and Stone Co., tile sidewalks, 94c. per sq. yd.; to same, sheet cement driveways, \$1.25 per sq. yd.; to Georgia Granite Co., brick sidewalks, 51c. per sq. yd.; to Pine Mountain Granite Co., granite curb, 37½c. per lin. ft.; to Atlanta Tile Co., tile for repair work, 12½c. each.

Chicago, Ill.—By Repair Department, Division of Bridges, sectional road pavement, 2½ ins. thick, 2,000 sq. yds., \$2.35 per sq. yd.; 3½ ins. thick, 2,000 sq. yds., \$2.70 per sq. yd., to Geo. P. Cullen, 78 La Salle st.

Winnetka, Ill.—To Indiana Paving Brick and Block Co., for 16,000 sq. yds. brick paving on concrete base, and 15,000 ft. combination curb and gutter.—Windes & Marsh, 598 Birch st., Engineers.

Bloomfield, Ind.—Macadamizing the W. W. Clogston road in Washington Township, to Stafford & Carpenter, Lyons.

Fairmount, Ind.—By County Commissioners, to Will Williams and Jacob Drock for construction of A. B. Scott gravel road which lies wholly within corporate limits of city, \$4,042.

Hartford City, Ind.—By Commissioners of Blackford County, to Charles Clamme for the construction of county line road.

Mount Vernon, Ind.—Building two miles of Road, Robb Township, to S. A. Gano, city, \$6,791.

Rushville, Ind.—Building macadam road, Ripley Township, to Smith & Pierce, Zionsville, \$7,775.

Tipton, Ind.—Constructing county roads, to Barnes & Granel, Logansport, \$5,714; to Brown & Hines, city, \$7,198, and to Isaac Cox, city, \$6,387.

Crowley, La.—Additional cement sidewalk contract for eight miles of 4-ft. walk, to De Jersey & Bernard.

New Orleans, La.—To John A. Craven & Co., city, for constructing subsurface drains, curbs and gutter bottoms in Milan st., from South Franklin to South Claiborne st., \$18,524.70, and on Pine st., from Magnolia to Jeannette st., \$7,533.30; to Southern Bitulithic Co. for repaving Milan st., \$19,119; to Barber Asphalt Paving Co. for paving Pine st., \$8,688.

Baltimore, Md.—Furnishing cement year, to W. Wirt Clarke & Son, \$1.17 1/2 lb.

Boston, Mass.—Grading and surfacing Lynn Fells Parkway, Tremont st., Bellevue ave., to Rowe Contracting, Brighton, 9,000 cu. yds. earth grading, 3,500 cu. yds. filling material, 50c.; 450 of 8-in. vit. and 70 ft. 10-in. pipe, 40c.; 45c.; 29 catch basins and manholes, and \$25; 124 ft. straight edge stone, 580 ft. curved edge stone, \$1.10 and \$1.3,000 cu. yds. loam, \$1.20; roadway facing, 2,709 sq. yds., 50c.; walk surface, 1,000 sq. yds., 20c.; total \$10,156.

Detroit, Mich.—Supplying asphaltic for year, to Craig Oil Co., tank cars, \$ per ton.

St. Paul, Minn.—Macadamizing Mill View and Bald Eagle roads, to Gus H. White Bear, \$5,437, and for laying graveling Lexington ave. extension, George E. Nienaber, \$7,735.

New York, N. Y.—Maintaining asphalt pavements on various streets: Contract Nos. 1 and 2, to Vulcanite Paving Co., \$722 and \$21,714, respectively; No. 3, Sicilian Asphalt Paving Co., \$25,588; 5, to Barber Asphalt Paving Co., \$21,137.

Hudson, O.—To Paul & Henry, Barton, for five miles of brick paving.

Erie, Pa.—Laying asphalt on W. 20th to John McCormick & Son, \$1.16 per 28c. for base and 50c. for Bessemer bl. gutters.

Wilkes Barre, Pa.—Paving Fairbairn to Jno. E. James, \$2.09 per sq. yd.; curb red stone, to the Keystone Quarry Co., per ft.; Kulp ave., to D. M. Rosser Construction Co., \$2.15 per sq. yd.; curb concrete, to William Bowen & Co., 60c. ft.; West Elm and Auburn sts., to John James, \$2.09 per sq. yd.; curbing, stone, to William Bowen & Co., 72c. per Franklin st., to Frank Anstet, \$2.22 per yd.; curbing, red stone, to William Bowen & Co., 60c. per ft.; with exception of Franklin st., which will be paved with Metropolitan block, brick manufactured by Clearfield Clay Working Co., Clearfield, Pa., will be used.

Newport, Tenn.—By Cocke County Commissioners, for the completion of 35 mi. of pike roads, to T. L. Peters and J. Gibson, of Knox County; south side Pigeon River, earth, 81½c. per cu. yd.; loose rock, 38c. per cu. yd.; solid rock, 78c. per cu. yd.; north side of Pigeon River, earth, 19c. per cu. yd.; loose rock, 38c. per cu. yd.; solid rock, 69c. per cu. yd. macadamizing, \$1.48 per cu. yd.

Seattle, Wash.—Grading 45th ave. S. to Mouglin & Price, 333 Burke Bldg., \$51.80.

Huntington, W. Va.—To Harrison Dean: Adams ave., 1,780 sq. yds. Carbrick; Johnson's Lane, 4,120 sq. yds. Carlyle brick; 5th st. West, 750 sq. yd. Portsmouth granite block; 6th st. W., sq. yds. Portsmouth granite block; 2d E., 2,495 sq. yds. Portsmouth granite block; 6th st. E., 2,495 sq. yds. Portsmouth granite block; 5th st. E., 3,165 sq. yd. Portsmouth granite block; 7th st., 4 sq. yds. Portsmouth granite block; 7th st., 2d and 4th avenues, Portsmouth granite block; 7th st., 5th and 7th avenues, Portsmouth granite block; 7th st., 2d and 3d avenues, 6-in. concrete base, same brick; to Freshwater Sons: 7th ave. and 10th st., 8,690 sq. yd. Carlyle and Porter brick; 7th ave. and 8th sts., Porter brick; 7th ave. and 10th sts., and 10th st. and 7th ave. C. and O. Railroad, concrete base, same material; 13th st., about 2,000 sq. yd. Carlyle brick; 5th ave., 13,870 sq. yd. Portsmouth granite block; 6th ave., 4 sq. yds. Portsmouth granite block; George Hinkle: 11th st., 6th and 7th ave., 1,307 sq. yds. Athens brick; 21st st., 2 sq. yds. Athens brick; 4th ave., 8,730 sq. yds. Portsmouth block; Cemetery road announced to be awarded to Hinkle, but contract not yet let; bids on brick ramp from \$1.72 per sq. yd. down; concrete curb and gutter will be used in all contracts save in those governing paving of 7th ave. between 9th and 10th sts., 10th st. to C. and O. Railroad and 7th st. between and 3d ave.; filler has not yet been decided upon although it will probably be what is designated as pitch filled.

BIDS RECEIVED

Buffalo, N. Y.—Concrete sidewalk construction and repair: Anthony Cervi, 87 per sq. ft.; Robert Seibert, 89-10c.; Crescent Concrete Co., 89-19c.; Liberty Concrete Paving Co., 9c.; Leonard Gentile, 9c.; Carde M. Ursitto, 9½c.

New York, N. Y.—Repairing sheet asphalt or asphalt block roadway pavement in Manhattan Borough, where directed during year, (a) 9,500 sq. yds. roadway pavement of sheet asphalt, including binder course to replace, per sq. yd., (b)

ys. roadway pavement of asphalt to replace, per sq. yd., (c) 25 cu. yds. and cement concrete, per cu. yd., (d) s; Barber Asphalt Paving Co., 30 ch st., (a) \$1.12, (b) \$1.94, (c) \$7.88, \$12.053; Sicilian Asphalt Paving Co., ark Row, (a) \$1.57, (b) \$1.90, (c) \$7, \$15.495; Uvalde Asphalt Co., 1 Broad- (a) \$1.25, (b) \$1.90, (c) \$5, (d) \$13.145.

rkfolk, Va.—Paving at the Navy Yard: s—McGuire, City Hall ave., \$26,975; s—Mlayrant Co., Charleston, S. C., \$28-, Field, Barker & Underwood, Inc., de Bldg., Philadelphia, Pa., \$23,550; s—Lawson, 834 W. Highland ave., \$26-, Atlantic Bitulithic Co., Richmond, \$24-, Barber Asphalt Paving Co., Land Title Philadelphia, \$21,544.20.

lepton, Wis.—Laying 8,000 sq. yds. g: (a) brick block, (b) creosote wood, (c) 1 concrete, (d) No. 2 concrete, (e) asphalt, (f) asphalt, (g) macadam; ing & Shenley, St. Paul, Minn., (a) (b) \$2.60; J. F. Hill, Chicago, Ill., (a) Aug. Kunppel, Appleton, (c) \$1.45, \$1.22½; Kasel Contracting Co., Me- (c) \$1.67, (d) \$1.45; C. Johnson, osh, (a) \$2.09, (b) \$2.41, (c) \$1.56, (d) (g) \$1.39; Hackworthy Construction Appleton, (c) \$1.41, (d) \$1.24; J. an, Green Bay, (a) \$1.99, (b) \$2.49, \$1.44, (d) \$1.34; White Construction Milwaukee, (e) \$1.82; Western Imment Co., Racine, (a) \$2.12, (b) \$2.38, 1.70, (d) \$1.90, (e) \$2.04, (f) \$2.09.

SEWERAGE

ola, Ga.—City is considering election nds for construction of sewer system.

anzville, Ill.—Installation of sewerage m is being considered.

infield, Ill.—Council will consider onition of a sanitary and storm water r; cost \$50,000.—S. L. Wyley, City ; H. T. Hallett, Aurora, Engineer.

ada, Ia.—Council is considering inction of sewer system.

eyville, Kan.—Plans are being preal for construction of seven miles of 15-in. vit. pipe sewer in Sanitary r District No. 5.

ncy, Mass.—City has petitioned the Legislature for authority to issue 000 bonds for extension of sewers.— T. Shea, Mayor.

roit, Mich.—Board of Public Works soon let contracts for lateral sewers 2126, 2134, 2176, 2183, 2184, 2185, 2190, 2192 and 2193.—J. J. Haarer, Commisr.

uth, Minn.—Board of Public Works passed favorably upon the petition for sewer in East Superior st.; estid cost \$5,000.

rks, Miss.—Council has ordered \$5,000 issue for sewerage and water works.

ghamton, N. Y.—City Engineer John lies has sent 32 sets of plans, coming intercepting sewer system, sewage sal plant and Fifth Ward trunk sewer m, to Albany for approval of State Deent of Health.

maroneck, N. Y.—Citizens are considerelection on bonds for constructing t sewer into Long Island Sound and ng other improvements.

racuse, N. Y.—Estimates have been red from the City Engineer on cost of small sewer contracts and ordinances ted fixing the amounts as follows: nson st., \$1,050; Dorothy st., \$1,001; on st., \$1,150.

herst, O.—Engineer L. E. Chapin, ral Savings Bank Bldg., Canton, has ared plans for a gravity sanitary sewer disposal plant, including 8, 10 and 12-in. pipe and two automatic syphons; \$25,000.

ach City, O.—Plans have been preed by Engineer L. E. Chapin, Central Savings Bank Bldg., Canton, for sewers, rising 900 ft. of 18-in., 379 ft. of 15-nd 240 ft. of 12-in. pipe, 30 manholes 11 catch basins.

nton, O.—City has decided to construct miles of sanitary sewer, 4 miles storm rs, 4 miles of storm water sewer and t sewers, 1¼ miles, this year.—B. F. t, City Clerk.

nt, O.—Plans are being prepared by neer L. E. Chapin, Central Savings r Bldg., Canton, for one mile of gravity ary sewer; cost \$4,000; will require 8 10-in. vit. piping, 12 manholes and flush tanks.

ddletown, O.—Preliminary plans have e prepared by City Engineer G. B. Hall 7,600 lin. ft. of 12 to 24-in. vit. tile rs.—C. C. Dell, Director of Public ice.

rest Grove, Ore.—Spannard & Richon. Portland, will make survey and ate of cost of proposed sewer system.

ndelton, Ore.—Council has decided to id sewer system for one mile.

rtland, Ore.—Council is planning to ruct trunk sewer from Woodlawn

northwest to lower end of peninsula with opening into Columbia River.

Bristol, Pa.—Council will at once ask bids for construction of proposed sewer and water system; \$163,000 bonds will be issued.

Cheraw, S. C.—Citizens will vote on \$70,000 bonds for construction of sewer system and water works.

Newport, Tenn.—Citizens will vote on \$50,000 bonds for construction of sewer system and water works.

Dallas, Tex.—Municipal Commission has instructed City Secretary to advertise for bids for laying large storm sewer in South Harwood st., Jackson st., to Grand ave.

Calgary, Alta., Can.—Citizens will vote on \$40,000 by-law for sewer connections; by-laws are being prepared for large trunk sewer and lateral extensions; cost about \$500,000.—A. G. Graves, City Commissioner.

CONTRACTS AWARDED

Denver, Col.—Building sanitary sewers in a part of Subdistrict No. 6 of East Side Sanitary Sewer District No. 1, to Denver and Pueblo Construction Co., \$16,102.99; other bidders: Dillon Stone Co., \$16,145.30; National Construction Co., \$16,654.31; Municipal Construction Co., \$16,946.57; S. M. Kerns, \$17,081.66; Gaffy & Keeffe Construction Co., \$17,781.12.

St. Joseph, Mo.—Building sewers: John Marnell, two contracts; 95c. for 10-in. sewer pipe, and 98c. for 12-in. pipe; to D. B. Kelley, 84c. and 94c.; to E. F. Mignery, 67½c. and 77½c., respectively.

Summit, N. J.—Construction of 4,900 lin. ft. of 8 and 10-in. vit. pipe sewer in Springfield ave. and Tulip st., and manholes, excav., etc., to Russell Klockner, Trenton, \$7,902; other bidders: John C. Shrade, \$12,908; Fuaco Construction Co., \$10,878; Michele Garofano, \$9,082; P. Mauriello, \$16,656; New Rochelle Construction Co., \$10,940.—John S. Stiger, City Engineer.

Frankfort, S. D.—To Jones & Roderick, 810 W. 13th st., Sioux Falls, for construction of certain sewers, \$8,015.14.—Robt. J. Dickson, City Auditor.

Corpus Christi, Tex.—Furnishing sewer pipe, to San Antonio Sewer Pipe Co., \$7,466.75; manholes, to Hardwick-Abot Mfg. Co., \$7.90 each.

BIDS RECEIVED

Richmond, Ind.—Reliable Construction Co., Indianapolis, was lowest bidder Feb. 13 for following work: 867 lin. ft. 42-in. concrete pipe, \$4.35; 556 lin. ft. 24-in. vit. pipe, \$3.25; 1,849 lin. ft. 20-in., \$2.72, and 449 lin. ft. 12-in., \$2.15.—F. R. Charles, City Engineer.

Yorkville, N. Y.—Installing sewer system, Samuel Bonn, Syracuse, about \$21,000; C. T. Hookway, Syracuse, \$24,000; J. W. Johnston, Utica, no lump sum given; Haden & Corbin, Oxford, \$23,970; A. T. Darrow, Canandaigua, \$25,192; Frank George & Co., Rome, \$23,302; Albert Gaffney, Syracuse, \$23,239; Eddy & Colonglo, Rome, \$18,108; J. B. O'Rourke & Co., Boston, no lump sum given; Antonio Rienzo, Rome, \$24,545.

WATER SUPPLY

Gadsden, Ala.—Superintendent of Water Works M. E. Jones has asked for \$25,000 for extension of water mains.

Snyder, Ark.—Citizens have voted \$40,000 bonds for extension of water works and electric light system.

Lankersheim, Cal.—Board of County Supervisors, Los Angeles, has granted Edward Varney franchise for water distributing system.

Rockvale, Col.—City is considering improvements to water system, including impounding reservoir; cost about \$18,000.

Senola, Ga.—City is considering election on bonds for construction of water works.

Burley, Ida.—Council is considering granting of franchise to Chas. H. Helmer for water works.

Arenzville, Ill.—Installation of water system is being urged.

Homewood, Ill.—Plans are being prepared by Engineer Jas. H. Thompson, 324 Dearborn st., Chicago, for water works system, including 5 miles of pipe, 10 hydrants and 30 valves.

New Athens, Ill.—Town will construct water works system at cost of \$9,000.

Fort Wayne, Ind.—National Board of Fire Underwriters has recommended installation of number of water mains and hydrants; installation of high pressure is being considered.

Mishawaka, Ind.—City is considering employment of first-class consulting engineer some time in early summer to design pumping station for East Mishawaka.

South Bend, Ind.—City Trustees have decided to build pumping station in Portage Park.

Manning, Ia.—Council is considering construction of sewer system.

Elk City, Kan.—Installation of water works system is under consideration.

Smith Center, Kan.—City is considering installation of large reservoir and concrete dam.

Newport, Ky.—Construction of reservoir is being considered.

Winthrop, Me.—Budley & Sawyer, Manchester, N. H., have completed surveys and are making plans for water works.—Frank L. Bishop, Chairman Water Commissioners.

Cambridge, Md.—City will expend \$25,000 for water works improvements.

Cuyuna, Minn.—Citizens have voted \$10,000 bonds for erection of good water works system, tapping artesian well strata at 100-ft. level.

Madison Lake, Minn.—Citizens have voted to issue bonds for water works; bids opened Feb. 6 for drilling an 8-in. well approximately 200 to 300 ft., from plans of John Wilson, Mankato, have been rejected; new bids will be received early in March.—F. J. Knoff, Village Clerk.

Kinney, Minn.—Village Council is considering construction of water works.

Marks, Miss.—Council has ordered \$5,000 bond issue for water works and sewerage.

Cole Camp, Mo.—Citizens will vote on \$10,000 bonds to install water works plant.

Pacific, Mo.—Citizens will vote on installation of water works plant.

Kenilworth, N. J.—John Hiller, Jr., Frank H. Kipling and Fritz H. Krantz have been appointed by Borough Council to investigate proposals for installing municipal water plant.

Farmington, N. M.—Election on bonds to install municipal water system is being considered.

Bath, N. Y.—Citizens will vote in March on extension of water mains on four streets; water company will do work and village is to pay rental.

Jamestown, N. Y.—City is planning to construct storage reservoirs having capacity of 15,000,000 gals.

Schenectady, N. Y.—Bids will be asked by Board of Contract and Supply for furnishing pipe bends and special fittings for Water Department.

Westbury, L. I., N. Y.—Westbury Water District has been incorporated; Walter E. Sexton, Mineola, has completed plans for proposed water works; cost about \$60,000.

Westbury, L. I., N. Y.—Town is considering construction of \$60,000 water works plant.

Bellaire, O.—Council has passed ordinance to authorize Directors of Public Service to employ consulting engineer to draft plans and specifications necessary to place filter plant in operation and appropriating \$2,500 for work.

Canton, O.—City has decided to construct four miles of water mains this year.—E. F. Faust, City Clerk.

Elyria, O.—Aetna Engineering Co., 125 La Salle st., Chicago, will investigate water works situation.

Kenton, O.—Riggs & Sherman Co., Toledo, will prepare plans for remodeling water works plant.

Lodi, O.—Engineer L. E. Chapin, Central Savings Bank Bldg., Canton, has completed plans for gravity system of water works, including reservoir, 5,280 ft. of 8-in., 3 miles of 6-in. and ½ mile of 4-in. c.-i. pipe and 26 hydrants; cost \$22,000.

Springfield, O.—Superintendent Cotter has recommended \$10,000 expenditure for extensions to water mains.

Sugarcreek, O.—Engineer L. E. Chapin, Central Savings Bank Bldg., Canton, has prepared plans for a system of water works; about 8,000 ft. of 6-in. and 2,700 ft. of 4-in. pipe, 15 hydrants and 10 valves will be needed.

Oklahoma City, Okla.—Citizens have defeated proposition to issue \$1,250,000 bonds for water works improvements.

Sentinel, Okla.—Citizens will vote in March on \$3,000 bonds for extension of water works.

Woodward, Okla.—Bids will soon be received for construction of a system of water works; iron pipe and pumping equipment will be needed. F. H. Kibourn can be addressed.

Silverton, Ore.—Citizens have voted \$75,000 bonds for installation of water system.

Bristol, Pa.—Borough Council has authorized advertisement for bids for the construction of proposed municipal water works and sewer system; \$163,000 bonds will be issued.

Lebanon, Pa.—Council is considering purchase of auxiliary pump for Hammer Creek station.

Schuylkill Haven, Pa.—Borough has voted \$50,000 bonds to build additional reservoirs.

Cheraw, S. C.—Citizens will vote on \$70,000 bonds for construction of water works and sewer system.

St. George, S. C.—City is considering election on \$17,000 bonds for construction of water works and electric light system.

Arlington, Tenn.—City is considering election on \$3,000 bonds for construction of water plant.—W. A. Taylor, Mayor.

Archer City, Tex.—Citizens will vote on bonds for water works construction.

La Grange, Tex.—Council is considering taking over of local water works plant; improvements are proposed.

Luray, Va.—City will require 5,000 ft. of 6-in. and 13,100 ft. of 4-in. c-i. pipe. S. O. Judd can be addressed.

Elma, Wash.—Council is considering extension of water works; resolution has been adopted authorizing employment of a competent engineer to make surveys.

Ellensburg, Wash.—Question of municipal ownership of water works will be submitted to vote of citizens at special election to be called by Mayor F. E. Craig in near future.

North Bend, Wash.—Installation of water system to supply Marshall and this city is being considered.—L. J. Simpson, Mayor.

Tacoma, Wash.—Commissioner Nicholas Lawson, of Department of Light and Water, is planning to improve water supply for next summer by drilling another large, open well at a point about opposite South Lawrence and 34th sts., from which he hopes to obtain 3,000,000 gals. every 24 hours.

Calgary, Alta., Can.—Citizens will soon vote on \$245,000 by-law for water works extension; \$256,000 has already been voted.—A. G. Graves, City Commissioner.

Penticton, B. C., Can.—Contract will be let in two or three months for construction of water works system; cost about \$130,000.—F. E. Tiley, City Clerk.

CONTRACTS AWARDED

Anna, Ill.—Supplying water to city, to Bruchhauser Bros., 9½c. per 1,000 gals for 50,000 to 75,000 gals. daily; 8½c. for 75,000 to 150,000 gals. and 7c. per 1,000 for 150,000 to 300,000 daily.

Chicago, Ill.—Furnishing 3,514 tons of c-i. water pipe, to United States C. I. Pipe Co., 638 The Rookery, \$23.75 per ton for all sizes of pipe; special castings, to same; flange specials, \$54.25 per ton; hub and spigot specials, \$44.65 per ton; tapping connections, to T. A. Cummings Foundry Co., 1338 Clybourn ave.; lead pipe, one year's supply, to Gardner Lead Pipe Co., 1374 W. Lake st., 5.04c. per lb.; sewer pipe, 30,000 ft. 4-in., to Wm. E. Dee & Co., 108 La Salle st., 3 2-5c. per ft.; 600 ft. 6-in., 5c. per ft.; 600 ft. 9-in., 10c. per ft.

East Moline, Ill.—By Water and Light Committee, to J. P. Miller, representing Artesian Well Co. of Chicago, to drill artesian well.

St. Paul, Minn.—Equipping artesian wells at McCarron Lake with pumping machinery, to Robinson, Cary & Sands Co., St. Paul, lowest bidder, \$26,812.

Columbia, Mo.—Drilling two wells, to P. L. Crossman & Son, Joplin, \$4,428.

Niagara Falls, N. Y.—Furnishing about 35 tons of 26-in. c-i. pipe, to U. S. C. I. Pipe Co., \$22.40.

Huron, S. D.—To Frank Jaehn Construction Co. for pumping plant, for brick pump house, including stack base and steel stack complete, \$4,859; to W. D. Lovell, Minneapolis, for construction of a reinforced concrete reservoir, \$9,900; to E. J. Merkle & Co., Kansas City, for construction of a power plant for water works system, \$13,000, including complete pumping plant with opposed type of pumping engine; plant is to be completed and in operation for both domestic and fire service on Aug. 1, subject to liquidated damages of \$20 per day for any delay after that date; to Des Moines Bridge and Iron Co. for construction of steel tower and tank.

Corpus Christi, Tex.—Furnishing pumps, to Griggs Weaver Co., Dallas, \$4,024.

BIDS RECEIVED

St. Paul, Minn.—Equipment of the six artesian wells at McCarron Lake as follows: Baily & Marsh Co., Minneapolis, two bids, \$28,796 and \$25,796; Hanke & Eha, city, \$22,958; R. B. Whittaker, city, three bids, \$29,600, \$30,700 and \$32,200; Robinson, Cary & Sands Co., city, two bids, \$26,812 and \$27,165; J. G. Robinson & Co., city, \$37,090; propositions cover direct lift, the air lift and the centrifugal pump operated by electric current.

Huron, S. D.—Bids received by Engineer Wolff for proposed water works improvements, (a) brick pump house complete with steel stack and brick base, (b) brick chimney in place of steel stack and brick base: Cook Construction Co., Des Moines, Ia., (a) \$4,900, (b) \$1,400; Frank Jaehn Construction Co., city, (a) \$4,859, brick chimney, (b) \$2,006; Tanner Bros., Webster, (a) \$5,295, (b) \$1,380; Betz Construction Co., city, (a) \$5,425, (b) \$2,300; construction of the pumping plant, (a) steam plant, (b) oil engine plant, (c) gas producer engine plant: Betz

Construction Co., city, (a) \$15,800, (b) \$18,500, (c) \$16,690; Dwyer, Field & Co., St. Paul, (a) \$15,000, glider frame, \$14,200, (b) \$18,500, vertical engine, \$17,900, (c) \$16,000, (c) \$13,200 plus \$1.00 one unit in place of 2, \$1,000 extra for Bituminous producer; Fraser & Danforth, Rochester, Minn., (a) \$13,500; E. J. Merkle, Kansas City, Mo., (a) \$12,550, (c) \$13,000; J. G. Roberts, St. Paul, (a) \$12,733, opposed type of engine, (a) \$12,800, 18-in. stroke, one wheel type, (a) \$14,000, 18-in. stroke, two wheel type, (a) \$13,823, 24-in. stroke, (a) \$15,819, 24-in. stroke, opposed type, four bearings, (a) \$15,485, 24-in. opposed type, two bearings; Minneapolis Steel and Machinery Co., Minneapolis, (c) \$15,775, (c) \$9,800, one 80-h.p. unit; Gould Co., informal, Chicago, \$1,735, one 600-gal. triplex pump on foundation, \$1,894, one 800-gal. triplex pump on foundations; De La Veigne, informal, Kansas City, \$7,910, one 50-h.p. and one 80-h.p. H. A. engine, \$7,355, one 85-h.p. F. H. engine; for construction of reinforced concrete reservoir, Peter Nelson, Huron, \$12,400; Cook Construction Co., Des Moines, Ia., \$10,205; Des Moines B. and I. Co., Des Moines, Ia., \$12,200; Tanner Bros., Webster, \$10,480; Betz Construction Co., city, \$13,359; Iowa Bridge Co., Des Moines, Ia., \$10,400; W. D. Lovell, Minneapolis, \$9,900; Fraser & Danforth, Rochester, Minn., \$10,200, Ia and Ill, \$23,800; Lewis & Lederer, Sioux City, Ia., \$13,200; J. W. Turner, Des Moines, Ia., \$12,490; construction of steel water tower and tank complete, (a) in accordance with plans and specifications, (b) according to manufacturers' standard plan; Cook Construction Co., Des Moines, Ia., \$11,600; Des Moines B. & I. Co., (a) \$11,088, (b) \$10,825, 6 post special, (b) \$10,975, 6 post special with balcony, or \$10,600, 4 post standard; Iowa Bridge Co., Des Moines, \$11,398; W. D. Lovell, Minneapolis, \$11,800; Chicago B. & I. Co., Chicago, (a) \$11,800, (b) \$12,000; Minneapolis Steel and Machinery Co., \$11,320; Kennicott Co., Chicago, (a) \$11,466, (b) \$10,505; Black Hawk Construction Co. of Waterloo, Ia., bid on entire plant \$38,641 plus \$1,396 for brick chimney.

LIGHTING AND POWER

Eufaula, Ala.—City has selected engineer to estimate cost of constructing electric light plant.

Snyder, Ark.—Citizens have voted \$40,000 bonds for extension of electric light and water systems.

Wynne, Ark.—City will rebuild electric light plant, changing system from direct to alternating current; \$50,000 bonds will be issued.—W. H. Almut, Superintendent.

Elsmore, Cal.—M. A. Gardner and M. L. Camburn have secured franchise to lay and operate gas distributing system; test well for natural gas will be sunk.

Merced, Cal.—San Joaquin Light and Power Co. is preparing to make improvements to its gas system, including erection of gas holder, to cost about \$25,000.

Santa Ana, Cal.—Residents of Tustin have voted to establish lighting district.

Ventura, Cal.—Board of Trustees will consider establishment of municipal lighting plant.

Wilmington, Del.—A. C. Wood, Consulting Mechanical Engineer, Philadelphia, Pa., is preparing report on question of installing municipal lighting plant.

Hope, Ida.—Construction of municipal electric light plant is being considered.

Peoria, Ill.—Walter J. Spruck is circulating petitions asking for installation of ornamental lighting system from river to Glen Oak.

Cynthiana, Ind.—Town Board has sold bonds for construction of electric light plant.

Columbia, Ky.—Columbia Lighting Co. is considering installing 60-kw. direct-current generator; proposes changing system from alternating current to direct current.—A. H. Pallard, Secretary.

Baltimore, Md.—Robert J. McCuen, Superintendent of Lamps and Lighting, has submitted to Board of Estimates application of Patapco Electric and Manufacturing Co., of which Victor G. Bloede is president, asking for franchise to extend its lines to municipal buildings, so as to enable company to enter competition for lighting city.

Chestertown, Md.—Federal Engineering and Construction Co., Philadelphia, has applied to Town Council for a gas franchise.

McComb, Miss.—City has decided to construct electric light plant.

Moss Point, Miss.—Board of Mayor and Aldermen has granted a franchise to F. L. Brown, Chicago, for purpose of installing gas plant in this city; the franchise carries with it privilege of putting down pipes and mains.

New Ulm, Minn.—Citizens desire installation of gas plant and Council will grant

reasonable franchise to responsible for operating a carburetted water or gas plant of sufficient capacity for supplying 500 consumers.—H. P. Blomquist, Engineer.

Irondale, Mo.—James P. Ward is vested in proposed construction of power-electrical plant.

Kirksville, Mo.—Citizens will vote \$65,000 bonds for construction of plant to light streets and pump from Chariton River, six miles distant.

St. Joseph, Mo.—City is considering construction of addition to electric light at 3d and Sycamore sts.; \$250,000 will be issued.—Dave Lawlor, City neer.

Madison, N. J.—Council has decided expend \$16,687 in modernizing electric plant.

Toms River, N. J.—Ocean County Co. has asked for permission to lay in Shore road between this city and erton.

Mohawk, N. Y.—Board of Village trustees are investigating cost of municipal plant; Mohawk Gas Co. has petition franchise to furnish village with gas.

Woodmere, L. I., N. Y.—Woodmere Rockaway Electric Light and Power has been incorporated to carry on tions in the unincorporated village of Woodmere, Cedarhurst and Sewlet the incorporated village of Lawrence in Far Rockaway, Arverne, Harb Rockaway Park and Belle Harb Queens Borough; capital \$100,000.—F. Correa and Maurice Hotchner, York City; Edwin J. Johnson, Brooklyn; and Arthur Watson, Nyack, Direct

Mansfield, O.—City is considering lation of municipal lighting plant; date ing secured.

Sentinel, Okla.—Citizens will vote March on \$12,000 bonds for construction electric light system.

Ogden, Utah.—Council has granted franchise to A. L. Brewer, J. S. Lewes, Scowcraft, J. N. Sprague and A. T. to construct and operate electric plant and supply electricity for lamps and motors.

Sheboygan, Wis.—Sheboygan Gas Co. is planning to lay about two of new mains about the city this summer.

Calgary, Alta., Can.—Citizens will on \$380,000 by-law for electric light tensions and \$60,000 for conduit system. A. G. Graves, City Commissioner.

Winnipeg, Man., Can.—Smith, Ke Chace, Consulting Engineers, Toronto, and Winnipeg, have estimate additional machinery required for power plant now being constructed. Point du Bois for completion of dem ent will cost \$980,000.

CONTRACTS AWARDED

Long Beach, Cal.—By Southern California Edison Co. to Charles C. Moore & 321 Trust Building, Los Angeles, for stalling piping connections for operation all turbines, boilers, pumps, etc., at pany's plant, \$39,000.

New Bedford, Mass.—Furnishing 70 gas lampposts, to Fairhaven Iron Co., 2½c. per lb.

Perth Amboy, N. J.—Main port work on the new Public Service house in the course of erection in the end of Buckingham ave., to E. M. W & Co., Newark, for mason and brick on the building and to Kayne Bros., ark, for structural iron work.

BIDS RECEIVED

Tacoma, Wash.—Completing remainder of city's Nisqually power. Hans Pederson, Seattle, only bidder follows: Bridge complete, \$52,500; c and reservoir complete except embankment borrowed, \$295,000; embankment rowed, per cu. yd., 60c.; pressure complete, in place, except the following items, \$135,000; excavation, earth, per yd., 50c.; rock, per cu. yd., \$1.50; house, complete, except following \$146,500; excavation, earth, power site, per cu. yd., 50c.; rock power site, per cu. yd., \$1.50; concrete reservoir, per cu. yd., \$1.50; concrete generator room, fall roll and retaining below elevation 535, per cu. yd., \$13 crete E. for generator room, below tion 535, per cu. yd., \$12; reinforcing for generator room, fall roll and retaining below elevation 535 in place, per 4c.; water wheels and generators complete, in place \$120,000; electrical equipment power house complete, in place, \$ electrical equipment for substation plate, in place, \$85,000; transmission complete, in place, using stranded cable, \$95,000; using stranded aluminum, \$92,000; item 30 as per specification lb., 8c.

FIRE EQUIPMENT

dale, Cal.—Purchase of fire engine being considered.

o, Col.—Purchase of auto chemical is being considered.

ad, Col.—Fire Chief R. A. Doughs recommended need of auto apparatus.

eport, Conn.—City will purchase Putnam st. for erection of engine.

ville, Conn.—Need of better fire provisions being considered; chemical may be purchased.

an, Ga.—City desires combination of chemical wagon.

aines, Ia.—Council will ask for bids on auto fire trucks.—Will Burnett, chief.

ence, Mass.—Purchase of auto fire truck is being considered.

, Mass.—Fire Chief Harris, Lynn, submitted suggestion to Mayor Conroy of adoption of practically all of horse-apparatus.

field, Mass.—Fire Chief Code has recommended purchase of auto fire engine.

h, Minn.—Board of Fire Commissioners has asked for bids for erecting engine at Lakeside.

on, N. J.—Fire Commissioner is urging formation of auto truck company for Twelfth Ward.

k, N. Y.—Mazepa Engine, Jackson and Jackson Hose Cos. are urging auto apparatus.

Castle, O.—Purchase of auto fire truck is being considered.

and, Ore.—Bids will be asked by Executive Board for furnishing 25 iron boxes.

isburg, Pa.—Combined chemical and wagon will be bought for Shamrock Co.

ooke, Pa.—Borough will purchase Noble st. for erection of fire station.

ucket, R. I.—Fire Chief Lewis H. has recommended erection and of fire station in southern section; auto apparatus favored.

ville, S. C.—City Council has voted all Gamewell fire alarm system.

ster, Wash.—Town will erect fire house in early spring.

aukee, Wis.—Council has ordered drawn for erection of fire house in tenth Ward.

ary, Alta., Can.—Citizens will vote \$1,000 by-law to erect fire station.—Graves, City Commissioner.

borough, Ont., Can.—Fire Chief Howard has recommended purchase of hose and hose wagon and erection of station.

CONTRACTS AWARDED

o, Cal.—Furnishing 800 ft. of Parand rubber lined hose, to Eureka Fire Hose Co., \$1.10 per ft.

o, Col.—Furnishing auto fire truck, American-La France Fire Engine Co., N. Y., \$5,750.

hington, D. C.—Erecting engine at Pennsylvania ave. and 28th st. to A. T. Howison, city, \$22,600.

on, Ga.—To Henderson & Mangham, d fire station in Vineville, \$7,400.

more, Md.—Furnishing two auto wagons, to Mack Motor Truck Co., own, Pa., \$7,500.

Bedford, Mass.—Furnishing 5,000 ft. on rubber lined hose, to American-apparatus Fire Engine Co., Elmira, N. Y., \$1.10 per ft.; other bidders: C. C. Fire and Rubber Co., \$7 1/2c. and 78c.; Bostelting Co., 85c.; S. C. Lowe Supply Co.; F. W. McLanathan & Son, Masbrand 85c., Globe brand 78c., Frankand 70c.; New York Royal Rubber Co.; Boston Woven Hose and Rubber Co.; Cornelius N. Callahan Co., 89c.; J. Fire Hose Co., \$1.

Vernon, N. Y.—Building fire house st., to Wm. H. Sergeant, \$11,995.

nectady, N. Y.—Furnishing 1,000 ft. fire hose, to Chas. Witbeck, 53c.; 1/2 in. hose, to Eureka Fire Hose Co., \$1.10 per ft.

ey, Pa.—Furnishing 1,500 ft. of fire hose, to Eureka Fire Hose Co., \$1.10 per ft.; coats and hats, to Chas. Tremayne, C. Pa.—Furnishing Reliance Fire Co., York, with auto fire truck, to Martin Co.

BIDS RECEIVED

ttle, Wash.—Furnishing 2,000 ft. of rubber lined fire hose: Gorham and Fire Apparatus Co., \$3,460; W. order Co., \$2,205; Eureka Fire Hose Co., \$2,800; Fabric Fire Hose Co., \$2, Boston Woven H. and R. Co., \$2,500; and Rubber Co., \$2,320; Bowers Rub-

ber Works, \$1,940; 3,000 ft. of 3-in. rubber lined fire hose: Gorham Engine and Fire Apparatus Co., \$1,170; W. A. Corder Co., \$2,772; Eureka Fire Hose Mfg. Co., \$3,609; Fabric Fire Hose Co., \$3,150; Boston Woven H. and R. Co., \$3,210; Diamond Rubber Co., \$2,685; Bowers Rubber Works, \$2,460.

BRIDGES

Brazil, Ind.—Clay County Commissioners are considering the building of a bridge over Connelly Creek in Harrison Township.

Elkhart, Ind.—County Commissioners will soon ask for bids for construction of two bridges in Elkhart City.—D. O. Batchelor, County Auditor.

Covington, Ky.—County Commissioners are considering erection of bridge on Grand ave. over creek.

Saginaw, Mich.—City Engineer Roberts has been instructed to prepare plans and estimated cost for new structure to replace present Johnson st. bridge.

St. Paul, Minn.—City Engineer Rundlett will prepare plans and specifications for construction of Lexington ave. bridge over the Great Northern tracks.

Kansas City, Mo.—Jackson County Commissioners have instructed R. T. Proctor, Highway Engineer, to prepare plans and estimates of cost of concrete bridge across Blue River at 85th st.

Clyde, N. Y.—Town is considering construction of bridge to cover New York Central and West Shore tracks; cost \$300,000.

Mamaroneck, N. Y.—Village is considering election on \$200,000 bonds to build bridge over Mamaroneck River at Barry ave. and making other improvements.

New York, N. Y.—Preliminary plans have been prepared by the Department of Bridges for proposed \$1,200,000 bridge across the Harlem River.

Port Clinton, O.—County Commissioners have passed resolution authorizing \$15,000 bond issue to be used in construction of drawbridge over Portage River.

Hugo, Okla.—Choctaw County will vote in May on \$125,000 of bonds for construction of bridges.

Harrisburg, Pa.—Select Council has finally passed ordinance authorizing construction of bridge over tracks and right of way of Philadelphia and Reading Railway Co. at 13th st.

Columbia, S. C.—Richland County will vote March 14 on \$75,000 of bonds for purchase of present bridges or erection of new structures across Congaree and Broad Rivers.

Chattanooga, Tenn.—State Senate has passed bill authorizing bond issue by Hamilton County for building bridge across Tennessee River at Market st.

Danville, Va.—City will ask for bids for construction of \$40,000 concrete bridge across Dan River at Union st.—J. O. Magruder; City Engineer; Wilbur J. Watson, Citizens' Bldg., Cleveland, O., Consulting Engineer.

Spokane, Wash.—Erection of bridge across Spokane River at B st. is being considered.

Walla Walla, Wash.—City Engineer Shipley has prepared plans for erection of proposed \$11,000 3d st. bridge over Mill Creek.

CONTRACTS AWARDED

Michigan City, Ind.—By County Commissioners, to W. A. Steigley, Laporte, for Bailey bridge, \$8,20 per ft.

St. Cloud, Minn.—Bridge work on the St. Germain st. bridge, to Thomas E. Molley, La Crosse, Wis., \$7,500.

Roanoke, Va.—To Roanoke Bridge Co., for erection of bridge in Patrick County, also contract for a bridge between York and Lancaster Counties, S. C., over the Catawba River.

MISCELLANEOUS

Gadsden, Ala.—Plans by Southern Structural Steel Co., San Antonio, Tex., have been accepted for erection of \$25,000 jail.

Oakland, Cal.—Board of Public Works will ask new bids for dredging Key Route Basin.

Woodland, Cal.—Board of Supervisors will ask for estimates and plans for erection of jail.

Markle, Ind.—Town has decided to erect town hall.

Covington, Ky.—Installation of improved patrol system is being considered.

Shelbyville, Ky.—City has purchased site on public square for erection of city hall and jail.

New Orleans, La.—City Architect Christy has nearly completed plans of new Dryades market.

Lynn, Mass.—Council has decided to issue \$2,300 bonds for purchasing road roller and equipment and \$4,000 for improvements to city hall.

Saginaw, Mich.—County Commissioners will consider erection of \$50,000 jail.

New York, N. Y.—Architect Grosvenor Atterbury will prepare plans for restoring rotunda of city hall at cost of \$25,000.

Bath, N. Y. Village will vote in March on \$10,000 bonds to erect town hall.

Syracuse, N. Y. Council has adopted ordinances ordering that bids be asked for water sprinkling, flushing and street car sprinkling; each contract specifies certain streets.

Cincinnati, O.—Architect A. C. Kuball is preparing working plans for erection of proposed \$750,000 jail.

Beaver, Pa.—Site will be purchased for erection of municipal building.

McKeesport, Pa.—Appropriation of \$6,000 to replace building around the garbage furnace, replace present flooring with concrete and make other improvements is asked by Board of Health.

Providence, R. I.—Metropolitan Park Commission has asked for \$45,000 appropriation for improvements.

Corpus Christi, Tex.—Citizens will vote on \$50,000 bonds to construct municipal wharf.

North Yakima, Wash. Council has decided on site for erection of proposed city hall.

Puyallup, Wash.—Council is considering establishment of comfort station. Councilman S. W. Greenwood is interested.

Calgary, Alta., Can.—City is planning to erect isolation hospital and municipal store house and machine shop during year; \$481,000 by-law has been passed for street railway extensions during coming summer; citizens will vote on \$120,000 by-law for two incinerators.—A. G. Graves, City Commissioner.

CONTRACTS AWARDED

Michigan City, Ind.—Building proposed docks, to Fitzsimmons-Connell Co., \$17.45 per lin. ft.

Boston, Mass.—To A. T. Fuller for Packard three-ton motor truck, \$3,400.

Boston, Mass.—To John J. Bradley for collecting and removing offal in Dorchester district, \$21,500; other bidders: John H. Winslow Contracting Co., \$21,879; D. M. Figgis & Co., \$24,721; John J. Loomie, \$29,000; removing ashes, refuse, etc., in West Roxbury district, to John J. Moore, \$8,160; other bidders: Thos. J. Shea Co., \$8,520, and T. F. Minton, \$12,500; Brighton district, to Jos. M. Greevey, \$11,280; other bidders: Joseph Sprissler, \$11,800; B. E. Grant, \$12,000; John H. Carter, \$14,500; Frank F. Kiley, \$14,990; John Kelley, \$15,425; South Dorchester district, to J. H. Winslow Contracting Co., \$17,610.

Passaic, N. J.—Furnishing six garbage wagons, to Barron Cole Co., New York City, \$945.—E. A. Greene and E. N. Kevitt, Committee on Public Works.

Albany, N. Y.—Removal of street dirt, to John J. Morrissey, \$11,497.

Cincinnati, O.—On recommendation of Street Cleaning Superintendent Fred Maag contract for four or five flushing machines was awarded to St. Louis Street Flushing Machine Co., \$780 each; contract for fifth machine is withheld until test of another make is made.

Tacoma, Wash.—To John Huntington for erection of comfort station, \$3,370.

Oshkosh, Wis.—To C. R. Meyer & Son for remodeling city hall.

BIDS RECEIVED

Atlanta, Ga.—John C. West, 110 Irwin st., has submitted bid for collecting and disposing of city's garbage and other yard trash; for a term of not less than 5 years, \$153,852 per year, adding 10,000 to this amount for each year after first year.

Lexington, Ky.—Operation of crematory for year 1911: C. M. Compton, \$12,000; John B. Payne, \$10,725; Henry Vogt, \$8,975; Joe Melvin, \$8,500; B. A. Graves, \$7,777; Barovs & Butler, \$10,500; Perkins & Bricken, \$9,475; J. H. Hostetter, \$11,975; Lee Anderson, \$9,750; Robert Lauderman, \$10,500; Shelby, Miller & Co., \$10,937.85.

Cumberland, Md.—Street cleaning: Frederick Perry, \$9,950, with \$20 per mile per year for newly paved streets during contract; S. Ousborn, \$12,000, with \$80 per mile for new streets; A. L. Elosser, \$11,980, with \$500 per mile for new streets; Charles S. Danner, \$11,000, with \$900 per mile for new streets.

St. Joseph, Mo.—Furnishing police ambulance patrol: Peerless, Robidoux Auto and Supply Co., \$3,987.50; Robinson Auto and Supply Co., \$4,300; Velie, Stanley & Ranger, \$3,700; Locomobile, Wyeth Auto and Supply Co., \$5,250, on board cars at Bridgeport, Conn.; Dorris, St. Joseph Auto and Supply Co., \$3,750.

Albany, N. Y.—Removing dead animals from the city, Frank Muckel, \$250, and John Vorian, \$312.

TOO LATE FOR CLASSIFICATION

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREET IMPROVEMENTS				
New York	New York	Feb. 24	Regulating and repaving portions of various streets; furnishing paving cement, sand and washed gravel	Geo. McAneny, Pres. Boro. Manh.
California	Ocean Park	Feb. 27	Constructing sidewalks on portions of various streets	C. G. Watt, City Clerk.
New York	Brooklyn	Mar. 1	Paving with granite and asphalt various streets; furn. 200,000 gal. asphalt road oil; 1,600 tons refined asphalt; broken tap rock screenings	Alfred E. Steers, Pres. Boro. B'klyn
New Jersey	Hoboken	Mar. 2, 3 p.m.	Improving certain streets	Walter O'Mara, Clerk.
Indiana	Rockville	Mar. 6, 1 p.m.	Constructing gravel road	James E. Ehler, County Auditor.
Indiana	Jeffersonville	Mar. 6, 10 a.m.	Constructing gravel roads	Peter Nachand, County Auditor.
Delaware	Wilmington	Mar. 7, noon	Building State road	Francis A. Price, Hwy. Comr.
Georgia	Savannah	Mar. 9, noon	Furnishing 5,000 cu. yds. cement or like material for improving public roads	Board of County Commissioners.
Indiana	Muncie	Mar. 11	Paving various streets	J. Kelly, City Clerk.
Pennsylvania	Youngwood	Mar. 13	Paving about 2 miles of street with brick blocks	Warren Mitchell, Greensburg, Bor.
Indiana	Logansport	Apr. 1	Constructing 50,000 sq. yds. of sheet asphalt	William Pickett, City Clerk.
SEWERAGE				
New York	Long Island City	Feb. 24	Bldg. sewers and appurtenances in various streets	Lawrence Gresser, Pres. Boro. Q'n
New York	Brooklyn	Mar. 1	Constructing sewers in various streets	Alfred E. Steers, Pres. B'klyn Bor.
Wisconsin	Watertown	Mar. 4, 2 p.m.	Constructing storm sewers	Bd. of Public Works.
Minnesota	Tracy	Mar. 9, 8 p.m.	Constructing sewer	Lester J. Fitch, City Recorder.
WATER SUPPLY				
North Dakota	Fairmont	Feb. 27	Constructing well	Peter Mergens, Clerk.
Alberta, Can.	Gleichen	Mar. 16	Drilling well; furnishing cast-iron pipe, etc.; erecting steel tank; supplying manhole castings	B. S. Corey, Secretary-Treasurer.
FIRE EQUIPMENT				
New York	Mount Vernon	Feb. 28, 9 p.m.	Furnishing two hose wagons	Chas. C. Howard, Pres. Bd. Fire C.
MISCELLANEOUS				
Rhode Island	Providence	Feb. 25, 10 a.m.	Dredging certain rivers	Wm. C. Pelkey, Clk. Bd. C. and S.
Florida	Tampa	Feb. 28	Furn. about 50 two-piece uniforms	W. J. Barritt, Chm. Police Com.
New York	Schenectady	Mar. 1, 2:30 p.m.	Furnishing cast-iron pipe and specials; furnishing one street flushing machine; refilling machine sweeper brooms; furnishing street sweeping machine and one 600 gallon street sprinkler	Harry F. Miller, Sec. Bd. C. and S.
New Jersey	Jersey City	Mar. 2, 3 p.m.	Erecting complete stone crushing plant	Walter O'Mara Clerk.

STREET IMPROVEMENTS

Nevada City, Cal.—Supervisor Bennets intends to macadamize Nevada-Grass Valley Road from city line to Glenbrook Park, between here and Grass Valley.

Lawrence, Kan.—Council has decided to pave Hancock st. with vit. brick.—F. D. Brooks, City Clerk.

Fort Scott, Kan.—Bids are being asked for paving First st.; estimate of cost of proposed North Judso st. paving will be prepared.—J. O. Brown, City Clerk.

Minneapolis, Minn.—Bids will be received Feb. 24, 7:30 p.m., for furnishing granite curbing for year.—H. W. Knott, city clerk.

Syracuse, N. Y.—Engineers have completed survey for the new county highway between Camillus and Skaneateles and Division Engineer Frederick W. Sarr of State Highway Commission in this city is preparing plans.

Williamsport, Pa.—Paving of Grant st. is being considered.

Comanche, Tex.—Citizens will vote March 25 on \$100,000 bonds for construction of roads.

SEWERAGE

Oxford, Ala.—Mayor Cooper has appointed a Committee, composed of W. C. Gray, W. H. Cooper and J. B. Privett, to advise as to best plan of establishing sewerage system.

Duluth, Minn.—Board of Public Works has been ordered to proceed with several sanitary sewers; estimated cost, \$5,000.

Las Cruces, N. M.—Board of Trustees is considering bond issue for installation of sewer system.

Fairport, O.—Bids will be received March 6 for \$12,000 sewer bonds.—Robt. Meyers, Village Clerk.

Muskogee, Okla.—Citizens have voted bonds to construct sewage disposal plant to carry sewage six miles to Arkansas River. A. F. McGarr, Mayor.

Canton, S. D.—City is considering installation of sewer system.—Geo. Hokensta City Auditor.

Cleburne, Tex.—Management of the Cleburne Sewerage Company is having plans drawn for extensions to local plant; Council is considering asking a bond issue to establish up-to-date sewerage system western section of city first and to subsequent sections if any money should remain.

Port Washington, Wis.—Council has decided to issue \$35,000 bonds for construction of sewers.

London, Ont., Can.—Construction sewers on Elizabeth, Elias and Dean st. have been recommended by Board Health and City Engineer.

Nelson, B. C., Can.—Council has decided to spend about \$5,200 in extension sewers; work to commence immediately.

Prince Rupert, B. C., Can.—Preliminary plans for sewerage system have been prepared; work to be done this year will cost approximately \$200,000.—Alderman Lynn is interested.

Grand Haven, Mich.—Bids received Jan. 3 for paving: (A) W. W. Hatch & Son Co., Hammond Bldg., Detroit; (B) Markle Cemen & Coal Co., Muskegon; (C) C. H. Kaumuer, 919 Sixth st., Port Huron; (D) C. Marsman, 226 Sixth st., Grand Rapids; (E) Farrell Bros 701 Main st., W., Lansing; (F) Carpenter & Anderson, Shepard Block, Grand Rapids (two bids); (G) C. E. Williams, 33 Paddock st., Grand Rapids; (H) Anson Greene, 47 South Union st., Grand Rapids; (I) John Vander-Weele & Cornelius Vander-Weele, 51 Baldwin st., Grand Rapids.

	A	B	C	D	E	F	F	G	H	I
12 old inlets reset	\$3.00	\$3.25	\$3.00	\$3.00	\$2.00	\$2.00	\$2.00	\$3.00	\$1.00	\$3.00
16 c.-i. inlets complete	15.00	16.00	13.00	15.00	15.00	10.00	10.00	15.00	7.00	15.00
1 combined catch basin and inlet	40.00	40.00	40.00	40.00	30.00	20.00	20.00	30.00	15.00	35.00
2 brick catch basins	35.00		35.00	35.00	35.00	20.00	20.00	30.00	35.00	40.00
Manholes and covers	35.00	30.00	35.00	40.00	35.00	30.00	30.00	30.00	35.00	45.00
8 new c.-i. covers for old manholes	10.00	14.00	11.00	12.00	15.00	10.00	10.00	10.00	8.50	12.00
739 lin. ft. headers, 5x14-in.	.40	.40	.35	.40	.40	.40	.40	.40	.50	.50
315 lin. ft. gutter plate headers	.35	.40	.40	.30	.40	.30	.30	.30	.50	.50
8,248 lin. ft. combined curb (7/8) & gutter (1/4")	.48	.52	.55	.50	.45	.35	.35	.45	.38	.38
739 lin. ft. cobble stone pavers at headers	.12	.15	.15	.15	.15	.10	.10	.15	.15	.15
45 c.-i. gutter plates in place	9.00	7.00	7.00	7.00	7.00	3.00	3.00	7.00	5.00	7.00
Pavement laid on new 6-in. concrete foundation:										
14,627 sq. yds. with Bessemer block	1.96		1.92	1.72	1.85			1.69	1.75	
14,627 sq. yds. with Harris block	1.96					1.75				
14,627 sq. yds. with Nelsonville block			1.88							
14,627 sq. yds. with Athens block			1.88							
14,627 sq. yds. with Metropolitan block			1.93		1.86	1.75		1.71	1.75	
14,627 sq. yds. with No. 1 block										1.00
14,627 sq. yds. asphalt filler	.20		.20	.20	.20	.15	.15	.15	.20	
14,627 sq. yds. cement filler	.08		.10	.05	.12 1/2	.07	.07	.09	.06 3/4	
14,627 sq. yds. sand filler	.02		.02	.05	.02	.02	.02	.03	.04	
50 cu. yds. extra gravel or broken stone	1.00	1.25 & 1.50	1.25	av.	1.25	1.25	1.25	av.	1.20	1.00
10 cu. yds. extra concrete	4.50	7.00	4.00	8.00	5.00	4.00	4.00	7.00	4.00	5.00
718 lin. ft. 10-in. connections in place	.70	.70	.60	.70	.60	.45	.45	av.	.45	.50
276 lin. ft. 12-in. connections in place	.80	.80	.70	.80	.70	.50	.50	.80	.50	.50
100 hrs. common labor	.25	.25	.25	.25	.25	.20	.20	.25	.22 1/2	.25
50 hrs. skilled labor	.40	.50	.40	.40	.40	.30	.30	.40	.30	.40
50 hrs. team labor	.50	.50	.45	.50	.50	.40	.40	.50	.40	.50

(A) also bid on furnishing 8,248 lin. ft. machine-dressed 4x18-in. set in sand, 50c.; 12,294 "Westrumite" wearing surface, \$1.88; 50 c. yds. extra crushed stone, \$1.90; 14,627 sq. yds. before Jan. 15—Bessemer block, \$1.94; 2,333 sq. yds. with "Westrumite" brick between rail, \$2.07; (B) bid on 14,627 sq. yds. Tarvia X on 5-in. base course, 2 1/2-in. top, \$1.19 1/2; 16,627 yds. same, on 6-in. concrete foundation, 3-in. top, \$1.60, and on 6-in. crushed stone foundation, 4-in. top, \$1.33; (C) bid on 8,248 lin. ft. com. curb and gutter on sand, 40c.; 14,627 sq. yds. heated or asphalt macadam, \$1.17; 14,627 sq. yds. asphaltic concrete pavement, \$1.75; (F) bid on same, \$1.70; (G) bid on 14,627 sq. yds. asphalt macadam on 6-in. concrete, \$1.20; on 6-in. broken stone, \$1.18; tar macadam on 6-in. concrete, \$1.17, and on 6-in. concrete stone, \$1.15; (H) bid on Tarvia X, crushed stone, 1-in. top, \$1.18; concrete base, 4-in. top, \$1.58; totals of all bids given in issue of Jan. 18.

CONTRACTS AWARDED

Monton, Ala.—Building sewer system disposal plant to Sullivan & Long, mer, \$17,965.

ene, Kan.—Building sewers, to Sny-Ringle, Selina, \$11,885.

acuse, N. Y.—Building sewers: Seneca tisco to Tully st., to James Swift, ; Ontario st., Otisco to Marcellus st.; hael Casey, \$386; Oswego st., West e to Gifford st., to James Swift, Avery ave., Ulster to Tompkins st.; ert Gaffey, \$517; Lewis st., Milton to ave., to Philip Thomas, \$472.90; rdson st., West Newell st. to Lafay- ve., to Charles Bonn, \$825.90; Hest- lace, to James Swift, \$764.50; Helen Philip Thomas, \$916.25; Hawley ave., Beech st. to Mather ave., to Albert , \$330.

BIDS RECEIVED

iamspont, Pa.—Building sewers, s Run route, G. W. Rockell, Sun- \$35,700; also on plans other than of city engineer, \$33,900 and \$34,000; C. Schrade, \$28,400 or \$25,000; on plans Busch & Stewart bid by lin. enn St. route, G. W. Rockwell, \$22,- on other plans, \$21,175; \$21,000 or : John C. Schrade, \$24,530 or \$22,700 ; \$5,200; Busch & Stewart bid by lin. f. id was not computed.

WATER SUPPLY

ter, Ia.—Council is considering bond for installation of water works sys-

ca, Kan.—Citizens have voted \$15,- nds of additional water works sys-

appel, Neb.—Plans have been prepared engineer W. E. Douner, Grand Rapids, stallation of water works system at f \$13,000.

Crucos, N. M.—Board of Trustees is ering bond issue for installation of works.

evener, Okla.—Citizens have voted 9 bonds for construction of water plant; contract will be let at once.

okege, Okla.—Citizens have voted 00 bonds for improvements to water n, new intake of not less than 48 in diameter, one 6,000,000-gal. low amp; one 6,000,000-gal. high service one 6,000,000-gal. purification plant, 00-gal. reservoir on top of Agency 1,700 ft. of 24-in. c.-i. mains and t. 16-in. c.-i. mains.—A. F. McGarr, veville, Pa.—Citizens have voted \$30,- nds for water works.

LIGHTING AND POWER

Minette, Ala.—Town is considering ation of electric light plant; H. D. r, city, and W. H. Isabell, Bowling Ky., propose \$20,000 plant.

th Pasadena, Cal.—Petition will be ated to Council by W. W. Fogg, head eonta Park Improvement League, g for better lighting in south part y and along Southern Pacific line and ation.

neapolis, Minn.—Bids will be received 24, 7.30 p. m., for lighting streets with city; one, three, five or ten year is.—H. N. Knott, city clerk.

las, S. D.—Council has granted Dallas, Heat & Power Co. franchise to con- and operate electric light plant.

ridge, S. D.—Smith & Hill have for franchise to install electric light

Antonio, Tex.—San Antonio Gas and c and Traction Companies will ex- \$250,000 for improvements.

milton, Ont., Can.—Board of Control advertise for tenders from engineers estimate of cost of installing house and lighting system.

gston, Ont., Can.—City will expend \$13,000 for improvements to the elect- ing plant.—W. W. Sands, City Clerk; Folger, Engineer.

Victoria, B. C., Can.—Wm. M. Northcott, Purchasing Agent, will shortly call for tenders for supply of 300 iron standards to be used in extension of cluster lighting system.

FIRE EQUIPMENT

Pueblo, Col.—New bids will be received at once for furnishing 70 h.p. auto truck.—A. L. Fugard, Mayor.

Terryville, Conn.—Town has appropriated \$1800 for purchase of hand drawn chemical truck containing two 35 gallon tanks of chemical and sufficient hose, small hook and ladder truck, jumper and 800 feet of regulation fire hose.—Selectman Alfred Bakeslee, Andrew W. Granniss and William J. Berg, Purchasing Committee.

Lake Charles, La.—Council is considering asking for bids for construction of central fire stations.

Minneapolis, Minn.—Bids will be received Feb. 24, 7.30 p. m., for furn. 7,500 ft. 2½ in. fire hose and 1,000 ft. 3 in. fire hose.—H. N. Knott, City Clerk

Tuckahoe, N. Y.—Citizens have defeated proposition to expend \$8,000 for motor fire engine for Waverly Engine & Hose Co.

Toledo, O.—Council has sold \$2,500 fire department bonds to Security Savings & Trust Co., Toledo.

Cleburne, Tex.—Establishment of paid fire department with first class equipment is being considered.

BRIDGES

Ida Grove, Ia.—Township Trustee and Road Superintendent have voted in favor of cement and concrete as the best material for all county bridges and culverts, county to purchase concrete mixing machine and do their own overseeing and employ all home labor.

Leavenworth, Kan.—City Engineer Joseph O'Neil has been instructed to prepare specifications and other data for erection of a 40-foot concrete bridge span over Three Mile Creek.

Lampasas, Tex.—County will vote on \$6,000 bond issue for construction of bridge across Lampasas River.

MISCELLANEOUS

Tampa, Fla.—Carnegie library will be erected in near future at cost of \$50,000.

Minneapolis, Minn.—Bids will be received Feb. 24, 7.30 p. m., for furnishing one 30 h. p. traction engine, \$150; one elevating road grader, \$150; twenty 2-yard dump wag- ons or boxes, \$150; one 16 cu. ft. capacity batch concrete mixer, with spreading de- vice and power, \$150; two continuous con- crete mixers, 10 cu. yd. per hour capacity, gasoline power, \$50.

Trenton, N. J.—Plans for comfort pavil- ion have been drawn for the Park Com- mission by William P. Endebrock, archi- tect, and as soon as weather will permit work of construction of building will be started in Cadwalader Park.

Rensselaer, N. Y.—Council will prepare plans and specifications for the cleaning of streets and will soon direct City Clerk Salt to advertise for proposals for this work.

Syracuse, N. Y.—Contracts are soon to be let for completing Municipal Bath build- ings; it is planned to finish work early in summer.

Cincinnati, O.—City Engineer Shipley has instructed Engineer Raschig to draw revised plans contemplating narrow stair- way and different style of hand rail at Celestial st.

Muskogee, Okla.—Citizens have voted \$35,000 to install garbage disposal plant.—A. F. McGarr, Mayor.

CONTRACT AWARDED

Boston, Mass.—To A. De Stefano, for collecting and removing ashes, etc., in East Boston District, \$13,168; other bid- ders: William Carr, \$14,297; Charles Ber- man, \$14,400; B. E. Grant, \$15,200.

BIDS RECEIVED

New Bedford, Mass.—Furnishing motor truck; specifications call for a truck capa- ble of carrying a load of 1 to 1½ tons: Bert

A. Vance, Ranier motor truck, has been used some, \$700; J. E. Delano, Fairhaven, 4-cylinder 25-h.p., limited to 1 ton, motor truck, \$750; J. Edward Newton, Fall River, 1 ton Sampson truck, \$2,250; same truck with different body, \$2,100; Sampson chas- sis only, \$2,000; S. C. Lowe Supply Co., Franklin auto truck, one ton capacity, 100 lbs. overload guaranteed, \$2,400; Harry E. Borden, Johnson service truck, \$2,900; Taylor Motor Sales Co., Boston, Deca- turator motor truck, \$2,000; Decatur chassis only, \$1,800; seven different styles of bodies offered at varying prices above \$2,000; Park Square Automobile Station, Boston, Alco, 1½ ton truck, chassis, \$3,000; S. C. Lowe Supply Co., Locomobile auto truck, \$5,300; five passenger touring car, not less than 25-h.p., air-cooled engine preferred; 1910 Franklin to be taken in exchange; Bert A. Vance, Cole 30, \$1,852; J. Edward Newton, Fall River, Knox air-cooled, \$2,750; Stevens Duryea, \$2,850; allowance for 1910 Franklin car, \$1,050; S. C. Lowe Supply Co., 1911 Franklin, air-cooled, \$2,700, allowance for 1910 car \$900; Locomobile Model L, \$3,500, Franklin Model M \$3,500, allowance for 1910 car \$1,050; Franklin Model H \$4,500, Locomobile, Model M \$4,500, allowance for 1910 car \$1,050; Park Square Automobile Co., 1911 Stoddard-Dayton, Model M, \$1,- 500; seven passenger touring car, J. A. Benson, Oldsmobile 1910, car formerly owned by Miss Mary J. Howland, been run 1,600 miles, 4 cylinders, 40-h.p., \$2,000; Mitchell Auto Co., Walter R. Richards, agt. Mitchell, Model S, \$2,300; J. Edward New- ton, Fall River, Stevens-Duryea, \$3,675; Stevens-Duryea fore-doors, \$3,675; Stevens- torpedo, \$3,775; Stevens-Duryea, Model Y, \$4,000; Stevens-Duryea, Model Y, fore- doors, \$4,150; tops and speedometer, extra; allowance for Franklin 1910 car if all three cars purchased of this bidder, \$1,350; Stephen D. Peirce, manager for Robert W. Powers, Pope-Hartford, 1911, 6 cylinders, 7-passenger, \$4,100; Peerless, 1911, 6 cylin- ders, 7-passenger, \$6,900; S. C. Lowe Sup- ply Co., Locomobile, Model M, 6 cylinders, 7-passenger, \$4,800; Carlow Auto Co., Taunton, Oldsmobile, 6 cylinders, 7-passen- ger, \$5,000; Auto Selling and Supply Co., J. S. Coy, 1911 American, 4 cylinders, 7- passenger, \$4,500; Harry E. Borden, John- son Service car, 4 cylinders, 7-passenger, \$3,250; Park Square Automobile Co., Alco, 1911, 6-cylinder, 7-passenger, \$5,500.

New Bedford, Mass.—Addition to city barn, to J. B. Sullivan & Son, \$19,470; other bidders: Thos. F. Callinan, Providence, \$19,- 490; Henry T. Bulman, \$19,925; J. W. Bishop Co., \$20,282; Patrick McQuade, \$20,- 477; B. F. Smith Co., \$20,552; George How- ard & Sons Co., \$23,460; Charles O. Bright- man, \$24,096.

Rochester, N. Y.—Street sprinkling for 1911: Bantel & Hartung and William H. Sours, second, each bid 48¼ per cent of the estimate of \$85,889, or \$42,655.16; Wil- liam Baker, 71 per cent of the estimate, and August Kimmell, 69 per cent; contract takes in 591 streets comprising 154 miles of thoroughfare to be sprinkled.

Do you want to have your munic- iple improvements done right and at lowest prices?

If so, advertise your

PROPOSALS

IN

Municipal Journal and Engineer.

It gives contractors the kind of information they want and is read by them.

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Lead flange, in from one eight branch.

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ALL SIZES—ANY STYLE—FOR ANY MACHINE
GET OUR PRICES BEFORE PLACING ORDERS

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NEW INCORPORATIONS

Bjork Brothers Construction Co., Chicago, Ill.—Contractors and engineers; capital, \$2,500. Incorporators: August E. Bjork, David T. Bjork, C. A. Bjork.

Upper Hudson Stone Co., Marlborough, Ulster County, N. Y.—Quarry and deal in stone, etc.; capital, \$300,000. Incorporators: W. B. McKenna, No. 26 Cortland st.; A. W. Mackintosh, No. 80 Broadway; Edwin C. Parlow, No. 30 Pine st., all of New York City.

New York Blaugas Co., Manhattan, N. Y.; Manufacture patent liquid to produce light and heat, etc.; capital, \$1,300,000. Incorporators: Wm. J. Shilliday, Colonial Heights, Yonkers, N. Y.; Milton F. Steindler, 100 Broadway, New York City; Lawrence H. Tasker, No. 154 Nassau st., New York City.

Ohio Corrugated Culvert Co., Middletown, O.; capital increased from \$65,000 to \$100,000.

Chemical Fire Extinguishing Co., Cleveland; \$20,000; by Charles A. Burke, Charles A. Aaron, J. A. Burke, William M. Byrnes, Thomas P. Carey.

Cincinnati Wood Preserving Co., Cincinnati; \$20,000; by John D. Cherrington, Gordon L. Lindsay, Frank W. Cherrington, J. M. Stirnkorb, H. H. Beers.

Arlington Water Co., Arlington, N. J.; capital \$50,000. Incorporators: William Baldwin and E. J. Parsons, New York; John A. Afford, New Rochelle; George Bowe, Philadelphia; Charles H. Stott, Hicksville, L. I.

The Great Hill Quarry Co., New York, N. Y.; quarry building stone, etc.; contracting, etc.; capital \$1,000,000. Incorporators: William S. Armstrong, Coling M. Ingersoll, both of 60 Wall St.; George N. Webster, Flushing, and two others.

Moberly Paving Brick Co., Canton, O.; capital \$300,000. Incorporators: C. W. Kepingler and others.

Lebanon Water Company, Lebanon, Pa.; capital, \$25,000.

Milton Light, Power & Water Co., Milton, Del.; capital, \$20,000.

Water and Sewage Purification Corporation, New York, N. Y.; capital, \$3,000,000; to acquire the Clifford D. Meeker and Lynn T. Leets water purification patents. Incorporators: Charles H. Silliman and Charles C. Gifford, New York City, and Kathryn Flanders, Newark, N. J.

West Mahanoy Electric Co., West Mahanoy, Pa.; capital, \$5,000. Incorporators: Calvin Pardee and Alfred Pardee, of Whitmarsh; Calvin Pardee, Jr. and John S. Wise, Jr., of Hazleton; A. W. Drake, Latimer Mines. To supply power from the Harwood Electric Co.'s plants in Luzerne County. Twelve other companies of the same capital and same incorporators were also incorporated to supply power to the following towns: Butler, Union, Mahanoy, East Union and Delano, Schuylkill County; Wilkes-Barre, Wright, Fairview, Hanover, Luzerne, Coal and Mt. Carmel, Northumberland and Conyngham, Columbia.

The Ford Meter Box Company, Wabash, Ind.; capital, \$25,000. Incorporators: E. H. Ford, T. W. and W. A. McNamee.

The Donnell Sanitary Milk Can Company, St. Louis, Mo.; capital, \$50,000. Incorporators: W. F. Donnell, of Hematite, Mo.; John F. Meier, of Pevely, Mo., and L. W. Meier, of St. Louis.

HELP WANTED

STATE OF NEW JERSEY.
CIVIL SERVICE COMMISSION.

NEW JERSEY CIVIL SERVICE EXAMINATION FOR
INSPECTOR OF GAS AND GAS METERS,
PUBLIC UTILITY COMMISSIONERS
FOR THE STATE OF NEW JERSEY.
Salary, \$125 per Month.
On MONDAY, March 13th, 1911.
For particulars address Civil Service
Commission, Trenton, New Jersey. (7-8)

WANTED TO BUY
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PROPOSALS

NOTICE OF RECEIVING BIDS FOR THE CONSTRUCTION OF A MAIN TRUNK SEWER

Niles, Mich.

Take notice that the Board of Public Works will meet at the Council Rooms in the City of Niles on the 1st day of March, 1911, at 8 o'clock p. m., for the purpose of receiving written sealed proposals for the construction of a main trunk sewer, commencing at the St. Joseph River, running thence east on Sycamore Street to its intersection with Seventh Street; thence south on Seventh Street to its intersection with Broadway; thence east on Broadway to the east side of Ninth Street, in accordance with the maps, plans, diagrams and specifications now on file with the City Clerk, and which have been duly approved and adopted by the Common Council of the City of Niles, and to which reference is made.

That each bidder is required to file his sealed proposal with the City Clerk on or before 8 o'clock p. m. on Wednesday, March 1st, 1911; and each proposal shall be accompanied by the bidder's certified check for five hundred (\$500.00) Dollars, payable to the City of Niles, in case said bidder's proposal is accepted and said bidder neglects to enter into a contract with said City within ten (10) days after the acceptance of his bid.

That the person to whom the contract is awarded will be required to enter into a bond as required by the resolutions heretofore adopted by the Common Council and the Board of Public Works of the City of Niles, and by the Statutes of the State of Michigan.

The Board of Public Works reserves the right to reject any and all bids.

By order of the Board of Public Works.
HERMANN ROEBECK,
City Clerk.

SEWER AND DISPOSAL PLANT

Atlanta, Ga.

Sealed proposals, addressed to the Mayor of the City of Atlanta, will be received by the Mayor's Secretary, until 3 p. m., March 14, 1911, for furnishing all labor and materials for constructing Intrenchment Creek Disposal Plant; also the Intrenchment Creek Intercepting Sewer from the County Line to the location of the plant, and for constructing what is known as the DuBos Aqueduct on the Peachtree Creek Intercepting Sewer line, and the Aqueduct and Bridge over the Orme Street branch on the Collier Road, and the Aqueduct on Intrenchment Creek. Work to be done in accordance with the plans and specifications on file in the office of the Chief of Construction, Atlanta, Ga. Bids to be made on the blanks submitted with the specifications. A certified check as required in the specifications must accompany each bid. Plans and specifications will be furnished on application to the Chief of Construction, Atlanta, Ga., or Messrs. Hering & Fuller, No. 170 Broadway, New York, N. Y.

A deposit of \$25.00 will be required for a copy of the plans and specifications.

AUTO FIRE TRUCK

City of Bozeman, Gallatin County, Mont.

Notice is hereby given that sealed proposals will be received by the undersigned up to 5 o'clock p. m., March 2, 1911, for one Auto Combination Chemical and Hose Wagon, according to following specifications:

H. P.—80 to 90—A. L. A. M. Rating; speed 45 miles per hour; partition body; 1,200 feet 2½-in. hose; 40 gallon steel chemical tank and basket for 250 feet ¾-in. chemical hose; two short extension ladders; Bosch magneto; electric lights and revolving search light on dashboard; with or without dual tires; capacity eight men. Complete specifications to be furnished with each proposal.

A. M. BRANDENBURG,
City Clerk.

PROPOSALS

WATER WORKS PLANT

Spring Lake, N. J.

Sealed proposals will be received by the Council of the Borough of Spring Lake, Monmouth County, N. J., at the office of the Borough Clerk, until 2 o'clock p. m. Friday, March 10th, 1911, and will be publicly opened and read immediately thereafter, for furnishing, delivering and erecting the complete mechanical equipment of an Artesian Water Works Plant, comprising the following:

- Brick Pumping Station, with Boiler House annexed.
- Radial Brick Stack and Foundation.
- Concrete Reservoir.
- Concrete Building and Machinery, Foundations and Floors, etc.
- Five Artesian Wells.
- Two Triple Expansion, Direct-Action Pumping Engines.
- One Duplex Cross-Compound Steam Two-Stage Air Compressor.
- One Surface Condenser, with combined air and circulating Pump.
- One Boiler Feed Pump.
- Two Feed Water Heaters.
- Three Return Tubular Boilers, and Stack Breaching.
- Suction and Discharge Mains to Pump and Reservoir.
- Piping Seven Artesian Wells.
- Conduit from Wells to Reservoir.
- Removal and resetting old Boiler.
- Removal and resetting old Air Compressor.
- Steam and Exhaust Connections to Boilers and Machinery.

Each proposal must be accompanied by a certified check, to the order of W. W. Trout, Treasurer, in the sum of 5 per cent. amount of each bid, or same will not be considered. A bond in the sum of 50 per cent. of the contract price will be required for the faithful performance of the contract.

The Council reserves the right to reject any or all bids, or to accept any bid should it deem it to be for the best interests of the Borough of Spring Lake to do so.

O. H. BROWN, Mayor.
E. V. Patterson, Borough Clerk.
Borough of Spring Lake, N. J.
JOS. L. SWEIGARD, Engineer.
Betz Building, Philadelphia, Pa.

SAND FILTRATION PLANT, PUMPING EQUIPMENT AND APPURTENANCES

Ogdensburg, N. Y.

Sealed proposals will be received by the Board of Water Commissioners, Ogdensburg, N. Y., at its office, until 12 o'clock noon, March 7, 1911, for the construction of covered sand filters, pipe lines, steam and electrical pumping machinery, water turbine, electrical equipment, boilers and other appurtenances.

Plans may be seen and copies of the specifications, proposal, bond and contract obtained at the above office, or at the office of Hazen & Whipple, Consulting Engineers, 103 Park Avenue, New York City.

JAMES M. WELLS, Chairman.
FRANK CHAPMAN,
GEORGE F. DARROW,
DR. WILLARD N. BELL,
Water Commissioners.

FOR INFORMATION

or Books relating to Municipal Matters, write
Municipal Journal and Engineer

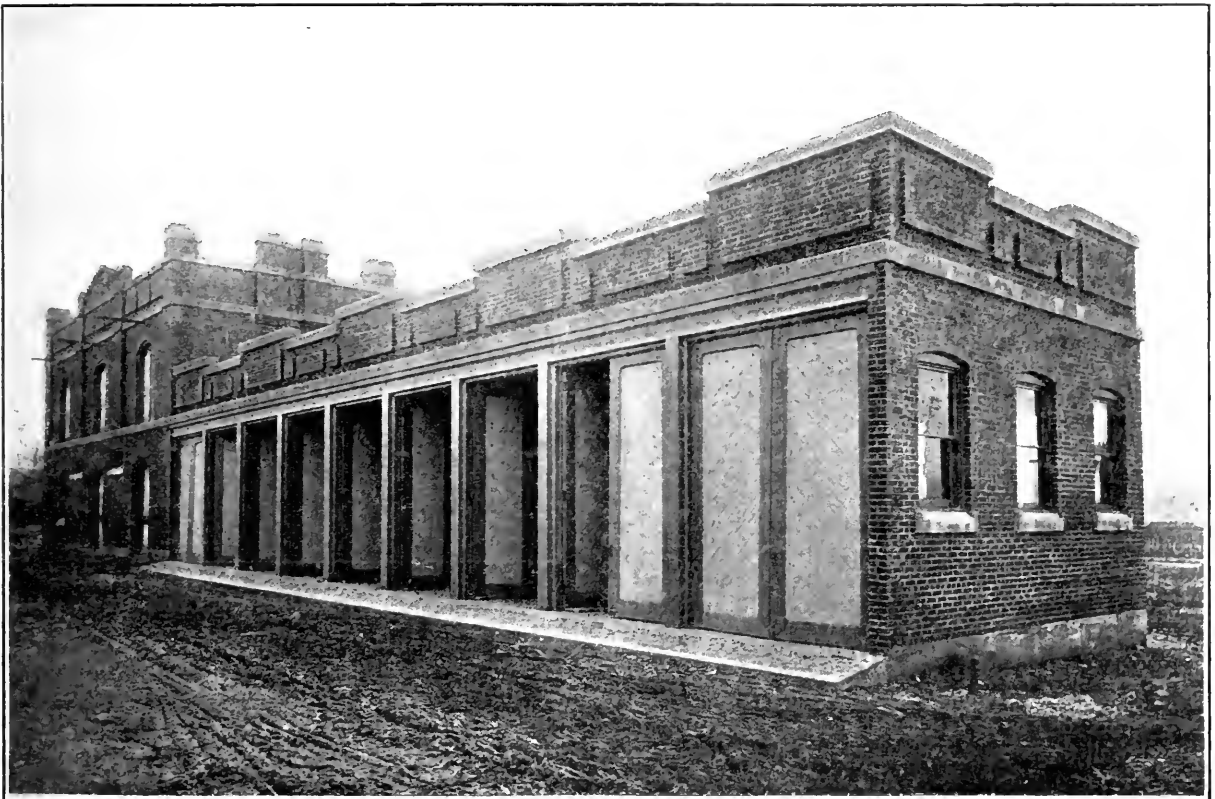
Municipal Journal

And Engineer

VOLUME XXX.

NEW YORK, MARCH 1, 1911

No. 9



STABLE AND WAGON HOUSE FROM NORTHEAST

MUNICIPAL STABLE AND WAGON HOUSE

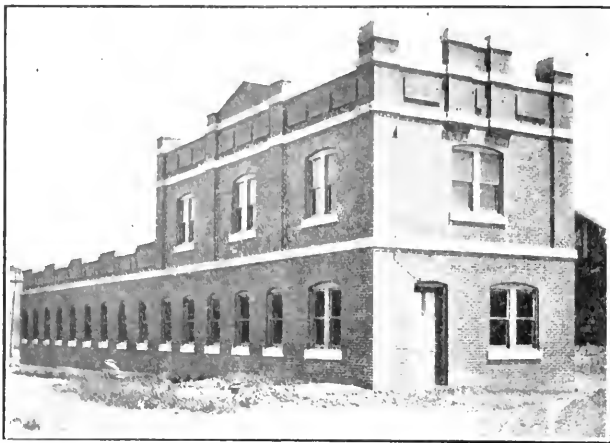
For Water Works Department—Construction Details—Brick, Timber and Concrete Used—All Rooms Have Concrete Floors and are Well Drained—Pipe Handling Trestle and Storage Yard.

THE city of Reading, Pa., completed last year a new stable and wagon house for the water works department, a considerable part of the property on which this building is located being also arranged for use as a storage yard. The city had previously maintained a storage yard, shop and stable, but the quarters were altogether too contracted and as it was impossible to extend them without purchasing expensive property, if at all, it was decided to move to a new site and construct the buildings and pipe handling structures herein described. The property contains one acre and thirty-two perches. At the time it was purchased it contained a siding from the Philadelphia & Reading Railway, a brick foundry building, traveling crane, frame

boiler house, engine room, sheds, office building, boiler, engine and drill press. This property cost about \$12,000.

Few of the buildings or pieces of machinery were considered suitable for use by the department, and the city at once proceeded to construct a stable and wagon house and a work shop, and such steel trestles and traveling cranes as were desired for the handling and storing of iron pipe and specials.

The stable and wagon shed were built of brick with stone trimmings, and an effort was made to give the exterior a pleasing although not ornamental appearance. This structure consists of two parts, a one-story wagon house, and south of this a two-story stable. The wagon house is 64 ft. 3 in. long by



STABLE AND WAGON HOUSE FROM SOUTHWEST

20 ft. wide and is enclosed by a rear 12-inch brick wall, two end brick walls each 9 inches thick, and a front composed entirely of doors, there being eight double doors, each pair being separated and supported by a 6 x 6 spruce post with a 1¼-inch board nailed to each side. Each doorway is 7 feet wide in the clear by 12½ feet high. Each of the spruce posts is supported on a 6 x 6 x 6 stone block, the block and post being held in place by an iron dowel extending into the foundation. All walls and posts rest upon concrete foundations. The entire floor of the wagon room is of concrete 6 inches thick and slopes toward two drain openings provided with bell traps for carrying off wash water. Opposite each doorway, in the rear wall, is a window, and these, together with the open front, serve to light the wagon room thoroughly. The roof is an ordinary peak roof of 2 x 8 rafters and tie beams spaced 2 feet between centers.

South of and communicating with this and also with the stable, and located between the two, is the manure room which is 8 feet wide by 20 feet deep, provided with a window at the west end and a doorway at the east end the full width of the room; also with two small doors, one opening into the wagon room and the other into the stable. In this room also there is a drain opening with a bell trap.

South of the manure room is the stable, a rectangular room 35 feet 3 inches long by 20 feet wide and containing five stalls. In the east wall there are two doors each 5 feet 6 inches wide by 9 feet high, and two windows; and in the west wall there is a window with movable sash for each stall. The stalls all drain to the concrete floor in front of them and the entire stable drains to a bell trap at the north end. The floor in front of the stalls is of 6-inch concrete and the floors of the stalls themselves are of well-packed earth. The partitions between the stalls are of plank carried up a height of about 6 feet, and fastened at the west end to the wall of the building and at the east end to 6 x 6-inch oak posts. Each post rests upon a 6 x 6 x 6 stone block, which in turn rests upon a concrete foundation. A 1½-inch iron dowel pin 2 feet long is fastened in the concrete foundation, passes through the stone block and extends for about 6 inches into the bottom of the oak post, thus holding it in place. At the top the line of oak posts is tied together with a 6 x 8 oak beam, which also supports the floor beams above.

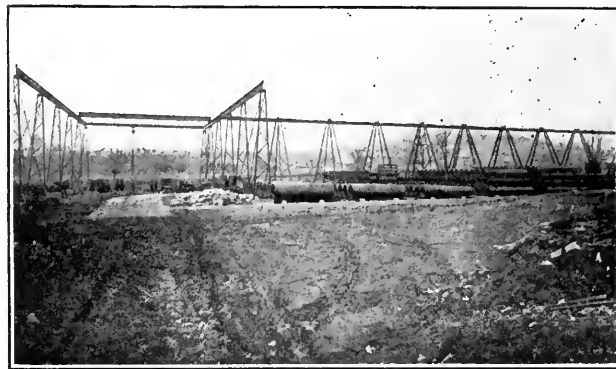
In the front part of this stable are two feed boxes, two harness closets, two closets for brushes and other small matters, and a watering trough. The watering trough is supplied with water through two ¾-inch faucets, one for hot and one for cold water.

The extreme south end of the building is occupied by an office 12 feet wide by 20 feet deep with a stairway leading to a room on the second floor. The second floor over the stable proper is used for storing feed, and for this purpose is provided with two doors, a projecting beam for carrying block and tackle being provided over the center of each door.

For draining this building a drain pipe is carried from south to north through the ground under the building a few feet to the east of the center line. This is 10 inches in size to the center of the stable, where it receives the drainage from the roof of the two-story section. From here it is continued as an 8-inch sewer pipe into the wagon shed, where it receives the roof water from part of the one-story section, just above which point it is reduced to 6-inch sewer pipe, and at the further end to a 4-inch. This drain receives, besides the rain water, the drainage from the wagon room, manure room and stable through the bell traps already referred to.

The second floor is supported on 2 x 8 beams 12 feet between centers, which beams are supported near the center line of the building by the oak beam, which, as before stated, rests upon the oak posts which form the fronts of the stall partitions.

This building was constructed by contract by Mr. Geo. H. Meinholz, the contract price being \$5,880. The necessary grading, construction of drives and building of drains was done by employees of the water department. The old sheds, boiler and engine house which were on the property when it was purchased were torn down to make room for pipe runs. The main building of those already existing was retained and a new boiler was placed in it, together with a small amount of ma-



STORAGE YARDS FOR PIPES AND SPECIALS

chinery, which it is expected to add to later. The railway siding was moved, lowered and extended to conform to the layout of the yard. The general plan of the pipe run, steel trestles, etc., is very simple and is indicated by the accompanying illustration. The traveling crane was purchased from J. G. Spiedel, and the steel trestles and runs, hoist and crane were erected by the W. F. Rempis Company.

WATER RATES IN NEW ORLEANS

In New Orleans all services are metered, the meters being set by the Sewerage and Water Board. The consumer has the option of paying either \$15 for a ½-inch meter installed and permanently maintained, on \$1.50 per year meter rental. The minimum rate is \$6.60 per year for 40,000 gallons, and 10 cents per 1,000 gallons for all in excess of this. There is, however, an unusual provision made necessary by the law governing the Board, which requires it to furnish water free for flushing water closets; to meet which requirement the Board, wherever water closets exist, allows for this purpose 4,000 gallons per capita per year above the quantity allowed for minimum rate, before excess water is charged to the consumer.

During 1909 the Board furnished free water to a considerable number of citizens by means of public faucets. These were self-closing and were attached to fire hydrants at distances apart of not less than two blocks. Up to the end of that year only about one-fifth of the residences of the city were connected to the mains, the balance relying upon rain water cisterns. During the drought many of these go dry, and the free water was furnished to prevent actual suffering among large numbers of people. The Board recognizes that the placing of faucets on fire hydrants is very objectionable, and is endeavoring to secure the introduction of city water into all houses.

MAKING WATER RATES

Method for Municipal Department Based on Business Principles—Payment for Fire Protection—Basis of Rates—Meters

By J. N. HAZLEHURST

From report to the Town of Clarksville, Tenn.

As a business proposition it seems altogether desirable that water rates should be maintained sufficient to provide a revenue large enough to make these works self-sustaining.

It is of course understood that under municipal ownership the water plant is run upon a co-operative basis, and that it may be regarded merely a matter of bookkeeping where one "robs Peter to pay Paul"; but this is not entirely true, for the burden of maintenance should fall most heavily upon the section or sections enjoying the larger benefits; and besides a self-respecting water department should receive a fair credit for services rendered—allowed some latitude in the matter of expenditures and expenditures without being called upon to become a pensioner upon the solicitor of the municipal bounty.

The matter of rate making is too often the result of slipshod or ignorant tinkering; sometimes with a little politics injected. Most frequently the rates are fixed by the council or a committee entirely by comparison of the schedules of other communities, perhaps approximately equal in the matter of population, but most generally entirely dissimilar in the local conditions affecting the cost of supplying water.

The following table compiled at random will show how water rates may differ upon important items in towns of about the same class in the Southern section:

Name.	6 in Family.	Bath.	Water Closet.	75 Foot Square Sprinkling.	Stable.	Total Flat Rate.
Clarksville, Tenn.	\$6.00	\$5.00	\$5.00	\$10.00	\$5.50	\$31.50
Memphis, Miss.	6.00	3.50	5.00	14.00	8.00	36.50
Montgomery, Ala.	12.00	12.00	8.00	12.00	....	....
Mobile, Ala.	6.00	6.00	6.00	10.00	5.00	33.00
Clarksville, Tenn.	6.00	6.00	5.00	5.00	6.00	28.00
Average.....	\$7.20	\$6.50	\$5.80	\$10.20	\$6.12½	\$35.82

Clarksville is a private plant; the others are municipal.

Fundamentally under municipal ownership, water rates are a direct tax for the use of water and like all taxes should be fully adjusted and equitably distributed.

Primarily the rates established should be sufficient to provide for (1) the fixed or overhead charges and (2) the maintenance and operating expenses.

Further differentiation of these two general requirements should be to create rates capable of (a) meeting the annual interest charge upon the cost of construction or purchase usually represented by a bonded debt; (b) laying aside each year a contribution to a sinking fund sufficient ultimately to extinguish the debt; (c) providing a similar fund annually commencing and calculated to accumulate a sum sufficient to pay for new obsolete or perishable parts; and lastly (d) the rates should be high enough in addition to safely meet current operating expense with a margin to take care of usual and anticipated extensions and betterments.

To meet these necessities without creating a burdensome surcharge, and at the same time charge no more for the service than the service is reasonably worth is a matter of nice adjustment and should be intrusted only to engineers or experts capable of understanding and dealing with such conditions and problems.

These revenues are derived from domestic consumers, manufacturing plants, railways, etc., for direct service, in addition to which private and public fire protection is paid for upon a "ready to serve" basis.

Eminent authorities have estimated that about one-half the cost of construction is chargeable to the necessity for furnishing adequate fire protection and that some 20 per cent of the operating charge is required to maintain this service.

Applying this average to your case, and assuming the cost of the works as represented by the bond issue to be \$105,000 upon a 5 per cent interest rate, and that the operating expense is \$18,000 per annum, then \$6,225 would represent the revenue which should be obtained from public or private sources for fire protection. It is generally customary to provide for such collections by an annual hydrant rental. Since Clarksville has 131 hydrants, the rate on each on this basis would amount to \$47.50, which would seem about in line when compared with the average of a recent tabulation of 70 Southern towns and cities which averaged \$44.00 for hydrant rental. To place the department upon a self-sustaining basis, some such sum should be regularly charged and collected from the city.

The remainder of the needed revenue must come out of the direct sale of water. The charge for this service varies in different communities both in amount and kind; as, for instance, by basing rates upon (1) the size of dwelling or number in family; (2) the number of water-using appliances, such as closets, baths, sinks, etc.; (3) the character of building or business served, as, for instance, saloon, barber-shop, hotels, etc.; (4) the size of the service pipe supplied; (5) the number of faucets in use; (6) the value of the consumer's property or premises; (7) the property frontage of the consumer; and lastly (8) upon a "flat" or sliding scale predicated upon the amount of water used, as estimated or measured.

Many tariffs have been devised, based upon one or a combination of these methods of collecting the needed revenue, but perhaps that best adapted to the smaller plants is the method proposed by a select committee of the New England Waterworks Association some years ago and known as the "multiple minimum" plan.

In this the consumer pays a stated sum for each fixture. This entitles him to a given amount of water, but when exceeded the excess is measured by meter and charged upon stipulated sliding rates. A few of the more usual or important fixtures may be taken for the minimum charge to simplify the bookkeeping and records.

How meters should be purchased is a matter of local public policy. Some cities purchase the meters out of the current revenues by direct taxation or bond issue. Some towns require the consumers to supply themselves with the meters, and where this is the policy the cost is sometimes rebated from the water bill until finally absorbed. In most cities the water department maintains the meters in good order. In Atlanta, and other cities which might be mentioned, the property owner pays all charges in connection with the purchase and installation of the meter and fixtures. Inasmuch as the section in which the water mains are laid is generally within a limited district, it hardly seems fair to tax the general public with the cost of these fixtures which benefit those who are fortunate enough to reside within the water limits, and who have not only the comfort and convenience of a water supply under pressure, but benefit by the lessened hazard from fire risk; and therefore it would seem more equitable to require each consumer to buy his own meter, although from the standpoint of increasing the revenues, the use of water would be made popular by minimizing the difficulties and expense of securing same.

WATER RATES IN EAST ORANGE

The new water rates schedule of the East Orange Water Department, which went into effect in March, 1910, contains one feature at least which is somewhat unusual. This is set forth in Article 77 as follows:

"For the purpose of accounting on the books of the department for the use of fire hydrants and for water used by other departments of the municipal government, but for which the department receives no pay, the following charges are established, the rates for water being per each one thousand cubic feet:
 "For water for public street sprinkling, \$1.00.

"For water for flushing the public sewers, \$1.20.

"For water for fire protection, supplying municipal buildings and any other purposes where water is furnished for municipal purposes free of charge, \$1.20.

"For furnishing, setting, maintaining, repair and supervision of public fire hydrants, per year, each \$30.00.

"Where free water for municipal plants is not metered the engineer will estimate as nearly as practicable the quantity used."

Public schools and free public libraries of the city are charged at the rate of \$1.20, and public hospitals and the charitable institutions of recognized standing and usefulness to the city are charged at the rate of \$1.00. The minimum rate for other consumers is \$1.20, which is charged for all water in excess of 100,000 cubic feet in any quarter. The other rates to regular consumers are \$1.65 for the first 10,000 cubic feet, \$1.58 for the next 15,000, \$1.50 for the next 25,000 and \$1.35 for the next 50,000, the quantities being those used in any one quarter. It is seen by the above that the city is charged for public purposes at the minimum rate allowed private consumers, although this charge is merely a book charge. We heartily commend this provision for a business-like accounting method by the department; too many departments which attempt to keep their books in such a way as to receive credit for service rendered to the city, being required to assume a charge for water furnished to the city for public purposes, in which case such assumption may give to some the impression of being an unwarranted procedure on the part of the superintendent for the purpose of making a better showing.

The new regulations provide that, from the date of their going into effect, each new service installed shall be provided with a meter and all charges for water used through such service shall be by meter rates. They also provide that any owner may have a meter installed on his service pipe by application to the engineer, and also that the board may place meters on such services as they may select because of excessive use or waste of water or where there is other good reason for requiring payment by meter rates. The meters are retained as the property of the department, and all the necessary expense of installing and caring for the meters is borne by the department unless such repairs are rendered necessary by the acts or carelessness of the owner.

INJURIOUS EFFECT OF SALT IN WATER

In a recent article on "Public Water Supplies" by Mr. John W. Hill, M. Am. Soc. C. E., of Cincinnati, published in the Bulletin of the Ohio State Board of Health, appears the following:

There are some interesting facts connected with public water supplies which I have not seen exploited as far as they should be. One of these is the possible relation of a saline water supply to the disease popularly known as "cancer." Several years ago in some publication of which I took no note at the time, and now unfortunately cannot recall, a statement was made that "cancer" most frequently occurred with people who were accustomed to a liberal use of salt, and realizing that with low stream flow of the Delaware river above Philadelphia, and the future draft of several hundred millions of gallons of water per day, that the water drawn might during the flood tides furnish a water for the people of Philadelphia which would contain more than the normal or desirable quantity of salt I sought information from one of the cities of Holland, (Leuwaarden) which was drawing its water supply from Lake Leuwaarden (itself affected by the salt from the German ocean), upon the "cancer" rates before and after this new source of supply was adopted for general use, and a comparison of the reported cases of "cancer" for the decades before and after Lake Leuwaarden was tapped showed an increase in the rate of 100 per cent. When the burgomaster's attention was called to this fact he exhibited great alarm, and promised to submit the matter to the health authorities and give me the result of their discussion, but no further information was forthcoming, and I have wondered whether the Leuwaarden data were in confirmation of the statement read

years ago, about the influence of salt on the "cancer" rates, if the remarkable increase in the "cancer" rates in that city for the ten years following the introduction of the Leuwaarden water might be due to other causes. The chlorine in the lake water as reported to me by the city authorities was about 150 parts per million.

In another instance in which I appeared as a witness there was a judicial inquiry into the effect on the human system of a saline water, with no reference, however, to "cancer," wholly upon the amount of salt which a drinking water might contain before it became objectionable or distasteful, and expert medical testimony was taken upon the question whether "salt" was a food or a poison, and of the amounts which the system could daily absorb without injury.

(In passing it is well known that salt or sodium chloride constitutes 1 per cent of the corpuscles in the blood, and contributes to the 1 per cent of salts in the serum, and that whether food or poison some salt may be daily taken in the circulation without injury).

The large amount of salt allowed to each soldier in the army, and in the armies of England, France, Germany and Japan (1900), indicated that if these quantities were regularly used in diet and taken into the system it would far exceed the salt in the ordinary allowance per person of the Leuwaarden drinking water, and if salt is in any manner connected with "cancer" the army medical officers, both here and abroad, do not seem to know it, and yet the fact can easily be verified that the introduction of salt water into the city of Leuwaarden was followed by a 100 per cent increase in "cancer" rates.

One incident connected with this investigation may be of interest. To test the amount of salt which drinking water might contain without being noticed by the users, six sections of distilled water and salt, ranging from five parts per 1,000,000 to 300 parts per 1,000,000 of chlorine, were made each bottle was numbered, and the key was unknown to the drinkers. A number of men and women employees of the Bureau of Filtration, Philadelphia, were separately brought to the office and requested to drink first from a bottle of distilled water (free from salt) and then to drink from the other bottles until the taste of salt was noticed on the palate. None of the drinkers knew at the time of the proportion of chlorine in the water which they were drinking, and the result of the test, on over 20 persons, showed that while some could detect the salt in the water containing less than 100 parts of chlorine per 1,000,000 others could not detect it in the water containing 300 parts of chlorine per 1,000,000. Tobacco users I think discovered have an impaired sense of taste, but whether this is due to smoking Carolina Perfectos or only Wheeling stop I am not prepared to say. At any rate the most delicate sense of taste was shown by the young women stenographers in the Bureau, while confirmed smokers could detect no difference in taste between the distilled water and water containing twice the amount of chlorine found in the Lake Leuwaarden water.

This instance of the supposed injurious effect of too much salt in our diet or drinking water suggests that there may be other dangers in water not represented by the germ disease.

WATER RATES AT DAYTONA

In January of this year the Board of Public Works of the city of Daytona, Fla., adopted new water rates which contain a few features not found in the majority of rates. All services are metered, the meters being owned by the city. The charges are \$5 for placing a 3/4-inch tap, and \$10 for a one-inch tap. A meter deposit of \$5 is required before the water is turned on, to be refunded when the service is discontinued, less any unpaid bills.

The rates are divided into two parts, one based upon quantity passing through the meter, for which there is a uniform rate of ten cents per thousand gallons; the other, as prescribed as follows, takes into consideration other factors:

The minimum annual charges for maintaining services are as follows:

For a three-fourth-inch service, \$5.00.

For a one-inch service, \$7.50.

For larger services the Board will be consulted.

These charges are to cover the cost of maintaining services and are distinct from water charges, which are reckoned solely on the basis of water consumption.

This is practically a "ready-to-serve" charge, which has been authorized by the courts, in the case of other classes of utilities, for real service for which charge can be legitimately made.

STREET LIGHTING IN CINCINNATI

Enclosed Arc and Incandescent Gas Lamps — The Latter Cheaper — Discussion of Length of Contract Desirable

The city of Cincinnati is about to arrange a new contract for lighting its streets, bids for this having been advertised for and submitted on Feb. 28 of this year. In discussing this, the Bureau of Municipal Research of Cincinnati has given a statement of the present lighting system in a published report, but the major part of the report is devoted to an interesting discussion of desirable and undesirable features of a lighting contract.

As described by them, the present lighting is principally by means of electric arc lights and incandescent gas lights. The latter are of the enclosed arc type, of which about 1,000 are in the center of the city and are served by wires and cables which are all carried in underground conduits. The rest of the city, known as the "overhead district" contains about 5,000 enclosed arc lamps. Of gas lamps there are about 3,000, of which about 300 have two mantles each, these being generally placed at street corners and sections. Gas lights are located in both downtown and residential districts, though in the former they are found principally in alleys. Recently intense lighting of several downtown sections by means of electric clusters has been installed by the city at its expense. The electric lights are furnished by the Union Gas & Electric Company at \$72 per lamp where the wires are underground, and \$60 per lamp in the overhead district, these figures covering the entire cost to the city. This contract expires on June 1 of next year.

In the case of gas lights the city owns the posts and entire equipment outside of the gas mains, and pays the Union Gas & Electric Company for the gas furnished (natural gas), the globes, globes, etc., and for the maintenance, lighting and extinguishing of the lamps; a separate price being fixed for each.

The contract price for these several services are as follows: Gas, 30 cents per 1,000 cubic feet; care, lighting and extinguishing, \$5 per lamp per year; mantles, 20 cents each; street globes, 85 cents each; boulevard globes, 95 cents each; residential domes, 45 cents each; No. 2 globes, 65 cents each; No. 1 globes, 75 cents each; bug protectors, 20 cents each. The monthly average number of lamps was 2,748 single burners and 1,000 double burners; a total of 3,039 lamps, or 3,330 burners. Gas consumed during the year 1910 52,179,068 cubic feet of which there were purchased for them 26,378 mantles (about 26 mantles per burner), 503 bracket globes, 1,549 boulevard globes, 2,184 boulevard domes, 10 No. 2 globes, one No. 1 globe and 55 bug protectors. The average cost per single burner lamp for the year was approximately \$12.75 and per double burner lamp \$18.54.

On January 28, at the request of certain civic organizations, the Board of Public Works and Director Sundmaker gave a public hearing on the specifications for the new lighting contract, which had previously been published, and several recommendations were made by the Bureau of Municipal Research and a joint committee of civic organizations. The former had employed Messrs. Mailloux and Knox, of New York City, as consulting engineers to report upon the specifications, and certain of their recommendations are of more than local interest. Among these are the following:

Experience had in many other localities, especially in the large cities and towns, both here and in Europe, gas is still, all things considered, the cheapest and most satisfactory illuminant for the outskirts, suburbs and outlying residential districts of cities and towns. It is a significant fact that in European cities and towns, street lighting by gas lamps has not only held its own in the residential portions, but has even encroached upon the territory of electric lighting, namely, the central, public and business portions.

The particular reason for making the above statement was the belief that the specifications proposed might remove from the city the right of using any gas lamps, because of a certain clause which it was thought might be construed to this effect.

Concerning the length of contract for street lighting which it is desirable to make, the consulting engineers reported as follows:

We do not advise calling for bids for a ten-year period only. On the contrary, we advise, strongly, calling for alternative bids for different shorter periods. Furthermore, we do not advise awarding the contract for so long a period as ten years, under any circumstances.

Long-term contracts or renewals of contracts for electric street lighting are no longer in favor, especially in the large cities and towns. They never were at any time really desirable from the standpoint of the municipality. The most that can be said for them is that they were necessary or unavoidable evils in the earlier days of electrical industry. The larger cities are breaking away from this custom, which has nothing in its favor, and much against it, in their case. In New York, all street lighting contracts are made for one year only. The charter of the city now prohibits a longer period. The plan is satisfactory. It was thought that the effect of a short period would be to cause an increase in the unit-price (price per lamp, per year); but, practically, it has had little or no effect of that kind. In other large cities (like Boston) the contract renewals are for periods varying from one to five years.

The advantages to the municipality are wholly on the side of short-term contracts. Many cities and towns are to-day paying the old price for a lighting service which is behind the times or obsolete, because the lighting contracts were made for too long a term. In other cases the lighting contractor has changed the system and gets the benefit of lower cost of production, while still charging the old price, under the contract. The short-term contract enables the municipality to take advantage of all improvements in lighting methods, systems and apparatus, and to get a fair share of the reduction in cost of generating electricity.

Our opinion and recommendation is that bids should be called for for periods of two, three and five years. We would further recommend that the longest term considered be five years.

Concerning this matter the report of the bureau comments further as follows:

The objection is sometimes raised that a shorter term would prevent competition by a new company. This, however, does not appear to be the case. A new company would be unlikely to compete at all unless it were permitted to furnish commercial light and power as well as the public lighting called for by the contract; on the other hand, if such a company were permitted to furnish commercial light and power, it would regard this as the main part of its business and would be likely to bid on a public lighting contract, no matter whether the period were ten years, five years or three years. In other words, there are other factors more important than length of contract in determining whether there shall be competition or not. If there is no competition, the city certainly should not tie itself up by a ten-year contract under the proposed specifications.

The suggestion that there be coupled with a request for new bids on street lighting the agreement that a franchise for commercial lighting will be granted to the successful company might be impracticable or be accompanied by undesirable features in a number of cases. It appears to us that an alternative which would permit of a long-term contract without the objectionable feature of tying the city down to rates which in three or four years might be unduly high or to conditions which might become antiquated, would be to make a contract for say ten years, with the provision that at the end of each two- or three-year period the rates and certain specified conditions of the lighting should be readjusted by a commission of experts composed of appointees of both parties to the contract, the rates to be such as will yield to the company an adequate return upon a basis specified in the contract. Many of the franchises granted by New York City in recent years have clauses similar to this, which have been accepted by the parties of the second part without serious objection.

WISCONSIN MUNICIPAL REFERENCE BUREAU

THE Municipal Reference Bureau, which is carried on as a part of the University Extension work of the University of Wisconsin, has been referred to by us, especially in connection with the information which they have collected and furnish concerning commission government. It is proposed by the City Club of Milwaukee to request the Legislature to appropriate \$150,000 for the furtherance of this work throughout the State of Wisconsin.

The Reference Bureau was established on July 1, 1909, the purpose being to collect data and information concerning various departments of municipal activity and government for the purpose of rendering such material available to the cities and citizens of the State. In setting forth its aims the Bureau calls attention to the fact that municipal reference departments have been established in many of the large cities such as New York, Boston, Baltimore, Philadelphia, Cincinnati, etc., which departments collect information for the use of its own officials; but that the smaller cities cannot afford to maintain such a municipal reference bureau. It is the aim of the university to establish one whose records are accessible to all of the smaller cities.

This reference bureau, supported by the Wisconsin State institution, "aims to collect and furnish information on all subjects of municipal organization and administration, public works, public utilities and public service rates, municipal employment, paving, sewage disposal, water supplies and water purification, garbage disposal, parks and playgrounds, housing, street cleaning, street sprinkling, dust prevention, smoke abatement, city planning, civic centers, art commissions, care of city trees, schools, charities and corrections, health and sanitation, accounting methods, comparative statistics, commission government, civic organizations, and all other objects of municipal interest; and so far as possible to collect and maintain a file of charters and ordinances of the principal cities of the United States, and the available municipal material of the principal

cities of England and the continent. In short, it aims to be a clearing house for municipal experiments and experience."

Maryland has established very much the same sort of bureau; and we believe that it would be to the advantage of the cities in every state if such bureaus should become universal throughout the country.

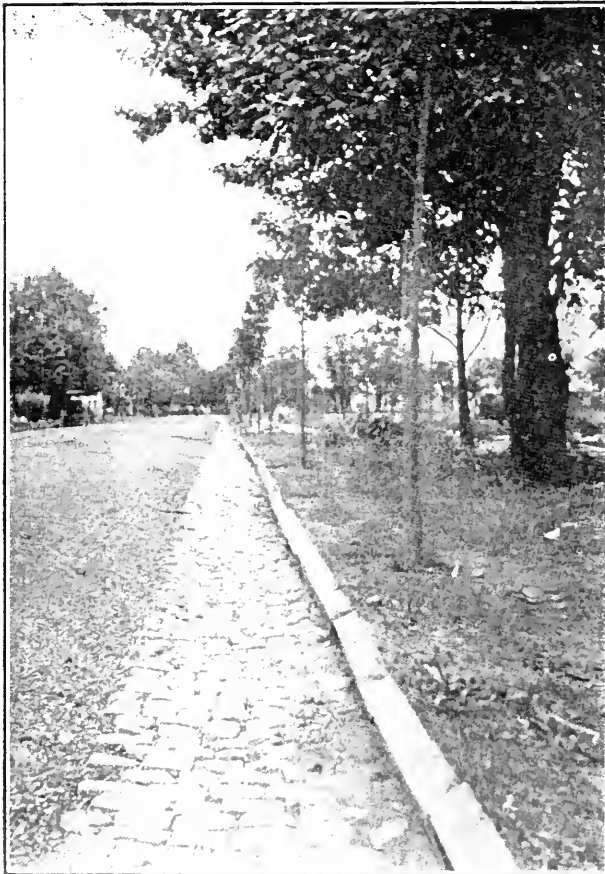
ODORS FROM SPRINKLING FILTERS

IN a discussion of a paper by Mr. Earle B. Phelps before the Boston Society of Civil Engineers entitled "Disinfection of Sewage Filter Effluents," Prof. L. P. Kinnicutt (recently deceased), said:

"There seems to be another use for bleaching powder in sewage treatment besides sterilizing the effluents. In sewage treatment, when using the septic tank in connection with contact beds and sprinkling filters there are often, as you all know, very obnoxious odors given off into the air. Dr. Rideal in a recent paper advocates the addition of bleaching powder to septic tank effluent before running the effluent onto contact beds and sprinkling filters. In one of his late papers he has shown that chlorine has, what has already been noted in this country, a selective action, acting much more readily upon bacteria which develop at blood heat than upon the water and soil bacteria, and that the treatment of the septic tank effluent by bleaching powder does not at all interfere with the bacterial action of the contact bed or sprinkling filter, while it does prevent a nuisance arising from the odors from the septic tank effluent."

REPAIRING CURBS AND SIDEWALKS

IN the annual report of City Engineer Frederick A. Reimold of East Orange, N. J., mention is made of the great improvement to the appearance of a street resulting from care in constructing and maintaining sidewalks, curbs and gutters of uniform surface, width and alignment. This is especially true in cities where the curbs are of stone cut in short lengths, and the sidewalks also are of stone which has been thrown mo-



CURB AND GUTTER BEFORE REPAIRING



CURB AND GUTTER AFTER REPAIRING

less out of uniform surface by the action of frost or insecure foundation. The accompanying illustrations, which are taken from Mr. Reimer's report, indicate conditions which he found in East Orange and the improvement effected. During the year covered by the report curbs and gutters were reset and relaid to proper grade and line to the extent of 11,673 feet of curb and 2625 square yards of gutter. In resetting the curbs it was necessary to use 218 feet of new curbing to replace that which was broken; the cost of the new curbing amounting to \$94.60. Including this, the total cost of repairs to curb and gutter was \$2,817.49. The average cost per foot was 24 1/5 cents.

The city also relaid 39,848 lineal feet, or 178,265 square feet of sidewalks at a cost of \$3,527.28, or a little less than 2 cents square foot. One would judge from the illustration that the cause of the irregularity of the old sidewalk was the roots of trees, which might have been avoided had the sidewalk paving been kept further from the trees. It is possible that in this case the width of the sidewalk space was insufficient to permit this, but this certainly illustrates the desirability of leaving ample planting space where there are to be shade trees. Concerning this Mr. Reimer says in his report, "There is at present no ordinance regulating the placing of sidewalks in relation to the distance from the curb line. I recommend that such an ordinance be adopted and that the lengths be established as follows: On streets having 10 feet reserved for sidewalks, one walk to be placed at least 4 feet from the curb; on streets having 11 feet reserved for sidewalks, 5 feet from the curb; on streets having 12 feet or more reserved for sidewalks, 6 feet from the curb." The minimum width of sidewalk, he thinks, should be 5 feet, which would leave a 1-foot space between the inner side of the walk and the property line where the sidewalk width is 12 feet or less. He also recommends concrete walks in place of stone when new walks are to be built. In replacing the stone walks he recommends that if these are in any place less than 4 feet in width the owner be required to put in new walks at least 5 feet wide.

BERLIN WASTE UTILIZATION PLANT

BERLIN has a plant for the destruction of wastes which has now been working for two years in a manner satisfactory from both a hygienic and a technical standpoint, according to the *Gesundheits Ingenieur* for January 21, from an article in which, descriptive of the plant, we have prepared the following:

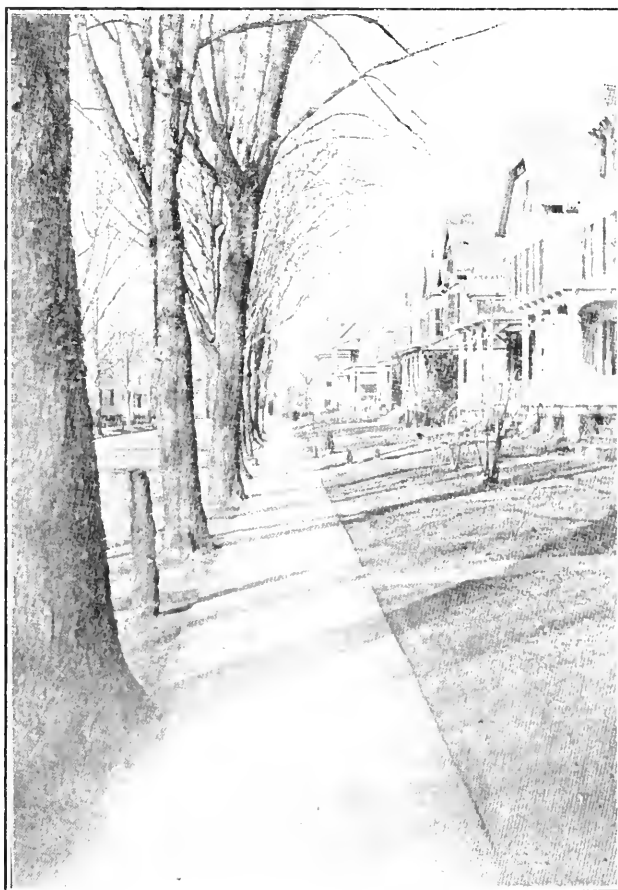
This plant lies several miles outside the city limits and is reached by a special side track from the main railway line. The site covered by the plant is divided into two parts, in one of which the wastes are received and in the other they are put through a utilization process. This division makes it possible to secure a perfect separation of the impure wastes and the products of reduction, which is considered to be desirable in order to prevent any epidemic or disease from being spread by products which have been brought in contact with infected wastes.

On the receiving side there are large tanks for storing the wastes, a disinfecting plant and a water purifying and sterilizing equipment. The other side contains a mechanical plant for the destruction of refuse as well as the storage tanks for the finished products. On each side there are facilities for shower and tub baths, a disinfecting plant for the workmen's clothing and recreation rooms.

Special railroad cars and, in the case of nearby communities, motor trucks of special design bring the wastes to the plant. The animal refuse is reduced in six Hartmann extractors, each of which has a capacity of 5,500 pounds at one charge. The refuse is subjected to steam under four atmospheres pressure in perforated drums in the extractor, and the fats and water are thus removed. These, which are in liquid form, flow into a fat separator, where the fat gathers in an upper section of conical shape, protected against the decomposing influence of the ammonia gases and oxygen generated during the process. After considerable fat has gathered it is drawn off into a fat collector and filtering tank. The glue-like mass remaining flows from the fat separator into a receiving tank, from which it is pumped into the evaporator, where the



SIDEWALK BEFORE REPAIRING



SIDEWALK AFTER REPAIRING

exhaust steam separates and goes back again into the extractor. The residue, or tankage, is dried in the extracting tank by use of steam. Power for operating the plant is furnished by an 80-hp steam engine. Two duplex steam pumps raise the necessary water from a 100-foot well into the reservoir.

Ventilation of the plant is obtained by windows which swing on a horizontal axis, thus permitting them to be opened to any extent desirable. In addition there are numerous exhaust fans for drawing off the impure air. The foul effluent waters are pumped into the ditches of an adjacent irrigation field, and the liquors which escape on the receiving side of the tank, after first being sterilized, are likewise turned into the irrigation ditches.

The plant cost about \$260,000, in addition to which \$64,000 was paid for special tracks and railway cars and \$25,000 for the collecting station in Berlin where the waste is collected and stored until there is enough to load one of the railway cars.

EXCAVATION AND CONCRETE

Classification of Excavated Materials in St. Louis—Two Classes vs. Several—Proportioning Concrete—Lack of Accuracy in Specifications

The Journal of the American Society of Engineering Contractors, the eighth number of Volume II, contains an interesting paper contributed to that Society by Mr. H. R. Fardwell, Sewer Commissioner of St. Louis, describing the sewers and sewer construction methods in that city. Possibly the most interesting part of this paper is that discussing the more general features of classification of excavated materials and greater exactness in preparing specifications.

Concerning the matter of classification Mr. Fardwell stated:

"In all the specifications at the present time under which our work is being carried on there are two classifications of excavation, viz.: Class "A," and Class "B." Class "A" is solid rock, including detached pieces of rock or boulders one cubic yard or more in contents, and all masses of solid, well-defined ledges of stone or masses of rock. Class "B" includes all other materials encountered. In my opinion, a better classification might be had, provided the engineer and contractor could reach some understanding as to the method of bidding, from which neither would vary.

In the above classification, Class "B" material may be either earth, macadam, shale, fire clay, gumbo, or cinders, with various kinds of rubbish dumped in excavations on the street. It is an undoubted fact that shale, fire clay, and gumbo will cost more to excavate than good top soil or clay, and it is also known that the concrete on the top of streets and macadam cost more to excavate than earth. Under this classification, however, the contractor is required to make a bid on anything that may be encountered, so that it is necessary that he either take a chance on these materials, or make his bid sufficiently high to enable him to take care of them. Where he does encounter them and has not made his bid to cover them he loses money; where he does make his bid sufficiently high and does not encounter these materials, the city loses money. The city, however, in trying to minimize this difficulty, has, in some of the districts, used core boring machines, and has given to the contractor a continuous core at certain definite points. These cores were placed on exhibition in the office of the Sewer Commissioner, and could be seen upon application. In districts where core borings were not made, a punch rod, with a spoon, was used, and samples were taken every five feet of depth; this, of course, does not give as good an idea of the condition of the ground as core borings.

Incidentally, as a matter of interest from personal observation, it might be stated that some of our contractors do very little more than walk over the site of the work. In one of our particular contracts, we had core borings made to show the nature of the limestone and the kinds of material above the limestone, so that the contractors might know the exact condition of the ground at various places; and out of twelve or fifteen contractors that took out plans for this work, only two looked at these core borings. Still, they put in bids.

Core borings, as well as the punching rod method of testing the ground, are expensive. If there were some means whereby it would not be necessary to make core borings, to any great extent at least, or to test the ground by means of punching

rods, the city would save not only on the excavation but also the money spent for preparing estimates. The necessity for doing this preliminary work would be lessened if the classification was enlarged, thereby giving the contractor the means of securing pay for the different materials encountered in his work.

In discussing this portion of the paper Mr. E. Wegmann stated that he considered the division of excavated material into two classes only to be very bad practice. "It makes the engineer's work very easy, but on the other hand it makes it almost impossible for the contractors to bid intelligently. The proper way to do is to pay for every kind of excavation that is likely to be encountered in the work, such as solid rock, loose rock, hardpan, macadam, etc. The contractor can then bid reasonable prices for each class of excavation and the additional work that may be caused to the engineer by such a classification is too insignificant to be considered."

Mr. E. H. Abadie stated that, in his belief, "a great many specifications are drawn, after careful forethought, with the intent to cover all conditions; but many problems are shifted, in cleverly worded specifications, to the shoulders of the contractor, because the engineers are unable to define clearly certain features of the work about which they are unsettled in their own minds prior to the beginning of the undertaking or letting of contract."

The Society of Engineering Contractors has a committee on classification of excavation.

Concerning the matter of specifications for concrete, Mr. Fardwell called attention to some rather unusual features in the St. Louis specifications. Among the more interesting clauses are the following:

All stone for concrete . . . must be quarried from ledges and have a specific gravity of not less than 2.60. . . . The grading of the stone or gravel shall be such that 100 per cent will pass a ring $1\frac{1}{2}$ inches in diameter; not more than 70 per cent nor less than 50 per cent will pass a ring $1\frac{1}{8}$ inches in diameter; not more than 40 per cent nor less than 30 per cent will pass a ring $\frac{5}{8}$ inch in diameter; and not more than 5 per cent will pass a ring $\frac{1}{4}$ inch in diameter.

After the broken stone or washed gravel has been graded to meet the above requirements, the voids will be calculated in the following manner: The broken stone or washed gravel shall be shoveled loosely, without compacting, into a box of known capacity, and shall be struck with a straight edge level with the top of the box. The actual volume of the broken stone or gravel shall then be determined.

The volume of the box minus the volume of broken stone, divided by the volume of the box, is taken as the percentage of voids.

The concrete is divided into three classes, A, B and C. Each class of concrete is made by mixing with the broken stone or gravel an amount of mortar 10 per cent in excess of the voids in the stone or gravel. The difference between the classifications is in the mortar so mixed.

Mortar for Class A concrete shall have the ratio of one barrel of cement to 7.6 cubic feet of sand. Mortar for Class B concrete shall have the ratio of one barrel of cement to 11.4 cubic feet of sand. Mortar for Class C concrete shall have the ratio of one barrel of cement to 15.2 cubic feet of sand.

In discussing these Mr. Fardwell stated that:

The various sizes of stone were so graded that the voids, measured in loose heaps, should be between 40 per cent and 50 per cent; but the voids were not determined accurately, so that it was impossible to state the exact number of cubic feet of cement to be used per cubic yard of finished work. In fact, the specifications above written do not state what is desired with a positive degree of accuracy, though they more nearly describe what is desired than the old way.

As the result to be arrived at is dense concrete, which gives the strength for which the sewer was designed, it becomes necessary for the engineer to use extra precautions in securing enough cement in the mixture. This anxiety on the part of the engineer often results in friction on the work.

A better method, in all probability, than either of the specifications is to have specified the number of cubic feet of cement to the cubic yard of finished work for the various classes of concrete work which are to be used, and in this way all misunderstanding on the work will be eliminated and the contractor will know exactly what he is bidding on at the time he bids on the work.

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239 West Thirty-ninth Street, New York
Telephone, 2046 Bryant, New York
Western Office, 929 Monadnock Block, Chicago

A. PRESCOTT FOLWELL, Editor

F. E. PUFFER, Assistant Editor

Business Department

S. W. HUME, President

T. MORRIS, Manager. A. PRESCOTT FOLWELL, Secretary

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MARCH 1, 1911

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The Water Rate Problem

An article and shorter items in this issue call attention to the importance which the matter of rate making is assuming in the operation of water works plants. The problem has always been a more or less difficult one, and few efforts have been made to solve it with anything like mathematical exactness or scientific principles. In fact, not only do the few who have given the subject adequate consideration failed to agree entirely upon just what principles should govern the determination of rates, but in the majority of cases no attempt was made by those who fix the rates to base them upon any definite or comprehensive principles whatever. Probably the most common plan has been to collect the rate records from a number of cities, average the rates found on these and adopt either these averages or a series of flat rates approximately proportionally to such averages. Later the

adoption of meters seemed to simplify the matter somewhat. By this time a general idea had been obtained by most of the companies as to how much income was necessary to meet all charges and necessities, and meter rates were fixed with the idea of producing this amount. In some cases a uniform rate was charged all consumers, but in the majority of cities a sliding scale has been adopted. More recently it has been impressed upon the minds of a number of superintendents that neither a uniform or sliding scale of meter charges is just to either the company or the consumer; and there is besides this the service rendered to the city itself, which must either be included in the private consumers' meter rate or charged against the city treasury. Certain of these ideas as set forth in the rates of Daytona, New Orleans and East Orange are given in the preceding pages. The problem is an interesting and a very important one, and we expect to present, next week, a discussion of some additional features of it.

New York Milk Regulations

THE Board of Health of New York City has adopted new regulations concerning the sale of milk in the city, to take effect Jan. 1, 1912. The resolutions setting forth the rules adopted were as follows:

Resolved, That after December 31, 1911, all milk and cream offered for sale in the City of New York, except that to be used only for manufacturing or cooking purposes, must be of the grades technically designated and recognized by the Board of Health as certified milk or guaranteed milk, or it must be pasteurized under conditions as prescribed by the regulations of said board.

Resolved, That it is the sense of this board that milk sold in this city be graded as follows:

Grade A. *For infants and children* (To be sold in bottles only) includes:

- (1) Certified milk.
- (2) Guaranteed milk.
- (3) Milk pasteurized under special regulations.

Grade B. *Milk safe for adults* (to be sold in bottles or drawn from proper containers; not dipped) includes:

- (1) Grade A.
- (2) Pasteurized milk produced under regulations of this department.

Grade C. *Milk suitable for cooking and baking purposes* (to be sold in bottles or from cans) includes:

All milk complying with the general regulations of the department, but not complying with requirements for grades A and B.

That no one should use any milk inferior to that of grade A for feeding infant or child.

That every person purchasing milk for drinking purposes is entitled to receive milk not inferior to grade B.

That the efforts of the Department of Health in the supervision of milk will be specially concentrated on grades A and B.

The meaning and significance of this, of course, depends upon the definition of "certified," "guaranteed," "pasteurized under regulations" and "pasteurized under special regulations." These definitions are as follows:

Certified milk is milk certified by the Milk Commission appointed by the Medical Society of the County of New York or the Medical Society of the County of Kings as being produced under the supervision and in conformity with the regulations of that commission as laid down for certified milk. No milk, however, shall be held, kept, offered for sale or sold and delivered as certified milk in the City of New York which is produced under regulations less than those of the said board for guaranteed milk.

Guaranteed milk is milk produced by farms holding a permit therefor from the Board of Health and produced and handled in accordance with the rules and regulations of said board.

The minimum requirements of the Board of Health for guaranteed milk are as follows:

- 1. That only such cows be admitted to the herd as have not reacted to a diagnostic injection of tuberculin.
- 2. That all cows be tested annually with tuberculin, and all reacting animals be excluded from the herd.
- 3. That the milk shall not contain more than 30,000 germs per c. c. when delivered to the consumer.
- 4. That the milk be delivered to the consumer only in sealed bottles which shall have been filled at the dairy, and shall bear a label giving the name of the dairy, and the date of the earliest milking at which the milk forming part of the contents was drawn.

5. That such milk be delivered to the consumer within 36 hours.

The milk pasteurized under special regulations, known as grade A pasteurized milk, is that which, in a raw state, is "selected" or "inspected," containing not more than 100,000 bacteria per c. c., and has been pasteurized by being heated to at least 140 degrees F. for at least 20 minutes and which, when offered for sale, does not contain more than 10,000 per c. c. Grade B pasteurized milk is that produced on farms where the rules and regulations have been complied with, the bacterial content of which before pasteurization is not excessive and which, after pasteurization and before sale, does not contain more than 50,000 bacteria per c. c.

The general regulations of the department concerning pasteurization provide that the milk, after pasteurization, must be at once cooled and placed in sterilized containers and the containers sealed. Also that all pasteurized milk must be delivered to the consumer within twenty-four hours of the pasteurization and must be delivered in sealed containers which are plainly labeled "pasteurized." The labels must also bear the date and hour when the pasteurization of the milk was completed, the degree of the heat employed, the length of time exposed to the heat, and the number of pasteurization permit issued by the Board of Health. It is not permitted to pasteurize milk a second time. In pasteurizing, the milk must be subjected to one of the following conditions of temperature and exposure: 158 degrees F. for three minutes, 155 degrees for five minutes, 152 degrees for ten minutes, 148 degrees for 15 minutes, 145 degrees for 18 minutes, or 140 degrees for 20 minutes. The apparatus used in pasteurizing must be automatic, equipped with automatic temperature and time-regulating and recording devices.

HARRISBURG WATER WORKS NOTES

In the report of the Harrisburg, Pa., water department for the year 1910 (one of the first complete reports for that year to reach this office) Superintendent Geo. G. Kennedy states that the pumping of filtered water produces an appreciably less amount of wear in the pumps than was observed when unfiltered water was being used. During the year "the number of valves in the pump end that had to be replaced was very low, showing the difference by their lasting qualities from those used before filtered water was pumped. This filtered water has also reduced to a minimum the packing necessary for the plungers and other parts of the pump end. The pumpage is checked frequently with the slip indicator and the slip never allowed to amount to any noticeable difference. It has always been less than five per cent." This amount of slip is lower than would be found in the majority of plants where accurate tests of the same made, and it seems probable that this also may be due to the fact that filtered water only is pumped.

During the year 3,293 meters were removed and tested and 3,236 reset, after being repaired if necessary. If the cost of the parts needed for repair amounted to a small sum (a change of gear or similar parts, for instance) the meter was reset and no charges made. If, however, the repairs required to bring the meter back to correct registration were expensive a bill for them was sent to the owner. "Many of the meters taken out during the year had been in use since 1888 and 1889 and it was remarkable how well some of them maintained their accuracy. None of the meters has been in use less than five years, and every one which has been taken out for test so far was in service before filtered water was furnished and had to pass the sand and coal which was carried in suspension in the water furnished before filtration was introduced." The total number of meters in use on Dec. 31, 1910, was 9,954.

The filter plant has previously been described by us, but it may be stated briefly that it is of the rapid filtration type, sulphate of alumina being used as coagulant. The plant has been in operation for five years.

During 1910 the total number of gallons filtered was 3,401,679,700, but 2.3 per cent of this amount was used in washing the filters. The cost of filtering based on the total amount

filtered was as follows for the several items: Coagulant, \$1.18 per 1,000,000 gallons; coal, 66.1 cents; supplies, 27.2 cents; materials and repairs, 36.6 cents; oil and waste, 6.2 cents; chemist and laboratory expenses, 36.4 cents; salaries, \$2.46; a total of \$5.37. On the basis of filtered water pumped to the consumers the total cost was \$5.49 1/3. This, of course, does not make any allowance for overhead charges, but merely for operating expenses.

STUDY OF TYPHOID EPIDEMIC

At Des Moines, Ia., by Public Health and Marine Hospital Service—All Possible Causes Investigated—Water Found Responsible—Precautions Recommended

In November, 1909, there was an outbreak of typhoid fever at Des Moines, Ia., which reached its culmination on the 23d of that month. A short time after this, the secretary of the Iowa State Board of Health requested the surgeon-general of the Public Health and Marine Hospital Service to investigate the outbreak with a view to determining its cause and suggesting methods for preventing its recurrence. The investigation was begun on Dec. 22, 1910, and completed on Jan. 7, 1911. In general this survey probably did not differ from several others which have been made in this country; but probably none have been more complete than this one and it may therefore serve as a typical illustration of how an exhaustive study of this kind should be made.

A sanitary survey was made of the Raccoon river, which passes through the city and empties into the Des Moines river within the city limits; the water supply was examined bacteriologically; an epidemiological study of about fifty individual cases was made and a review of the data previously collected by the city health officer; an inspection of a number of dairies, grocery stores and ice cream manufactories; and careful inquiry into the origin and distribution of fruits, vegetables and shellfish sold in the city during the outbreak; a clinical study of a number of cases of the disease, a survey of the general sanitary conditions of the city, and a consideration in general of all conditions which appeared likely to throw any light on the situation.

A study was first made of the typhoid death rate of the city for several years previous as well as during the time of the outbreak, and it was found that there were sixteen cases in December, 1910, whereas the highest number in any previous month of any year had been four. Unfortunately the Iowa laws do not require the reporting of cases of typhoid, and it was consequently impossible to determine with anything like accuracy the development of the disease except as indicated by the death rate. It is probable that had the outbreak been known by the health authorities earlier it might have been suppressed much more promptly.

It was found that most of the cases whose history was known were scattered generally over the city, that the epidemic reached its maximum suddenly, that the majority of the cases were persons whose ages were between ten and twenty-five, and there were other characteristics which indicated that the disease had its origin in the water supply. However, due attention was given to the possibility of the outbreak having been occasioned by the sewerage, by foods or beverages, by milk, ice cream, raw shell fish, soda water, ice, raw vegetables and fruits, or by contact. There could be found no indication that any of these could have been responsible for more than a very small percentage of the fifty cases studied, and the responsibility of individual causes for some of the cases seemed to be impossible; only one of the fifty, for instance, had eaten raw shell fish within thirty days prior to illness. Two of the cases were probably attributable to infection by contact; and all of the fifty except one of these two had used unboiled city water as his principal fluid diet for several weeks previous to illness.

The above merely indicates the several lines of investiga-

tion, but each one was followed out with all the thoroughness which was possible, and the customary method of solving the problem by elimination was followed out in a scientific way.

Had there, however, been no facts showing probable reasons why the water might have been the cause of the epidemic, this also might have been considered as partly eliminated and the problem have been left unsolved. The study of the water supply, however, showed the following conditions. The city of Des Moines is located on the Des Moines river at the junction with it of the Raccoon river. On the latter, about 1½ miles from the Des Moines river, is the pumping station, which draws its supply from filter galleries placed along and under the river. Probably the major part of the supply reached the pump well through the sand and gravel in the bed of the river and overlying the filter galleries. As is very frequently the case, the surface of this sand becomes more or less clogged at times with fine sediment and the water company has been in the practice of scraping away a small amount of the surface sand at such times to permit the water to enter the filter galleries more freely. During the week ending November 5, scraping had been resorted to and a larger amount of sand removed than at any other time during the year; and a second scraping in the week ending November 12th, removed almost as great an amount, and was succeeded by another scraping on November 26th. Moreover, beginning on November 10th and continuing for some time thereafter a centrifugal pump was used to draw down the water in the river galleries so as to increase the flow into them from the river. The epidemic assumed serious proportions just two weeks after the beginning of this pumping, which had been preceded only five days by the first scraping of the beds. Twelve days is the usual incubation period of this disease, and November 17 marked the beginning of the epidemic and November 23d and 24th its height. These several days and periods certainly serve as circumstantial evidence against the scraping of the filters and the pumping of the galleries as being among the causes of the epidemic. In fact, there would seem to be extreme probability that such acts would have introduced into the public supply a greater or less number of any germs which might have existed in the river water.

On investigating further, it was found to be probable that typhoid germs were in the river water at that time. An investigation was made of the drainage area above Des Moines on the Raccoon river and it was found that just above the city is the village of Valley Junction, with a population of about 2,500. This village dumps its garbage and night soil on the banks of the river and there are a number of private sewers and house drains discharging into the river at this point. It was also found that there were cases of typhoid fever under treatment in Valley Junction in October and November. It therefore seemed far from improbable that typhoid bacilli were in the waters of Raccoon river during those months. No analyses of the river water or city water were known to have been made during the epidemic; but analysis made in December showed the presence of colon bacilli in the city water, although at that time the water was being obtained from a new infiltration gallery where the filtration of the water in entering the gallery probably was much more effective than in entering the old galleries under the river bed during November.

As, therefore, the general features of the epidemic indicated the water supply as the cause, as all other probable causes appeared to be eliminated by the facts secured, and as there seemed to be very good reasons for thinking that the water supply was contaminated with typhoid germs, there seemed to be little doubt that this was the source of nearly, if not quite, all of the cases.

While the investigators were making analyses of the city water the company began the use of hypochlorite, and immediately with the use of this material the bacterial condition of the water greatly improved. The surgeon-general, through his representative, recommended that the Raccoon river be pro-

tected from pollution by sewage at points above the filter galleries, and also from all surface drainage likely to introduce typhoid bacteria into the river. Also the abandonment, as soon as practicable, of the filter galleries which cross under the river and the obtaining of the supply from a gallery and sand basin which parallels the river near the bank; this being the new basin which went into service last December. Until both of these precautions have been taken and the safety of the water has been determined by prolonged bacteriological studies, he recommends that the whole water supply be treated with hypochlorite of lime; and until it had been rendered safe by such hypochlorite treatment the people were advised to boil the city water before using it for drinking purposes.

While it did not seem probable that the epidemic was due in any way to milk or other food supplies, the local authorities seemed to deserve little credit for this, as there had been practically no efficient control of the dairies or places where milk or food of any kind was sold in the city.

SEWAGE DISPOSAL AT SHORE RESORTS

In the latest report of Mr. H. M. Herbert, engineer of the State Board of Health of New Jersey, the matter of disposing of sewage along the ocean front, especially near pleasure resorts and bathing beaches, is discussed as follows:

During the last season the wisdom of treating the sewage before it is discharged into the ocean was apparent. All sewers along the beach with ocean outlets, from Deal to Point Pleasant, inclusive (except Belmar, where legal complications prevented the completion of the works until after the season closed), were provided with septic or sedimentation tanks which discharged a fairly clear effluent into deep water. As a result, the bathing beaches were free from the objectionable fecal matter which at times heretofore interfered with the pleasure and comfort of the bathers. There were, however, two exceptions; the first was a complaint from Spring Lake that fecal matter was being washed up on the beach at that place. An inspection proved that it came from the Belmar outlet, where the temporary screens had become displaced. These were at once put in proper condition and no further trouble was experienced during the season. The second instance was a complaint from Loch Arbour to the effect that sewage from Allenhurst made the water unfit for bathing. A thorough inspection was at once made and it was found that the trouble was not with the Allenhurst plant, which was doing good work, but that Asbury Park had discontinued using the septic tank and was by-passing the raw sewage into the ocean through the outfall pipe. Several careful examinations were made of the tank and the intercepting sewer on Ocean avenue by representatives of this division at different times, and a report showing the defects of the system and making suggestions for its improvement was made to the State Board of Health.

It is understood that a part of these suggestions is now being carried out. The other plants along the coast are apparently working satisfactorily, as no complaints against them have been received at this office.

Our State was the first to conduct practical experiments on the disinfection of sewage by the use of hypochlorite of lime, commonly known as "bleaching powder." During the summer of 1907 the State Sewerage Commission, through the co-operation and courtesy of Professor Earle B. Phelps, of Boston, Mass., installed the necessary apparatus for treating the entire sewage of Red Bank for a period of about two months, at a cost of only a few hundred dollars. The results obtained were extremely satisfactory and proved that an effluent free from dangerous germs could be obtained at a nominal cost.

It is believed that this method of treating sewage, combined with thorough screening and sedimentation, can, where the effluent is discharged into a large body of moving water, especially salt, be advantageously installed, as the first cost is small compared with cost of contact beds or sprinkling filters, and the cost of maintenance is not great. Thus many thousands of dollars will be saved by some of our municipalities.

NEWS OF THE MUNICIPALITIES

Current Subjects of General Interest, Under Consideration by City Councils and Department Heads—Streets, Water Works, Lighting and Sanitary Matters—Fire and Police Items—Government and Finance

ROADS AND PAVEMENTS

Plan to Reduce Paving Cost to Taxpayers

Springfield, Ohio.—Instead of making the people along the street to be paved stand the cost of putting down the pavement, of maintaining it and keeping it clean, while the street car company, which uses it more than any resident, pays only for that portion between its tracks and refuses to pay a cent in assessments for cleaning it, City Council can compel the street car company to pave at least three feet more of a street than it has been doing, according to a discovery made by City Engineer M. J. Bahin. This probably will lead to the introduction of an ordinance in Council soon, which will compel the company to pay a greater portion of the cost of paving the streets on which it has lines. Mr. Bahin has been doing some quiet investigating and announced that in his opinion the Council can adopt an ordinance compelling the company to pay for more of the street paving, and that all that will be necessary to insure its holding in the courts is to bring forth proof, which he can do, that the requirement is reasonable. He holds that this is covered in the provision of the franchise giving Council the power to "make such other rules and regulations as may be just and reasonable" or in the blanket portion of the franchise.

Corpus Christi Will Improve

Corpus Christi, Tex.—The City Commissioners have decided upon a plan of constructive work that will entail the expenditure of many thousands of dollars within the next several months. Among other matters, is a massive concrete bridge, 138 feet in width, which will be built across a small ravine or arroyo on one of the principal streets. An additional mile of water mains is now being laid, making the total mileage in the city 19 miles. The awarding of contracts for sewerage system supplies insures the commencement of this work within the next 60 days. The initial expenditure will be \$75,000; the total outlay will reach \$140,000. The street department is putting plans in operation to fill up the principal streets in the city, a proposition calling for a considerable amount of filling. This work is preparatory to the commencement of construction on pavements.

Propose to Spend \$50,000,000 on State Roads

Harrisburg, Pa.—Senator William C. Sproul, of Chester County, has introduced a bill providing for a State system of public highways, which, in principle and its general scope, is said to have the approval of Gov. John K. Tener. A companion measure was also presented in the form of a resolution proposing a constitutional amendment permitting the State to issue bonds in the sum of \$50,000,000.

Object to Wide Streets

Milwaukee, Wis.—Asserting that streets 100 feet wide have been found to be a failure in other cities, property owners on North avenue have filed a remonstrance with the Council against the proposition to widen that thoroughfare between Forty-fifth street and Sherman boulevard.

Street Signs to Teach History

Paris, France.—Paris intends to make the city streets teach history to Paris children. The Municipal Council is expected soon to pass a bill requiring that the historical significance and dates of events shall be added to the street name signs. The streets are already placarded plainly with white letters on a blue background, not only at every street intersection, but on every angle of every building on every corner. Practically every important street in the city is named in honor of some famous man or victory. Future signs, therefore, will read: "Rue Rivoli—French Victory in 1797;" "Avenue Victor Hugo—French Poet and Novelist, 1802-1885;" "Rue Lincoln—Famous President of the United States, 1809-1865."

Ashes Used in Improving Streets

Perth Amboy, N. J.—Ashes are at a premium with the Street Department. They are being used in all portions of the city filling in bad places in the streets and making sidewalks passable. Street Commissioner Adair would be glad to hear from any factories or other places who have suitable ashes in large quantities to dispose of for use on the streets.

Will Loan State a Million for Highway

Wilmington, Del.—Delaware will have a highway the entire length of the State, 103 miles, that will have no superior in the country. This was virtually assured when it was announced authoritatively that T. Coleman DuPont, President of the DuPont Powder Company, has offered to advance \$1,000,000 to the State for the construction of the highway. It is his intention to make the proposed road the equal of any in the United States. He wants the highway to be 100 feet in width, but his advisors have urged him to make the dimensions 80 feet and possibly 60 feet. Mr. DuPont, when asked about the project, confirmed the announcement of his proposition. "There is such a great need in Delaware for a State highway of the best construction," said he, "that I am willing to risk putting up all the money for it. Farm property will increase as a result, the State will be better in every way and the citizens will be the beneficiaries."

Special Land Tax for Good Roads

St. Augustine, Fla.—Realizing that if St. Johns County is to have an up-to-date system of good roads, it will be necessary to secure more money than is possible under the present arrangement of ordinary taxation, the Board of Trade at its regular monthly meeting last week took steps to secure special legislation whereby it will be possible to levy a tax of 2 cents per acre on all lands in St. Johns County, the taxes to be used for road purposes only.

Legality of Ten-Year Guarantee Questions

Wilkes-Barre, Pa.—Brick paving seems to be in disfavor in this city, as residents along the various streets that are to be paved during the coming summer have held up the action of Council with a request that asphalt be used instead. In this connection the members of the Street Committee will be called upon to solve a difficult question, as the bids asked for require a ten-year guarantee that the streets will be kept in good condition. According to representatives of the asphalt company desirous of bidding on the local work, this is out of the question, as surety companies will not issue a bond for that period, as shown by the following communication:

To the Honorable the Councils of the City of Wilkes-Barre, Pa.
Gentlemen: We beg to express regret at our inability to file with your honorable body proposals for paving West Elm, Auburn, Kulp and South Franklin streets, in accordance with your advertisement, for the reason that your specifications require that the work shall be guaranteed and maintained for a period of 10 years, and that a bond shall be filed supporting such maintenance requirement.

All of the responsible surety companies transacting in the United States and Canada have declined to obligate themselves upon surety bonds in any form under contracts which require a guaranty or maintenance existing over a period in excess of five years.

Our inability to secure a surety, therefore, is our reason for failing to bid.

The 10-year maintenance guarantee has been practically abandoned by all municipalities, not only because of the attitude of the surety companies on the subject, but because, from the standpoint of the municipality, such a requirement is not considered economical or advisable, since competition is thereby restricted, and the city pays what amounts to a heavy premium of insurance on the pavement, an item which it could more economically carry itself.

Furthermore, the Supreme Courts in several States, Pennsylvania particularly, have held that assessment proceedings based upon a contract which includes a provision for 10 years' maintenance are invalid as charging against the owner of abutting property a cost with which he is not properly assessable. We will not burden this communication with citations of cases, as your law department is doubtless familiar with this point.

Respectfully submitted,

THE BARBER ASPHALT COMPANY,
By J. L. Rake, General Agent.

Paving Around Postoffice

Tacoma, Wash.—Commissioner Owen Woods has completed paving the streets around the Federal Building and figures prepared by Chief Clerk A. F. Metzger show that the work done by day labor cost \$4,863.13, which is \$1,233.37 below the appropriation allowed for the improvement and probably \$500 less than it could have been done by a contractor. The work was paid for out of the general fund. Street improvements are usually made by the local improvement district plan, but the State Government refused to pay the cost of this improvement, and it was a case of either appropriating money out of the general fund for the work or letting it go undone.

Plans for Elimination of Grade Crossings

Syracuse, N. Y.—Plans for abolishing the New York Central grade crossings in Syracuse have been completed. Two propositions will soon be taken up for decision between the company and the city authorities. One plan is to elevate the West Shore Railroad tracks and the other is to run passenger trains over the present freight tracks at the head of Onondaga Lake. Under the first plan all the present freight trains on the West Shore would be sent north of the city over the present freight tracks. A passenger station would be erected convenient to the center of the city, probably near the old West Shore depot. Under the second the West Shore tracks would be left at grade for freight transportation. The present freight tracks north of the city would be continued. The new passenger station would be located near the site of the old iron pier.

SEWERAGE AND SANITATION

Amend Bronx Sewer Act

Albany, N. Y.—Assemblyman Haines, of Yonkers, has introduced in the Legislature a bill to amend the act creating the Bronx Valley Sewer Commission. Five amendments are proposed. They are: Giving authority to the commission for the construction of a settling, reducing or screening plant. Changing the methods of levying the assessments for the cost of the sewer, so that the whole amount of interest on the bonds already issued shall not be included in the first assessment levied. Increasing the amount of bonds authorized to be issued by the commission by \$500,000. Authorizing the commission to use the premiums received on the issue of bonds. Extending the terms of the commissioners to one year beyond the completion of the construction work.

Big Relief Sewer Nearly Finished

Elizabeth, N. J.—It is declared by the engineers who have charge of the work of constructing the new intercepting sewer, described in the MUNICIPAL JOURNAL of April 6, 1910, that the work of the contractors would be finished by April 1. The contractors are now engaged on the last piece of work on Union street, where the sewer will be extended to the junction of Westfield avenue. Work was begun on August 19, 1909. With the completion of this sewer, it is expected and hoped that the Elizabeth River will be made clean. All of the sewage that is now emptied into the river will flow into this sewer, with the exception of one sewer that empties into the river near its mouth. To date City Council has authorized the issuance of bonds for \$250,000 for the work. The State Legislature will also be asked to pass an amendment to the bonding act so that bonds for \$25,000 more may be issued if needed.

Drinking Fountains in Schools Planned

New York, N. Y.—C. B. J. Snyder, Superintendent of Buildings of the Department of Education, declares that the common drinking cup used in the schools helps spread disease among the children, and he is looking about for a practicable substitute. He turned his attention first to the various kinds of sanitary fountains, but so far has been unable to find any that, in his opinion, is entirely satisfactory. It is said that Mr. Snyder has become so interested in the subject that he is contemplating inventing a fountain. It would require a great number of fountains to supply the needs of the schools and the additional cost had to be taken into account.

Would Apportion Cost According to Use

Newark, N. J.—Changes of an important nature in the Passaic Valley sewerage district law are proposed in a bill offered by Assemblyman Mylod. The bill provides for a sinking fund commission and the apportionment of costs according to the use that each municipality shall make of the sewerage facilities. As to the cost, the present law requires it to be apportioned according to the ratables of 1907. The bill leaves the division of cost as at present, but provides that the bonds are to be repaid by means of a sinking fund and contributions to the funds are to be made yearly in proportion to actual use. The bill also would provide that the part of the trunk sewer within the city of Paterson should be considered as a lateral construction and not chargeable to the district commission's construction. The district sewer, according to this construction, would extend only to the southerly limit of Paterson. The bill also provides for the issuance of 50-year bonds. The Governor is to appoint three members of a "sinking fund commission of the Passaic Valley sewerage district." They are to receive a salary. The amount is left blank in the bill, to be filled in by the committee that has the bill. The bill was prepared at the request of the sub-district that includes Bloomfield, Montclair, Glen Ridge and East Orange.

WATER SUPPLY

Put Ban on "Sidewalk" Meter Reading

St. Paul, Minn.—The Water Board has inaugurated a campaign to put the system of "sidewalk readings" by its meter readers under the ban. It developed at a recent meeting that meter readers have been changed recently and the bills of some consumers have increased materially. The Board members are inclined to believe some of the former readers did not actually read the meters of all patrons, but merely guessed at the reading some months. This form is known as "sidewalk reading." Some cases under investigation by the Board show that for three and four months a consumer's bill has been practically the same amount for each alleged reading, and when a new reader has gone into the territory this same consumer's bill is doubled or trebled. This is accounted for by the contention that former readers did not actually read the meter at all, but presented a reading covering consumption about equal to the minimum the patron would be expected to use. Consequently new readers in some instances have found actual consumption much greater than the minimum. With the employment of new readers, the Water Board expects to keep tab on the actual consumption, and any case of "sidewalk reading" reported will make the accused reader subject to immediate dismissal.

Favor Municipal Ownership of Water Plant

Escanaba, Mich.—Ever since the fact developed that the municipal lighting plant has during the last five years earned \$70,000 over and above all operating expenses, there has been growing a strong sentiment and conviction that it would be a good thing for Escanaba to own a water works system. It is figured out that if the city can do so well with its lighting plant, when it is so honestly and efficiently conducted, as it has been by the Board of Public Works, it can do just as well with a municipal water works system. Many citizens are now openly advocating the purchase by the city of the water works plant and some of them most interested in the question and the public welfare generally are collecting data from cities owning such plants, which data will be used with effect when the time comes for acting upon the proposition of purchasing the plant.

Artesian Water Supply Inadequate

Devils Lake, N. D.—The water problem for this city steadily assumes a more serious aspect. The artesian well which has supplied this city for the past 20 years is now unable to supply enough water and as a result the city has been compelled to cut off the night supply. The several devices that have been used to increase the flow of water have failed, and it will be necessary to dig a large number of wells in order to insure a sufficient amount of water.

Advocate Free Water for All

Lockport, N. Y.—The Lockport Board of Trade is discussing the matter of giving free and unlimited water to manufacturers, business men, residences and, in fact, to every user of that necessary commodity within its corporate limits. This subject was broached by John R. Earl, who was most enthusiastic in urging upon his fellow-members the advisability of the city granting this right to every one with no restrictions whatever; in fact, advertising to the world at large that it will do so with the idea of inducing new industries to locate here. The acquisition of more factories and concerns of all kinds seems to hinge entirely upon their securing satisfactory water rates from the city, which if they obtain free and unlimited water would be the greatest inducement for them to come here that any community could offer prospective industries.

Work on Municipal Water Works Temporarily Stopped

Mattoon, Ill.—Judge Wright has granted a temporary injunction restraining the city of Mattoon from further work on its municipal water works. The judge says that for the city of Mattoon to operate its own water works system or to make an agreement with another company is a violation of its contract with the Clear Water Company.

Water Company Offers to Buy City Water

Niagara Falls, N. Y.—The Western New York Water Company, a private water concern, has submitted to the city a proposition for the purchase of water from the new municipal system, which is expected to be put in operation within a month. While the private company's proposition cannot be accepted by the Water Board in its entirety, the members believe that the first step toward an amicable agreement between the city and the company which may eventually lead to the purchasing of the plant of the private company has been taken. The water company's offer is as follows:

The company to purchase from the city all potable water required in its service.

The company to pay the city \$16 per million gallons for raw water and \$20 per million gallons for filtered water, the company to take filtered water when the city is ready to serve it.

The limits of territory to be supplied by the city and by the company, respectively, to be defined in the contract.

The company to have the right to supply any or all of its consumers through meters to be installed at the expense of the company and the consumer's minimum rate for such metered service shall not exceed the existing flat rate for non-metered service.

The company to operate its present plant to supply manufactories within a reasonable distance of its pumping station with raw water from its present source of supply, where potable water is not necessary.

The term of contract to be 20 years.

Work Begun on Stamford Reservoir

Stamford, Tex.—A new reservoir is being built which when completed will have a capacity of 4,000,000 gallons and will be the largest reservoir in West Texas, with the possible exception of one other. The general lay of the country, however, as shown in the photograph, would not strike an engineer living in New England, for instance, as a particularly favorable site. The contractor is J. W. Cox, of Stamford, and the work is being done under the supervision of Gurley & Hill, Stamford.



Courtesy San Antonio Express.

A TEXAS RESERVOIR SITE

Pure Water Assured by New Water System

Bristol, Va.—Bristol's new supplemental water main to the Frank Preston spring, five miles east of the city, has just been completed and the two Bristols will now enjoy an addition of from one to one and a half millions of gallons of water daily. The new supply has been pronounced by chemists to be absolutely pure. The cost of constructing the new main is about \$100,000. A modern intake, constructed of concrete, will be provided. The new supply is owned jointly by the two Bristols.

Test of Pump Is Satisfactory

Ft. Dodge, Ia.—Last week a test was made by the Mayor and City Council and Water Superintendent Pray of the new centrifugal pump recently installed at the pumping station. The test developed that the pump works satisfactorily. That it will furnish sufficient water at all times for the city supply must be determined by another test, which is now being made. When the pump was started the water in the big shaft was on a level with the top of the pump and during the morning the pump was turned on to its full capacity and only succeeded in lowering the water about 65 feet or within about 6 feet of the tunnels wherein about a million gallons of water is stored at all times. Efforts to lower the level of water from this point were unavailing and it is a significant sign that in all but very extreme cases the city supply can in the future be furnished from the deep well.

For New Onaga Water Works

Onaga, Kan.—Onaga has begun active work on its new \$20,000 water works system. A well and pumping station is under way on the banks of Hise Creek. The tower, 180 feet high at the greatest elevation in town, gives abundance of gravity pressure for the four miles of water mains now being put in. The reduction in insurance rates will pay much of the cost.

Tax Municipalities for Water Diversion

Trenton, N. J.—Fifteen municipalities and water companies will be charged this year for excess diversion, according to a schedule filed with the State Comptroller by the State Water Supply Commission. The total amount charged for excess diversion of surface waters is \$5,519.58 the tax being at the rate of \$1 per 1,000,000 gallons. Although the revenue from this source is inconsequential at this time, the indications are that within a few years it will become a source of substantial revenue to the State. This prediction was made at the time of the passage of the act providing that municipalities and water companies should pay a fee for all water taken beyond a fixed stipulated amount from sources of public supply.

Temporary Water Supply for Yonkers

Yonkers, N. Y.—The joint committee of citizens and Aldermen is considering a temporary supply of water—2,000,000 gallons daily to June 1. There are three possible sources for this temporary supply, as follows:

Water from Pocantico to be stored in local reservoir for use during dry season.

Extra filtration plant for surplus supply of Saw Mill River water.

Underground sources such as might be secured by the Oglesby plan, tube wells, etc.

Will Resume Old Damage Suit for Delay

Lockport, N. Y.—The Buffalo Dredging Company will resume the fight to make the city pay the claim of \$17,000 over alleged damages on the water supply system intake work in Niagara River, the payment of which was stopped three years ago by an injunction served by the taxpayers on Mayor Baker and the Common Council just as the Council was voting to pay \$10,000, the sum agreed on as a compromise, in settlement of the matter. Samuel J. Dark, secretary of the Buffalo company, appeared before the Committee on Accounts of the Board of Aldermen last week and pointedly asked what the city is going to do about the matter, intimating that his company intended to press the claim in the near future. The company's claim was for damages for alleged delay in getting the right of way.

STREET LIGHTING AND POWER

Dangerous Street Illumination Fixture Ordered Removed

Washington, D. C.—The old bell which has been a central figure in street illumination schemes in the downtown section of the city for the last two years has been relegated to the scrapheap. Complaints were made to the Board of Public Works by the Washington Water Power Company and by a number of citizens, who feared that the bell and the festoons might become coated over with ice and that the weight might become too great, and that the bell would fall on the electric wires below. The Board of Public Works decided that the bell must come down.

Cheap Electricity Furnished by Municipal Plant

Walla Walla, Wash.—The rates charged for electricity in Ellensburg, Wash., is said to be an excellent illustration of the advantages of municipal ownership of electric lighting plants. Compared to the rates charged for electricity in Walla Walla, Ellensburg is furnishing consumers with this necessary commodity at prices much lower than charged in this city. In general the rates charged in Ellensburg are 9 cents per kilowatt hour as the maximum charge, down to 5 cents per kilowatt hour as the minimum. These rates are subject to a discount of 10 per cent for prompt payment, which brings the maximum down to almost 8 cents and the minimum down to 4½ cents per kilowatt hour. The maximum charge in Walla Walla is 15 cents, or almost 7 cents per kilowatt hour higher than is charged in Ellensburg. A bill for 20 kilowatt hours in Walla Walla \$3, while in Ellensburg the same kilowatt charge would be \$1.60, or \$1.40 less in favor of the Ellensburg consumer.

Ordinances Providing for Underground Wires

Dallas, Tex.—Ordinances have been drawn and are being circulated for signatures for initiative legislation looking to the placing of all wires of every public service corporation in conduits underground. This is to apply at present only to what is called the "fire limits of the city." There are two of the ordinances, separately submitted. Each must have the necessary 5 per cent of the number of voters at the last preceding general election for Mayor, or about 200 in all. One ordinance will apply to all telegraph and telephone companies. The other is to apply to electric light and power companies. Both are to have the initiative provision attached before presenting to the Board of Commissioners, as it is not believed by the workers upon these matters that the Municipal Commissioners would pass the ordinance without a vote of the people.

Company Donates Town Free Lights

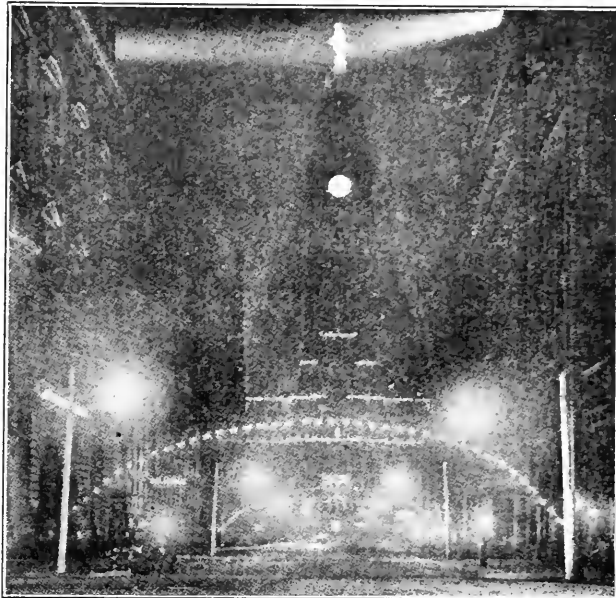
Weaverville, Cal.—At the request of the Women's Civic Improvement Club the Weaverville Electric Light Company has given 30 electric lights to Weaverville streets. Each light is to be of eight candlepower. As the company usually charges 85 cents a month for such lights, the donation made at the request of the women is equivalent to a cash gift of \$25 a month. The location of the lights is to be determined wholly to the Women's Civic Improvement Club.

Looking Toward Municipal Lighting for Minneapolis

Minneapolis, Minn.—F. R. Mistersky, Superintendent of the Public Lighting Commission at Detroit, Mich., told Mayor Haynes and the Council Gas Committee last week how his city saves money by running its own street lighting plant. Mayor Haynes, who is strongly in favor of lighting Minneapolis streets from power generated at the proposed high dam, arranged the conference. Mr. Mistersky declared that the actual cash cost for one arc lamp in Detroit is \$30.34 a year, as compared to the price of \$84 charged for Minneapolis by the Minneapolis General Electric Company, including depreciation, interest on bonds and other overhead expenses. Mr. Mistersky declared the total cost per lamp is only \$50, showing a clear saving of \$34 a lamp for the Minneapolis charge. The Detroit plant, Mr. Mistersky declared, is valued at \$1,400,000 and has been in operation since 1895. Detroit has 4,565 arc lights, as compared to 1,384 for Minneapolis. Detroit, however, has no street lamps, as has Minneapolis. "People of Detroit couldn't abolish the municipal lighting plant under any circumstances," said Mr. Mistersky.

Philadelphia City Hall Special Illumination

Philadelphia, Pa.—During the recent Electrical Show Broad street was illuminated by temporary arches of incandescent lamps which spanned the street, extending from the Armory to the City Hall. The City Hall was specially



CITY HALL AND APPROACHES ILLUMINATED

lighted and had erected on the North Broad street side a sign of welcome. The illustration shows the City Hall tower with the statue of William Penn illuminated by searchlights.

Ornamental Illumination Paid for by Assessment

Dayton, Ohio.—The City Council, at a recent meeting, unanimously enacted into law the legislation necessary so that the city could contract with the Dayton Lighting Company for the future maintenance of the present system of ornamental street lighting now in use. Since the installation of these lights payment for same has been made by the property holders or lessees of the property direct in accordance with agreement with Dayton Lighting Company. As soon as the Board of Control enters into a contract with the lighting company, in accordance with the legislation as passed, the cost for the lights will be put on the tax duplicate and assessment made direct by the city, the same as is done in other methods of city improvement.

Municipal Lighting for Orange

Orange, N. J.—Beginning February 16 Orange was lighted by its new municipal lighting system. The city has not yet assumed full responsibility for operating the system, as much finishing work remains to be done.

All Night Street Lighting for a New Hampshire Town

Rochester, N. H.—At an adjourned meeting of the City Council it was voted to have all night street lighting on and after February 14, the contract to be signed with the Twin State Gas & Electric Company.

Explosion in Sewer Cuts Off Electric Current

Kansas City, Kan.—One night last week an explosion of gas in a sewer severed four conduits controlling the electricity which supplies power to practically every electric light and street car in the city. As a consequence all the lights were out for three hours and not a street car was running. No one was injured by the explosion. It was more than an hour before the seat of the trouble was located. Reserve policemen were immediately sent to all parts of the city. Firemen patrolled downtown streets to safeguard against fire. There was neither a fire nor a robbery reported during the time the city was dark. The trouble occurred between the hours of seven and ten, when people were most dependent upon lights and cars, and great confusion reigned, especially until all were assured that there was no danger.

FIRE AND POLICE

Vote to Test Motor Engine at Tuckahoe

Tuckahoe, N. Y.—With Mayor Lennon, Commissioner of Public Safety Fleming, Aldermen Mooney and Stillwell, of Yonkers, as spectators, a demonstration of the motor fire engine from the Fire Department of Yonkers was given at Tuckahoe station and at Waverly last week under the direction of Chief Mulahey, of the Yonkers department, and an agent of the manufacturers. The demonstration was in anticipation of the vote on the proposition to expend \$8,000 for the purchase of one for the Waverly Engine Company.

Police Chief in Saddle

Allentown, Pa.—Besides maintaining four mounted officers in Allentown, the Police Committee has decided to secure a mount for the chief of police. The present chief, Major Charles D. Rhoads, ordnance officer of the Fourth Brigade, is not satisfied to sit at headquarters and receive reports, but wants to go out on the job and inspect what the subordinates are doing.

New Fire Company Inaugurated

Augusta, Ga.—Chief Frank G. Reynolds, of the Augusta Fire Department, has named the personnel of the new No. 6 auto chemical company, making his selections from among the experienced men in the department, with just one of the newly elected firemen to fill out the roll. By this selection No. 6 becomes one of the strongest and most efficient of the companies, being almost entirely composed of men of experience in the science of fire-fighting. The company will go into commission next week, at which time the formal opening of the company and the dedication of the new station will be celebrated by a gathering of the officials of the department, the city officials and a few invited guests from Augusta and the neighboring cities.

Police Statistics Sent to Governor

Baltimore, Md.—The annual report of the Board of Police Commissioners to Governor Crothers has been completed and sent by the Commissioners to the State offices in the Union Trust Building. The report shows that during 1910 33,055 persons were arrested and \$205,278.10 of lost and stolen property was recovered by the police. In regard to "pistol toting," it is shown by the report that under the new law the Commissioners issued 21 permits to carry weapons. The new private detective law passed by the last Legislature diminished the number of so-called "private detectives" and the Commissioners issued licenses to 49 men. During the year the police turned in 221 fire alarms and members of the department extinguished 300 fires without sending in an alarm.

Library Service for Fire Companies

Boston, Mass.—For many years the Boston Public Library has been sending books to fire companies. The work has increased year by year till at present books are sent to 58 companies. Others would be supplied if they requested it. The number of volumes sent in the year 1910 was 17,400. The books are in small sets, and delivery is made once a month by the library wagon. Half the books are fiction. An attempt is made to include some books that are likely to be of special interest to members of the Fire Department, and if requests come in for special books, these are sent when they are obtainable.

Prevention Work Proposed for Retired Firemen

Chicago, Ill.—H. H. Glidden, manager of the Board of Underwriters, has a plan for building inspection to prevent fires which he thinks would be exceptionally efficient and not very expensive. He proposes that the 1,200 retired firemen now drawing pensions from the city be employed as inspectors. "The city," said Mr. Glidden, "could increase their pensions to the size of a good salary by utilizing the sum annually collected as insurance tax on the premiums of the fire insurance companies. The fund amounts to nearly \$200,000 a year. One-half goes to the firemen's pension fund. The employment of these former firemen as inspectors should save the city many thousands of dollars every year."

Police Matron for Chickasha

Chickasha, Okla.—The members of the United Charities Society, the largest women's organization in the city, has petitioned the City Council and Mayor of this city for the appointment of a police matron.

New Fire Engine for Chico, Cal.

Chico, Cal.—Word has been received that the new fire engine ordered for the local department will be delivered about April 1. It is being built in Elmira, N. Y., by the American La France Company and the construction work on it is now well under way. The completed engine will be one of the most modern and best in the State, and will easily answer all the requirements of the Chico situation. The cost is about \$5,000, and it is expected that the engine will last the city at least 20 years. The old engine has given service longer than that, and is still in commission. Eight hundred feet of fire hose has been ordered from the Eureka Hose Company. It will go well with the new engine, for it is said to be one of the best brands on the market.

Underground Fire Alarm System Contemplated

Ft. Worth, Tex.—James A. Allen, one of the nominees for City Commissioner, and City Electrician Smith have been to Houston to inspect the underground fire alarm system of that city. They returned well pleased with what they saw. Ft. Worth is working on plans for an underground system. The city had an offer at one time from a company to install the underground system in this city for \$7,000. Since then the city has grown and the installation would have to be much more extensive. It is estimated the cost would be now \$15,000 or more. There will be several substations. At first the underground system would be restricted to the business part of the city.

Fire and Police Pensions Sought

Portland, Ore.—Members of the Fire Department are seeking to have created a pension and relief fund for the care of aged and incompetent firemen who have served many years in the department or have been injured in the performance of their duty. To this end a proposed charter amendment has been submitted to the Council with the request that it be placed on the ballot for the consideration of the voters at the coming municipal election. A similar bill creating a pension fund for the Police Department was presented to the Council.

Baltimore Fireboat Near Completion

Baltimore, Md.—Finishing touches are now being put on the new fireboat Deluge at the yards of the Skinner Shipbuilding & Drydock Company, and in a short time the trim vessel will be ready for delivery to the Fire Department. According to the United States steamboat inspectors who recently examined the Deluge, the vessel is perfect in every



Courtesy of Baltimore News

NEW FIREBOAT "DELUGE"

respect, and Baltimore's big interests along the water from expect from her strong protection against fire. A doctrinal of the machinery has been conducted and the builder are well satisfied with the result. A big water tower on the stern of the fire fighter is one of the striking features and the top of the tower shows a large nozzle, while on the main deck are many other nozzles, all of which might be a reminder of a warship ready for action.

Permanent Technical Library for N. Y. Fire Department

New York, N. Y.—A donation of \$10,000 from Mrs. Russell Sage to the firemen of New York, to be used for the installation of technical libraries in firehouses has been announced by the Rev. Edward Knapp, the department's chaplain. Mr. Knapp has been at work upon the library project for several months. Three weeks ago he succeeded in interesting Mrs. Sage in it. The \$10,000 gift, the chaplain says, will be expended for books dealing with subjects the firemen meet in their civil service examinations. Through an arrangement made with the Public Library recently, popular literature, including light fiction and historical writings, has been provided for the fire stations. Cases in which to keep these books have been ordered and will soon be installed, and space will be provided in them for the technical works that are to become the permanent property of each firehouse. The circulating libraries will consist of 50 books for each fire station, to be changed every two months. About the same number of books will be purchased for the permanent supply. Chaplain Knapp announced that Fire Commissioner Waldo has made him chief librarian of the department and has designated the assistant foreman of each firehouse as librarian for the branch to be located there. In all, 257 branches will be established, to cover the city's four boroughs.

Police Patrol Boats to Be Kept in Touch with Headquarters

New York, N. Y.—First Deputy Police Commissioner Priscoll has practically completed his plans for reorganizing the Harbor Squad. The scheme comprises the location at prominent places on the Staten Island, South Brooklyn and East and North River shores of signal stations for the patrol. These will consist of telephone booths in which a patrolman will be constantly on duty. Each booth will be equipped with a New York Telephone Company wire for the use of the public and a private wire to the Police Department. The public wire will enable citizens to call up the booth and ask for assistance or notify the patrolman that some danger impends in the waters near by. On each booth will be a flagstaff, on which the patrolman will raise a flag by day and lantern signals by night. A danger call having been 'phoned to him, he can use his police wire to ascertain the location of the patrol boat and report to the Central Office and then raise his signal to call the attention of the boat. In order that the general public may know the location of these booths, the Police Commissioner will have cards printed giving the address of each and the telephone number. These cards will be distributed all along the shores of the harbor and rivers and at such other places where they may, in the discretion of the Police Commissioner, be of service. The launches of the Harbor Precinct also will receive new patrol schedules. They will be out much more than they have been in the past, and they will have to keep in touch with the shore signal stations. It is planned also to equip these launches with searchlights for night service. Hitherto when patrolling at night along the piers, the police have lost over thieves under the piers. These gentry would mutually make a bee-line for the darkest places, and by simply lying motionless on their oars, the thieves could not be seen by the pursuing police launch. With a powerful searchlight on their boat the police will be enabled to follow and capture their quarry.

Hoods on Cap Abolished

New York, N. Y.—Police Commissioner James C. Cropsey has issued a general order amending the rules and regulations to the effect that cloth hoods with winter caps will be no longer worn.

Police Have New Flash Lights

Hutchinson, Kan.—The Police Department has received our patent electric flash lights designed for the use of patrolmen. The batteries of the lights are made to fit in coat pocket, the cord running down the coat sleeve with the flash light attached to the inside of the cuff in such a way as to be convenient to reach. They are a great improvement over the old-fashioned light carried in the hand and the batteries of which burned out so often as to be too expensive for use.

GOVERNMENT AND FINANCE

Aims to Tax Gas Mains

Allentown, Pa.—Allentown is in the throes of a movement as pioneer among Pennsylvania cities to tax gas mains. One or two municipalities in this State do obtain revenue from their gas companies, but they are places where the more modern spirit prevailed of providing for taxation when the franchises were granted. In this city, as in hundreds of other municipalities throughout Pennsylvania, the gas company operates under the law of 1874, whereby gas companies not only have a monopoly, but are free from taxation, the franchises furthermore being self-extending when the city annexes adjoining territory. Last year Charles M. Schwab looked into this matter when he arranged for the construction of a monster coke plant at the Bethlehem Steel Works. One of the by-products of the coke operation is an enormous quantity of gas, more than enough to supply all the municipalities within a radius of 30 miles. He was considerably surprised when he learned that he could not, under the State law of 1874, secure a rival franchise, no matter how low the price at which he offered to supply gas. Recently an ordinance was introduced into the City Councils to tax gas mains.

New York Special Franchise Tax

New York, N. Y.—The total tentative special franchise assessments in Greater New York for the year 1911 are \$483,908,300, as compared with \$465,400,000 final assessments for 1910. Among the principal assessments for this year, as compared with last year, are:

	Final. 1910.	Tentative. 1911.
Am. Dist. Telegraph.....	\$100,000	\$100,000
Brooklyn R. T. system.....	53,276,300	59,304,800
Brooklyn Un. Gas system.....	18,470,000	20,085,000
Edison Elec. Ill., Brooklyn.....	12,000,000	13,000,000
Empire City Subway, Ltd.....	9,192,000	10,000,000
Consolidated Gas system.....	86,144,000	92,522,500
Manhattan Ry. Co.....	78,512,500	81,412,500
Metropolitan St. Ry. Co.....	20,258,000	19,200,000
Nassau Electric R. R. Co.....	3,056,400	3,056,400
N. Y. Telephone Co.....	44,170,000	48,500,000
Ninth Avenue R. R. Co.....	2,800,000	2,800,000
Penn. Tunnel & Term. Co.....	15,800,000	16,000,000
Third Avenue R. R. Co.....	7,920,000	8,300,000
Trustees, N. Y. & L. I. R. R.....	5,451,500	5,451,500
Twenty-third Street Ry. Co.....	2,790,000	1,625,000

Proposed Changes in New York Charter

New York, N. Y.—Material changes in the government of New York City are provided for in the report of the joint Legislative Charter Revision Committee, of which Assemblyman Fred W. Hammond, of Syracuse, is chairman, which has been submitted to both branches of the Legislature. The report consists of a brief synopsis of the work of the committee last year and a bill of more than 500 pages, which is the proposed charter for the city. The most important change advocated is the elimination of the borough presidents from the Board of Estimate, so that their entire attention can be given to the administrative affairs of their respective boroughs, and the provision for five commissioners, one to be elected by the voters from each borough, who will devote their whole attention to the Estimate Board. Provision is made for a Vice-Mayor, who will be a member of the Board of Estimate and preside at the meetings of the Board of Aldermen and act for the Mayor in his absence.

Defeat of Water Bond Election Explained

Oklahoma City, Okla.—The defeat of the water bond election was brought about, it is stated, not because the people are unmindful of the fact that Oklahoma City is in need of more and better water, but because they deemed it wise to delay the disbursement of such a large sum of money until the proposed commission form of government has become operative.

Plans to Have Annual Reports of Departments on Time

Boston, Mass.—The Mayor has issued a circular addressed to the heads of departments calling attention to an ordinance which provides that every officer in charge of a department shall issue his report within 30 days after the close of the fiscal year and asking the various officers to submit their 1910 reports within the prescribed time.

STREET CLEANING AND REFUSE DISPOSAL

Children to Assist in Cleaning Streets

South Bend, Ind.—In the organization of "clean street" leagues in the various public school buildings in South Bend nearly 10,000 school children will be enlisted in a movement to clean up the city this year, according to plans now under consideration. The children will assist in improving the condition of streets, sidewalks and lawns, but they will be liberally rewarded by the Chamber of Commerce, which is sponsor to the movement. The campaign will be launched as soon as arrangements can be completed and may become an annual feature of the work of the commercial organization. According to plans discussed by the Cleaner City Committee of the Chamber of Commerce, "clean street" leagues will be organized in all the city schools as soon as possible. Every scholar will be eligible to membership and the motto of the movement will be, "We are for clean streets." Committees will direct the actual work. Badges will be provided for the members of the committees, as well as the captains, and other badges will be distributed from time to time among the scholars particularly active in the work. The pupils will be asked to sign pledges, which may be recited in chorus before the close of school each afternoon, and will notify members of the committee of people failing to join in the movement. The people will be appealed to in various ways to assist the children in their work. The plan has been tried with great success in Brooklyn, N. Y., for several years.

To Clean City Ward by Ward

Dallas, Tex.—March has been designated as the time for a thorough clean-up of the city of Dallas and beginning on the first day of that month the city will be put in first-class sanitary condition, the work to be done ward by ward until every nook and cranny of the city is worked over. This was decided at a meeting of the Public Hygiene and Sanitation Committee of the Dallas City Plan and Development League, representatives of the Board of Health, the City Health Officer, the working head of the City Sanitary Department and representatives of the Chamber of Commerce. Another important action by the meeting was the passage of a resolution asking the City Commission to make adequate provision in the next financial budget for the proper support of the work of the Board of Health. The plan to be followed in putting the city in satisfactory sanitary condition is that efforts shall be concentrated on one ward at a time, and that each district shall be thoroughly relieved of all trash and dirt. The five city sanitary inspectors will go ahead of the trash wagons and urge residents to have all trash on their premises collected in a pile so that it may be hauled off. The city will be asked to send out 20 wagons for this work. In each ward there will be appointed from the residents a general, several captains and enough subcommittees to look after every foot of land in the ward. It is probable that premiums will be offered to children for the largest trash piles. This plan was used last year and is declared to have been a big success, the children getting good results from the friendly competition aroused by the offers. Ample notice will be given through the press of the ward to first be visited and from time to time the next district to be worked will be advertised. Three days will be spent in each ward.

Day Set Aside for Annual Cleaning for All Texas Towns

San Antonio, Tex.—March 11 has been set aside as official "clean-up" day, and every city and town of any size in Texas will, metaphorically speaking, get out with a scrubbing brush and broom. A great many cities in this State are preparing to go at this "clean-up" work in a most systematic manner.

Crusade for Clean Streets in Rome, Ga.

Rome, Ga.—The crusade for clean streets, sidewalks and premises is on in full force. Stringent regulations insuring absolute cleanliness are already on the statute books and will be rigidly enforced. These regulations relate to the cleaning of yards, the disposal of garbage, the sweeping of sidewalks, etc.

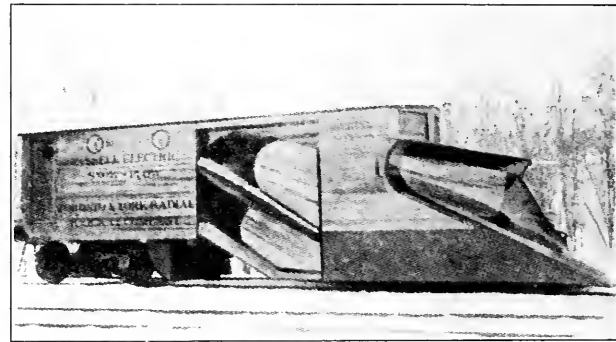
Street Flushing with Aid of New Nozzle

Altoona, Pa.—W. H. Fields, of the Highways Department, has put two or three gangs of men to work flushing the streets in all parts of the city. The work was started in the business district, and will be continued until all the paved streets are given a thorough cleaning. The departments recently procured a nozzle especially adapted to street cleaning work, and they can make much greater speed in the work by using it. It throws a spray of water about eight feet wide, and in addition to the advantage thus derived, a horse is used to drag the hose back and forth along the street. Thus not so many men are required and several gangs can be put to work. In the residential districts the work can be done in the daytime.

RAPID TRANSIT

Snow Plow for Electric Line

Toronto, Ont.—The Toronto & York Radial Railway control three suburban lines running into the city of Toronto. The longest of these lines is 55 miles, and runs through the Ridges of King, which are high hills in which the snowfall is large, and because of the location of the



SNOW PLOW FOR CANADIAN SUBURBAN LINE

road, the cuts deep. The problem of snow removal is frequently an expensive one to the company each winter. This winter they have ordered from the Russell Car & Snow Plow Company, of Ridgway, Pa., one of their newest models of plows suitable for electric lines. The principal dimensions of this plow are: Height over all, 12 feet; height of mold board, 8 feet 5 inches; length over all, 32 feet; extreme width of body, 10 feet 1 inch; width of bit, 9 feet 4 inches; total width of clearance when wings are extended, 14 feet 1 inch; equipped with air brakes; wings and flanges operated by air; approximate weight, 50,000 pounds.

Pennsylvania Legislation for Municipal Ownership

Harrisburg, Pa.—Numerous bills relating to municipal corporations, especially to second class cities, have been introduced in the House. The most important would permit municipal corporations to construct street railways and buy all equipment necessary to operate them and then lease to corporations for periods of years to be fixed by Councils. Another general bill empowers viewers to assess damages or benefits for grading of streets on railroads and street railways where they may be affected. A third provides that cities acquiring property shall take title in a simple.

Ordinance Would Put Two Men on Each Car

Moss Point, Miss.—An ordinance pending in Council, if adopted, will require the Pascagoula Street Railway & Power Company to have two men on each car at all times while operating within the city limits. The company is now operating the pay-as-you-enter system with one man to a car.

Subway Trains from New York to Mount Vernon

Mount Vernon, N. Y.—That the city officials are working to settle the question of better, quicker and cheaper transportation to New York City was again declared when Mayor Fiske made the statement that by October 1 the Interborough subway trains probably will run over the tracks of the Westchester & Boston Railroad to the union station at Columbus avenue, in Mount Vernon.

MISCELLANEOUS

Co-operation in Effect to Stamp Out Disease

Seattle, Wash.—The Seattle and Tacoma Boards of Health have promised to co-operate in securing proposed legislation having for its purpose the stamping out of tuberculosis among cattle of the State. The Seattle Board has stated its intention of taking up the matter with the Spokane Health Board and the health officers of other large cities of Washington.

Would Imitate Cleveland's Workhouse System

Toledo, Ohio.—In an effort to solve the problem of securing a central garbage loading station with which city officials have been wrestling unsuccessfully for several months, the Health Committee of the Chamber of Commerce now proposes that the city establish a county farm and workhouse close to Toledo to replace the present workhouse on Duck Island, which would permit that site to be used as a city yard and garbage loading station. Both the representatives of the city and the members of the Chamber of Commerce committee believe that a county farm and workhouse operated along the lines of the successful Cleveland institution would be a good thing for Toledo. It was stated that with a farm of not less than 500 acres the workhouse inmates could be employed the year around instead of being forced to idleness during the winter. The hay, oats and corn, products of the farm, could be used by the city safety and service departments, while the vegetable crops could be utilized in feeding the institution's inmates. At present the men are employed during the summer in making bricks, from which considerable revenue is derived. However, it is believed that in the end the farm would be just as profitable.

Band Concerts by Appropriation or Popular Subscription

Indianapolis, Ind.—Mayor Shank has under consideration asking the Board of Park Commissioners to set aside from \$1,000 to \$1,500 for giving band concerts in the parks and street centers this summer. The Mayor says band concerts will be given during the summer months, but that he has not decided definitely whether he will ask the Park Board to bear the expense or solicit subscriptions from business men, as he did last summer. The Mayor believes that for about \$100 a week concerts could be given each Sunday afternoon and evening in two parks or street centers. Last summer, through money contributed by business men, the Mayor gave two concerts each Sunday in different parts of the city, some of the concerts being given in neighborhoods where the poorer class of people live.

Municipal Council Takes Up Subject of News Stands

Lynn, Mass.—Newspaper stands located on curbstones and against buildings in the business district of the city are going to be investigated by the Commissioners of Public Safety for the purpose of determining whether they are to be regarded as a nuisance. This decision was reached at the regular meeting of the Municipal Council last week.

City Employees Want Tests for Promotion

Toledo, Ohio.—While most of the policemen and firemen are satisfied with their present berths, there are 129 of them who have just signified to the Civil Service Commission that they are not averse to promotion, and on February 14 the Civil Service Commission will hold examinations for an eligible list for promotion in the classified service.

Would Have Shade Trees Along Streets

Akron, Ohio.—The City Improvement Committee of the Chamber of Commerce at the meeting of the Chamber of Commerce last week recommended in a published report the planting of shade trees along the streets and in the yards. The committee in its report recommends the setting out Norway maples, elms or pin oaks. They are slightly higher in price, but are more hardy and much longer lived. The committee also recommends that property owners instead of planting trees between the sidewalk and the curb should, wherever possible, plant their trees 3 to 4 feet inside of the sidewalk. The tree will grow better and faster in such location and be much less liable to injury.

Votes of Women Control Election

Seattle, Wash.—In last week's primary to choose 18 candidates for Councilmen the votes of the women, following up their vote of February 7, which ousted Mayor Hiram C. Gill and his appointive officers, defeated all but three candidates who were accused of being close to the Gill administration. Most of the nominees are wealthy men, and some have devoted much time to the study of civic government. The proportion of women voting, compared with the total registration, was larger than of men.

Minneapolis Shows Interest in Playgrounds

Minneapolis, Minn.—Minneapolitans will have the opportunity to see for themselves practical demonstrations of playgrounds work on Thursday evening, April 8, when the National Playgrounds Institute will open a three days' session here with a public mass meeting. Moving pictures of playgrounds scenes, with children enjoying themselves with the swings and turning poles and invigorating games, will be a feature of the meeting. Then there will be folk dances as carried on under play leaders in parks and shelter houses of other cities, with children from one of the local settlement houses showing just how happy they can be made by such innocent pleasures. Minneapolis boy scout patrols will also drill. It is planned to make the meeting enjoyable as well as instructive.

Norfolk City Brings Suit Against Railway

Norfolk, Va.—The Norfolk & Portsmouth Traction Company, together with the Ocean View Railroad Company, an independently operated subsidiary has been made defendant here in suits aggregating \$85,000 damages in which the city of Norfolk claims actually \$43,000 for "between tracks" street paving. The traction company resists on the ground that an ordinance franchise in 1887 required its predecessor to only pay for labor and not material, while its legislative charter in 1886 requires the payment for both labor and material in paving "between tracks." The action involves some \$200,000 in back claims if the city wins.

Experts Discuss Dynamite

New York, N. Y.—The Municipal Explosives Commission gave a public hearing at fire headquarters last week in reference to the prohibition within this city of the manufacture, storage, transportation and sale of high explosives having nitroglycerine as a base. Manager Wasserman, of the W. H. Blumenstein Chemical Company, of Pottsville, Pa., said he would call attention to an explosive that his company made that was absolutely safe, though not as strong as dynamite. He gave it the name of canite. Mr. Haskell, a representative of the Dupont Powder Company, said that 95 per cent of the accidents that happened through dynamite were caused by explosion while the stuff was being thawed out. John von Lengerke, Vice-President of the Keystone National Powder Company, said that carelessness in handling dynamite was responsible for most of the accidents. W. F. Jordan, of the New York Central Railroad, said that dynamite was the only explosive that could be used to advantage in blasting.

Bill Providing for Municipal Construction

Des Moines, Ia.—A bill designed to revolutionize the method of performing city work or improvements, giving municipal cities the privilege of making improvements by private contract, has been introduced in the House by Representative Shankland, of Polk County. The following paragraph outlines the bill:

That whenever under the law governing such cities, any work or improvement is required to be done or made by contract the Council shall have power before ordering said work or improvement to cause an estimate of the cost thereof to be made and filed with the City Clerk, and if the bids or proposals thereafter received therefor shall exceed the estimated cost, or if no bids are filed in response to advertisements for proposals, the Council shall have the power to do said work without contract and to employ such labor and purchase such material as may be necessary therefor.

Don't Want to Be Village

Bellefontaine, Ohio.—The City Council has adopted resolutions opposing Representative Connoughton's bill to raise the line of demarcation between cities and villages from 5,000 to 10,000. It would change the form of government of 44 cities to the village plan.

LEGAL NEWS

A Summary and Notes of Recent Decisions—Rulings of Interest to Municipalities

Employment of Private Detectives

Flannagan vs. Buxton et al.—Municipal corporations can only exercise such powers as are clearly embraced within the legislative grant of power, or those derived therefrom by a clear and undoubted implication. Statute, 1898, authorizes villages to establish ordinances and by-laws for the maintenance of good order, and authorizes the village board to appoint policemen, night watchmen and superintendent of police, and prescribes their duties. Held, that a village organized under such act has no power in the absence of special necessity to employ private detectives at village expense to report violations of law in such village.—Supreme Court of Wisconsin, 129 N. W. R., 642.

Injury from High Voltage Wire—Liability

Hoppe vs. City of Winona et al.—The city of Winona, under authority of Congress and of the Legislatures of Wisconsin and Minnesota, constructed a bridge across the Mississippi River, from the Minnesota to the Wisconsin side thereof, and thereafter operated it as a toll bridge. By an ordinance duly enacted the city authorized defendant power company to string its electric wires over and attach the same to the framework of the bridge for the transmission of electricity from its plant in Wisconsin to and the distribution thereof in the city of Winona. The city reserved the right to control the manner in which the wires were so strung, and directions in that respect were given by the ordinance. The wires so placed upon the bridge carry from 25,000 to 45,000 voltage of electricity, and at times throw off a "brush" or "disruptive discharge" sufficient to cause the death of a person in close proximity therewith, without actual contact with the wire. The city thereafter let a contract for painting the bridge, and decedent was in the employ of the contractor in doing the work. He was killed while so at work by a "brush" or "disruptive discharge" of electricity from the wires. It is held:

(1) That if the wires were negligently strung upon the bridge, by reason of the fact that they were uninsulated and not sufficiently elevated upon supports above the structure to avoid persons coming in contact therewith while at work upon the bridge, both the city and the power company are liable.

(2) Whether there was negligence in this respect was, on the evidence, a question of fact and the verdict of the jury is sustained.

(3) That the relation of the city to the bridge was that of private owner of a quasi public highway, and its grant of authority to the power company to string its wires thereon was an exercise of its municipal and not of its governmental functions.

(4) The dangers from a "brush discharge" of electricity from the wire were unknown to the contractor or decedent, and both were entitled to warning thereof from the city.

(5) The doctrine of independent contractor has no application to the case.

(6) The question of decedent's contributory negligence was a question of fact for the jury.—Supreme Court of Minnesota, 120 N. W. R., 777.

Location of Sewage Disposal Plant

Borough of Florham Park vs. Borough of Madison et al.; Toth vs. Same; Ward vs. Same.—The act which requires the consent of certain bodies before a sewage disposal plant can be located in a municipality other than the one desiring the same applies to all municipalities; it also applies to all proceedings taken to construct such plants, save such proceedings as at the date of the approval of the statute had reached a stage where the work had proceeded so far that the municipality was irrevocably bound to complete the work or else suffer serious pecuniary loss.—Court of Errors and Appeals of New Jersey, 78 A. R., 753.

Defective Streets—Warnings—Lights

Lasityr vs. City of Olympia.—In an action against a municipal corporation for injuries by falling over an obstruction in the street the court charged that it was the duty of the city by day or night to properly guard any obstruction placed upon a sidewalk during construction or improvement by proper and efficient signals or special lights or barriers and warnings, and that the foot passer has the right to assume that the sidewalk is safe, in the absence of reasonable barriers, lights or warnings to the contrary, and unless cautioned by some sign or notice, and the counsel for plaintiff in argument contended that the court had charged that it was the city's duty in all cases to place signal or beacon lights on barriers or obstructions in the street, and the defendant thereupon requested the court to correct the counsel and instruct the jury to the contrary. This the court refused to do on the ground that the jury had the written instructions. Held, that the refusal of the court to correct counsel or further instruct the jury was not prejudicial error.—Supreme Court of Washington, 112 P. R., 752.

Public Duty—Sprinkling Street Car Tracks

State ex rel. City of Milwaukee vs. Milwaukee Electric Railway & Light Co.—A street railway's duty under an ordinance to sprinkle the part of streets occupied by its tracks is a public one and enforceable by mandamus. A proceeding to compel a street railway to sprinkle the part of streets occupied by its tracks from April 1 to November 1, as required by ordinance, is not defeated as presenting a moot question because pending outside that period and because the duty may be afterward performed, where the ordinance has been disregarded for five years, and its validity is contested by the railway. A municipal regulation requiring a street railway to sprinkle the part of streets occupied by it so as to prevent dust rising, but not so as to create mud or pools of water, merely requires ordinary care and is not void as being unreasonable. An ordinance requiring a street railway to sprinkle the part of streets occupied by it is not void as discriminating in favor of users of automobiles and other vehicles who are not compelled to bear like expense.—Supreme Court of Wisconsin, 129 N. W. R., 623.

Police Officer—Removal—Evidence

People ex rel. Devon vs. Baker, Police Commissioner.—In a proceeding before the police commissioner of the City of New York to remove a police officer for improper conduct, the burden is on the prosecution to establish such conduct. In a proceeding before the police commissioner of New York City to remove a police officer for wrongfully assaulting and arresting another, evidence held to show that such other was the aggressor in the combat between him and the officer, so that the officer was justified in striking and arresting him.—New York Supreme Court, 126 N. Y. S., 885.

Contracts—Forfeit of Deposit

Davin vs. City of Syracuse.—Where a city advertised for sealed proposals for a public improvement, specifying that no bids would be received unless accompanied with a certified check for a certain percentage of the bid, and a bid was made accompanied by the check and the contract awarded to the bidder, who declined to make a contract, he could not recover the deposit declared forfeited by the city. The deposit will be deemed liquidated damages for a breach of the bidder, and in an action by him to recover it the city need not prove actual damages, substantial damages being presumed in the absence of evidence to the contrary. A contract must be construed in the light of the surrounding circumstances at the time it was made and not in the light of subsequent events.—Onondaga, N. Y., County Court, 126 N. Y. S., 1001.

Defective Streets—Ice

Hatch vs. City of Elmira.—A city is responsible for the defective condition of its sidewalks by reason of snow and ice, where dangerous ridges are formed and allowed to remain after the weather reasonably permits removal; but it is not liable for failure to remove small hummocks of ice on the sidewalk, which were made in snow and melting slush by passing pedestrians and later frozen.—New York Supreme Court, 126 N. Y. S., 863.

Milk Ordinance—Tuberculin Test

Adams vs. City of Milwaukee et al.—Where there are conflicting scientific beliefs or theories on the question of danger of infection from bovine tuberculosis and of the efficacy of the tuberculin test, it is for the city council to determine upon which theory it will base its police regulations, and unless it is clearly and manifestly wrong the courts will not interfere. In an action involving the validity of an ordinance requiring an inspection of milk and a tuberculin test, evidence considered, and held sufficient to show that milk from cows affected with tuberculosis is inimical to health. An ordinance applying to the inspection of milk and regulation of sale thereof and certificate of freedom of cows from disease and destruction of milk therefrom is within the power of the common council of the city of Milwaukee, under its charter. An ordinance of Milwaukee providing for inspection of milk coming from outside the city and tuberculin test and certificate of freedom from disease of cows producing the milk is not unconstitutional because it singles out milk dealers outside of the city and does not apply to dealers within it, where dealers within the city are under supervision of the board of health. An ordinance providing for inspection of milk and tuberculin test and destruction of milk from diseased cows does not violate Constitution U. S., Amendment 4, or Constitution Wisconsin, as depriving owner of property without due process of law, when the destruction is necessary to preserve the public health. In all ordinary cases of destruction of property under authority of the city council the property owner has a right of action for damages against the city for a wrongful destruction.—Supreme Court of Wisconsin, 129 N. W. R., 518.

Officers—Inspector of Buildings

Scanlon vs. Carey.—Revised Laws, providing that the superintendent of public buildings or such other officer as the mayor and the aldermen of the city may designate, shall be inspector of buildings, does not increase the number of persons holding office, but simply adds another office to that of the superintendent of public buildings, unless the mayor and aldermen designate some other officer of the city to be the incumbent of the new office; and an ordinance providing for the appointment by the mayor, triennially, of an inspector of buildings, subject to confirmation by the city council, is in violation of the statute, which calls for a designation in another way.—Supreme Judicial Court of Massachusetts, 93 N. E. R., 697.

Records of Treasurer—Deprivation of Property

Robison et al vs. Fishback.—Where a city treasurer prepared a card index system referring to assessments for public improvements at his own expense, such indexes not being required by law, an injunction against the removal of the indexes at the expiration of his term is not "taking" of services or property without just compensation, and does not violate Constitution prohibiting such taking without just compensation. An injunction against the removal by a city treasurer at the expiration of his term of office of card indexes prepared at his own expense is not a deprivation of property without due process of law.—Supreme Court of Indiana, 93 N. E. R., 666.

Sidewalks—Duty to Repair

O'Loughlin vs. Pawnee City.—A sidewalk constructed by a city along a public street in the usual place under the directions of the city and afterward controlled by it and repaired by the public should be repaired by the city, and the city may be liable for damages resulting from negligence in failing to do so, though the sidewalk is not within the limits of the street as originally platted.—Supreme Court Nebraska, 129 N. W. R., 271.

Hospitals—Nuisance

Board of Health of Ventnor City vs. North American Home et al.—Police law 1910, declaring that tuberculosis an infectious and communicable disease dangerous to the public health, does not render an institution for the treatment of persons afflicted with bone tuberculosis a nuisance per se, where it appears by the testimony of competent physicians that bone tuberculosis is neither contagious nor infectious.—Court of Chancery of New Jersey, A. R., 677.

Public Water Supply—Reasonable Waste

J. N. Matthews Company vs. City of Buffalo et al.—For failure to pay a valid claim for willful or unreasonable waste or for fraudulent use of water, the supply may be cut off until the waste is stopped and all arrears paid. In an action against a city to restrain the cutting off of plaintiff's water supply, evidence held insufficient to show plaintiff was guilty of fraudulent use or unreasonable waste of water. An ordinance of the city of Buffalo (section 44), providing that water may be shut off in case of unreasonable waste and until such waste is stopped and all arrears are paid, does not authorize the discontinuance of water service for non-payment of accounts that may be rendered for reasonable waste. In an action to restrain the discontinuance of plaintiff's water supply, evidence held insufficient to show that plaintiff had unreasonably wasted water so as to authorize the discontinuance of service. Where a water consumer chose to take water through an unmetered line, it was liable to pay rates for unmetered service, and the fact that it supposed that it was paying the water through metered lines will not relieve it from the established rate for water through unmetered lines.—Supreme Court of New York, 126 N. Y. S., 596.

Public Improvements—Proceedings

McCoy et al. vs. City of Omaha et al.—The mayor and council of cities of the metropolitan class had power under the act of 1897 to prescribe by ordinance duties of the board of public works not specified in the statute. The ordinance of the city of Omaha directing the board of public works to advertise for bids for street improvements was within the power of the mayor and council and valid. A notice inviting bids for street improvements, signed by the chairman and secretary of the board of public works, will be presumed to have been authorized by that board in the absence of evidence to the contrary.—Supreme Court of Nebraska, 129 N. W. R., 429.

Contracts—Approval of City Engineer

Baker vs. City Council of City of La Moure et al.—Where a city and a contractor enter into a contract for the construction of a sewer, and said contract specifies that the work must be done to the satisfaction of the city engineer, such provision is binding upon the city and the contractor, and the city will be restrained from levying assessments against individual property where the city engineer, in good faith, refuses to approve of the contractor's work. The fact that the supervising engineer was appointed by the council especially to superintend the building of a sewer, there being no city engineer, does not affect the question of the binding effect of the contract or the application of the statutes to that question.—Supreme Court of North Dakota, 129 N. W. R., 464.

Sidewalk Improvement—Reasonableness—Notice

City of Winchester vs. Bush et al.—Where a city passed an ordinance for the improvement of a sidewalk, providing for 30 days' notice to property owners within which they might do the work themselves, such notice should be construed as contemplating that the owners commence the improvement within the 30 days and, as so construed, provided a reasonable time for that purpose.—Court of Appeals of Kentucky, 133 S. R., 791.

Change of Grade of Street—Liability

Quinn et al. vs. City of Columbia.—Where there was a difference in the level of the ground on the two sides of a street, and a grade was established at the natural surface on one side, the city could not make a material change of grade from the natural surface on the opposite side without becoming liable to the abutting owners for the damages resulting from a change in the grade.—Kansas City Court of Appeals, Missouri, 133 S. W. R., 663.

Sidewalks—Pedestrians—Care Required

Kelley vs. Kansas City.—A pedestrian need not exercise a "higher degree of care" in descending a step in a sidewalk than in passing along a level walk, though ordinary care, which applies in both situations, might require more caution in stepping down.—Kansas City Court of Appeals, Missouri, 133 S. W. R., 670.

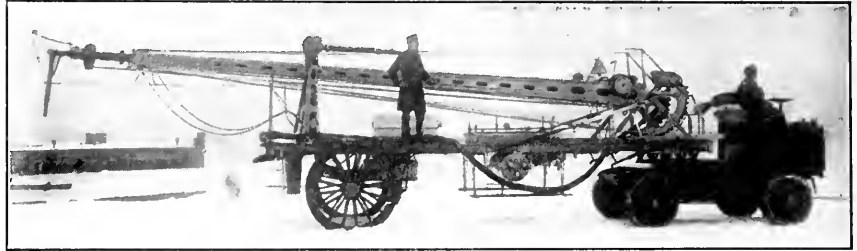
MUNICIPAL APPLIANCES

Electrically Propelled Water Tower

ONE of the most difficult pieces of apparatus to handle in the New York Fire Department, the water tower, has been equipped with the gasoline-electric motor system of the Couple-Gear Company, 149 Broadway, New York. At the first fire at which the newly equipped tower did actual work it was one of the first pieces of apparatus to arrive, whereas usually it is among the last. So notorious is this fact of the slowness of water towers to get into action that they are called by the firemen "window washers." The machine is capable of a speed of 15 miles an hour, and it weighs seven tons. The tower must be very stable because when raised to its full height of 65 feet and the water pressure reaches 165 pounds the reaction at the nozzle creates a tremendous leverage.

Briefly, the apparatus consists of a short, heavy chassis with four-wheel drive and four-wheel steer, which is placed under the front end of the vehicle to be handled, the fifth wheel of the vehicle being pivoted on a universally jointed platform attached to the chassis. In other words, the power chassis takes the place of the two front

wheels and horses originally used. Stability, when in service at a fire, is insured by locking the frame of the water tower to the frame of the chassis. It can be turned within its own length, the four-wheel steer permitting the power chassis to be turned at right angles to the tower, so that the rear wheels of the tower become pivots. The machine can be run backwards for any distance as fast as circumstances permit. Turning corners is greatly facilitated by the fact that when the four wheels of the power chassis are deflected they all travel on the same arc. The machine at present in service



NEW YORK WATER TOWER—GASOLINE-ELECTRIC DRIVEN

in New York is made up of one of the standard commercial semi-trailer chassis of the Couple-Gear Company, of New York, coupled up to a standard 65-foot water tower. The driving power is applied through the agency of electric motors, inclosed within the wheels, which are built up of steel discs. The motor itself is stationary, forming practically an extension of the axle. The wheel rotates about the motor, being driven by two small gears, one at each end of the armature shaft, which mesh with two large gears attached to the inner faces of the wheel discs close to the rim. The small gear on one end of the armature shaft engages the large gear in the wheel at one side, and the opposite shaft gear engages the other large gear on the other side. This is done so that both small gears will drive the wheel in the same direction. The wheel discs are fitted with doors through which access is obtained to the motors for inspection, oiling and cleaning. When the doors are in place the wheels are dustproof and may be run through water up to the hubs without danger of leakage. Current for the motors is supplied by a generator direct connected to a 50-horsepower, 4-cylinder gasoline engine. The engine and generator are so designed with relation to the requirements of the service that by manipulation of the throttle controlling the speed of the engine any desired current output may be obtained. It is possible to move the vehicle at a speed so slow as to be barely perceptible, while by merely opening the throttle (which is operated by the foot) the speed can be brought up to maximum in a few seconds. The vehicle has no fixed speeds, but any rate from minimum to maximum may be obtained at will. The machine is equipped with a controller which is the electrical equivalent of the usual automobile change speed gear. By means of the controller the speed of the machine can be cut in half, while the pulling power is doubled. In other words, the engine and generator maintain their speed, while the vehicle's speed is cut in two.

New Meter Box Top

THE Ryder self-locking meter box top, for which a patent has been applied for, has been placed on the market by the Clarksville Foundry & Machine Works, Clarksville, Tenn. The construction is shown in the accompanying drawing.

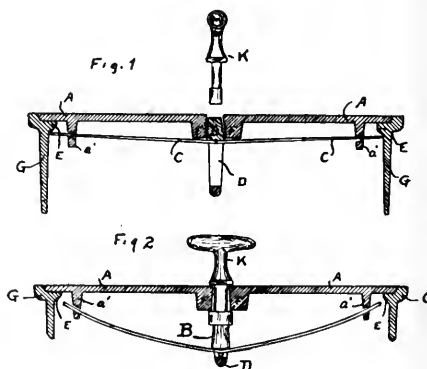
Fig. 1 is a section view across the center of the box through the center of the opening for the key B. This view shows the top A locked in position by means of the spring C extending under the projecting lugs E, which are cast on the body of the box G. The top A is made of cast iron and has an opening B at the center, a boss F on the under side around this opening and two guide lugs a' on opposite sides of the boss F and a Guard D to protect the spring C which passes

through the guide lugs a'. The spring C is made of the best spring steel and has shoulders at each end which prevent it from passing through the guide lugs a'. It also has a lead plug E riveted to it at its center which serves to close the opening in the top when the box is locked. Lead plug B is shown in Fig. 6.

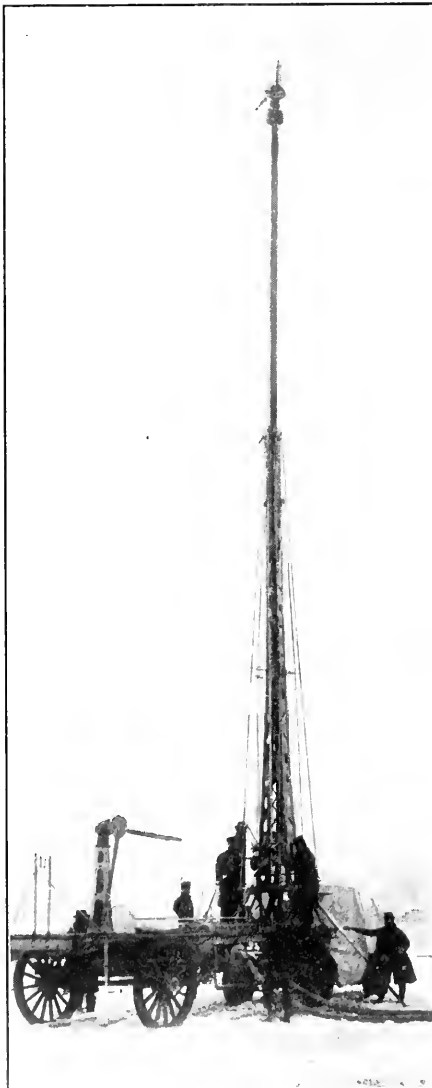
Fig. 2 is a sectional view across the center of the box through the center of the opening for the key. This view shows the top A unlocked with the key K in position and shows how the shape of the key K serves as a handle by which to lift off and replace the top when reading the meter. The shape of the key K is plainly shown. The top complete consists of only three pieces.

When it is desired to open the box the key K is pressed down upon the lead plug B until the shoulder comes against the top and the key is given a quarter turn, when the top can be lifted off by the key K as a handle. The top is then laid upon the pavement while the meter is being read. When it is desired to close the box the top is picked up by the key K and put in position and the key K given another quarter turn, when the force of the spring will bring the lead plug B back to its seat and the top will be in a locked position.

The advantages claimed are as follows: The opening in the center of



SELF-LOCKING METER BOX



TESTING MOTOR WATER TOWER

the top for admitting the key is closed automatically by a lead plug which will not corrode and which prevents dirt, water and cold air from entering the box.

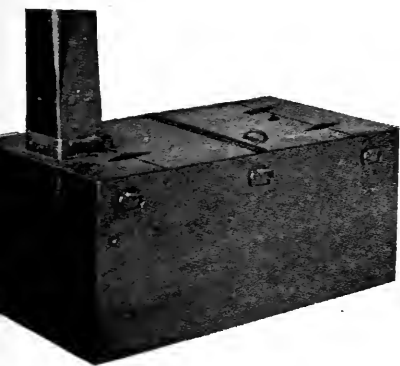
The key for unlocking the top is of such a shape that it serves as a handle by which to lift the same.

The key cannot be removed without having the top in a locked position, leaving no chance for the meter reader to leave the box in an unlocked position. It is quick to lock and unlock owing to the shape of the key and to the fact that the locking device is not visible from the top, it is hard to unlock without the special key made for the purpose so that boys or unauthorized parties have the greatest difficulty tampering with the meter.

The guard underneath serves as a protection to the spring when the top is laid upon the pavement in reading the meter and also makes it impossible to force the spring down far enough from the top to break it; as only enough room is allowed to unlock the box freely.

Small Garbage Incinerator

A SMALL portable garbage incinerator, shown in the illustration, is made by the Harris Incinerator Co., Rochester, N. Y. The construction and operation are both simple. It consists simply of an iron box divided into an upper and a lower compartment. The up-



PORTABLE GARBAGE CREMATORY

per is for garbage and the lower is the fire box. Suitable doors are provided for charging and for firing. The incinerator is made in different sizes. It is largely used in United States Army hospitals, and is suitable for hospital and other special municipal purposes.

Buffalo Pitts Steam Macadam Roller

In issuing their 1911 catalogue the Buffalo Steam Roller Company, Buffalo, N. Y., call attention to the fact that the Buffalo Pitts roller has now been on the market for nearly 20 years. New improvements have been made in design and new improved metallic compounds used as they have been invented. Even the first rollers, however, are still in satisfactory use.

Some of the important features which have made these rollers so serviceable and efficient are the following:

Steel yoke and flanged front housing, practically unbreakable. Smoke box uncovered to allow radiation and prevent burning out. Short locomotive boiler of large diameter to permit great variation of grade. Boiler of high pressure construction. Engines with locomotive link valve motion with hardened wearing parts, insuring long life. Two cylinders, avoiding dead centers and shock to shafting and

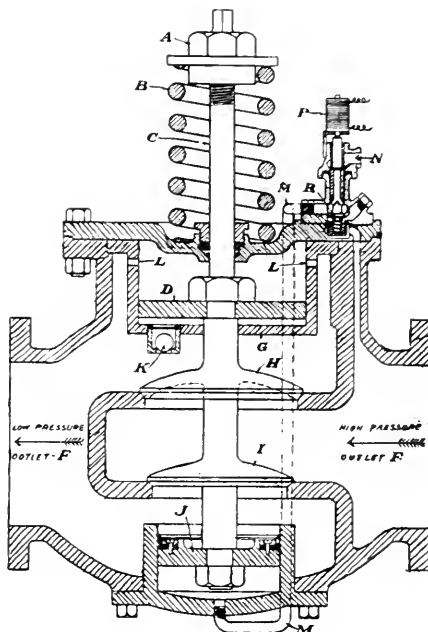
gearing. Cylinders steam-jacketed and cast in one piece with the guides. Shafting and gears of forged steel. System of gearing eliminating bevells and enabling full power to be applied to either one or both of the driving rolls at the will of the operator. All shaft boxes in removable housings. Two-speed gearing, which increases efficiency. Water glasses and gauge cocks near end of crown sheet. Low center of gravity, but with ample clearance from the ground. All working parts within sight, all levers, etc., within reach of operator. Force feed lubrication for cylinders. Large water and fuel capacity.

All of the Buffalo Pitts standard macadam rollers are equipped with two-speed gearing. It is patent to every experienced road builder that the roller is required to move rapidly when "puddling" and rolling the finishing courses, and it is necessary to move slowly with abundant power when rolling a subgrade, and the first layers of road metal, or when used for hauling purposes. The high-speed gearing of the Buffalo Pitts roller meets the first mentioned conditions, while the increased ratio of the low-speed gearing meets the latter conditions, and enables the roller to handle itself without increase of steam pressure on soft material or heavy grades or get itself out of a ditch or soft spot, where a single-speed gear machine would be unable to move itself. The double-speed gear also adds to the durability of the rollers, inasmuch as the wear is thereby distributed on two sets of gears instead of one, as is the case with a single-speed machine.

Water Pressure Regulating Valve

THE Golden-Anderson Valve Specialty Company, Fulton Building, Pittsburgh, Pa., have placed on the market an entirely new device, an automatic, cushioned, double-seated, quick-opening, electrically operated water pressure regulating valve. The valve, as shown in section, is in a closed position. When the spring B is adjusted by the nut A to the required pressure, the valve discs H and I are forced open. The high pressure, or inlet, is at E. The low pressure, or outlet, is at F. When the pressure on the low side has reached the pressure at which the valve or spring B is set, the pressure, still increasing, exerts a pressure on top of piston J (the valve H and piston D being balanced), causing the valves H and I to close. In order to have the

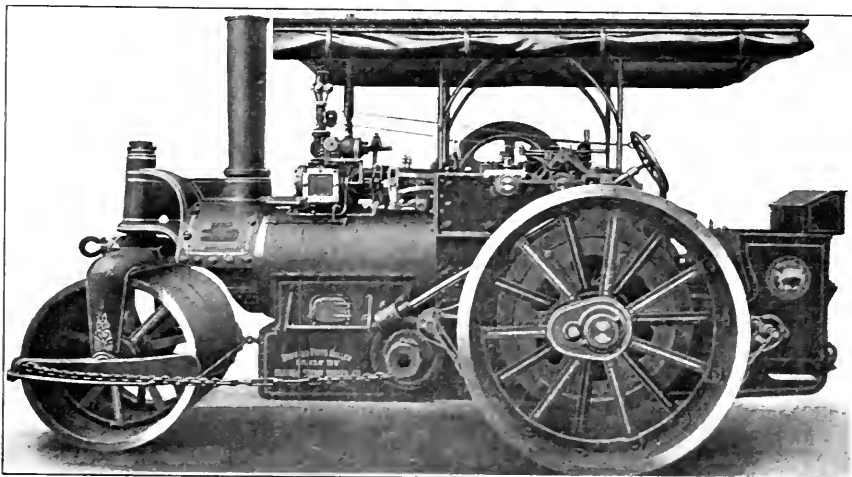
valve open freely and at the same time close very slowly, there is placed a ball check K in the bottom of dash pot G. The ports L placed in the upper rim of dash pot G prevent any accumulation of air while the valve is in service. The water above and below



PRESSURE REGULATING VALVE

the piston D and the air beneath the piston J prevent any water hammer and perfectly cushion the valve in opening and closing.

The solenoid P which controls the auxiliary valve R is wired to a switch at pumping station or any other convenient point and in case of fire the switch is thrown into contact, which causes solenoid P to open auxiliary valve R, allowing high pressure from the inlet side of the main valve to pass up through the auxiliary valve and down through small pipe M to the under side of piston J, which causes the main valves H and I to open to the full area. When the full pressure is no longer required, the switch is thrown out of contact. This allows the auxiliary valve to close and the pressure from the under side of piston J returns through the auxiliary valve, exhausting at port N. The pressure being released, the main valves return to position.



LATEST DESIGN OF 20-YEAR ROLLER

NEWS OF THE SOCIETIES

Connecticut Society of Civil Engineers.—The twenty-seventh annual meeting of the society was held at New London, February 14-15. Alfred D. Flinn, Department Engineer, Board of Water Supply, New York, delivered an illustrated lecture on the Catskill water works for New York. The author reviewed the general results to be accomplished by the project and then described in detail interesting engineering features of every part of the work. He gave special attention to the dams, conduits, siphons and various pipe and valve details.

Herbert M. Knight, formerly engineer with the Baltimore Sewerage Commission, gave an address illustrated with many lantern slides of Baltimore's ten-million-dollar sewerage system. The speaker described the legislation leading up to the project and outlined the main features of the project—a sewerage and drainage system in nearly every street in the city and a disposal plant a number of miles away. The high standard of purification required by law and the reason for it were explained. The difficulties in constructing sewers in streets where so many structures had previously been built were described.

Dr. Willis L. Moore, Chief United States Weather Bureau, read a paper on "The Relation of the Weather and Forestation to Stream Flow." The speaker argued that forests have no appreciable effect on temperature, rainfall or run-off and that therefore their removal cannot affect the occurrence or the extent of floods.

R. F. Stoddard gave a short description of the Congress Street Bridge at Bridgeport, Conn. This is a reinforced concrete highway bridge, 55 feet wide, comprising four 39-foot skew arches and a 70-foot single leaf Scherzer rolling lift draw. The main points of interest in the construction are the use of a granite protecting facing on the outside of the piers between high and low water and the use of a reinforced concrete sidewalk slab and a wood roadway.

Prof. C. M. Allen, Worcester Polytechnic Institute, read a paper, illustrated with views, on "Testing Water Wheels after Installation." He described in detail the Alden brake equipment with which he had tested a number of waterwheels in New England installations.

James A. Newlands read a paper on "Hyperchlorite Treatment of Water," which explained the theory and described a number of installations. A paper on "Actual Yield of a Typical Connecticut Watershed," by R. A. Cairns, was read by title only.

The election of officers for the ensuing year resulted as follows: Charles A. Ferry, New Haven, president; A. W. Sperry, New Haven, first vice-president; S. E. Minor, Greenwich, second vice-president; J. F. Jackson, New Haven, secretary and treasurer.

League of Michigan Municipalities.—At a special session of the League of Michigan Municipalities the representatives of the different cities in attendance unanimously adopted resolutions asking the Legislature to amend the home rule bill so as to empower the cities to amend their existing charters without holding a charter convention for the purpose of making a general charter revision. The action was directly in line with the plan proposed by Mayor Thompson of Detroit.

Lake Michigan Sanitary Association.—The fourth annual meeting was held at the La Salle Hotel, Chicago, February 18. The association is comprised of members from Illinois, Indiana and Wisconsin, and its purpose is to secure scientific analyses of the water of Lake Michigan and to promote legislation looking toward its purification. President R. R. McCormick, in his annual address, said in part:

This meeting comes at an opportune time, when for several days the Calumet River has been pouring a large volume of polluted water into Lake Michigan, owing to the recent rains. I want to point out to you that it is necessary to make haste if we want to solve these problems of sewage disposal in our own way and in a manner least expensive. The Secretary of War, under the law, has the right to prevent the putting into navigable waters of factory waste and all kinds of sewage other than liquid. As I read the law that authority extends to a point beyond where the Calumet becomes navigable on the theory that non-navigable waters cannot be allowed to pollute navigable waters. Under this law he can prevent pollution of the Calumet River and of the Chicago River. If the local bodies of Illinois and Indiana don't solve this problem the United States Government will do so, and it will not give the same attention to the wishes of the local people as the closer bodies would do. It is an open secret that when Col. Goethals finishes with the Panama Canal he is to be appointed chief engineer of the army. He has paid close attention to sanitation and has turned a fever swamp into a delightful health resort. He is coming into the office with drastic ideas of sanitation, and if we don't act first he will demand more rigorous and expensive methods than are really requisite.

Col. G. B. Young, Surgeon of the United States Public Service and Marine Hospital Service, spoke in favor of the passage of the Mann bill, now pending in the United States Senate. This bill enlarges the province of the department and authorizes it to study all questions pertaining to the public health and the propagation and spread of disease, including such questions as sanitation. Col. Young suggested that the association should ask the next Congress to give the federal officers wider authority in sanitary matters. Other speakers were Dr. W. A. Evans, Health Commissioner of Chicago, and Langdon Pearse, chemist in charge of the experimental station at the Thirty-ninth street plant of the sanitary district.

Officers of the association elected for the coming year are W. D. Weis, president; Dr. H. B. Favill, first vice-president; A. J. Horlish, second vice-president, and W. R. Humphrey, secretary.

Association of City Sealers of Weights and Measures.—City Sealer John H. Sullivan, of Newark, N. J., in an address at the convention of city sealers, held in the headquarters of the National Bureau of Standards, at Washington, February 17-18, made suggestions as to ways in which legislation could be made effective and practical in its results and described the system of the Newark department. He told of the methods that had been used here to break up dishonest practices of unscrupulous peddlers and merchants, and showed photographs of scales and measures which he and his assistants had confiscated.

A proposed "model bill" was taken up clause by clause during the two-day session of the convention and was unanimously approved in every part. Mr. Sullivan says that it is superior to the bill recently introduced in the New Jersey Legislature by Senator Prince, and that he will make an effort to have the Prince bill withdrawn and the bill approved by the sealers substituted for it.

Fire Chiefs' Club of Massachusetts.—The monthly meeting of the Fire Chiefs' Club of Massachusetts, held at the Copley Square Hotel, Boston, February 15, was the most important and best attended that the club has had in ten years. The club had as guests several men prominent in the real estate and insurance world, who discussed "What Change, if Any, Should Be Made in the Building Laws Governing the Construction and Space Between Apartment, Tenement and Single Houses in Unrestricted Districts?"

The guests of the club were Building Commissioner Arthur G. Everett, F. Eliot Cabot, secretary of the Boston Board of Fire Underwriters; Col. Edward H. Eldridge, representing the Boston Real Estate Exchange, and C. M. Goddard, representing the New England insurance exchange. There were nearly 100 present. Chief John A. Mullen, president of the club, presided.

Secretary Cabot said that in Boston the number of wooden buildings erected annually were numerous and that in districts where they were grouped the fire hazard was increased. The number here is overwhelming, he added, and the city must be protected against devastation. According to Mr. Cabot, men who persisted in having roofs shingled were really criminals. They were constantly exposing their neighbors and themselves to danger, and serious consequences might result from their acts at any time. He believed that roofs should be constructed of a less combustible material. In closing, Mr. Cabot said he has always felt that fire departments should have representation on committees that were planning to bring about changes in fire laws.

Building Commissioner Everett said that something should be done toward securing legislation to compel the better construction of buildings. Such legislation would naturally reduce the fire hazard. Insurance agents, he said, often took big risks, thus encouraging men who, if they were refused insurance, would be compelled to erect buildings that would come up to the conditions required.

C. M. Goddard said in order to better conditions it would be necessary to educate the public. Petty economy was making many property owners careless, he said. Their motto seemed to be, "Save a dollar to-day." They never realized, he declared, that they might lose \$1,000 to-morrow or next year. Mr. Goddard said that he believed in insurance, but if there was no insurance there would not be any cheap buildings.

Col. Eldredge said that the height of the buildings would have to be taken into consideration in the matter of determining the distance between frame houses in unrestricted districts. Chief Mullen, Chief Spencer of Chelsea, Ex-Commissioner Wells, who introduced the subject, and several others were heard.

New England Water Works.—The March meeting will be at Hotel Brunswick, Boston, March 8. The following papers will be presented: "The New England Portion of the Proposed Atlantic Intra-Coastal Waterways," illustrated, by Edward Parrish, Assistant United States Engineer, Newport, R. I. "The Reforestation of Watersheds for Domestic Supplies," illustrated, by F. W. Rane, State Forester of Massachusetts. This paper will be discussed by E. R. B. Allardice, Superintendent of Wachuset Department, Metropolitan Waterworks; E. S. Bryant, Practical Forester of Boston, and others.

Association of Borough Officials of Pennsylvania.—Seventy or more boroughs of the State were represented at Harrisburg last week when a formal organization was effected for the purpose of obtaining better legislation.

The organization went on record as favoring the codification of the laws relating to boroughs, the commencement of the fiscal year on the first Monday in January, instead of the first Monday in March, audits on the first Monday in March, 1911, and the first Monday in January thereafter, the election of all officers, except those whose terms are of longer duration, biennially.

The delegates met in the Senate caucus room at the Capitol and a temporary organization was formed by the election of T. F. Chrostwaite, Hanover, as chairman.

Special emphasis was placed by borough solicitors upon the need of a law permitting boroughs to issue municipal paying bonds, a privilege third class cities have long had. The bill providing that third class cities and boroughs direct telephone, telegraph and electric companies to place their wires in conduits was commended, but it was agreed to examine the bill carefully before asking legislators to vote for it.

Relief from the laws which limit the borrowing capacity of boroughs will be asked for, it being claimed that boroughs which own their own water companies that are bonded are in many instances unable to issue bonds for any other purpose.

Nanticoke was decided upon as the place for the next meeting, to be held in October, the date being left to the committee on organization. The following officers were elected: President, T. F. Chrostwaite, Hanover; secretary, Raymond Staub, New Oxford; treasurer, John C. Nissley, Harrisburg.

American Society of Mechanical Engineers.—The sixty-third meeting of the society will be held in Pittsburgh, Pa., from May 30 to June 2, inclusive. The society has not met in this city since 1884. The American Society of Mechanical Engineers is one of the foremost organizations of technical and professional engineers in the world, with a membership of over 4,000 in this country as well as abroad. The headquarters of the society are in New York City, and Col. E. D. Meier, of St. Louis, is president this year. The society has in the Pittsburgh district alone a membership of about 160. Last year the society held a joint meeting in England with the British society, the Institution of Mechanical Engineers. George Westinghouse, who was president of the society last year, presented a paper on "The Electrification of Railroads," which aroused a great deal of interest. The British society, through its local committees in Birmingham and London, entertained the American engineers by showing them many things of professional interest, as well as providing delightful social functions. An executive committee, consisting of E. M. Herr, chairman; George Mesta, J. M. Fate, Jr., Chester B. Albee, D. F. Crawford, Morris Knowles and Elmer K. Hiles, secretary, will have charge of the Pittsburgh meetings. It is expected that from 300 to 400 members and ladies will be in attendance. There will be professional sessions, when papers will be read and discussed. There will also be inspection trips through the leading local industrial establishments, besides automobile trips through the parks, a visit to Carnegie Institute, Memorial Hall, etc.

South Dakota Engineering Society.—A number of engineers of the State met at Pierre and effected the organization of the South Dakota Engineering Society. The object is the advancement of engineering knowledge and practice in the State and the maintenance of a high professional standard among its members. Any professional engineer or architect whose qualifications meet the requirements of the society is eligible for membership. For a full member those comprise six years' experience and two years in charge of important work. To become a junior, two years' experience or graduation from a school of recognized standing is required. The society will be managed by a board of directors, a director being chosen from each of the four geographical districts into which the State has been divided. The officers are: President, S. H. Lea, State Engineer, Pierre; Vice-President, A. B. McDaniel, professor of civil engineering, State University, Vermillion; Secretary-Treasurer, R. G. Culbertson, secretary the Missouri Valley Engineering Company, Mitchell. Directors: First district, C. A. Trimmer, president Missouri Valley Engineering Company, Madison; Second district, C. C. Witt, engineer South Dakota Railroad Commission, Pierre; Third district, B. C. Yates, assistant chief engineering Homestate Mining Company, Lead; Fourth district, Stein Bangs, civil and hydraulic engineering, Rapid City.

Oklahoma Engineering Society.—At a meeting, Oklahoma City, February 2, the following resolution was adopted:

Resolved, that it is the sense of the Oklahoma Engineering Society that the bill now pending before the Legislature creating the office of State Highway Commissioner should be amended to provide that the Governor appoint a competent engineer to the office of State Highway Commissioner, who shall serve as ex-officio State Highway Engineer, but if in the wisdom of the Legislature it should be deemed necessary that both a Highway Commissioner and a Highway Engineer be appointed, then it is the sense of this society that the incumbents of both offices should be thoroughly qualified engineers, and that both of them should be appointed by the Governor.

Resolved, that a copy of this resolution be mailed to the chairman of the House committee and to the chairman of the Senate Committee on Good Roads.

Mayors' Association of Alabama.—City Attorney Romaine Boyd, of Birmingham, has announced that at the suggestion of members of the legislature he will call a conference of all the mayors, city attorneys and presidents of the city councils of Alabama to meet in Birmingham early in June to revise the State municipal code. Mr. Boyd declares that the time has come to give the cities of Alabama adequate and definite laws. He says the present code is a conglomeration with many things so vaguely stated that he is unable to interpret them. He and Mayor Exum will later formally call the conference and suggest that a permanent organization be formed.

Engineers' Society of Milwaukee.—R. C. Newhouse, engineer in charge of the crushing and cement department of the Allis-Chalmers Company, gave an illustrated talk February 8 on Cement Machinery before the Engineers' Society in the Plankinton House.

International Association of Inspectors of Plumbing.—The eleventh annual convention of the American Society of Inspectors of Plumbing and Sanitary Engineers was held in the council chamber, Milwaukee, February 7-9.

The address of welcome was delivered by Health Commissioner Kraft, followed with a response by William G. Williamson, Detroit, president of the organization. E. C. Stover, Trenton, spoke on "Abolition of Drinking Cups," while J. J. Luff, Cleveland, read a paper on "Shall Traps Having Concealed Partitions be Prohibited by Ordinance?" In the afternoon the following papers were read: "Ordinances of Anti-Siphon Traps," Joseph Graham, New York; "Harm Done by Plumbing Calalogs," A. S. Shaver, Pasadena; "Cast Iron Fittings for Sanitary Purposes," R. R. Rust, New York. Tuesday morning the following papers were presented: "Waterworks and Distribution Systems," Chief Engineer Thomas McMillan, Milwaukee; "Sewage Disposal of Milwaukee," City Engineer Poetsch; "Milwaukee's Incinerator Plant and Garbage Disposal," Supt. S. A. Greeley.

In the afternoon the delegates visited one of the large breweries where lunch was served; a visit was made to the refuse incinerator, and to several fire boats. At night an illustrated lecture was given by M. Wailley on "Air We Breathe." Mayor Seidel also spoke.

Addresses Wednesday morning follow: "Sizes of Vents," W. B. Gray, Louisville; "Examinations of Plumbing," E. H. Donahue, Peoria; "Construction and Repair of Barns, Regulation of Lights, Vents, and Drainage," William Huy, Portland.

Congress of Technology.—A congress of technology will be held in Boston on April 10-11, in celebration of the fiftieth anniversary of the granting of the charter of the Massachusetts Institute of Technology. In line with this idea the fifty or more papers which will be presented at the Congress will be written by graduates of the Institute, and will thus serve to record the part the alumni of the institution have taken in the development of scientific industry.

As the titles of these papers are sent in by the writers it is becoming evident that the managers of the congress will succeed in their effort to make the proceedings of the congress show from another point of view the general industrial advance that has taken place during the past fifty years under the guidance of trained engineers. The papers will cover a wide range of subjects, from architecture to sewage purification, and the names and professional standing of the writers show that they will together discuss authoritatively every important problem of modern industrial technique and management. It is already clear that this record is not limited to any narrow activity within merely technical lines, but that it covers the broader problems of the relations of science to industry, the place of the engineer in creating a more efficient type of industrial management and the general shaping of material conditions to serve alike the changing conditions of business and the improving conditions of labor.

New York Academy of Medicine.—At a meeting, February 21, Dr. Charles E. North read a paper on "An Investigation of Recent Outbreaks of Typhoid Fever in an Adirondack Camp and the Discovery of a Typhoid Carrier."

Oregon Society of Engineers.—With a charter membership of 160 the Oregon Society of Engineers came into existence February 6, at the Commercial Club, when the first annual meeting of the organization was held, officers were elected, a constitution was adopted, and arrangements made to gather into the association all Northwest engineers, estimated to number from 600 to 700 in this field. All engineers in any line of work are eligible to membership from any part of the Northwest, although the name of this State was taken.

The officers chosen were as submitted by the nominating committee, and were as follows: D. C. Henry, consulting engineer of the United States Reclamation Service, president; O. B. Coldwell, general superintendent of the power department of the Portland Railway, Light & Power Company, first vice-president; W. R. King, consulting hydraulic engineer, second vice-president; William H. Corbett, president of the Willamette Iron & Steel Works, third vice-president; C. E. Bliven, secretary; F. A. Naramore, assistant engineer of the Northwest Bridge Company, treasurer; Thomas Bilyeu, J. H. Norton and M. Quimby, one-year term directors; H. E. Plummer, A. D. Monteith and B. Honeyman, two-year term directors, and Ralph Budd, Frederick Powell and E. P. Rawson, three-year term directors.

New England Contractors' Association.—This association was organized at Boston, February 9. Some twenty-five contractors and firms were present, among them Holbrook, Cabot & Rollins Corporation; Stone & Webster, W. L. Miller, Warren Brothers, Ward Brothers, Hanscom & Co., Fred T. Ley & Co., Charles R. Gow, Stewart & Sons Co., H. P. Converse, A. D. Fuller, Eastern Bridge Company, P. B. Elkins, Osgood Construction Company and Messrs. Smith, Cashman & Gray. Letters were read from several who were unable to attend, but promised their support. James W. Rollins, Jr., presided at the dinner, with W. M. Denman, through whose efforts the meeting was arranged, acting secretary. Mr. Rollins stated the need of an association in New England to insist on better working conditions in the contractors' business and cited a few of the annoyances which his company had experienced and which were common to all.

Kentucky Fire Prevention Association.—Besides inspecting the fire fighting facilities at Georgetown at their last meeting on February 28 the association asked that the firemen be clothed with police powers; that is, that they be given authority to arrest a person suspected of incendiary designs. The council at Maysville, where the association met last year, has already passed such an ordinance.

National Conference of City Planning.—The third annual conference will be held in Philadelphia, Pa., in May, 1911. An exhibition of city planning and housing conditions is to be held at the same time.

California State Highway League.—Initial steps for organizing a State Highway League were taken at an informal dinner given by W. G. Scott, of the Inyo Good Roads Club, at the Sacramento Hotel recently. The purpose of the league will be to create public interest in California's possibilities for tourists and the necessity that the roads of the State be put in condition for the use of automobiles. It is hoped that sectional differences will be threshed out and the highway plan be placed on the broad basis of a State proposition.

Calendar of Meetings

February 28-March 1.

Northwestern Cement Products Association, West Hotel, Minneapolis, Minn.—Henry B. Smith, Secretary, 834 Security Bank Building, Minneapolis, Minn.

March 6-11.

Canadian Cement and Concrete Association—Annual Convention, Toronto, Ont.—Wm. Sneath, Secretary, 57 Adelaide street East, Toronto, Ont.

March 8-10.

Engineering Society of Wisconsin—Annual Meeting, Madison, Wis.—W. G. Kirchoffer, Secretary, Vrooman Building, Madison, Wis.

March 21-22.

New York State Railroad Association.—Quarterly Meeting, Syracuse, N. Y.—C. Gordon Real, Secretary, Kingston, N. Y.

May.

City Commission Congress.—Meeting, Galveston, Tex.—Mayor Lewis Fisher, Chairman of Committee, Galveston, Tex.

May 29-June 3.

National Electric Light Association.—Annual Convention, Engineering Societies Building, New York, N. Y.

June 6-10.

American Water Works Association.—Thirty-first Annual Convention, Powers Hotel, Rochester, N. Y.—John M. Diven, Secretary, 14 George street, Charleston, S. C.

June 11-16.

International Association of Chiefs of Police.—Eighteenth Annual Convention, Rochester, N. Y.—Major Richard Sylvester, Superintendent of Police, Washington, D. C., President.

June 13-18.

New York State Association of Chiefs of Police.—Annual Convention, Rochester, N. Y.

PERSONALS

ADKINS, BEN C., former vice-president of the St. Louis Americans, has resigned as Water Commissioner of St. Louis.

AKEN, MAJ. H. M., has been appointed general superintendent and manager of the water works of Knoxville, Tenn., a position which he held for several years before municipal ownership was established.

ALLEN, CHARLES S., Chief of the Fire Department of Trenton, N. J., has been granted a leave of absence for the purpose of taking a trip to Florida for his health.

BERNAY, C. L., assistant city engineer of Houston, Tex., has accepted a position in the Texas Company's asphalt division.

BRAENTIGAM, H. T., Cincinnati, Ohio, has been appointed Superintendent of the City Electric Light Plant of Portland, Ind., succeeding Charles W. Bailey.

BUCHANAN, N. B., has established a general consulting engineering practice with offices at Huntsville, Ala. He had lately served as assistant resident engineer on the construction of Corey, the model industrial city for employes of the U. S. Steel Corporation.

CAREY, DENNIS E., has been appointed Chief of the Fire Department of Lawrence, Mass.

DANENHOWEN, R. O., assistant city engineer of Cincinnati, O., has tendered his resignation, to take effect March 10. Mr. F. L. Rachig, draftsman in the track elevation department, has been promoted to fill the vacancy caused by Mr. Danenhower's withdrawal.

DENNIS, FRANK, has been appointed Fire Chief of Long Branch, N. J.

EPPS, LOUIS, has been elected Mayor of Blackstone, Va., to succeed Mayor Geo. P. Adams, resigned.

FANNING, COL. JOHN T., Water Works Engineer, died recently in Minneapolis. He was formerly a citizen of Manchester, N. H., where he constructed the water works system.

FOSTER, CLAIR, has resigned the position of Water Register of the Borough

of Manhattan, New York, to become assistant to Irving T. Bush, President of the Bush Terminal Company.

HOPKINS, FRANK, of Poughkeepsie, N. Y., a recent graduate of Cornell University, goes to Keokuk, Iowa, to accept a position as Assistant Civil Engineer under the Resident Engineer of the Keokuk and Hamilton Water Power Company, which company has a contract for the construction of a dam in the Mississippi River that will impound water for a distance of forty miles.

JOHNSON, F. G., Mayor pro tem, has been elected Mayor by the City Council of Blossom, Tex., to fill a vacancy caused by the removal of Mayor J. M. Lenoir.

KOHLER, FRED, known as the "Golden Rule Chief," has been called to take charge of the Police Department of Los Angeles, Cal. Chief Kohler has announced that he does not wish to leave Cleveland.

KOESTER, FRANK, previously employed with the Rapid Transit Subway Construction Co., recently opened an office at 115 Broadway, New York, as consulting engineer. Mr. Koester is author of "Steam Electric Power Plants" and "Hydroelectric Developments and Engineering."

MARSH, C. L., Columbus, Ohio, has been appointed City Engineer of Gadsden, Ala.

MCDONOUGH, CHAS., of Buffalo, has been appointed to succeed Henry A. Kunze as Assistant Superintendent of Canals for the Western Division.

MOORE, A. H., has been appointed Collector of Taxes of Jersey City, N. J.

MURPHY, THOMAS, a Police Captain of New York City, has been retired at his own request after forty-three years' service in the Department.

PARKER, HAROLD, chairman of the Massachusetts State Highway Commission, is reported to have been offered by Governor Dix the position as head of the State Highway Commission of New York.

PATTERSON, JACOB, has been appointed Inspector of Street and Sidewalk Construction of Oroville, Cal.

RASINSKY, CHARLES E., Assistant City Engineer of Cincinnati, O., addressed the Engineers' Club of that city February 16 on the subject, "Elasticity and Strength of Concrete."

REILLY, FRANK, Mayor of Pensacola, Fla., has received two important appointments from the Governor of his State. He will be a delegate to the Southern Commercial Congress to be held at Atlanta March 8-11, and will be an honorary member for the State of Florida of the National Committee on the Anglo-American Peace Celebration.

RIDER, FREDERICK, has been named by the Mayor of Jersey City as his private secretary.

STYRING, EDWIN, has been appointed Division Engineer of New York State Barge Canal by State Engineer John A. Benschel. The position was formerly held by Guy Moulton, of Syracuse.

SWANSTROM, J. EDWARD, ex-Borough President of Brooklyn, is dead. Mr. Swanstrom was a leader in many improvements for the advancement of Brooklyn.

WOOD, W. J., Naval Architect, has been employed to prepare the plans and supervise the construction of a new steel fire boat for the city of Portland, Ore.

WOODARD, S. H., consulting engineer of New York City, has been elected a member of the Institution of Civil Engineers.

YOUNG, A. R., of Chanute, has been appointed city engineer, Topeka, Kan.

TRADE NOTES

Cast Iron Pipe.—Chicago—The demand for all sizes is very active. A large tonnage is pending, made up of small lots from various municipalities. Prices are very firm. Quotations: 4-inch, \$25.50; 6 to 12-inch, \$24.50; 15-inch and up, \$24. Birmingham—Producers report a better feeling and stocks have been materially reduced. Quotations: 4 to 6-inch, \$21; 8 to 12-inch, \$20; over 12-inch, average, \$19. New York—The situation is reported as steadily improving, the foundries gradually increasing their percentage of operation. Quotations: 6-inch, car pads, \$21.50 to \$22.

Lead.—Market is weak. Quotations: New York, 4.425c.; St. Louis, 4.275c.

The Quebec Bridge.—It is stated that the engineers to whom the Quebec bridge tenders were referred have reported 4 to 1 in favor of the St. Lawrence Bridge Company's offer. The design prepared by Phelps Johnston, managing director of the Dominion Bridge Company, one of the two corporations composing the St. Lawrence Bridge Company, is said to have been referred by the experts to the official design. The company submitted tenders on both designs. It is further stated that the St. Lawrence Bridge Company will spend \$2,000,000 on new machinery if it gets the contract, as shops will have to be built.

Water Meter.—A. M. Lockett & Company, Ltd., New Orleans, La., have published a pamphlet illustrating and describing the operation of the Tulane pitot tube, which is designed for measuring the flow of large volumes of water in pipes and open channels.

Wire Rope.—The Macomber & Whyte Rope Company, Chicago, wire rope manufacturer, with plants at Fostoria, Ohio, and Coal City, Ill., is negotiating with several cities with a view to consolidating its two plants at one point. Among the cities under consideration is Waukegan, Ill.

Traction Engines.—Woods Brothers Steel Self-Feeder Company, Des Moines, Iowa, have published a catalogue illustrating and describing a line of single and double geared internal combustion traction engines. A special feature of the double-gear engine is the use of a center crank and two gear trains, one on each side.

A Million Dollars in Water Pipes.—The Bay Cities Water Company, Oakland, Cal., has now in place and on hand ready to be laid half a million dollars' worth of pipe. Sixty miles of pipe line have been laid in the territory embracing East Oakland and between six and seven hundred men are employed in the work. It is announced by the officials of this company that their policy is to employ as far as possible local labor. Through freight schedules have been smashed by the railroads in transporting the pipe for this company from Pittsburgh and Alabama in twelve days.

New Dustlayer.—The demand for a painless, odorless and efficient dustlayer is said to have been satisfied by a new product which has just been placed in the market by the Alden Spare's Sons Company, of Boston, New York and Chicago. This dustlayer is called Tasscoil. It is recommended for use on streets not having extremely heavy traffic and in residential sections. Tasscoil is an oil which it is claimed will not evaporate. It is applied from an ordinary watering cart.

Concrete Ties.—The Consolidated Concrete Tie Company, Cairo, Ill., has been incorporated with \$100,000 capital stock to manufacture concrete ties under the Snedd and Cowan patents. The company has a plant in operation at the present time at Pulaski, Ill., and is having plans prepared for another to be erected at Cairo. All parts necessary to the manufacture of the ties, including the wood and paper cushions, iron reinforcing rods, rail fastenings, etc., will be made by the company.

Chicago Cement Show.—The Fourth Annual Chicago Cement Show was held in the Coliseum February 16 to 23, inclusive. Practically all of the space, which had been divided into 270 booths and uniformly decorated by the Cement Products Exhibition Company, was occupied, some of the larger companies having more than one stand and booth. It was estimated by the management that the total attendance was something over 70,000. While the unfavorable weather gave the show a poor start the second week's attendance was large and most of the exhibitors seemed pleased with the results.

The bag-handling exhibit of the Universal Portland Cement Company given last year was repeated. The various exhibits of cement manufacturers were usually examples or artistic work in concrete, illuminated illustrations of the mills or illustrations of methods of sampling the finished product. Models were used extensively to show cement houses and methods of pouring them, while the machinery men usually preferred to show full-size apparatus in motion, running it by electric motors.

Water Company.—The change in the management of the Bristol Water Company, which has been a certainty for several months on account of a change in the holding of the controlling interest in the capital stock, occurred at the recent annual meeting of the stockholders. At a meeting of the directors officers elected were as follows: President, C. T. Treadway; Vice-President, W. A. Dunbar; Secretary, C. L. Wooding; Treasurer, M. C. Treadway. The newly elected President has issued a statement to the effect that it is too soon to make any definite statement as to the policy of the company, but criticism is invited as to rates and any other matters pertaining to the service. The assurance is given that the company will not oppose the bill now before the General Assembly giving the town the right to purchase the rights and privileges of the company.

Municipal Railway Cars.—The Canada Ford Company, Montreal, Canada, has obtained the contract for the cars of the municipal electric railway system in Regina, Sask. The company is having the cars built at the works of the British Company, Loughborough, England. These will be the first English-made cars used in the Canadian West. It is thought that the Loughborough company will establish works in Montreal.

Crusher.—The San Diego (Cal.) Stone Company is considering the addition of a No. 6 crusher and a complete pneumatic drilling plant at its Sweetwater quarry.

Electric Goods.—The General Electric Company will shortly occupy a nine-story warehouse at Greenwich and Morton Streets, New York. It has 90,000 square feet of floor space and will enable the company to carry a much larger stock than its old quarters on West street will accommodate.

New Automatic Alarm.—The International Electric Protection Co., 115 Broadway, New York, is introducing a new automatic alarm system. The new system is styled the Air Alarm. Its basis consists of a small hollow wire of copper alloy, one-eighth of an inch in diameter and containing a tiny insulated wire. The hollow wire acts as a conductor for the air whose expansion causes a fire alarm to sound. The tiny wire is known as the trouble wire. If for any reason the hollow wire is cut or broken the result is that an electric circuit is also broken, which causes the little wire to send a "trouble alarm" to the headquarters of the alarm company. Fire headquarters hears nothing, unless there happens to be a real fire at the time the wire breaks or is cut. Loops of this inconspicuous hollow wire are strung under the ceiling or carefully concealed behind the molding of the rooms, houses and buildings to be protected, the loops ending in a detector, which consists principally of a disc, containing a delicate diaphragm. If fire starts in a room the air in the hollow tube expands under the influence of the heat and operates a sensitive diaphragm in the detector, causing it to close an electrical circuit which sets in operation all the marvelous fire alarm machinery. All the older systems are held largely defective, due to the use of what is known as a "thermostat," placed at intervals on the ceiling. These are constantly exposed to the effects of the air and the electrical contacts become oxidized or clogged with dust, and when needed fail to operate at all or only after a raging fire is in full blast. The new system deals with incipient fires.

The new system gives an almost instantaneous alarm. If a pair of curtains catch fire, or even a newspaper, an effective alarm is given within ten to forty seconds. Moreover, another alarm is rung on a box outside of the building, which also indicates the exact location of the fire. Thence the alarm goes on and directly into the fire headquarters, where the exact location is also announced. Robert Walker is president of the company and D. G. Reid, of the Rock Island railroad, is interested. A franchise has been obtained in New York City.

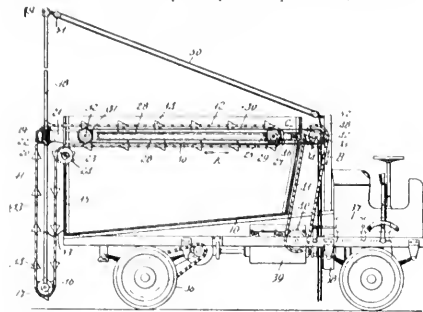
Road Machinery.—The improvement of roads is one of the liveliest questions in the South, Kentucky and Tennessee especially having aroused sentiment in favor of better highways through the formation of State organizations. One of the results of this has been the opening of many rock quarries and the purchase of rock crushing equipment in preparation for the heavy demand for road making material, which will undoubtedly be in evidence a little later on. Dealers in quarrying equipment of all kinds report sales remarkably stimulated on this account.

Catalogues of American Goods.—An import and export firm in the United States writes to the Bureau of Manufactures that it has extensive representation in Brazil, and that its agents in that country are constantly writing for catalogues of all kinds of American manufactures. Catalogues must be printed in Portuguese; those in any other language will be useless. The firm would like to be supplied with all kinds of catalogues in order that it may forward them to its agents in Brazil. For further information write No. 6244 Bureau of Manufactures, Washington, D. C.

PATENT CLAIMS

983,906. EXCAVATING-CONVEYER. John Kelly, Jamaica Plain, Mass. Serial No. 544,356.

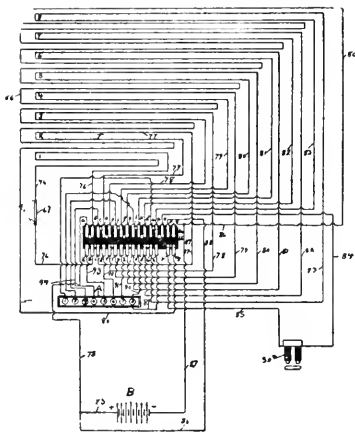
An apparatus of the class described, having, in combination, an endless belt conveyer having a vertically disposed portion and a horizontally disposed portion, a dry-



ing wheel engaging said horizontally disposed portion, a drum connected to said driving wheel, an endless flexible member wound about said drum and having two portions extending horizontally in opposite directions, respectively, from said drum, means to impart a longitudinal movement to said member, and a pawl and ratchet connected to said drum and operating to hold the same against rotative movement in one direction.

983,713. FIRE-ALARM. Stephen J. Heinrich, Bellevue, Pa., assignor to American Electric Alarm Company, Pittsburg, Pa., a Corporation of New Jersey. Serial No. 306,019.

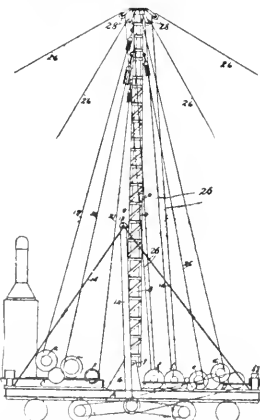
In a fire alarm, a clock train, an indicator arm operated by the clock train, a dial for the indicator arm, a sector connected with



the indicator arm forming part of the clock train, a lever having an armature, a magnet to attract the armature, a circuit for the magnet, controlling means for the lever operated by the clock train, and a thermostat in the circuit.

984,514. PORTABLE CABLEWAY. Joseph H. Dickinson, Montclair, N. J. Serial No. 425,649.

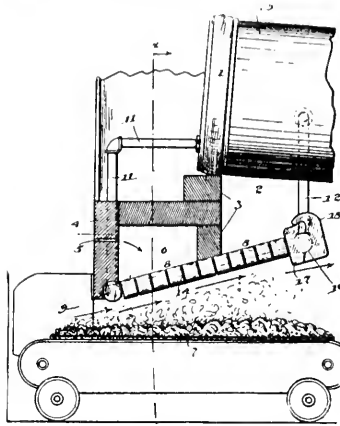
In a cableway the combination with a support, a rope connection for the sup-



port, a main cable and a tension guy adapted to be interchangeably connected to the rope connection.

983,510. SMOKE-CONSUMING FURNACE. John W. McNeal, Chicago, Ill. Serial No. 535,488.

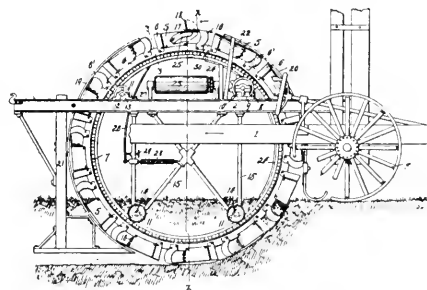
A fire arch consisting of a series of water tubes; a series of larger fire bricks formed to partially encompass a tube at the top, substantially entirely encompass it at the bottom and having their outer upper corners rounded; a series of smaller fire bricks having narrow lower portions adapted to



fit between the lower portions of said larger bricks and upper portions partially encompassing the tops of said tubes at one side and having projections at the upper corners of their other sides adapted to engage the rounded corners of said larger bricks; and a terminal brick similar to said smaller bricks except that its outer upper corner is squared off at right angles, substantially as described.

983,959. EXCAVATING-MACHINE. Hiram Walters and Nathan Bumpus, Curtice, Ohio. Serial No. 551,324.

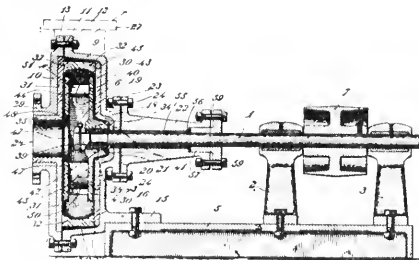
In an excavating machine, the combination with a rotary excavating wheel having a series of inwardly opening peripherally arranged buckets, of a gate hinged to the rear end of each bucket at its outer edge and adapted to have its opening and closing movements in the plane of rotation of



the wheel, a wing projecting at an angle from the hinged end of each gate and adapted to project substantially radially from the wheel when the attached gate is open and to project rearwardly from the associated bucket in substantially the arc of movement of its outer peripheral edge when the gate is closed, and means encircling portions of the wheel and cooperating with the bottom of a trench being dug to act on each gate wing to prevent an opening thereof except at a predetermined point in its revolution.

984,456. CENTRIFUGAL PUMP. William F. Trenary, Marietta, Ga. Serial No. 442,878.

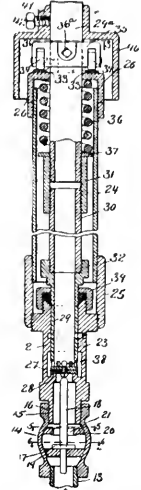
In a centrifugal pump, the combination with its rotary piston, shaft, and shell



within which the piston works, of a peripheral lining fitting loosely within the shell, and a soft metal backing-ring introduced between said lining and shell

983,545. HYDRANT. John Ewart, Arlington, Mass., assignor of one-half to M. P. McLaughlin, Wakefield, Mass. Serial No. 584,647.

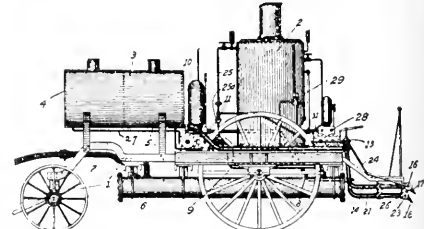
A hydrant comprising a tubular casing adapted for attachment to a water main, and having an internal valve seat, a tubular conduit rotatable and movable endwise in said casing and provided with a valve



adapted to close on said seat, a spring adapted to move the conduit in one direction to close the valve, cams supported by the casing and runners connected with the conduit and pressed by the spring against said cams, the cams and runners causing an endwise movement of the conduit to open the valve when the conduit is rotated in the casing.

984,455. SPRINKLING-MACHINE. Ellis Tomer, Visalia, Cal. Serial No. 580,707.

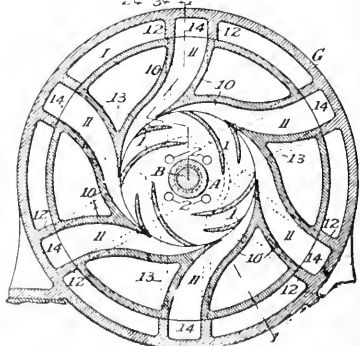
A sprinkler comprising a frame, a steam engine on said frame, a pump on said steam engine, a drum suspended beneath said frame, a flexible pipe leading into said drum, a union in said pipe, steam pipes leading from said engine and through said drum, a pipe connecting from said drum to said pump, a pipe disposed across said frame at the rear end thereof and connected with said pump, a pair of adjustable



valves in said last named pipe, a plurality of distributing pipes leading from between said valves, a main spraying pipe communicating with such plurality of distributing pipes, a plurality of discharge spray nozzles on said main spraying pipe, another series of distributing pipes leading from one side of the last one of said pair of valves to another spraying pipe, and a plurality of independent spray nozzles on such last-named spraying pipe.

984,189. CENTRIFUGAL AND TURBINE PUMP AND THE LIKE. William C. Brown, Prescott, Ontario, Canada. Serial No. 440,665.

A centrifugal pump, blower, or the like, having diffusing passages surrounding the



impeller and corresponding passages of substantially uniform area continuing the diffusing passages to the suction of the next impeller or to the pump delivery.

THE WEEK'S CONTRACT NEWS

Relating to Municipal and Public Work—Street Improvements—Paving, Road Making, Cleaning and Sprinkling—Sewerage, Water Supply and Public Lighting—Fire Equipment and Supplies—Bridges and Concrete Work—Sanitation, Garbage and Waste Disposal—Police, Parks and Miscellaneous—Proposals and Awards

To be of value this matter must be printed in the number immediately following its receipt, which makes it impossible for us to verify it all. Our sources of information are believed to be reliable, but we cannot guarantee the correctness of all items. Parties in charge of proposed work are requested to send us information concerning it as early as possible; also corrections of any errors discovered.

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREET IMPROVEMENTS				
Texas	Sweetwater	Mar. 4	Constr. about 22,000 sq. yd. macad-asph. pave.	L. S. Polk, Secy.
Texas	Dallas	Mar. 4, 10 a.m.	Grading and graveling 4,100 ft. of Dallas and Hutchins road	Geo. L. Fearn, County Auditor.
New Jersey	Jersey City	Mar. 6, 2 p.m.	Improving Holmes Avenue.	Geo. T. Bouton, Clk. Bd. S. & W. C. City Clerk.
New Jersey	Plainfield	Mar. 6	Furnish crushed stone, culverts, etc.	W. A. Harris, Secy. Bd. Pub. Wks.
Virginia	Spottsylvania	Mar. 6	Constructing 1 3/4 miles macadam road.	B. I. Bizler, City Clerk.
Indiana	Fowler	Mar. 6, 1 p.m.	Constructing three stone roads	John W. Weaver, County Auditor.
Indiana	Huntington	Mar. 6	Constructing gravel road.	M. Stockman, Town Clerk.
New Jersey	Irvington	Mar. 6, 8 p.m.	Constructing telford pavement in Myrtle ave. and Park place.	James E. Elder, County Auditor.
Indiana	Rockville	Mar. 6, 1 p.m.	Constructing gravel road.	Peter Nachand, County Auditor.
Indiana	Jeffersonville	Mar. 6, 10 a.m.	Constructing gravel roads.	Walter W. Lester, Sec'y.
Pennsylvania	Aliquippa	Mar. 6	Paving portion of Main st. with vitrified brick.	J. H. McConnell, County Auditor.
Ohio	Canton	Mar. 6, 10 a.m.	Grading and cutting road.	D. H. Moffitt, County Auditor.
Indiana	Williamsport	Mar. 6, 1 p.m.	Constructing gravel road.	R. J. Cunningham, Co. Compt.
Pennsylvania	Pittsburg	Mar. 6	Furnishing ballast, screenings, cement, etc. for imp. roads.	Thos. Nugent, County Auditor.
Indiana	Washington	Mar. 7	Constructing 2 gravel roads.	J. E. Wallace, County Auditor.
Indiana	Logansport	Mar. 7	Constructing gravel and macadam roads.	J. P. Nofztger, County Auditor.
Indiana	Wabash	Mar. 7	Constructing gravel roads.	F. E. Crane, City Engineer.
New York	Amsterdam	Mar. 7	Constructing 8,400 sq. yd. fire-clay brick pavement.	Calvin Tomkins, Comr. Docks, Pier A, North River, New York City.
New York	N. Brigh'n (S. L.)	Mar. 7	Grad. and pav. ferry appr. and construct. subway ducts.	John. C. Hall, Chm. Bd. Co. Comrs. W. G. Kirchoffer, Madison, Con. Engr. Francis A. Price, Hwy. Comr.
Indiana	Paoli	Mar. 7	Constructing 9,989 ft. of road.	C. Lyman Denison, Chm. Twp. Com. I. H. Villard, Chm. Bd. C. Comrs
Wisconsin	Monroe	Mar. 7	Laying 5,057 sq. yds. paving.	L. B. Johnston, City Clerk.
Delaware	Wilmington	Mar. 7, noon	Building State road.	A. B. Kieffer, Chm. Co. Comrs.
New Jersey	Belleville	Mar. 7, 9 p.m.	Furn. five-inch bottom stone, two and one-half inch and one and one-half inch broken stone and screenings, first quality Orange Mountain taprock.	Mayes Cooper, Hwy. Engr.
Ohio	Wooster	Mar. 7, 1 p.m.	Grading and paving 0.71 mile of road.	Board of County Commissioners.
Ohio	Lorain	Mar. 7, noon	Constructing sidewalks, cross-walks and repairing.	J. H. Sundmaker, Dir. Pub. Serv.
Georgia	Springfield	Mar. 7	Furnishing a 10-ton road roller.	Geo. W. Baxter, Auditor.
Mississippi	Jackson	Mar. 9	Constr. gravel and sand roads. \$100,000 bonds issued.	J. Kelly, City Clerk.
Georgia	Savannah	Mar. 9, noon	Furnishing 5,000 cu. yds. cement or like material for improving public roads.	Clay County Commissioners.
Ohio	Cincinnati	Mar. 10, noon	Building culvert.	Wood County Commissioners.
Indiana	LaFayette	Mar. 10, 10 a.m.	Constructing gravel road.	Warren Mitchell Greensburg, Bor. E.
Indiana	Muncie	Mar. 11	Paving various streets.	E. C. Pannell, Co. Aud.
Indiana	Brazil	Mar. 11, 11:30 a.m.	Constructing 7,655 ft. of gravel road; 10,000 ft. limestone road	J. O. Brown, City Clerk.
Ohio	Bowling Green	Mar. 13	Constructing stone road.	State Highway Comr., Bowlby.
Pennsylvania	Youngwood	Mar. 13	Paving about 2 miles of street with brick blocks.	State Highway Commission.
Illinois	Worthington	Mar. 13, 2 p.m.	Grade approx. 10,066 yards of streets.	George E. Via, Chm. Com. on Highways and Sewers.
Kansas	Fort Scott	Mar. 13, 5 p.m.	Grading and macadamizing portion of First street.	Capt. R. B. McBride, Con. Q. M. U. S. A.
Washington	Chehalis	Mar. 15	Constructing about 3 1/2 miles macadam road.	William Pickett, City Clerk.
New York	Albany	Mar. 20, 22, 24	Building state roads, 66 pieces.	
Virginia	Newport News	Mar. 20, noon	Constructing concrete curb and gutter.	
Virginia	Fort Monroe	Mar. 21, 10 a.m.	Constructing macadam walks and roads.	
Indiana	Logansport	Apr. 1	Constructing 50,000 sq. yds. of sheet asphalt.	
SEWERAGE				
New York	Watertown	Mar. 3, 8 p.m.	Constr. sanitary sewer, requiring approx. 1,800 ft. 20-in tile; 300 ft. 18-in. tile; 300 ft. 16-in. tile; 1,200 ft. 12-in. tile; 1,200 ft. 10-in. tile.	Board of Public Works.
Illinois	Bement	Mar. 3, 1 p.m.	Furnishing material and constructing system of storm sewers and outflow drain.	W. I. Day, Pres. Bd. Loc. Imp.
Wisconsin	Stoughton	Mar. 3, noon	Constructing sewerage system.	L. C. Currier, City Clerk.
Washington	Vancouver Bar's	Mar. 3, 11 a.m.	Constructing sewers, manholes and house connections.	Constructing Quartermaster.
Wisconsin	Watertown	Mar. 4, 2 p.m.	Constructing storm sewers.	Bd. of Public Works.
Minnesota	St. Cloud	Mar. 6, 8 p.m.	Constructing sewers, manholes, catch basins, etc.	Earl C. Scott, City Clerk.
New Jersey	Jersey City	Mar. 6, 2 p.m.	Constructing sewer in Baldwin Avenue.	Geo. T. Bouton, Clk. Bd. S. & W. C.
Iowa	Garner	Mar. 7	Furnishing tile laterals.	W. L. Fitkin, Aud. Hancock Co.
Wisconsin	Shawano	Mar. 7, 8 p.m.	Constructing main and minor sewers, manholes, etc.	D. E. Wescott, City Clerk.
New Jersey	Bridgeton	Mar. 7, 8 p.m.	Construction of disposal works and pumping station.	J. B. Jones, City Clerk.
Ohio	Hamilton	Mar. 7, noon	Constructing sanitary sewers in various streets.	C. M. Robertson, Clk. Dept. Pub. S.
Idaho	Pocatello	Mar. 9, 8 p.m.	Constructing trunk sewers.	D. W. Church, Mayor.
Minnesota	Tracy	Mar. 9, 8 p.m.	Constructing sewer.	Lester J. Fitch, City Recorder.
Pennsylvania	Norwood	Mar. 9	Constructing 16,000 ft. terra cotta pipe sewers.	A. W. McClellan, Clk. Bor. Council.
Pennsylvania	Glassport	Mar. 13, 8 p.m.	Constructing sewers in various streets.	M. E. Randall, Bor. Secy.
Georgia	Atlanta	Mar. 14	Constr. intercepting sewer and disp. plant.	R. M. Clayton, Com. Pub. Wks.
Colorado	Fort Logan	Mar. 14, 10 a.m.	Constructing sewage disposal plant.	Capt. Chase Doster, Con. Q. M. U. S. A.
Florida	Jacksonville	Mar. 15, 3 p.m.	Constructing sewers and drains.	R. N. Ellis, Supt.
Texas	Cameron	Mar. 15	Constructing sewer system.	D. L. Wilson, City Secretary.
Maryland	Ft. Washington	Mar. 20, 1:30 p.m.	Constructing sewer outlet and outfall.	Capt. R. B. Kelton, C. Q. M. U. S. A.
West Virginia	Moundsville	Mar. 21, 10 a.m.	Constructing 26 miles of sewers.	Oscar B. Bonar, City Clerk.
Ohio	Columbus	Mar. 21	Constructing sewer and outlet at Grand View	John Hinterschied, Clerk.
California	San Jose	July 3	Construct septic tank for County hospital.	City Clerk.
WATER SUPPLY				
British Col., Can	Victoria	March 3	Furn. 250 4-in., 100 6-in. and 10 12-in. double gate valves, and 15 tons best blue pig lead.	Wm. H. Northcott, Purch. Agt.
Ohio	Toledo	Mar. 3, noon	Furnishing cast iron pipe.	J. R. Cowell, Dir. of Pub. Ser.
Michigan	Mt. Clemens	Mar. 3	Furn. a 3,000,000-gal. pumping engine for water works.	Winfred Ferrin, Deputy City Clk.
Illinois	Wheaton	Mar. 6	Furn. 60 h. p. gas engine, gas producer, pumps; 100,000 gal. concrete reservoir, etc.	Louis Ellsworth, City Clerk.
South Dakota	Bridgewater	Mar. 6, 8 p.m.	Constr. water tank and tower, cap. 50,000 gal. height 125 ft.	O. A. Rietz, City Auditor.
Wyoming	Sheridan	Mar. 6, 3 p.m.	Constr. water supply main with approx. 7,934 ft. of 14-in. and 760 ft. of 10 in. c. i. pipe.	Arnold Tschirgi, City Engr.
New York	Ogdensburg	March 7	Constr. covered sand filters, pipe lines, steam and elec. pump machinery, etc.	Jas. M. Wells, Chm. Bd. W. Com.
Mississippi	Macomb City	March 7	Sinking artesian well.	J. D. Harrell, City Clerk.
Georgia	Rockmart	Mar. 7, 2 p.m.	Furn. mach. mat. and construct. w. w. and sewerage system.	City Clerk.
Wisconsin	Shawano	Mar. 7, 8 p.m.	Laying water pipe and placing hydrants.	D. E. Wescott, City Clk.
Washington	Seattle	Mar. 7, 10 a.m.	Constructing steel water tower.	C. B. Bagley, Secy. B. I. Pub. Wks.

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
WATER SUPPLY (Continued)				
Iowa	Atlantic	Mar. 8, 2 p.m.	Improving water system	City Clerk.
Nebraska	Fairbury	Mar. 9	Extending water works and furnishing appurtenances	B. Z. Millikan, City Clerk.
Michigan	St. Charles	Mar. 9	Constructing water works system	Chas. Krause, Village Pres.
South Dakota	Vermillion	Mar. 10, 2 p.m.	Drilling Artesian well	Irwin D. Aldrich, Secy. Re. Educa.
New Jersey	Spring Lake	Mar. 10, 2 p.m.	Furn. and install artesian water works plant	E. V. Patterson, Boro. Clerk.
Kentucky	Owensboro	Mar. 10, noon	Constructing water softening plant	E. B. Anderson, Chm. Elec. Lt. Com.
Massachusetts	Pt. Andrews	Mar. 10	Extending water mains and changing sewers	Ct. A. M. Miller, 263 Summer st. Bos.
Ohio	Troy	Mar. 11, 10 a.m.	Constructing water mains	A. E. Sinks, County Auditor.
South Dakota	Pierpont	Mar. 12	Furnishing cast-iron pipe, hydrants and fittings	City Clerk.
Pennsylvania	Pittsburg	Mar. 13, 10 a.m.	Constructing pumping station building and appurtenances	City Comptroller.
Ohio	Canton	Mar. 13, 10 a.m.	Furnishing water piping	J. H. McConnell, Auditor.
Alberta, Can.	Gleichen	Mar. 16	Drilling well; furnishing cast-iron pipe, etc.; erecting steel tank; supplying manhole castings	B. S. Corey, Secretary-Treasurer.
Pennsylvania	Bristol	Mar. 20	Constructing water works and filtration plant	Jos. R. Grundy, Chm. Com.
Ohio	Columbus	Mar. 21	Laying water mains and water pipes at Grand View	John Hinterschied, Clerk.
Pennsylvania	West Telford	April 1	Constr. water works; approx. cost \$30,000	H. Z. Walpole, Secy. Water Co
Texas	Galveston	Apr. 3, noon	Installing 10,766 lin. ft. of water main	City Commissioners.

BRIDGES

Ontario, Can.	Lanark	Mar. 4, 6 p.m.	Bldg. rein. conc. single span bridge 70 ft. long	J. Boyd Caldwell, Chm. R.&B. Com
Virginia	Courtland	Mar. 4	Constructing several bridges	County Clerk.
Indiana	Terre Haute	Mar. 4	Constructing 65 ft. reinforced concrete bridge	Comrs. of Vigo County.
North Dakota	Grand Forks	Mar. 6	Construct steel bridges and reinforced concrete bridges	County Auditor.
Ohio	Port Clinton	Mar. 6	Constructing a draw bridge	W. H. Mylander, County Auditor.
New York	White Plains	Mar. 6, 10 a.m.	Rebuilding two bridges	E. A. Forsyth, Chm. Bd. Super.
California	Los Angeles	Mar. 6, 2 p.m.	Constr. concrete arches, graveled approaches, curbs, fences, hand-railing, pylons, etc., across Arroyo Seco and extension of Pasadena Ave.	H. T. Lelande, County Clerk.
California	South Pasadena	Mar. 6, 2 p.m.	Constr. 6 arch concr bridge, 600 ft. long	Wm. L. Cox, City Clerk.
New York	Troy	Mar. 7, 11 a.m.	Repairing Rensselaer viaduct	Bd. Contract and Supply.
Wisconsin	Janesville	Mar. 7, 2 p.m.	Constr. 2 bridges across Rock River, one 384 and one 264 ft. long	W. F. Carle, Chm. St. Assess. Com.
Indiana	Vincennes	Mar. 9, 10 a.m.	Erecting three bridges	Bd. Comrs. Knox County.
Ohio	Hamilton	Mar. 11, 10 a.m.	Construction of bridge and road fill	J. E. Brate, County Auditor.
Wisconsin	Oakwood	Mar. 15, 2 p.m.	Constructing reinforced concrete one beam bridge	John A. Davitz, Town Clerk.

LIGHTING AND POWER

Massachusetts	Boston	Mar. 4	Furn. and install. approximately 11,000 gas lamps with incandescent mantel burners; additional alternative bids for automatic lighting devices; special post extensions; and furnishing additional parts and repairs; also maintaining 11,000 gas lamps for period of ten years; city to have option of installing automatic lighting device at any time	Louis K. Rourke, Comr. Pub. Wks.
Iowa	Newton	Mar. 6	Constructing municipal gas plant	E. G. Finch, City Clerk.
Illinois	Ottawa	Mar. 7	Lighting approaches to Illinois River Bridge	Gas. F. Farrell, Mayor.
Iowa	Atlantic	Mar. 8, 2 p.m.	Improving lighting system	City Clerk.
Nebraska	Fairbury	Mar. 9, 3 p.m.	Extending electric light plant	B. Z. Millikan, City Clerk.
Pennsylvania	Etna	Mar. 13, 5 p.m.	Constructing light plant	J. C. Armstrong, Boro. Clerk.
Arkansas	Monticello	Mar. 15, 3 p.m.	Constructing electric light plant	N. C. Roe, Chairman.
Indiana	Columbia City	Mar. 25	Furnishing machinery for electric light plant	City Clerk.

FIRE EQUIPMENT

New York	Jamestown	Mar. 6	Furnishing automobile combination chemical and hose appar.	Chm. Fire Committee.
California	Los Angeles	Mar. 7	Furnishing motor propelled combination auto fire-engine, chemical engine and hose wagon	H. J. Lelande, City Clerk.
Ontario, Can.	Ottawa	Mar. 14, noon	Furn. comb. automobile fire engine of pump. capacity of 700 to 800 gallons a minute	John Henderson, City Clerk.
New Jersey	Princeton	July 5	Furn. auto pumping engine	E. M. Urdike, Chm. P. & W. Com.

MISCELLANEOUS

Arkansas	Bentonville	Mar. 4	Erecting jail and jailer's residence	J. M. Jackson and W. T. Maxwell, C.
Ohio	Hamilton	Mar. 4, noon	Renting complete flashlight patrol system	Clinton Egbert, Clk. D. P. Safety.
Ohio	Hamilton	Mar. 6, noon	Furnishing wrought iron pipe	C. M. Robertson, Clk. D. P. Serv.
North Carolina	Dunn	Mar. 6	Erecting municipal building	C. K. Grantham, Secy. Bldg. Com.
Pennsylvania	McKees Rocks	Mar. 13	Constructing garbage disposal plant	City Clerk.

STREET IMPROVEMENTS

Cullman, Ala.—City has selected W. A. McCalla, Decatur, to prepare plans for construction of about five miles of sidewalk.—M. L. Robertson, Mayor.

Hermosa Beach, Cal.—City Trustees will at once ask bids for improving eleven streets.—E. McCloskey, City Clerk.

San Jose, Cal.—Plans will be prepared for improving portions of First St.

Stockton, Cal.—San Joaquin Highway Commission, R. M. Morton, Highway Engineer, is preparing plans for oil macadam pavement with 3-ft. shoulders on road leading from Lodi to Lafayette thence 2 miles north and back to Woodbridge, entire length being 9 miles; Cherokee Lane will be improved with oil macadam from the Hubbs place near Stockton to the Eight Mile House; Hogan road from Ripon south to the county line will be improved with the same material; about 25 bridges and culverts will be installed along road.

South Norfolk, Conn.—Plans are being prepared for street paving to cost \$30,000.—S. W. Hoyt, City Engineer.

Wallingford, Conn.—Bids will be received, about Mar. 15, for relocating, raising and building highways.—Wm. A. Mackenzie, City Engineer.

Americus, Ga.—City is considering paving of streets at cost of \$130,000.

Gainesville, Ga.—Hall County Board of Commissioners desires prices on road scrapers.—John A. Smith, Chairman.

Summerville, Ga.—Citizens will vote about Mar. 20 on \$75,000 bonds for improvement of streets and extension of water works and sewerage.

Coeur D'Alene, Idaho—Council is considering election on bonds for paving number of streets.

Chicago, Ill.—Board of Local Improvements will consider widening of 12th st. of about 2 miles.—Albert F. Keeney, President of Board.

East St. Louis, Ill.—City Engineer W. J. Crocker will receive bids after Mar. 1 for vit. brick paving, on concrete foundation, on 38th st.; cost, \$20,000.

Sterling, Ill.—Board of Local Improvements has instructed City Engineer to prepare estimates for paving E. 4th st., from Broadway to the city limits, intersections of Broadway from Broadway to 3d st. and east driveway on Broadway from 4th to 11th st.

Evansville, Ind.—County Council will consider \$1,000 appropriation for rock to be used on county roads.

Mt. Vernon, Ind.—Council is considering improvement of E. 5th st.

Carroll, Ia.—Council has decided to pave number of streets.

Nortonville, Ky.—City has decided to macadamize streets.

Oakland, Md.—Commissioners of Garrett county have filed petitions with the Good Roads Commission of residents of Accident and Friendsville asking that a new road be built between towns.

Aberdeen, Miss.—Citizens will vote Apr. 1 on \$50,000 of bonds for street paving and other improvements.

Meridian, Miss.—Good Roads Commission has \$200,000 available for construction of 40 miles of road in Beat No. 1; material to be used, broken stone or gravel. W. P. Moore, engineer, will supervise construction.

Omaha, Neb.—Council is considering paving of Douglas st.

North Wildwood, N. J.—Petitions are being circulated asking Council to open and grade Surf ave., one block from ocean, and make it ocean boulevard, 10 ft. wide, along entire front of borough.

Trenton, N. J.—Bids will be asked for paving West End ave.—Harry Salter, City Clerk.

Hudson, N. Y.—Bids will soon be received for improving streets at cost of \$25,000.—Wm. Wortman, City Clerk.

New Rochelle, N. Y.—Council is considering widening of North ave. and opening of Division st.; cost, \$180,000.

Oneida, N. Y.—Bids will be received about May 7 for paving at cost of \$20,000.—Geo. Lebbitts, City Engineer.

Plattsburg, N. Y.—Bids will be received about April for paving portions of two streets, at an estimated cost of \$8,000.—R. H. Rogers, Superintendent Public Works.

Rochester, N. Y.—Bids have been rejected for repairs to 42,000 ft. of asphalt pavement; new bids will be asked by Board of Contract and Supply.

Fayetteville, N. C.—City will receive bids for street paving to amount of \$35,000; light traffic pavement; work to begin on or about April 1.—C. B. Ledbetter, Chairman Street Committee.

Akron, O.—Council is considering paving of Armadale ave. and Second ave.

Barberton, O.—Cost of widening Third st. has been estimated at \$17,473.82.

Canal Dover, O.—City is considering improvement of Wooser, Third, Factory and Walnut sts.

Cantfield, O.—Paving of Broad st. is being considered.

Cincinnati, O.—County Commissioners are considering improvement of Linne-mann road, Madisonville to Wooster pike, estimated cost of \$13,646; also improvement of Groesbeck and Montauk roads; county Surveyor's plans and specifications for improvement of Broadwell road, Round bottom road to half mile east of the N. W. Railroad at estimated cost of \$4,951, have been approved.

East Liverpool, O.—Plans are under way to secure a paved road between Pittsburg and East Liverpool at cost of \$200,000. Resolutions have been passed to pave St. George st. and Bradshaw ave.

New Lexington, O.—Perry County is considering \$500,000 bond issue for road improvements.

Painesville, O.—Bids will be received in spring for paving Main st. at cost of \$6,000.—John C. Ward, City Engineer.

Pomeroy, O.—Council has adopted resolution to pave Front st.; cost, \$20,000.

Tiffin, O.—Plans are being prepared for paving Webster, Hudson, Schoenhart and second sts.—Edward Kuhn, Superintendent paving.

Willoughby, O.—Raymond L. Pike, Village Engineer, is preparing plans for paving Euclid st. and portion of Revere st. with brick, concrete base, stone or cement curb; distance about 1 mile.—S. S. Wilson, Mayor.

Youngstown, O.—New bids will be asked for paving Superior and Oak sts. and Logan ave.

Hugo, Okla.—County Good Roads Association has applied to Good Roads Division of Agriculture Department at Washington for experts and 4 miles of demonstration road, between here and Grant will be constructed, according to arrangements.

Central Point, Ore.—Town is considering tract paving.

Portland, Ore.—Estimates have been filed for 22.16 additional miles of hard-surface pavements.

Millville, Pa.—Borough Council has passed ordinance for improvement of Ohio st. from Pittsburg city line to Bridge st.

Pittsburg, Pa.—City will pave West Carson st. at cost of \$186,000.—N. S. Spragill, City Engineer.

Sharon, Pa.—Plans are being prepared by Borough Engineer Griff Nichols for 300 yds. of vit. brick paving, on 6-in. concrete base, on Silver st.; cost \$5,000; bids will be received after Apr. 1.

Sumter, S. C.—Citizens voted \$25,000 of bonds for paving business streets.

Memphis, Tenn.—Council has passed ordinance for paving Bellevue ave. with tar macadam at cost of \$15,223.

Brady, Tex.—Commissioner's Court has ordered election Mar. 25 on \$75,000 bonds improve roads.

Dallas, Tex.—Council has adopted specifications for paving Columbia ave.

Dallas, Tex.—Bids will be asked for furnishing steam or gasoline street roller of not less than ten tons in weight.

Georgetown, Tex.—Granger-Bartlett Justice Precinct, Williamson County, will vote Mar. 29 on \$100,000 bonds for macadam and construction.

Hamlin, Tex.—City has decided to pave salmness section with brick on concrete base.

Paris, Tex.—Precinct No. 1, Lamar County, including city of Paris, will vote within next ninety days on proposition to issue \$100,000 bonds to build system of permanent road roads in precinct.

Pearsall, Tex.—Frio County will vote Mar. 25 on \$75,000 of bonds for road construction.

Smithville, Tex.—Citizens will vote on bonds for street improvements.

Salt Lake City, Utah.—Board of Public Works is considering establishment of municipal plant for manufacturing and repair of asphaltum pavement.—John S. Mansford, Mayor.

Lebanon, Va.—Russell County has voted \$75,000 of bonds for road improvement and construction.

Roanoke, Va.—Russell County has voted \$75,000 bonds for improvement of roads.

Chehalis, Wash.—Council has directed specifications prepared for construction of hard surface roadway east on Market to city limits; also on Main st. to Chel-is River bridge; resolutions and ordinances for this improvement, also for about 1000 sq. yds. of paving within center of city have been ordered.

Spokane, Wash.—Paving of entire length Boone ave. is being considered.

Morgantown, W. Va.—City Engineer Davis has estimated cost of paving Sabran-ave. at \$6,825.

CONTRACTS AWARDED

Mobile, Ala.—Street Improvements in eighth District, including Broad st. from Spring Hill ave. to Texas st. and Conception st. from State to Beauregard st., to R. Ennis & Co., city, \$60,885 for wood block paving; to Gailey & Clark, city, \$3,915

for cement curbing.—Wright Smith, Chief Engineer.

Albion, Ill.—To Reeb Bros., Belleville, for 43,100 sq. yd. paving, \$33,432.

Moline, Ill.—Paving S. Fifteenth st. with brick, to Britt & Layden, Davenport, Ia., \$27,493; other bidders: Independent Construction Co., Davenport, \$27,736.70, and Tri-City Construction Co., Davenport, \$28,241.

Riverside, Ill.—To Nick Metz & Son, city, for construction of sidewalks, 14c. per ft.

Covington, Ind.—To Fred Cunningham, for building Jas. I. Brown road, \$6,285.

Manhattan, Kan.—Paving Poyntz ave. to W. W. Cook & Son as follows: 12,000 sq. yds. brick, asphalt fill, \$2.06; 1,350 sq. yds. brick, St. R. R. section, \$2.12; 4,000 cu. yds. excavation, 35c; 1,000 ft. 48 in. gutter, 48c; 500 ft. 12 in. face curb, 30c; 36 headers, \$1.10; 500 sq. ft. slabs for crossings, 20c; total, \$29,727; Houston and 4th sts., to R. J. & W. M. Boyd Constr. Co., Kansas City, Kan.: 15,800 sq. yd. asphaltic concrete, \$1.60; 400 sq. yd. asphaltic St. R. R. section, \$1.70; 5,400 cu. yds. excavation, 30c; 1,400 lin. ft. 18 in. gutter, 30c; 400 lin. ft. 8 in. face curb, 30c; 600 lin. ft. oak headers, 10c; total, \$28,180.

Vidalia, La.—To R. Scudmore, Natchez, Miss., to lay 900 yds. of six-foot concrete sidewalks.

New Bedford, Mass.—Supplying repair parts of stone crusher, to Earle C. Bacon, engineer, of Farrell Foundry & Machinery Co., \$641.

Albany, N. Y.—Furnishing oil for oiling streets, to Standard Oil Co.

Elizabeth City, N. C.—By Board of Aldermen, for paving streets with Belgian block to J. L. Lawson, Norfolk, \$1.60 per sq. yd.

Cleveland, O.—Grading Broadview road No. 3, to the Enterprise Paving & Construction Co., city, \$28,568. Other bidders: T. M. Campbell, West Park, O., \$29,971; Tubman & Burkhardt, city, \$30,503.

Columbiana, O.—Paving Fairfield ave. and South Main, Duquesne and Friend sts., to William McLane, \$15,886.

Springfield, O.—To Peter Bros. Paving Co., Chicago, for paving E. High st. with asphalt, \$13,861.44.

Youngstown, O.—South ave. paving, to Kennedy Brothers, \$16,853.70; Griffith st. paving, to Charles Harris, \$6,383; Millicent ave. paving, to James McCarron, \$10,343.15; Hillman st. paving, to James McGraw, \$12,424.20; Williamson ave. paving, to Henry M. Miller, \$3,462.60; Jefferson st. paving, to Joe Morrison, \$11,498.80; Gladstone st. grading, to Martin Connely, \$1,190.00.

Ardmore, Okla.—Paving First ave. S. W. to Shelby Downard Co.

Altoona, Pa.—Award of \$300,000 street paving contracts by the Board of Public Works to the Bell-Bockle Company, an Altoona firm, which was vetoed by Mayor Hoyer, has been confirmed by both branches of Councils over Mayor's veto.

Rochester, Pa.—Paving portions of East Jefferson st. and Jackson st., to J. G. McGuire & Co., \$7,280 and \$257.24; other bidders: Geo. E. Patterson, \$8,370 and \$283.92; Ira W. Logan, \$8,333 and \$288.38; R. C. McQuiston, \$8,289 and \$289.62; J. H. and H. E. Miller, \$8,437 and \$290.12.

Dallas, Tex.—Paving Griffin st., to D. J. Gregsby, \$2.65 per cu. yd. for Coffeyville brick on 6-in. gravel concrete foundation; Houston st., to Texas Bitulithic Co., material same, \$2.70 sq. yd.

Kelso, Wash.—Council has decided to pave 34 blocks with concrete.

Huntington, W. Va.—Paving 8th ave. with Portsmouth granite, to Freshwater & Sons, \$1.23.

BIDS RECEIVED

Elkhart, Ind.—Paving Middlebury st.: Rankert & Eggleston, \$19,395.90 for Metropolitan block with sand filler, concrete curb and gutter, \$20,180.50 for concrete filler and \$20,965.10 for asphalt filler; under same conditions but with stone curb their bid was \$21,172.35, \$22,017.35 and \$22,862.35; on Nelsonville block, sand, concrete and asphalt fillers, respectively, concrete curb and gutter, \$19,238.98, \$20,023.58 and \$20,808.18; for stone curb, \$21,791.95, \$21,591.95 and \$22,576.55; Bessemer brick, concrete curb and gutter, sand, concrete and asphalt fillers, \$19,552.82, \$20,337.42 and \$21,122.12; same with stone curb, \$21,541.35, \$22,125.95 and \$22,910.55. Daniels, List & Douglas for Nelsonville and Metropolitan block, concrete curb and gutter, cement filler, \$18,788.05, and with stone curb and gutter, \$19,776.75; sand filler, \$18,631.13 and \$19,607.75; asphalt filler, \$20,700.05 and \$21,888.75; Bessemer, conditions same as above, \$18,944.97, \$20,736.95 for concrete curb and gutter for first with sand filler and stone curb for second; for cement filler, \$18,788.05 and \$20,567.95, and for asphalt filler, \$20,856.97 and \$22,849.45; Metropolitan block, \$19,815.35; sand filler, concrete curb and gutter, and \$20,741.21 for

stone curb, the bid on each being about \$500 higher for concrete filler; bids on Nelsonville and Bessemer block ranged about the same as for the Metropolitan. Lake Shore driveway and alley to the warehouse ranged from \$8,274.95 by Daniels, List & Douglas for sand filler to \$10,265.63 by Rankert & Eggleston for asphalt filler with stone curb. East High st. bids ranged from \$9,502.30 by Daniels, List & Douglas for Nelsonville or Metropolitan block, sand filler, to \$11,774.22 by Rankert & Eggleston for asphalt filler. Daniels, List & Douglas were about lowest bidder on Edwarsburg ave.; Nelsonville or Metropolitan block, sand filler and concrete curb and gutter, \$5,773.48; asphalt filler brought the same material up to \$5,470.25. East Marion st.: Daniels, List & Douglas bid on Nelsonville or Metropolitan block \$4,605.50 for sand filler to \$5,092.78 for asphalt filler; Rankert & Eggleston bid on the same materials \$4,951.56 and \$5,341.36, and Haugk & Vogt bid \$5,785.96, asphalt filler. Bids on alley north of Lexington ave. ranged from \$573.24 by Daniels, List & Douglas for sand filler to \$719.88 for asphalt filler by Rankert & Eggleston; first named bid \$655.05 for asphalt filler.

Crookston, Minn.—Paving Houston ave. E. Fletcher and other streets, as follows —(a) Central Westrumite Co. (b) P. McDonnell, Duluth: 12,332 sq. yd. Class A top, using granite (a) \$2.19; (b) \$2.14; 12,323 sq. yd. Class B top, using limestone (a), \$1.89; (b), \$1.87; 12,332 sq. yd. Class A base concrete, 1:2:4 (b), \$2.10; 12,332 sq. yd. Class B base concrete, 1 to 6 (b), \$1.87; 1,095 lin. ft. cement combined curb and gutter (a), 50c; (b), 45c; 1,095 lin. ft. cement curb, 6x16 in., including 3-in. vit. tile drains (a), 40c; (b), 50c; 283 lin. ft. cement radius curb (a), 40c; (b), 50c; 1,307 sq. ft. cement driveways (a), 18c; (b), 18c; 4,753 cu. yd. surplus earth (a), 30c; (b), 30c; both concerns using West-rumite asphalt macadam.

Mt. Vernon, N. Y.—Paving E. Lincoln ave.: Eastern Asphalt Paving Company—New curb, \$1; old curb, 50c; brick pavement, 40c; sheet asphalt on 2-in. concrete foundation, \$1.75; sheet asphalt on 6-in. concrete foundation, \$2.23; new flag, 90c; old flag, 25c; Barber Asphalt Company—New curb, \$1.34; old curb, 74c; block asphalt on 1-in. cement foundation, \$2.42; block asphalt on 6-in. concrete foundation, \$3.20; new flag, 90c; old flag, 25c; Barber Asphalt Company—New curb, \$1.34; old curb, 74c; sheet asphalt on 2-in. concrete foundation, \$2.42; block asphalt on 6-in. concrete foundation, \$3.20; new flag, 90c; old flag, 25c; Hastings Paving Company—New curb, \$1.10; old curb, 40c; brick pavement, 50c; block asphalt on 1-in. cement foundation, \$1.85; block asphalt on 6-in. concrete foundation, \$2.81; new flag, 90c; old flag, 24c.

New York, N. Y.—Paving with asphalt block, on a concrete foundation, Bryant ave. from Westchester ave. to E. 172d st., Hastings Pavt. Co., lowest bidder, as follows: 7,689 sq. yd. completed asphalt block pavement and keep same in repair for 5 years, \$1.66; 100 sq. yd. completed asphalt block pavement, not to be kept in repair, \$1.66; 1,270 cu. yd. concrete, including mortar bed, \$5.92; 900 lin. ft. new curbs, furnished and set in concrete, \$1; 3,780 lin. ft. old curbs, rejointed, recut on top and reset in concrete, 33c; total, \$22,597; Barber Asphalt Paving Co. bid \$22,761; with asphalt block on concrete foundation, Kelly st., from Westchester ave. to Intervally ave., Barber Asphalt Paving Co. lowest bidder: 5,080 sq. yd. completed asphalt block pavement and keep same in repair for 5 years, \$1.76; 825 cu. yd. concrete, including mortar bed, \$6; 500 lin. ft. new curbs, furnished and set in concrete, 82c; 2,540 lin. ft. old curbs, rejointed and reset in concrete, 34c; total, \$15,164; Hastings Pavt. Co. bid \$15,569; with asphalt, block, on a concrete foundation, Bryant ave., from Seneca ave. to Garrison ave.: Hastings Pavt. Co., \$3,681, and Barber Asphalt Paving Co., \$6,610; With asphalt block, on a concrete foundation, Eastburn Ave., from 17th St. to 175th St.: Hastings Pavt. Co., \$6,692, and Barber Asphalt Paving Co., \$6,617; regulating grading, setting curbs, flagging, etc., Bronxwood ave., from Gun Hill road to Burke ave., A. Cebrella lowest bidder: 3,500 cu. yd. earth excavated, 35c; 9,300 cu. yd. rock excavated, \$1.40; 29,100 cu. yd. filling, 13c; 2,950 lin. ft. new curbs, 74c; 11,550 sq. ft. new flag, 24c; 2,700 sq. ft. new bridgestone for crosswalks, 60c; 110 cu. yd. dry rubble masonry in retaining walls, culverts and gutters, \$1; 50 cu. yd. rubble masonry in mortar, \$3; 160 lin. ft. 12-in. vit. stoneware pipe, \$1; 25 lin. ft. vit. stoneware pipe, 33; 1,900 lin. ft. new guard rail, in place, 20c; 100 cu. yd. concrete, \$5.25; 4,200 lb. steel bars, furnished and in place, 3c; total, \$26,154; F. Pitson bid for this work \$28,661; regulating and reregulating grading and regrading, setting and reset-

ting curbs, flagging, etc., in Ryer ave., from E. 183d st. to E. 184th st., and in E. 18th st., from Grand Blvd. and Concourse to Valentine ave., Delena & Zingales, lowest bidders, \$5,027; regulating, grading, setting curbs, flagging, sidewalks, laying crosswalks, building approaches, etc., in Trafalgar pl., from E. 175th st. to E. 176th st., De Menna & De Paola, lowest bidders, \$3,905.

Springfield, O.—Paving East High st. from bridge to Limestone st., Peters Bros. Paving Co., Chicago, low on sheet asphalt with brick between tracks, \$13,861.41; W. E. Payne is low on brick with a bid of \$22,886.01; Engineer's estimate on asphalt \$18,183, and on brick \$19,457; lowest offers of the other bidders were: Cleveland Trinidad Paving Co., sheet asphalt and brick, \$14,284.76; M. J. Hannon, sheet and brick, \$16,886.70; Toledo Asphalt Block Co., block and brick, \$20,552.92; W. E. Payne, brick, \$12,886.01; J. L. McHugh, brick, \$14,629.40; M. J. Hannon, brick, \$16,617.50.

SEWERAGE

Long Beach, Cal.—Plans and specifications have been prepared by City Engineer E. P. Dewey for construction of sewer system.

Winters, Cal.—Citizens will soon vote on bonds for construction of a sewer system.

Summerville, Ga.—Citizens will vote about March 30 on \$75,000 bonds for improvements, including extension of sewerage.

Indianapolis, Ind.—Board of Works has adopted resolution for construction of sewers on Princeton and Trenton aves.

Mt. Vernon, Ind.—Plans will be prepared for the construction of improved sewerage system from east 5th st. to Saw Mill st., thence to McFadden's creek; also on Barber st., W. 4th to Ohio River. Three different types of sewers are called for in plans and specifications.

Manning, Ia.—Town Council is investigating sewerage systems.

Lake Charles, La.—Board of Commissioners of the First Sewerage District will receive bids March 11, 8 p. m., for \$125,000 sewer bonds; as soon as the bonds are sold work will be advertised for construction.—Walter G. Kirkpatrick, Jackson, Miss., Engineer; A. A. Wentz, Secretary.

Easton, Md.—Citizens have voted \$40,000 bonds to install sewer system.

Lawrence, Mass.—Board of Aldermen is considering construction of sewer in western section of Tower Hill at cost of \$30,000.

Benton Harbor, Mich.—Plans are being prepared by A. A. Johnson for construction of a sewerage system; bids will be received about April 1; the system will consist of about 1,450 ft. of 12-in. crock tile.

Blackduck, Minn.—Installation of sewer system is being considered.

Ely, Minn.—Construction of sewer system, including about three miles of tile pipe, is being considered; Duluth Engineering Co., Palladio Bldg., Duluth, will prepare plans; estimated cost \$20,000.

Hibbing, Minn.—City is considering installation of septic tank sewage system, cost \$30,000.

Brookhaven, Miss.—City has ordered R. C. Huston, Memphis, to make survey and prepare plans for system of sewers.

McComb, Miss.—City is considering construction of sewer system.

Chillicothe, Mo.—Plans are being prepared by City Engineer Joe Broadus, providing for creation of sewer districts in city.

Gordon, Neb.—Citizens have voted to issue sewer bonds.

Nebraska City, Neb.—Charles A. Shannon, City Engineer, has completed plans for sanitary sewer covering whole of the south side of city and a portion of west end.

Neligh, Neb.—Town Council is considering resolution for construction of sewerage system.

Belleville, N. J.—Dr. Herbert B. Vail, President Board of Health, has recommended installation of sewerage facilities in Silver Lake section.

Paterson, N. J.—Board of Works is considering installation of sewers in nearly every street of West Paterson.

New Hartford, N. Y.—Engineer A. M. Scripture, city, has practically completed plans and specifications for construction of a sanitary sewer system in territory north of Saquoit Creek.

Oswego, N. Y.—Hering & Fuller, New York City, have completed plans for sewage disposal plant and outfall sewer on West Side and estimate the cost at about \$25,875.

Rochester, N. Y.—Board of Contract and Supply will ask for new bids for Section 1 of intercepting sewer; bids will also be asked for Sect. 3, which is to be about 1,600 ft. long and cost \$125,000.

Scarsdale, N. Y.—Town Board is considering construction of sanitary sewers

to cost about \$10,000; Scarsdale will pay one-third and village of White Plains two-thirds.

Rockingham, N. C.—City is considering bond issue for extension of sewer system.

Flasher, N. D.—Plans are being considered for installation of sewer system.

Lorain, O.—Bids will be asked latter part of next month for construction of sewers from 18th and 21st sts.

West Lafayette, O.—City will sell \$20,000 of bonds for construction of sewer system.

Britton, Okla.—Citizens will vote on \$20,000 bonds for construction of sewer system and water works for College place addition.

Central Point, Ore.—Town is considering installation of sewer system.

Carlisle, Pa.—Citizens have voted \$90,000 bonds for sewerage.

Colwyn, Pa.—Citizens will vote on loan for installation of sewerage system.

Hazleton, Pa.—Residents of Oak and 3d sts. are urging extension of Oak st. sewer.

Jenkintown, Pa.—Cost of proposed sewerage system has been estimated at about \$100,550.

Pittsburg, Pa.—Mayor Wm. A. Magee has approved ordinance providing for reconstruction of Try st. trunk sewer.

Sharpsville, Pa.—Borough Council has decided to issue \$14,000 sewer bonds.

Williamsport, Pa.—Council will receive bids for construction of proposed Grafius run sewer.

Madisonville, Tenn.—Robert Koeppe, civil engineer, Chicago, Ill., has completed survey of city preparatory to construction of proposed system of sanitary sewers.

Front Royal, Va.—A. F. Brown, Engineer, Fredericksburg, Va., has prepared plans for sewerage system to comprise about four miles of pipe; contract for construction work will soon be awarded.

Antigo, Wis.—Citizens will vote on \$50,000 bonds for sewer improvements.

Victoria, B. C., Can.—Plans have been prepared for installation of sewerage system.

Guayaquil, Ecuador.—City will improve sanitary sewer system, install water works and build new sea walls; over \$8,000,000 will be spent in improvements.—Mons. E. Coignet, Paris, Engineer.

CONTRACTS AWARDED

Fresno, Cal.—To Jos. House, for constructing main sewers in the Belmont annexed district, \$37,900.

Turlock, Cal.—To Edw. E. Paxson, city, for constructing sewers, about \$8,668.

Brooklyn, Md.—By Anne Arundel County Commissioners, Annapolis, for installation of sewers, to Bond & Bates, Baltimore.

St. Paul, Minn.—Building St. Anthony Park, N., sewer system to O'Neil & Preston, \$91,400; other bidders: Ilstrop & Olson, Minneapolis, \$144,000; Frazer & Danforth, \$147,100; Gilbert & W. Haggart, \$709,000; John Lind, \$148,000; J. J. Connolly, \$145,200; P. J. Ryan, \$147,000; Keough Bros., \$145,000; Thornton Bros., \$145,887.

Niagara Falls, N. Y.—Sewer on Mercer st. to Nick Nolfe, \$841.50; 23d st. to same, \$565.30; South ave. to Rinaldo, Dominico & Co., \$447.30.

Springfield, O.—Constructing sanitary sewer in Race st. to M. T. Cooney, \$1,733.

Youngstown, O.—Constructing sewer on Homewood ave. to Hannon Bros., \$1,090.40.

Toronto, Ont., Can.—Construction of low level interceptor, to Godson Contracting Co., Toronto, for section 1, \$13.10 per lin. ft.; for section 2, \$13.14 per lin. ft.; for section 3, \$18.30 per lin. ft.—C. H. Rust, City Engineer.

BIDS RECEIVED

Elkhart, Ind.—Morehouse Addition sewers: F. J. Miller, \$5,290.95; Northern Construction Co., \$5,601.60; Staples & Ackerman, \$5,750.40; Bankert & Eggleston, \$6,818.77; Oakland ave., north to Harrison st.: F. J. Miller, \$1,490.80; Northern Construction Co., \$1,528.60; Staples & Ackerman, \$1,680.25.

Minneapolis, Minn.—Furnishing sewer pipe, f.o.b. trenches: (a) straight, (b) Y's, (c) curve: (a) Red Wing Sewer Pipe Co., Red Wing, 6-in. Sc. per ft., 9-in. 16.5c, 12-in. 31c, 15-in. 42.5c, 18-in. 63c, 20-in. 91.5c, 22-in. \$1.09, 24-in. \$1.29; Blackmore-Post Co., St. Louis, Mo., 8.3c. per ft., 1.75c., 31.75c., 44c., 63.5c., 95c., 13.2c. and \$1.35; Streater Clay Mfg. Co., Streater, Ill., 8.3c. per ft., 17.5c., 31.75c., 44c., 95c., \$1.12, \$1.35; (b) Red Wing Sewer Pipe Co., 9-in. 66c. each, 12-in. \$1.55, 15-in. \$2.15, 18-in. \$3.10, 20-in. \$4.05, 22-in. \$1.85, and 24-in. \$5.70; Blackmore-Post Co., 78.75c., \$1.43, \$1.98, \$2.86, \$4.28, \$5.10, and \$6.08; Streater Clay Mfg. Co., Streater, Ill., 65c., \$1.515, \$2.20, \$3. \$4.11, \$4.90 and \$5.62; (c) Red Wing Sewer Pipe Co., 9-in. 55c. each, 12-in. \$1.35, 15-in. \$1.90, 18-in. \$2.75, 20-in. \$2.98, 22-in. \$3.58, 24-in. \$4.21, and 6-in.,

30c.; Blackmore-Post Co., St. Louis, Mo., 59.5c. each, \$1.405, \$1.98, \$2.85, \$3.10, \$3.72, \$4.48 and 32c.; Streater Clay Mfg. Co., 60c. each, \$1.28, \$1.80, \$2.60, \$2.98, \$3.50, \$4.30 and 32c.; 200 tons of special castings for sewer construction: Crown Iron Works, city, \$44 per ton; Minneapolis Steel and Machinery Co., city, \$45 per ton; Menzel & Jeffrey, city, \$43.50 per ton; William Bros. Boiler Co., city, \$40 per ton; Northwestern Foundry, city, \$39 per ton, Hauser Bros., city, \$38 per ton; Standard Foundry Co., city, \$38 per ton; Diamond Iron Works, city, \$37.35 per ton; Meyer Foundry and Manufacturing Co., South Bend, Ind., \$33.50 per ton.

St. Paul, Minn.—Building Otis st. sewer, lowest bidder J. J. Connolly, \$7,912; Engineer's estimate, \$6,816; other bidders: John Lind, \$8,000; P. J. Ryan, \$9,127; Thornton Bros., \$9,427; O'Neil & Preston, \$9,999.

WATER SUPPLY

Colorado Springs, Cal.—Hiram Phillips, Civil Engineer, Third Nat'l Bank Bldg., St. Louis, Mo., has been selected to submit plans for betterment of water works system; work contemplated is enlarging of the reservoirs and strengthening of distributing system.

Glendora, Cal.—Allin Bros., Consulting Engineers, Pasadena, are preparing plans for construction of a 3,000,000-gal. reservoir in San Dumas Wash for the Glendora Water Co.; bids will be asked in about two weeks; cost \$9,000.

Lordsburg, Cal.—All bids for construction of the municipal water system have been rejected by the city; Trustees have directed Frank Lathrop, Field Engineer for Olmstead & Gillelan, Consulting Engineers, Wright & Callender Bldg., Los Angeles, to proceed with construction by day labor.

Santa Ana, Cal.—Citizens have voted \$20,000 bonds to construct reservoir.

Wallingford, Conn.—Borough is considering extension of water mains to Yalesville and Tracy, six miles of 10, 8, 6 and 4-in. pipe, and construction of two dams at Pistapang Pond; cost \$40,000.—William A. Mackenzie, Superintendent and Engineer Water Department.

Titusville, Fla.—Citizens have voted \$30,000 bonds to install water works system.

Summerville, Ga.—Citizens will vote about March 30 on \$75,000 bonds for improvements, including extension of water works.

Lewistown, Ill.—City is considering the extension of water mains, digging of large well and installation of pump; cost \$7,000.—J. H. Allison, City Clerk.

South Bend, Ind.—Water Works Trustees are considering reconstruction of water system; thorough investigation will be made by experts.—William S. Moore, City Engineer.

Vail, Ia.—Town is considering bond issue to extend water works and to build large water tank.

Canton, Kans.—J. S. Worley & Co., Reliance Bldg., Kansas City, Mo., Engineers, are preparing plans for system of water works and electric light plant; cost \$30,000. C. M. Gray City Clerk.

Cherryvale, Kans.—J. S. Worley & Co., Reliance Bldg., Kansas City, Mo., Engineers, are preparing plans for a concrete purification and filter plant; cost \$50,000. E. E. Bellamy, City Clerk.

Newton, Kan.—City Commissioners will lay about 4,000 ft. of water mains in north-eastern section of city.

Winthrop, Me.—Surveys have been completed and plans are being prepared by Dudley & Sawyer, Manchester, N. H., for the construction of water works.—Frank L. Bishop, Chairman Water Commissioners.

Quincy, Mass.—Council has passed \$51,000 order for extending water system and making improvements; Mayor Shea will petition Legislature for right to borrow \$200,000 for extending water system.

Tupelo, Miss.—Citizens will issue \$50,000 of bonds for improving and enlarging water works, paving streets and erecting city hall.

Tylertown, Miss.—Installation of water and light plant is being considered.

Gordon, Neb.—Citizens have voted water bonds.

Buffalo, N. Y.—Bill to bond city for \$1,000,000 to equip new pumping station has been approved by Aldermen.

Schenectady, N. Y.—City is considering construction of underground reservoir; also repairing various streets; cost \$300,000.—Leland FitzGerald, City Engineer.

Waterford, N. Y.—City Health Officer has recommended construction of filtration plant.

Hamilton, O.—Council has passed ordinance authorizing Department of Public Service to contract pipe, valves, hydrants, water motors, etc., for extension of water mains at a cost of \$8,500.

Municipal Journal

And Engineer

VOLUME XXX

NEW YORK, MARCH 8, 1911

No. 10



FIG. 1.—SITES OF FILTER BEDS, FROM THAT OF MAIN SEDIMENTATION TANK

CHATHAM-MADISON SEWAGE DISPOSAL WORKS

Plant for Two Boroughs—Method of Apportioning Cost—Emscher Sedimentation Tanks—Double Contact Beds—Sand Filter—Sludge Bed—Concrete Construction Throughout—Detail Plans—Cost of Construction and Operation

In the Spring of 1910 the Boroughs of Chatham and Madison, N. J., which had been considering the subject of sewage disposal and each of which had employed engineers to advise on the subject, decided to join forces and to consider a large disposal plant to be used in common by the two boroughs. Messrs. Hering and Fuller had been acting as engineers for the borough of Madison and Clyde Potts for Chatham. With the agreement to co-operate, these engineers were retained, Messrs. Hering and Fuller as consulting engineers and Mr. Potts as constructing engineer, and the joint project is now under construction.

This disposal plant is deserving of special consideration chiefly for two reasons—the joint construction and operation under a New Jersey statute of 1910, and because of the inclusion of Emscher tanks in the plans adopted.

The state statute referred to prescribes most of the details of the plan under which such co-operation may be carried on. One of these is that there shall be a prescribed and fixed per-

centage of capacity of the works which shall be considered the property of and be paid for by each of the communities. Under this provision the cost of the works has been apportioned so that Madison shall pay five-sevenths and Chatham two-sevenths of the whole, these being approximately the relative populations of the two boroughs. It is also agreed that all necessary additions and enlargements to the plant, and also to the joint trunk line leading to the same, which may be required from time to time during the first five years, will be constructed and paid for in the same proportion, as shall also the operating expenses. Five years from the first use of the plant, however, and at five-year intervals after that, there is to be a reapportionment of the costs of enlargements, betterments and renewals and also of the maintenance charges, the apportionment each time being based upon the proportionate amount of sewage discharged by the two communities, measurements of the discharges being accurately determined by competent engineers. The engineers had advised that the interest and sinking fund

expenses also be reapportioned each five years, but this, we believe, was not permitted under the state statute. An agreement was made and formally signed by the representatives of the two boroughs embodying these ideas, together with a number of others of a legal and financial nature. This agreement provided that the contract shall continue in force during the life of the plant and its additions and enlargements, this time to be not

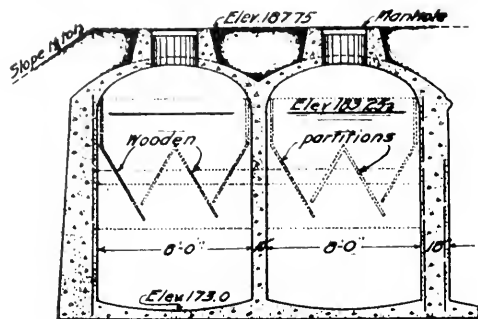


FIG. 2.—MAIN SETTLING TANK. SECTION ON H J.

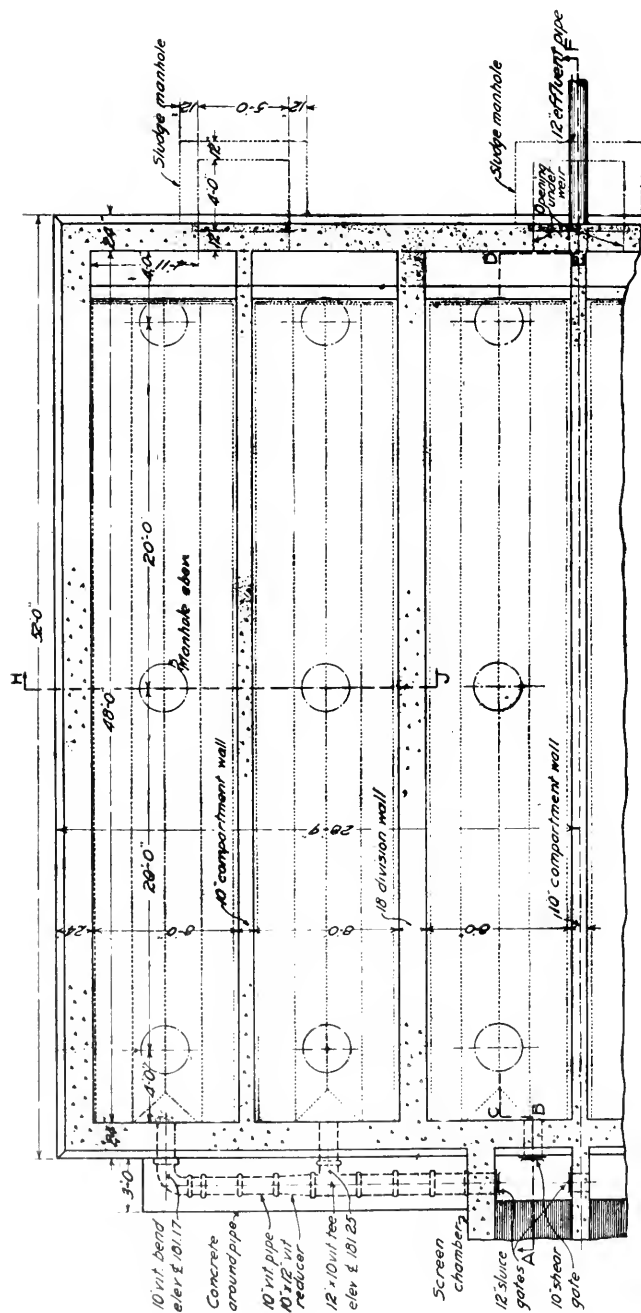


FIG. 3.—GENERAL PLAN OF ONE-HALF OF MAIN SETTLING TANK.

less than twenty-five years unless changed or abrogated by mutual consent.

The topography indicated the best site for the disposal works to be in the borough of Chatham, and the plant is now under construction on this site. Provision is made for treating 600,000 gallons per day of dry weather flow, but it is intended that the plant shall be capable of carrying an overload of 25 to 50 per cent during short periods of very wet weather. In general the plant consists of screens, main settling tank, first and second contact filters and sand filter, there being an additional settling tank provided between the two contact filters and between the second contact and the sand filter. There is also provided a sludge bed for receiving the sludge from the several settling tanks. The entire plant is about 900 feet long, the several elements following each other in a continuous straight line in the order named above.

On reaching the screen house the sewage first enters a small rectangular chamber 24 inches by 9 feet, in which are two openings leading to two screen chambers, each opening controlled by a 12-inch sluice gate. In each of these screen chambers are two screens through which the sewage passes in succession, the first having spaces of $1\frac{1}{4}$ inches between bars, the second with spaces of $\frac{5}{8}$ inch between bars. These screens are formed of $\frac{3}{8}$ x 2-inch bars held together by bolts and washers or spacers at top and bottom, each screen being the full width of the screen chamber—4 feet, and 5 feet 3 inches high. Over the screen chamber and extending some distance on either side of it is a "screen house," so-called, which contains a tool room 8 feet 7 inches by 12 feet 6 inches, and a laboratory 11 feet 7 inches by 12 feet 6 inches. This is constructed of brick with a chimney and slate roof. The screen room has a 2-inch yellow-pine floor on the ground level and the other two rooms have granolithic floors.

Immediately adjacent to the screen chambers is a settling tank divided into six sections which receives the sewage from the screen chambers (see Figs. 2, 3 and 4). Each of these six sections is 8 feet 9 inches in the clear and 48 feet long, with a depth from the bottom to the crest of the outlet weir of 10 feet. The bottom slopes 6 inches toward the center in order to facilitate withdrawing the sludge. This settling tank is covered by a series of six elliptical arches resting upon the partition walls, each arch containing three manholes giving access to the settling tank beneath. This settling tank is designed to act as an Emscher tank, and trough-like channels are provided for carrying the sewage flow. These are constructed of cypress boards fastened to a frame work of 2 x 4's, the whole fastened to the sides to the concrete walls by expansion bolts. At angles between the board surfaces 16-ounce copper flashing is used. A 2-inch slot is left at the bottom between the sloping board surfaces.

The sewage enters each of these tank sections through a 10-inch inlet whose invert is about $2\frac{1}{2}$ feet below the crest of the outflow weir, and flows the full length of the tank to the outlet. The outflow weir is in the form of a 10-inch concrete wall, outside of which is a channel 2 feet wide and 3 feet deep below the crest, through which the effluent is removed. To the front of this weir wall is fastened a scum board of 2-inch plank, held 3 inches from the face of the weir wall by spacers. This construction requires the sewage, in leaving the settling tank, to pass through the 3-inch space between the scum board and weir wall, flowing over the latter and dropping into the channel above referred to. This general construction is shown in the accompanying illustrations.

From this settling tank the sewage passes to the first contact filters. These consist of four beds, each 75 feet square in the clear, the four forming a square about 150 feet on a side. In the center of this, where the four filters come to a common corner, is placed a dosing device for alternating the flow upon the filters in succession. In the bottom of each filter, running diagonally from the common corner to the opposite one, is a main drain, to which are connected the lateral drains, the whole resting upon a concrete floor $\frac{1}{2}$ inches thick (see Fig. 6). The main drain consists of a depression in the floor 15 inches

side and from 4½ to 10½ inches deep (see Fig. 7). This is covered with a slab of 2-inch vitrified clay 24 inches wide. The lateral drains are made of split 6-inch pipe with bells, these pipes being laid with 1-inch openings at the joints, adjacent pipes being practically in contact. Along the edges of the main drain concrete is filled around these pipes and brought flush with the tops of them, in which concrete the slab covers the main drain are bedded.

In laying the split pipe in the contact filters, these are to be laid so that the joints between the ends of the pipes in any one row shall come opposite the middle of the tiles in the adjoining rows. "The tiles shall be laid as soon as practicable after the 4-inch concrete bottom of the contact filters is set. A finishing course of cement mortar about ½-inch thick shall be spread over the concrete surface, troweled smooth and then, before the mortar coating has set, the tiles shall be placed in their final position bedded slightly in the mortar."

The filters are to be filled with coarse material for a depth of from 3 feet to 3 feet 6 inches over the tops of the lateral drains. This filtering material is to consist of broken stone free from linters, or of vitrified slag, if satisfactory to the engineer. This is to be screened so as to contain no particles retained by 2½-inch circular opening and none which will pass through 1-inch circular opening. The larger pieces are first to be

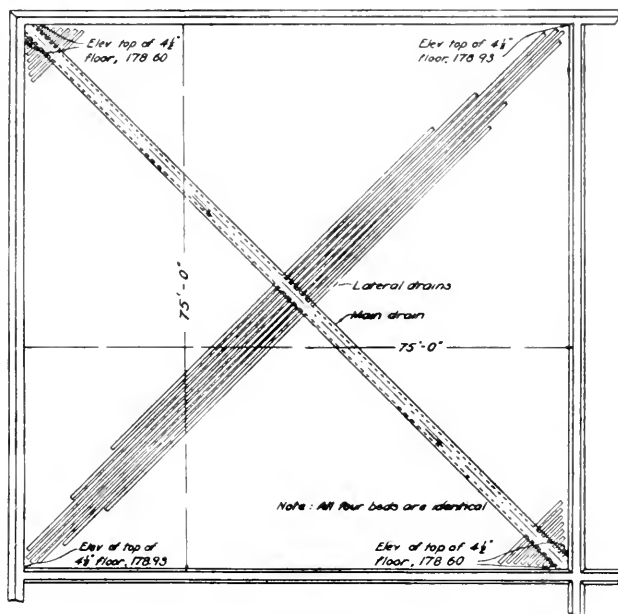


FIG. 6.—PLAN OF CONTACT FILTER, SHOWING DRAINS.

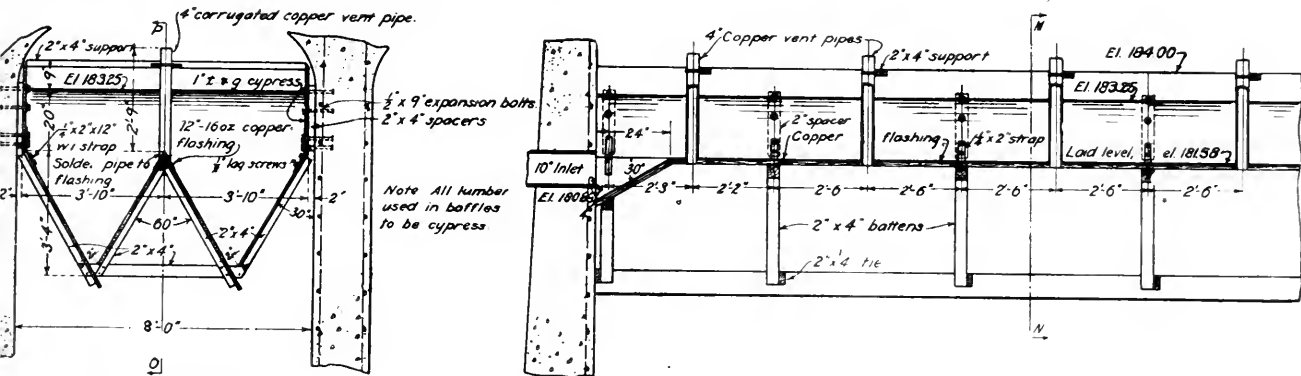


FIG. 4.—CROSS AND LONGITUDINAL SECTIONS OF MAIN SETTLING TANK.

placed around and between the drains so as to entirely cover the top of the pipe, after which the regular material is to be carefully deposited to the required depth. Automatic closing devices are to be installed which will "control the flow of the fluid from the main settling tank into each of the four primary contact filters in turn, filling them to the specified level, which is 4 inches below the top of the filtering material. The devices shall be arranged so that when necessary one or two

primary contact filters may be thrown out of service and the remaining ones continue to receive the sewage in rotation as usual."

From the first contact filter the effluent passes to a settling tank known as the preliminary settling tank, which is a double tank 16 feet wide and 48 feet long (see Figs. 9 and 10). This is provided with wooden partitions forming a trough of the general Emscher form similar to those described for the main



FIG. 5.—WALL OF SECOND CONTACT FILTER, AND PIERS FOR SUPPORTING FIRST CONTACT FILTER

one or gravel, the sand and gravel or broken stone being so proportioned that the sand and cement mortar shall more than fill the voids in the broken stone or gravel. Machine mixing is required.

It is provided that the contractors shall secure water-tight work in settling tanks and contact filters and that when these are completed they shall be filled with water and this shall not leak so as to give more than 1-inch fall in 24 hours.

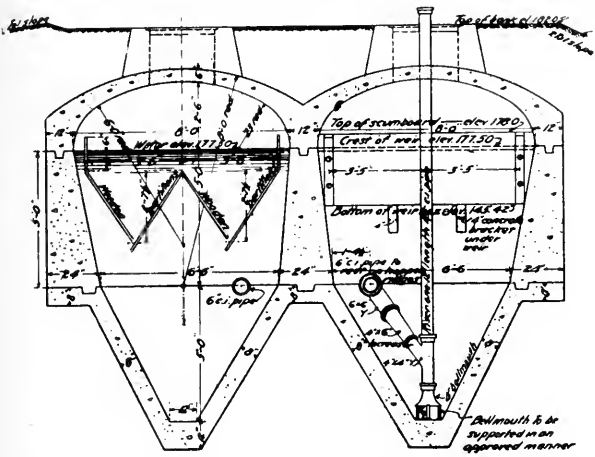


FIG. 10.—CROSS SECTION OF PRELIMINARY SETTLING TANK.

This plant is being constructed by Mr. J. W. Heller, of Newark, N. J., as contractor. The principal unit prices are as follows: earth excavation, 43 cents; earth embankment, 30 cents; concrete, \$7.40; steel reinforcing rods, 4 cents; lateral collectors, 1 cent a foot; flat tile drain covers, 40 cents a foot; broken stone for contact beds, \$2.35 a cubic yard; sand and gravel for filters, \$1.15 a cubic yard; automatic dosing apparatus (lump sum), \$7,730; wooden partitions and other appurtenances, \$400 per M. B. M. The total cost, on the basis of the estimated quantities, is \$58,696.

The engineers estimate that the annual maintenance cost will be as follows:

Attendant in charge.....	\$900.00
Labor	600.00
Repairs, maintenance and incidentals.....	200.00
General supervision	300.00
	<hr/>
	\$2,000.00

CIVIC CO-OPERATION IN PHILADELPHIA

THE circular reprinted below is offered as a double example of commendable co-operation with a city official by a citizen organization, and of a comptroller who makes a serious and intelligent effort to make his reports intelligible to the average citizens. This circular is being sent out by the Bureau of Municipal Research of Philadelphia, Pa., and is accompanied by a balance sheet condensed to twenty-one lines and five columns; the leaflet measuring 5 x 8 inches, and carrying the reading matter on one side and the table on the other.

BUSINESS METHODS IN PUBLIC BUSINESS

The City Controller's Report to Citizen-Stockholders

These statements are presented in this report for the first time on the City of Philadelphia with the desire to answer the questions of interested citizens.

The immediate purpose of the summary consolidated balance sheet is to present in a single picture the financial condition as well as all of the funding relations of the city.—Controller's Report to Councils, February 2, 1911, page 14.

SOME OF THE QUESTIONS ANSWERED BY THE SUMMARY BALANCE SHEET

As to the General (Current) Account

1. How much cash is available for meeting the city's current obligations?
2. What are the city's current obligations that must be met at once?
3. What funds have been appropriated, but not yet set aside under contracts?

4. What funds have been set aside to meet contracts already entered into?
5. What revenues due the city have not yet been collected?

As to the Capital Account

1. What is the total debt for which city bonds are outstanding?
2. What is the value of all lands, buildings and other permanent property owned by the city?
3. How much cash from loan funds is still available for permanent improvements?
4. What is the amount of the funds set aside to meet contracts already entered into?
5. What is the amount of these funds appropriated for capital outlays, but not yet set aside under contracts?

As to the Sinking Fund

1. What is the amount of cash on hand and investments for meeting the bonded debt as it becomes due?
2. Are sufficient funds being thus set aside to meet future demands?

As to the Fire Insurance Fund

1. What is the amount of cash on hand and investments for meeting the city's losses by fire?

Similar balance sheets are presented, giving in greater detail the analysis of the general account, capital account, and the appropriation and loan fund balances. If you are an "interested citizen" and would like to know more concerning the city's financial condition, write to the Controller for his last report to Councils.

WATER RATE MAKING

Items Included in Income Which Must Be Raised—Apportioning Rates Among Consumers—"Ready to Serve" Charge—One Rate Plan Impracticable

Abstract of a paper by F. C. Jordan, Secretary Indianapolis Water Company, before the Illinois Water Supply Association.

THE rates which a city charges for water should be ample to provide a sufficient fund to take care of the following items:

1. Necessary operating expenses.
2. Proper maintenance of the property.
3. Depreciation charges.
4. Interest charges on the investment in the plant.
5. (In the case of a privately owned plant) A reasonable profit sufficient to encourage capital to incur the risks of this class of enterprise.

The first item embraces the proper operating expenses, including those required to furnish a supply of pure water by filtering it if necessary.

Concerning depreciation, recent court decisions have set forth in very plain terms the necessity for setting aside in a separate fund an amount which will leave intact the value of the physical property. Concerning the last item also the courts have stated in no uncertain terms that inventors in water-works plants are entitled to a fair income on legitimate expenses incurred, but not on those due to gross error or lack of reasonable care. It has been held that a plant shall be appraised as a "going concern," with a proper credit for the reproductive value plus the added value of the business which has been procured at a considerable cost to the investor. Courts and public utility commissions have disagreed on the percentage of this return on the investment, from 7 to 10 per cent on the total value being considered proper by different parties.

With a proper appraisal and with reliable data covering the cost of operation and other expenses, the annual revenue necessary to take care of the plant can be ascertained, after which comes the question of the proper distribution of rates to provide this amount. Unfortunately, scarcely 50 per cent of our companies or departments can tell within a reasonable degree of accuracy what it is costing them per million gallons to furnish water to the consumers. It is also agreed by all that water should be furnished to the citizens without discrimination, but there is room for argument as to what constitutes discrimination. In every city there are certain sections which would not for years pay a revenue sufficient to cover the proper

charges on the investment necessary to furnish them with water and yet which it is desirable to furnish water to, both for fire protection and as a sanitary measure. In the majority of cases consumers in other sections must pay the deficit from such non-profitable sections.

Water mains add to the value of abutting property, and in addition their presence furnishes a "readiness to serve" for which the company or department should receive some remuneration. Both these items should be included in the water rates; the readiness to serve applying both to fire protection and to the readiness to furnish water at a faucet in a residence. The ability to obtain water whenever wanted and in any reasonable amount has a value separate from that of the amount actually used. The readiness to serve in fire protection enables the property owner to reduce his insurance rates, and is thus of direct value to him.

In preparing estimates on which water rates are based, consideration must be given not only to the amount of water to be furnished to each consumer, but also to that which will undoubtedly be lost on account of leaky services, broken lines, etc., which losses cost as much per million gallons as the water actually sold. This loss varies from 15 to 25 gallons per capita per day in New England towns, where it is recognized that the management is most careful and conservative.

The city will always be the largest consumer, and a proper rental for fire hydrants and charge for water used in sprinkling streets, flushing sewers, in public buildings, etc., should be included in the calculation. It has been estimated that the cost of fire protection is approximately 45 per cent of the interest and fixed charges due to construction, and from 18 to 22 per cent of the cost of operation. In most cases it is doubtful whether the city would pay the full amount which these figures would give, and the remainder of it must be added to the rates of private consumers. In general the amount which can be charged against the city should be deducted from the amount which has been ascertained to be necessary for carrying on the business, and the balance will be that which must be obtained from the private rates.

Various methods of rate assessment have been adopted by water companies, among them being the frontage assessment plan, the valuation assessment, and the assessment equal to a certain percentage of the flat rate. In some of the municipal plants it has been found that the assessing of a certain percentage on the valuation of the property has worked very satisfactorily; this assessment, amounting to from ten to fifteen dollars on a property assessed at \$3,000, is called a ready to serve charge and covers a small amount of water sufficient for domestic purposes. Under this plan every citizen of the town becomes a consumer, and the larger property owner pays his proper proportion of the cost of running the plant. It is manifestly unfair for certain properties to share in the benefits of the water supply and yet fail to pay their share of the cost of the operation of the company.

It will be a surprise to the average superintendent to find that as a general proposition the average line does not get on a paying basis until approximately twenty years after its installation; and meantime the balance, as stated above, must be met by the other consumers.

In the matter of meter rates some plants have found to their sorrow that the one-rate plan with no ready to serve charge does not provide sufficient revenue to cover the expenses of the company. The proposal to furnish water to all persons at one rate appears beautiful in theory, but in its workings is disastrous to the finances of the company.

"As has well been stated on a number of occasions, the public has a right to know the details of the operation of a plant, and full publicity of all matters pertaining to the supply of water is absolutely essential; and the writer shares the opinion of the best engineers that the average citizen, if given a clear understanding of the cost of the supply of water, will agree to a rate which is fair and is commensurable with the service furnished by the department."

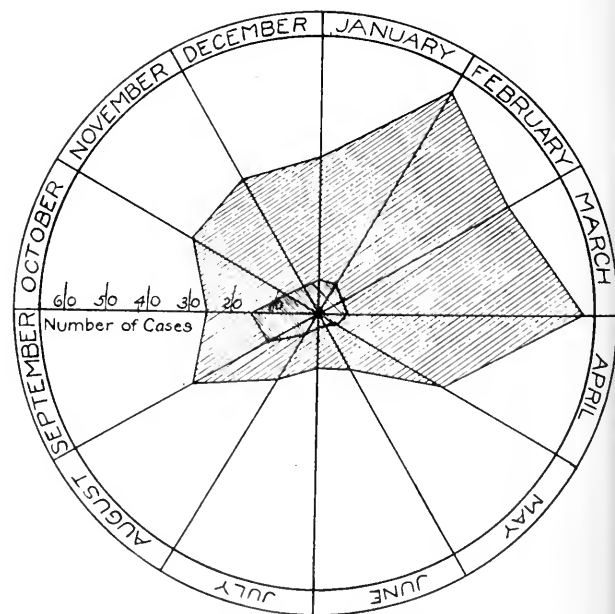
AMOUNT OF CHLORINE FOR STERILIZING

In discussing the subject of sterilizing water, before the Boston Society of Civil Engineers, Mr. S. DeM. Gage, biologist of the Massachusetts State Board of Health, made the following statement concerning the difficulty of proportioning the amount of hypochlorite to the varying conditions of the water treated:

At present there is no way of telling how much chlorine is needed or whether the amount added is sufficient, except by the results of bacterial analysis, and this bacterial analysis requires 18 to 24 hr. for the body temperature count which I mentioned, and from two to four days for a room temperature count, which is the one usually made. After a disinfection plant has been running for some time, if a complete record has been kept of all the variations in the raw water and the amount of disinfectant required with each, it may be possible to estimate the amount of bleach to use at different times, but there is no chemical test which will indicate with any degree of accuracy how much chlorine is going to be absorbed by the water before the destruction of the bacteria occurs. The oxygen-consumed determination indicates this more closely, perhaps, than any of the other chemical tests. Experiments with many hundred samples of waters and sewages at Lawrence have shown that the amount of bleaching powder required could have been predicted within 10 per cent. in about half the samples. In the rest of the samples the amount required as determined by bacterial tests was anywhere from one-tenth to one hundred times the amount estimated from the oxygen-consumed values. It may be that some satisfactory method will be devised by which the amount of bleach required can be determined in advance. If polluted waters are to be treated by this method without filtration, and the health of communities is to depend upon the satisfactory application of this process, some such test is essential before the element of danger is entirely removed. In the process as tried at Lawrence, disinfection was followed by filtration in both cases, and a large factor of safety was introduced, as even if disinfection failed to remove the bacteria, the filter might be counted on to do its work.

EFFECT OF FILTERS ON TYPHOID RATES

ACCOMPANYING the annual report of the water works department of the City of Albany, N. Y., is a diagram showing the average monthly typhoid rates for the nine years preceding and for the nine years succeeding the introduction of filtered water into the city. The irregular figure having the coarse shading represents the average number of cases for each month before filtration, while the diagram with the fine shading represents those after filtration. It will be noticed that before filtration typhoid fever was most prevalent during the winter and early spring months, while since filtration it has been most prevalent during and immediately after the summer vacation period. The average number of deaths per year per 100,000 population before filtration was 71.3 per cent and after filtration, 20.9 per cent, a reduction of 70.7 per cent.



TYPHOID DEATHS IN ALBANY, N. Y., BEFORE AND AFTER FILTRATION

Municipal Journal and Engineer

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A. PRESCOTT FOLWELL, Editor
F. E. PUFFER, Assistant Editor

Business Department
S. W. HUME, President

T. MORRIS, Manager. A. PRESCOTT FOLWELL, Secretary

SUBSCRIPTION RATES

United States and possessions, Mexico, Cuba.....\$3.00 per year
In all other countries..... 4.00 per year
Entered as second-class matter, January 3, 1906, at the Post Office at New York, N. Y., under the Act of Congress of March 3, 1879.

CHANGE OF ADDRESS

Subscribers are requested to notify us of changes of address, giving both old and new addresses.

Contributions suitable for this paper, either in the form of special articles or of letters discussing municipal matters, are invited and paid for.

Subscribers desiring information concerning municipal matters are requested to call upon MUNICIPAL JOURNAL AND ENGINEER, which has unusual facilities for furnishing the same, and will do so gladly and without cost.

MARCH 8, 1911

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Sewage Precipitation Patents

In this issue there is given a description of one of the first Emscher tanks to be built in this country, construction on this being just about been started. In previous issues we have described plans for using the same general type of tank in other cities, and the publicity which the idea has received and the encomium of prominent authorities render it probable that the use of such tanks will become more or less general.

Most of our readers are familiar with the misunderstandings and legal complications and expenses which have been experienced by many cities which have adopted the septic tank, and it is to be hoped that this history will not be repeated because of Dr. Imhoff's patents on the Emscher tank. This seems improbable, since all the plans so far made have been, we understand, with the consent of Dr. Imhoff. But on page 324 Mr. Shields gives information concerning plans made several years ago which, it seems possible, may furnish such precedents as to invalidate the Imhoff patents. It is to be hoped that all such possibly anticipatory cases may be learned of at once, and

a decision reached at the earliest practicable date, so that the adoption of this method may not be delayed by uncertainty. Possibly the organization which is defending septic tank suits will undertake the straightening out of this matter.

Promptness in Municipal Reports

THE Mayor of Boston early this year called the attention of the heads of the various municipal departments to an ordinance which provides that every official in charge of a department shall issue his annual report within thirty days after the close of the fiscal year. This, of course, does not mean the publication and distribution of the reports, but we hope that the Mayor will be equally as urgent with the printers and those responsible for the publication of the reports in order that these may reach the citizens promptly.

We have noticed considerable improvement within the last year or two in this matter of promptness in publishing municipal reports. We have already received annual reports for the year 1910 from several cities, possibly the greatest surprise being the receiving of the report of the New York Fire Department for the year ending December 31, 1910. Ordinarily New York City reports are published anywhere from nine to twenty-four months after the close of the fiscal year. This promptness is in line with improvements in the contents also of the reports which are now being published, which indicates a growing appreciation of the importance of these and the part which they may be made to play in securing for municipal departments the confidence and appreciation of the voters.

Pure Water Saves Lives in Cincinnati

A REMARKABLE illustration of what pure water means to the health of a city is found in a statement just issued by the Cincinnati, Ohio, water-works department covering the first three years of the operation of the new \$11,000,000 water-works system in that city. It is shown that typhoid fever has been reduced to a minimum, giving Cincinnati a death rate from typhoid fever in 1910 of only 5.7 per 100,000 people.

In 1910 there were only 21 deaths in the city from typhoid fever, compared with 239 in 1906, the last year of the operation of the old water-works. The total of deaths for 1908, 1909 and 1910 from typhoid fever is 133, compared with 664 the total of the last three years of the operation of the old system. It would therefore appear that the number of lives saved by pure water was 531.

There has also been a falling off of deaths from other intestinal diseases of from 563 in the years 1904-5-6 to 246 in the last three years, a saving of 317 lives, or a grand total of 848 lives saved.

The report shows that the present cost of pumping water is \$14.36 per million gallons, compared with \$32.05 per million gallons in 1906, so that the money saving has been enormous.

Water Situation in Erie

In Erie, Pa., following a typhoid epidemic, copper sulphate has been in use for treating the water since January 28, under the direction of the State Board of Health. A building 24 x 48 is under construction and is being equipped with concrete tanks for mixing hypochlorite, which will be regularly applied to the water as soon as the plant can be completed. In connection with this, the water board will maintain a perfectly equipped laboratory in charge of Mr. Dunwoody, of Troy, N. Y., as chemist, who begins his services this week.

Water Sedimentation in Poughkeepsie

The report for the year 1910 of the bacteriologist of the Poughkeepsie, N. Y., water works plant, Mr. Thomas A. Cole, gives details of the operation and efficiency of the plant during the year. Chlorine was applied to the raw water during the entire year and coagulant was used when necessary, the number of days per month on which it was used varying from four in October to thirty in March.

The sedimentation basin, which provides storage for about 24 hours average flow, was put in commission on October 2, 1900, and operated up to June 15, 1910 (8½ months), when the water was drawn off and the basin thoroughly cleaned out. After drawing the water off and before cleaning, the amount of sludge which had been deposited in it was carefully measured and analyses were made of the same. The basin was put into operation again on September 24th and continued throughout the year. The sediment removed amounted to 464.4 cubic yards, which was used to grade around the sedimentation basin. The total cost of cleaning was \$149.30.

The total number of gallons of water which had passed through the basins was 845,679,200, making the amount of sludge per 1,000,000 gallons about .55 cubic yard. The specific gravity of this sludge was 1.183. The removal of it effected an average removal of the turbidity of the water of 57.9. Of this sludge the dry material constituted about 29 per cent, or .163 ton per 1,000,000 gallons passing through the basin. An analysis of the sludge showed that it contained 83.3 per cent of vegetable matter.

It was found that 53.3 per cent of the sludge had been deposited in the first sixteenth part of the length of the basin; 70.1 per cent was found in the first third of its length, and 83.9 per cent in the first one-half of its length.

THE IMHOFF PATENTS

EDITOR MUNICIPAL JOURNAL & ENGINEER,
New York City.

DEAR SIR:

Sanitary and municipal engineers interested in the question of sewerage purification who have been following the developments of the science and have read the recent description of the Imhoff idea of constructing tanks will be interested in the following statement and the illustrations herewith presented for the general information of the public.

Mr. Imhoff's claims for patents in this country were filed on May 6, 1907, and the claims were allowed June 15, 1909. Claim 1, which covers the patents quite clearly, reads as follows:

"In sewage treatment apparatus the combination of a depositing chamber having a mud outlet at the base thereof, a mud decomposing chamber below the depositing chamber adapted to receive the deposited mud, means for preventing the return of gases and rising particles from the decomposing chamber to the depositing chamber, and means for providing a flow of liquid through the depositing chamber without disturbing a quiescence of the decomposing chamber."

In February, 1907, the writer was called upon to design a system of sewers including a sewage purification plant for a certain town in the State of Indiana. The plans and specifications were completed and submitted in April. A cross-section of the tank as designed is shown in Figure 1. In a description of the plant which was contained in a report made to the authorities bearing date of April 9, 1907, and following a description of the trapped channels running longitudinally through the tank, the following statement is found: "The heavier particles of the sewage, as it passes through the channels, is precipitated and passes down through openings beneath the side walls and is deposited in the pockets on each side. The beam beneath extends far enough to each side to

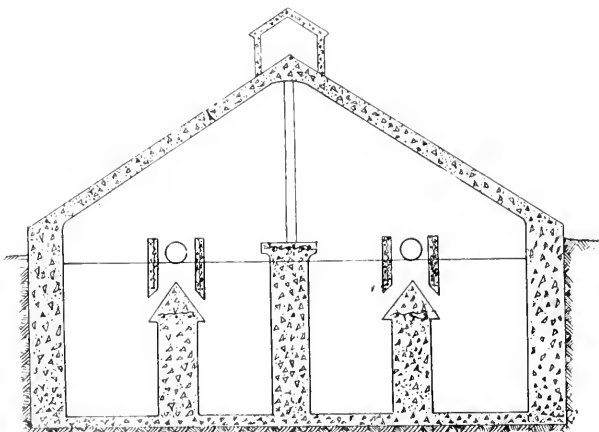


FIG. 1. DESIGNED IN FEBRUARY, 1907.

prevent any sludge from rising up and mingling with the current that passes through the channels." This plant was completed in the fall of 1907 and has been in continuous use to the present time. Similar tanks have been designed and constructed by the writer since this one, which follow along the same principles, one of which is indicated by Figure 2. This would indicate that the novelty of the claims set forth by Mr. Imhoff are not altogether new. The writer desires at this time to call the attention of those interested in the Imhoff patents to the above facts.

Again, in 1899 the then firm of Alvord & Shields was called upon by the city of Highland Park, Ill., to devise a plan for the disposal of the sewage from a small district in the western

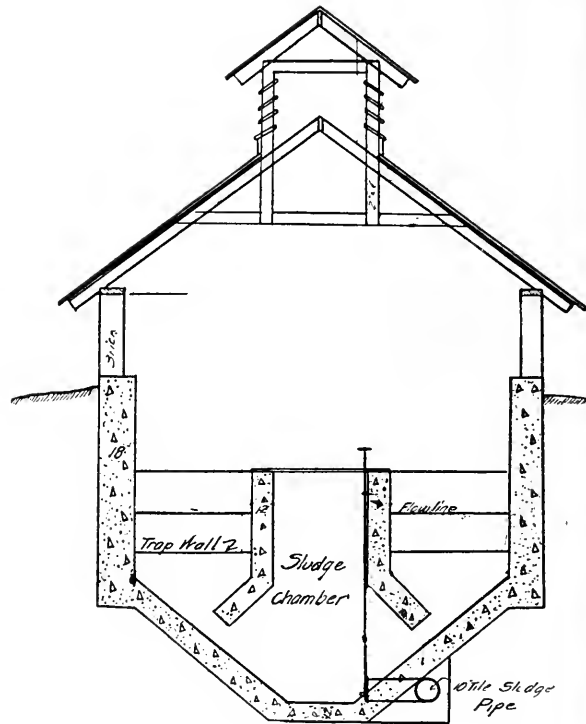


FIGURE 2.

portion of that city which had no natural outlet into which sewage might be discharged. In considering the proposition several schemes were discussed. At that time attention was been called to the different species of bacteria which were developed in the different parts of a septic tank and the possible advantage that might be derived by changing the flow of the sewage through a tank was then considered. Mr. Alvord personally worked out a plan of by-pass channels and gates so that the flow through the tank could be turned in several different directions. The tank was constructed in the year 1900 and has been in continuous operation since that time. It has been the writer's privilege to examine and report upon the working of this plant at several times during the years that have passed. The tank has been operated as intended, namely that the sewage might enter one compartment and pass through several longitudinal compartments to the outlet until the fresh sludge should accumulate to a considerable extent, then the flow would be reversed and what was first the inlet end would be changed to the outlet end. The plant has done excellent work and has served its purpose to the present time, although it has been cleaned out upon numerous occasions. It is still in use and a change in the flow was made under the observation of the writer within the past few months. This statement is made as it bears upon the later patents issued to Mr. Imhoff, application for which was filed February, 1910, and the patents issued December 20, 1910, Claim 1 of which reads as follows:

"The method of treating sewage in successive depositing chambers consisting in reversing the flow in order to obtain a similar sludge mixture in each depositing chamber."

It is most likely that other engineers have been thinking and working in this same matter and that other plants have been constructed containing these principles claimed by Mr. Imhoff. If so, it will be of interest and value to the profession to know of such cases, for if we have been using this form of construction we ought not to be required to pay royalties on foreign patents.

W. S. SHIELDS.

Chicago, February 24, 1911.

NEWS OF THE MUNICIPALITIES

Current Subjects of General Interest, Under Consideration by City Councils and Department Heads—Streets, Water Works, Lighting and Sanitary Matters—Fire and Police Items—Government and Finance

ROADS AND PAVEMENTS

Speed Limit to Be Enforced for Sake of Roads

Chattanooga, Tenn.—Automobiles running at reckless speed, in violation of the government regulations and exceeding, more than double, the speed permitted by law, are tearing away the splendid roads of Chickamauga Park faster than they can be replaced. In many places the crown of the roads has been worn off entirely, and it becomes necessary to fill in with rock to hold the road at all. To secure suitable rock the officials of the park have been at their wits' ends, and the situation, altogether, is a most peculiar, distressing and embarrassing one. The Chickamauga Park officials who reside in Chattanooga are not disposed to exercise arbitrary authority to the discomfort of their fellow citizens, yet the rules governing travel in automobiles through the park restrict the cars to ten miles an hour, and it will not be surprising if some notable examples are made, in the near future, of persons who exceed this limit.

Six Years' Paving Record

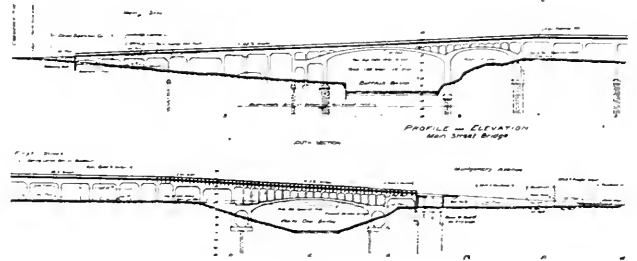
New Orleans, La.—City Engineer Hardee has sent to Mayor Behrman a statement of the amount of paving that has been done in the city since Jan. 1, 1905, the beginning of the Mayor's administration, and the present time, as compared with the amount that had been done up to that date in all previous administrations. The amount during the last six years has been 999,309 square yards and in the previous period of the city's existence it had been 724,368 square yards. The excess in amount in favor of the past six years is 274,941 square yards. The 999,309 square yards does not include any paving done in city streets by railroads or the extensive river front paving done by the Dock Board. The Illinois Central has paved a large number of streets with asphalt in the vicinity of its new terminals at Poydras street, and has still about as much more to do under its contract when it was given the use of certain streets in that locality. That was a very extensive paving contract, amounting to a number of miles of streets when finished. The paving in detail is given as follows: Asphalt—Previous to 1905, 576,475 square yards since 1905, 624,502 square yards; vitrified brick, previous to 1905, 138,300 square yards since 1905, 10,201 square yards; small granite blocks, previous to 1905, 10,168 square yards since 1905, 30,919 square yards; vitrified brick, previous to 1905, 138,000 square yards; granitoid, 138,808 square yards mineral rubber, 38,186. The effect of this work on the appearance of the city may be readily seen by inspection, the new paving covering streets in all parts of the city.

Wheat Straw Used to Build Good Roads

Walla Walla, Wash.—Wheat straw will play an important part in many miles of new good roads which will soon be built in this country. Straw has been used for years on roads in this State. It has been found to give the best results when put on wet and mixed with the soil. When scattered loosely on the road it ignites and the work of weeks is lost. The newer plans are better yet for the application of straw. In the first place, the roads will be ploughed and graded and brought to a crown. When the roadbed has been harrowed and made level the straw is put on to a depth of six inches. A disk cutter is used to cut the straw up and mix it into the earth. If all the straw works into the roadbed more straw is put on until a cushion is formed. A steam roller packs the earth and straw into a hard mat as durable as asphalt and a road which will turn off water if the grade is right. The new method of mixing the straw with the soil costs more than that of throwing straw into the ruts and makes a road that will outlast gravel and cinders. Gravel is expensive and the cost of hauling is heavy. In all the lowlands and uplands in this country straw will be used with the clay soil.

Viaduct with Some Unusual Features

Houston, Tex.—The accompanying illustration shows the design of the Main street and Montgomery avenue viaduct which will cross the ship channel, the railways and White Oak Bayou and will connect the north and south sides of the city. The total length of the structure will be 1600 feet. The roadway, 45 feet wide, will be paved with brick, and there will be two sidewalks 7½ feet wide each. The clear-



1600-FOOT VIADUCT FOR HOUSTON

ance will be 22 feet above the rails of the tracks and 58 feet above low tide. The viaduct was designed by F. L. Dormant. In the construction of this viaduct it is contemplated to lay a 12-foot or 15-foot water main under the roadway, also ducts for electric light wires, ducts for telephone wires, gas mains and also a number of hydrants for fire protection of craft in the ship channel and the upper turning basin, and also to wash and clean the brick pavement of the viaduct.

Improvements at Port Townsend, Wash.

Port Townsend, Wash.—A large amount of concrete work for a town of its size is being done under the direction of William J. Sadler, City Engineer. Last year there was completed about 27,000 sq. ft. of concrete sidewalk, 2,576 lin. ft. of combination curb and gutter, catch basins, etc. In connection with this work there was included a retaining wall containing about 275 cu. yds. of concrete and 3,000 cu. yds. of fill. During the coming year about 48,000 sq. ft. of concrete sidewalks will be laid in the residence section.

Half Million Spent on Pavements

Huntington, Ind.—Nearly a half million dollars has been expended by Huntington residents in paving streets. This is a fact brought out in a report just completed by City Engineer Wagoner covering the street improvements since 1892. During the seventeen years which have elapsed since the first dirt street was covered with brick, the total of sums expended on different thoroughfares reaches \$439,704.85. This is considered unusually high for a city of 10,000.

Illinois Good Road Bills

Springfield, Ill.—Senator Frank Landee, Moline, has introduced three bills in the Legislature designed to put roadmaking under State supervision.

Under the Landee scheme a superintendent of roads is provided for each county. He is to be appointed by the Governor on selection of the Boards of Supervisors or Commissioners. His salary is to be paid by the State. No one shall be appointed to the place unless he has had at least three years' experience as a civil engineer, and preference is to be given graduates of recognized colleges of civil engineering.

The County Superintendent is to devote all his time to his work and his salary is to be graded according to the amount of road and bridge taxes levied in the county, his pay averaging from \$800 where the tax is \$10,000 or less to \$2,400 where it is over \$100,000.

The County Superintendent of Roads is to classify the highways in his county in three classes.

First-class roads, which shall include the roads connecting the principal points in the county following the most traveled route.

Second-class roads, which shall include the principal roads leading to the main roads.

Third-class roads, which shall include all by-roads not in the first and second classes.

The first-class roads shall not include more than 25 per cent of the total road mileage of the county.

New Jersey State Road Work

Trenton, N. J.—State Road Commissioner Frederic Gilkyson's report for 1910 shows that there were 62,621 miles of public roads built in the various counties with State aid, the total cost being \$508,201.36, the State furnishing \$169,700.44 of the lump sum and the various counties the remainder.

Commissioner Gilkyson shows that since the passage of the State Aid Road Act in 1892 the total mileage of roads built in the various counties up to the end of last year was 1,562,204, and the State has expended as its one-third share toward building them \$3,050,882.70.

The Commissioner shows the list of the roads on which \$308,127.29 automobile money was spent in repairs, and he also shows that the various counties spent in addition \$1,080,160.04, making a total repair expenditure of \$1,394,296.42 last year. The list of county appropriations for road repairs singularly shows Hudson County, which has built such a small mileage with State aid, having the very largest appropriation—\$370,000. Essex County is very small, considering her area—\$85,133.54. Bergen County, another county building few roads with State aid, is large—\$126,000—whereas Middlesex County, over which every autoist making a run to the shore from New York and the northern part of the State, only spent \$45,865.01, showing the good condition of her roads and indicating how well they were put down to stand the enormous strain of the autos.

Town Now Owns Roller and Crusher

Galen, N. Y.—The Town Board has purchased a ten-ton Buffalo road roller. Last year the Board purchased a Climax stone crusher, and with this equipment propose to greatly improve the town's roads the coming season.

Seven Miles of Highway Under Way at Riverside

Riverside, Cal.—There are probably few cities in Southern California engaged in a more extensive campaign of street improvements than Riverside. Work now under way and for which proceedings have been begun amounts to approximately 90 city blocks, or seven miles of highway, to be constructed of rock roadbed with oiled macadam surface. In all cases cement curb and gutter will be constructed in connection with the roadbed. The cost will be approximately \$135,000.

South Bend Seeks Track Elevation

South Bend, Ind.—City officials from South Bend appeared before the Cities and Towns Committee of the Senate last week in behalf of a bill introduced by Senator Hibberd to give South Bend a track elevation law similar to the one now in operation in Indianapolis and Fort Wayne. The bill provides that the city shall pay 25 per cent of the cost of all street intersection elevations. Representatives of the railroad companies which would be affected through the operation of the proposed law desire it amended to compel the payment of the same per cent of the total cost of the entire work.

Superior Grade of Oil on Roads Found Economical

Milwaukee, Wis.—Because a superior grade of oil was used on thoroughfares in public parks last year, no additional street oil may have to be purchased by the Board this year. Oil to the amount of 50,000 gallons was purchased, and 6,000 gallons remaining may be sufficient to meet all requirements this year.

Wants Paving Rights

Toledo, O.—In order that Toledo may have the fullest possible use for the municipal asphalt manufacturing plant which is to be built with \$9,000 appropriated by Council a year ago, Service Director J. S. Cowell is seeking a change of existing law so as to permit cities to lay their own asphalt street pavements, instead of having them laid by contract. At Cowell's request, Representative Myer Geleerd recently introduced in the Legislature a bill to amend the law in this particular. The engineer's department estimates that the city could save 25 per cent by doing its own work, and it is urged that at the same cost asphalt paving could be put down instead of brick and inferior kinds. Product of the asphalt plant, plans for which already have been drawn by City Engineer Tonson, could be used only for repair work under the present law requiring all original paving to be done under contract.

SEWERAGE AND SANITATION

Dairy Averages Published by Health Board

Jacksonville, Fla.—The Board of Health has started to publish the standing of the various dairies that supply milk to the city. The standing is determined by daily inspections and tests of milk and an average is arrived at. This average constitutes a score. The dairies are being scored according to the methods approved by the United States Department of Agriculture.

New Sanitary Scheme

Ogden, Utah.—Dr. C. E. Coulter, President of the Board of Education, stated that, in accordance with the board's determination to give the "sanitary towel" a tryout in the local schools, orders have been placed with the manufacturers for a trial consignment, which will be installed at once. These towels are of paper, about 12 by 18 inches in size and come in big rolls, which are hung in convenient places about the wash rooms. The individual in using one tears it from the roll by means of the perforations, and after drying himself deposits the towel in a metal box provided for the purpose, and from which it cannot be withdrawn and used over again by some one else.

Mayors Will Confer on Mosquito Nuisance

South Orange, N. J.—Village President Ira A. Kip, Jr., of South Orange, has sent invitations to the mayors of twenty neighboring municipalities to attend a dinner at the Essex County Country Club on Wednesday evening, March 15, at which the extermination of the mosquito will be brought up for discussion. Dr. John B. Smith, chief entomologist of the State of New Jersey, will give an illustrated talk on "The Mosquito Problem" and will recommend the course of action to be followed in ridding this section of the pest, following the campaign successfully carried out in Panama and Cuba. An address will also be delivered by Dr. L. O. Howard, chief entomologist of the Department of Agriculture at Washington. Among those who will attend will be the executives of Newark, Elizabeth, Montclair, Glen Ridge, Bloomfield, Nutley, Belleville, Orange, West Orange, East Orange, South Orange Township, Irvington, Millburn, Harrison, Arlington, Summit, Springfield, Caldwell and Verona.

State Health Department to Issue Municipal Sanitary Regulations

Richmond, Va.—The small city or town in search of a sanitary code will have its needs met in large part when the model ordinances now being prepared by the State Health Department are ready for distribution. Covering the whole field of sanitary regulation, from the standpoint of the average Virginia city, these regulations are intended to be a guide to town and city councils and to give them a basis for such legal enactment as has been found effective in other cities. The new regulations, which will probably be issued as a number of the Virginia Health Bulletin, are based upon actual municipal ordinances, many of which have been tested in the courts and found thoroughly valid. They provide for the control of nuisances, the care of refuse material, the regulation of milk and food supplies and like matters of a sanitary character. The State Health Commissioner, on approving the new regulations, recently expressed his opinion that they would meet a long-felt want in the State. He said: "It is not likely that any city will find it expedient to adopt the entire code drafted by the department, but the ordinances cover the whole field and should be of service to all municipalities except those of the largest size."

Sanitary Conditions in New Orleans

New Orleans, La.—One of the most prominent sessions in some time was held last week by the City Board of Health in the City Hall Annex. It was made known that no cistern-screening inspections would be conducted this year, that the tenements would not be inspected and other work of the Board curtailed. Dr. O'Reilly, in his monthly report, showed that the city was in a very healthy condition, last month being the healthiest January in ten years.

WATER SUPPLY

New Pump to be Tested

Perth Amboy, N. J.—Work has now been completed on a Wisconsin cross-compound tank and fly wheel 12,000,000-gallon pump at the city water works at Runyon. The present month will be mostly taken up in making pipe connections with the mains and boilers, after which the pump will be tested. City Engineer Samuel Mason and Thomas Grieve, chairman of the committee on power of the Board of Water Commissioners, will conduct the test. Work on the pump in assembling the different parts has been going on at Runyon for the past six months. About twenty men have been employed continuously in this work and erecting buildings for housing the pump and accompanying boilers. The cost of the pump and appurtenances has been about \$2,000. The total money expended for buildings, boilers, pumps, etc., in connection with this latest addition to the efficiency of the city water supply system has been about \$50,000.

Extra Water Tax to Contractors

Wheeling, W. Va.—An old ordinance relating to the collecting of the water tax has been revived in the past couple of months and is now being enforced, to the effect that all bricklayers, brick makers, stone masons and plasterers and contractors must pay an extra water tax in proportion to the amount of work they do. Blanks have been furnished to the contractors in the business and also to the contractors doing concrete work that must be filled out each month, telling how much work was done by the contractor or company, and this report is collected by the water department and water tax assessed according to the law.

Litigation with Akron Water Company Ends

Akron, Ohio.—All litigation between the city of Akron and the Akron Water Works Company came to a sudden ending last week at a conference between city attorneys, members of the Akron Chamber of Commerce and representatives of the Akron Water Works Company. An agreement was arrived at whereby the water company will once commence to install apparatus for the purpose of giving Akron a sufficient water supply and the water is to be pure. The water company will spend several thousand dollars in giving the city immediate relief. All of the water is to be treated chemically, so that obnoxious odors and impurities will be removed.

The agreement means that the water company will continue to do business until the expiration of its contract with the city. In the meantime the city will go ahead with its plans for a municipal plant. The question of buying the present plant, if it can be secured at a satisfactory figure, will be taken up later.

Many Municipalities Interested in Proposed Reservoir

Albany, N. Y.—Walter McCullough, Consulting Engineer of the State Water Supply Commission, has submitted his report relative to the project of regulating the flow of the upper Hudson River. Investigations along this line have been conducted by Mr. McCullough as the result of requests for the improvement of the river in question from several municipalities and many property owners who are affected. The need of preserving the public health and safety was emphatically dilated upon in the requests for an investigation of existing conditions received by the commission. Mr. McCullough reported that the most practical method of regulating the river was by the construction of storage reservoirs. He recommends the construction of a reservoir on the Sacandaga River, with a dam at Conklingville, which would impound 29,000,000,000 feet of water at an estimated cost of \$4,650,000.

The report was adopted by the Commission, with a resolution declaring that in its opinion the improvement of the upper Hudson is practicable and directing Mr. McCullough to complete the maps, plans, specifications, estimates and lists provided by law, together with such information as may aid the Commission in determining the percentage of the cost of the improvement to be borne by the various counties, cities, towns and villages and by the individual properties benefited collectively.

Iola Water Tests Started

Iola, Kan.—The set of water testing instruments from Washington has arrived, and Commissioner G. C. Glynn, who is directing the experiments along the line of water purification by the electrolytic process, began arrangements for the first practical test of the new method. A small reservoir, which will be filled with river water, has been constructed, through which the electrical current and salt solution will pass, and after the full treatment has been given the water will be taken from the reservoir and tested by means of an instrument loaned the city of Iola by the United States Geological Survey and which will indicate the full amount of sediment left in the water.

Pure Water for Grand Forks

Grand Forks, N. D.—The new rapid sand filter which has been in the course of construction since early last fall was formally turned over to the city as completed last week by the Pittsburg Filter Company, and official tests are now in operation. It is expected that the city will accept the plant and the citizens will again have pure drinking water after being without it for more than four months.

Municipal Water System after Long Fight

Sylvania, Ga.—An interesting lawsuit between the city of Sylvania and the Sylvania Water Company has just terminated here by the city agreeing to purchase the plant and property of the local water company.

About a year ago the city voted \$40,000 of bonds for electric lights, waterworks and sewers, but was enjoined by the United States Court for the Southern District of Georgia on the application of the water company. The court held that, while the city could grant no exclusive franchise to the local water company, yet under the terms of the franchise it had bound itself not to compete with the water company and that installation of a new system would be competitive. A short time thereafter the city authorities, acting under a fire ordinance, forcibly removed a building of the water company outside the fire limits, and at the time considerable feeling was engendered on both sides. The city officials were ruled for contempt in the United States courts for violation of the injunction. The court further ordered the water company to improve its plant and make it adequate for the needs of the city. The company failed to do so and the city brought a petition for a receivership against the company. All three of these matters stood for a hearing before Judge Emory Speer at Savannah, but an amicable settlement was reached, and all the matters withdrawn on the purchase of the property and plant by the city. Active work will be begun in a few weeks for the construction of the new improvements.

Filter Plant in Operation

Moline, Ill.—Four of the six filtering units have been put in operation in Reservoir Park in Rock Island. It will require at least three days for the old water to be drawn from the mains. Here the plant was put in motion without a hitch. Each of the four units now working has a daily capacity of 1,000,000 gallons. The daily consumption in the city is approximately 3,500,000 gallons. Thus the plant, as now operated, is capable of supplying 500,000 gallons in excess of the daily demand. There are in all six units in the plant. Each has a capacity of 1,000,000 gallons. The plant is so constructed that units may be added as the consumption of the city increases. "The Pittsburg Filter Manufacturing Company has given a first-class job," says D. C. Kelly, superintendent of waterworks. "It is now up to the city to efficiently operate the plant. We will need to increase our force, and the future successful results will depend wholly on the efficiency of the men who will be put in charge. Sulphate of aluminum is to be employed in the purification of the water supply. Our next move will be the installation of a laboratory equipment. We have provided quarters for it at Reservoir Park, and it is expected that the equipment will be on hand at an early date. It is planned to engage a professional chemist from one of the universities and to retain him here a month or longer until he can have taught the chief engineer or some other person to be designated how to operate the analytical equipment. We will then be enabled to conduct a bacteriological test of the water every day in the year."

STREET LIGHTING AND POWER

Ossining's Lighting System Is Damaged

Ossining, N. Y.—A fire badly damaged the power house of the Northern Westchester Electric Light & Power Company and put the entire electric lighting power system of the city out of commission. It was feared at first that the plant had been wrecked beyond repair and the city streets, residences, factories and the Sing Sing prison would be forced to do without electric illumination for months. A test of the machinery after the flames had been extinguished, however, revealed that the plant could be put in shape within a short time.

City Council to Investigate Light Complaints

Charleston, S. C.—Much public interest is evidenced in the resolution passed by City Council on the motion of Alderman O'Neill providing for an investigation by City Council of the alleged excessive charges and the poor quality of both the electric and gas light which the Consolidated Company has been furnishing. No time has been yet appointed for the committee on lighting to meet, but it is expected that Chairman Masters will shortly call the committee together and take up the matter, that there may be no delay in presenting all the facts to the municipal body at the next meeting. For some time there has been much complaint and criticism about the character of the light which the Consolidated Company has been furnishing. Many householders make the point that they pay now larger gas bills with a rate of \$1.20 than they did formerly at the rate of \$1.65.

Municipal Light Plant May Go into Commercial Lighting

Columbus, O.—Electric lighting to be furnished the citizens of Columbus in their homes at a maximum rate of 5 cents a kilowatt hour from the municipal light plant is one of the recommendations which will be made to Council by Mayor George S. Marshall when he submits to them his annual report. The Mayor says:

"There is no doubt but that the local lighting company can make a reasonable profit upon its actual investment at 5 cents per kilowatt hour, and there is no reason why the people of Columbus should longer pay more than 5 cents per kilowatt hour for light. Of course," he is quoted as saying, "if the Columbus Railway & Light Company should see fit on its own account to reduce its rate to 5 cents there would be no reason for the city going into the business of commercial lighting." He states that numerous contracts have already been signed for current for power, and within the near future its sale will make the city plant self-sustaining, saving Columbus approximately \$70,000 a year. But he feels that the city plant has rendered the people an even greater service to the people by forcing the Rail-Light people to reduce its rates about one-half and sometimes more—in one case to 1 cent per kilowatt—to shut out the city from the contract.

City Grants a Franchise

Corpus Christi, Texas.—A franchise to construct a gas plant has been granted to Michael Maloney. It is estimated that the plant will cost \$100,000 and it is probable that bonds will be issued for the purpose. There is a provision in the franchise whereby the city is to receive one-half of the net revenue.

Village Without Light

Fenton, Mich.—The village has been in darkness for many nights as the result of a row with the lighting corporation. The underlying reason is that the municipal ownership spirit has come upon the village. The city fathers won't renew a contract with a private lighting corporation on the corporation's terms, whereupon the corporation supplies no electricity for the 50 street lamps. The price the corporation demands is \$60 a year per lamp and the lights to burn for but half an hour after midnight. Detroit, with her municipally owned and operated plant, lights her streets at an average cost, as shown by the city's last annual report, of \$32.17 per lamp for 4308 lamps and the lights burn all night, not the first half of the night only, as here. A committee of three of the village trustees is going to Howell to look over the municipal lighting plant there, which is said to be giving cheap and entirely satisfactory service.

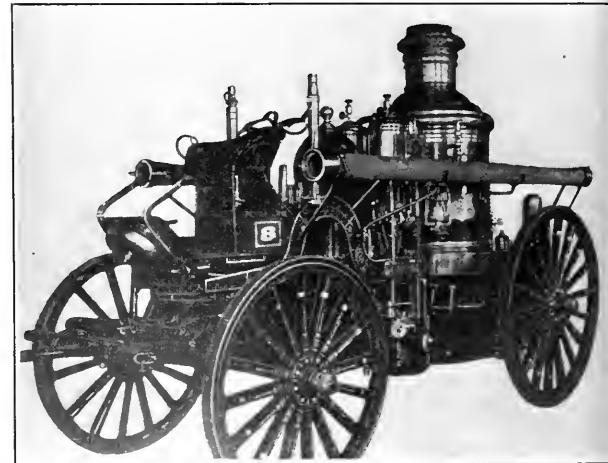
FIRE AND POLICE

Will Show Workings of Police Signal System

Toledo, O.—A feature of the police and fire exhibit in the Municipal Exhibition will be a map of the city, showing the police district, the location of call boxes and the like. These will be illuminated by tiny electric lights. The chart will be connected with the real police call system, and the lamps on the map will light as the patrolmen actually report. Citizens thus will be able to trace the movements of the guardians of the peace. They also will be allowed to hold their ears to what is called a "listening monitor," and thus hear what the patrolman says to the man on duty at the headquarters telephone station when he rings in and just how the system is conducted.

Steam Fire Engine Satisfactorily Tested

Wilmington, Del.—The new Metropolitan fire engine recently built by the American-La France Fire Engine Company, of Elmira, N. Y., for the Weccacoc fire company, of Wilmington, Del., was recently given a test at the foot of West street along the Brandywine Creek. The test was under the supervision of Andrew Jersey, a representative of the constructing company, and C. Whistler, their engineer. Besides these men the members of the local fire



Courtesy Wilmington Star.

NEW METROPOLITAN ENGINE FOR WILMINGTON

company were present, and nothing but admiration was manifested by all who witnessed the working of the modern firefighter. Steam was raised within seven minutes after its arrival at the testing grounds. The first test was with 1,000 feet of hose, the nozzle used being 1½ inches. The next test was with two lines of hose 500 feet in length and this, too, was made with a nozzle of the same dimensions used at first. Two lines of 250 feet were tried, and this, too, proved satisfactory. Three lines of hose containing 100 feet lengths with an inch nozzle were connected and the amount of water poured through the sections combined the same, appearing to prove the assertion of the builders that it would pump 8,000 gallons a minute. The last test applied to the engine was of two lengths of hose of 50 foot lengths siamesed into one, and for this test nozzle 1½ inches in diameter was used. The high water made all attempts at height throwing an impossibility. The machine cost \$5,250. It was placed in commission immediately after the test.

Improvements to Fire Department

Sanford, Fla.—The Sanford fire department is now being extended and improved so as to give the city such facilities in this regard as it needs. A steel tower has been erected to be used for giving the alarms and drying the hose. The second floor of the city hall has been divided and sleeping quarters arranged for the men who will have a highly polished brass pole to slide down just as they do in big cities and soon a locomobile fire engine will be in service. Sanford will then be prepared to do great things in the way of fighting fire.

Card Index System in Effect

Jersey City, N. J.—The new card index signal system of the Jersey City Fire Department went into effect on March 1 at 8.30 o'clock in the morning. This new system vastly simplifies the methods of the department in locating fires and properly controlling the force at the disposal of the department in case of several fires occurring simultaneously. The unwieldy and uncertain chart system is abolished. Likewise the "return blow" signal is done away with for all time. It had been used by the department since 1871.

Improvements in Fire Department Planned

New Bedford, Mass.—A drill tower more than eighty feet in height; regular courses of instruction for firemen; a fireman trained in New York's fire college as instructor, and regular monthly or bi-monthly drill for every fireman on the force are some of the interesting innovations that Chief Edward F. Dahill, of the fire department, is planning for this spring.

Fire Drill Tower for Los Angeles

Los Angeles, Cal.—Work on the new practice tower for the fire department at Avenue Twenty and Pasadena avenue is nearly completed and the first drill probably will be held there in about a week. The tower proper is practically completed and might be used now except for the fact that the ground around the foot of the structure has not yet been paved. An asphalt pavement will be laid around its base in order to permit of the easy movement of apparatus. Towers of this sort are in use in nearly all large cities, according to A. J. Eley, chief of the Los Angeles department, but this is the first one of its kind to be built here. The structure is about 20 feet square, of frame construction and in height corresponds to a six-story building, the top, which is surmounted by an iron railing, being at about the same distance from the ground as the seventh floor of an ordinary office building. On each floor of the tower there are eight window openings, two on each side. Two sides of the structure are equipped with ordinary iron fire escapes. The tower is constructed as much as possible like an office building and it is expected will be of great practical assistance in teaching the art of fire fighting.

Automobile Fire Apparatus Discussed

Butler, Pa.—An early morning fire in the business section of Lyndora gave the local firemen their first opportunity to employ the new automobile fire truck in actual service, and that the new machine is all that could possibly be expected is evidenced by the fact that water was being played upon the flames five minutes after the alarm sounded in the Central fire station on North street. It is estimated that on stretches of the run a speed of more than sixty miles per hour was attained. The run proves beyond a doubt the excellent worth of the new truck.

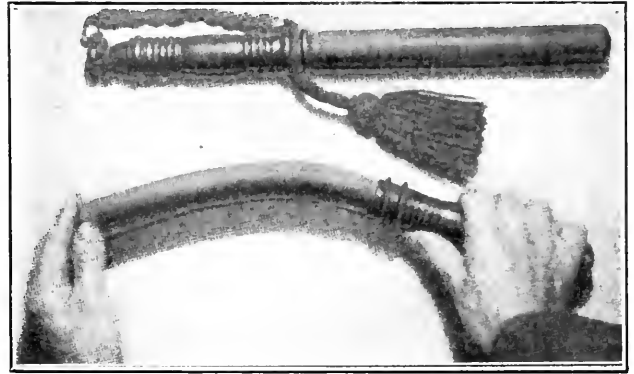
Buffalo, N. Y.—Chief McConnell, of the fire department recently told the members of the Equality Club that, in spite of the rapid advance made by the automobile fire apparatus, the horse would be used for many years to come in drawing fire apparatus. He said the present steam engine has many advantages over the new gasoline engine. "It has been demonstrated," said the chief, "that the gasoline engine weighing 15,000 pounds will not stand up under the rubber tires. Rubber dealers have told me that solid tires will not stand a weight greater than 10,000 pounds. If this is true it will require a lighter engine or a substitute for rubber tires." Chief McConnell further said that the present steam engine threw a greater stream than the gasoline engine; that it could make greater progress through snow and was generally more efficient. He doubted the practicability of the gasoline engine, except as a scout engine to make quick runs in the residence districts and extinguish fires in their incipency.

No Politics for Aberdeen Police

Aberdeen, Wash.—Chief of Police F. B. Archer has issued an order to the members of the police force declaring that any activity shown in municipal election would be followed by expulsion from the force. This is the first time that any head of a department of the city has ever issued a public order of this kind.

Humane Police Club Used by Denver Patrolmen

Denver, Col.—Since the adoption by the Denver Police Department over three years ago of what is known as the flexible humane police club, there has been an absolute absence of cut and bruised prisoners. This club is made entirely of the best grade of rubber, handle and striking end all in one piece. Through the center of the club there ex-



POLICE CLUB MADE OF RUBBER

tends a Bessemer steel handle, to which is attached a piano wire coil spring, which is loaded with shot and sand to give the required weight. The ends are vulcanized and the handle enameled a dark maroon color. Whenever officers have had occasion to use this club the prisoner has never shown any bad after effect from the blow. This club is very effective, and is said to be the only humane club in use. J. T. Gannon, while a member of the department, invented the club and the Police Department of this city was the first to use it.

Police Arrests in New York and London Compared

New York, N. Y.—Mayor Gaynor has sent to the Aldermen the second installment of his annual message. It has to do with police matters and contains many interesting observations and figures. He states that the number of persons arrested in New York City in 1909 was 220,366, as against 112,642 in Metropolitan London. Of these, i. e., in this city, 79,000 were discharged by the Magistrates as unjustified. The number of arrests during 1910 was decreased 50,000.

Police Chief Recommends Modern Ideas

Richmond, Ind.—The increase of crime in Richmond during the past year has led Chief Gorman of the police department to recommend in his annual report to Council that a number of modern police methods be adopted here among which he suggests the "flash light" patrol system and the purchase of two automobiles. Chief Gorman says the increase in crime is out of proportion to the increase in population. The large number of strangers who have come to Richmond for employment is the cause of the increase, according to Chief Gorman.

Chemical Auto Engine Giving Satisfaction

Rome, Ga.—Rome's new chemical auto engine is working satisfactorily, and those familiar with the fire engine and insurance situation predict that before many years the auto engines will entirely supplant the horse-drawn vehicles. It has been said that when the new auxiliary water-main is put in, three auto engines could handle the entire town, and thus decrease the expense of maintenance. It is said that motor equipment can be renewed every five years, at a less cost than required to maintain a horse department.

Police System for Smaller Cities

Huntington, Ind.—Corr's metropolitan police bill providing for a metropolitan police system in cities of the fifth class having a population of not less than 8,000, was passed by the House last week by a vote of 57 to 33. The bill originally included cities of 7,000, but an amendment by Representative Grieger, providing that the bill should apply to cities of not less than 8,000, was approved. The Corr bill grew out of the situation at Bloomington under the present law. Mayor John G. Harris, a Democrat, appointed a Democratic chief of police, but the Republican City Council named Republican police officers.

GOVERNMENT AND FINANCE

City Marshall Appointive Instead of Elective

Santa Ana, Cal.—A bill has been passed by the Legislature making the office of City Marshall of towns of the fifth and sixth class appointive by the Board of Trustees instead of elective as heretofore.

Co-operation in City Departments

Duluth, Minn.—The Board of Public Works has received a communication from the water and light department stating that the water and light board desires to work more closely with the works board and the engineering department in working on improvements. The communication stated that in the future the other city departments will be asked for necessary information before mains are put in. This action is taken so that when water pipes are laid the work will not interfere or damage other pipes which may already be in the street.

Commission Government Elections

Hillboro, Ill.—The commission form of government has been adopted by 212 majority, all four wards returning a majority for it.

Spring Valley, Ill.—The commission form of government was carried by a majority of 47 in a total vote of 700.

Olney, Ill.—At a special election it was voted, 331 to 177, to surrender the Olney charter and organize under the general law. The Olney charter was granted in 1869 on a proposal to establish a city court.

Sullivan, Ill.—The commission form of government was defeated on Feb. 14th by 52 votes. Only a light vote was cast.

Taylorville, Ill.—The proposition to place Taylorville under the commission form of government was defeated here on Feb. 17th by a majority of 186. Every ward in the city voted against it.

Vallejo.—Despite organized opposition the new charter, with its provision for a commission form of government was carried at the election of Feb. 24th by a vote of 1,279 to 809.

Appleton, Wis.—Appleton adopted, February 7, the commission form of government by a majority of 202.

STREET CLEANING AND REFUSE DISPOSAL

Plan to Increase Carrying Capacity of Garbage Wagons

Minneapolis, Minn.—John Brown, in charge of the garbage collection of the city; has a plan for dressing up the city garbage wagons. He proposes to buy canvas covers for the wagons to take the place of the present metal covers. Thus he would make larger loads possible, as he estimates that with the canvas covers each wagon would carry 500 pounds more than now, and end much complaint about poor service.

Solution of Garbage Disposal Problem

Boston, Mass.—Boston's garbage problem is nearer a definite solution than it has been for years. The Boston Disposal Company's offer to dispose of all the city's garbage, except that in East Boston and West Roxbury, for 54½ cents a ton, or approximately \$235,000 a year, is regarded by the Commissioner as a good indication that at last the city stands in a way to make a satisfactory contract.

Under the plan proposed by the company the city would build five receiving stations in Roxbury, Brighton, Albany street, Dorchester and Fort Hill, at an expense of about \$125,000. All the garbage of these districts would be carried to the stations by the city teams as at present, and in Roxbury and Brighton the garbage would be hauled to the waterfront by the company. This plan would mean the doing away with all dumps now used by the city, concerning the majority of which repeated complaints have been made. Mr. Rourke is convinced that the dumps should be given up at once to meet modern sanitary requirements, and says that it would be only a few years when all the dumps, at the present rate of filling, would be no longer available.

Municipal Housecleaning Becoming General

Little Rock, Ark.—Little Rock, under the direction of her City Beautiful League, is planning to have a thorough cleaning of the city by districts. District leaders for each district have been appointed. The district leader will have associated with him in the work two men, the three making an advisory committee to look after the entire district. The city has been divided into eleven districts. The City Beautiful Association plans to remove unsightly objects, see that streets are cleaned, vacant lots cleared of brush, grass and flowers set out and trees planted. Its object is to plan not only for the present but for the future with the end in view of making Little Rock one of the most beautiful cities in the South.

Muncie, Ind.—The Muncie Commercial Club is preparing to start on its campaign for a "Muncie Beautiful," and at the regular meeting of the Club last week President Marple announced the members of the special committee which will have charge of this work. This committee is now drawing its plans for the beginning of the campaign to "clean up" Muncie and at the regular meeting of the Club the chairman of the committee will announce the plans that are ready for the indorsement of the Club. The subject has been discussed to some extent, and from the expressions heard there is a growing sentiment among the business men of the city for a more beautiful city and a better city.

Street Flusher Proves Its Use

Lansing, Mich.—The new street flusher proved a very useful part of the city's equipment when Superintendent of Public Works Wilson cleaned the pavements in the business district with it last week. An attempt was made the fore part of the week to clean the streets by sweeping, but this only made matters worse; the flusher removed all dirt to the gutters where in its wet condition it was drawn away without being blown about.

Cost of Street Cleaning Is Reduced

Louisville, Ky.—The obvious improvement which has been noted in the condition of the streets of the city, and which had resulted in many compliments being expressed by citizens and organizations in letters to the Street Cleaning Department and the Board of Public Works, is analyzed in a report which has been made to the board by R. G. Heffernan, clerk of the department. The report covers the calendar years of 1909 and 1910, the latter being under the administration of Mayor Head, while 1909, with the exception of the final month, was under the previous regime. The report is interesting in that it shows that marked progress has been made in systematizing the work of the Street Cleaning Department. The report shows that during 1909 149,854 loads of ashes, garbage and dirt from the streets were disposed of by the Street Cleaning Department, as compared with 179,550 loads during 1910, under the present administration. The work was done in 1909 at a cost of \$153,675.66, compared with \$172,334.62 last year, making the cost per load under the former administration \$1.026, as against \$.960 under Mayor Head. Thus more work has been done during the past year, 26,696 more being hauled than in 1909, and at a smaller cost per load, the saving on each load handled amounting to over 6½ cents, which is a big item when applied to the work of such an important branch of the city's service as the Street Cleaning Department. The most marked improvement which has been shown has been a street cleaning proper, as distinguished from the handling of the garbage of the city. Under the former administration the records grouped the work on granite, brick and asphalt streets together, the number of loads of dirt removed from them during 1909 being 32,085. Under Mayor Head more than this amount of refuse was taken from the granite and brick streets alone, 41,020 loads being handled, while in addition 18,803 loads were taken from the asphalt streets. A point which has been emphasized in connection with the operation of the Street Cleaning Department is that not only are the streets in the downtown section being kept clean but the suburban districts are also being attended to, and crews of men are kept constantly busy in the outskirts.

RAPID TRANSIT

Test No-Seat No-Fare

Trenton, N. J.—The Trenton Street Railway Company has defeated the attempt of the city of Trenton to make a test case in the local police courts of the no-seat no-fare trolley ordinance by taking an appeal to the Public Utilities Commission to determine whether the ordinance is a proper regulation of street car traffic. The company claims that the power of the Utilities Commission to pass upon local regulations for trolley lines extends to an ordinance such as the one in question.

City's Transit Contract Legal

Philadelphia, Pa.—The contract between the city and the Rapid Transit Company has been declared legal by the Supreme Court, which yesterday affirmed the decision of Judge Kinsey in sustaining the demurrer and dismissing the suit of Elmer E. Brodie, a taxpayer. Justice Brown handed down the decision of the Court, from which Justice Mestrezat dissented. The Brodie suit was a companion action with the previous proceedings to test the right of the company to charge straight five-cent fares, following the withdrawal of the six-for-a-quarter tickets. His objections were that the whole scheme of the agreement with the city violated the constitutional provision with respect to a municipality becoming a stockholder in a private enterprise.

Would Run Street Railway

Toledo, O.—Council last week heard read the proposition of Charles A. Thatcher for the organization of a local company of \$1,000,000 capitalization to take over and operate the street railway system. The communication was referred to the committee on public affairs without discussion.

Further Municipal Railroad Planned for Los Angeles

Los Angeles, Cal.—There is a possibility that the city may be asked to build another municipal railroad, according to Charles Silent, park commissioner, who is nursing the project of a line for the purpose of opening up Griffith Park and making it more accessible to the public. Commissioner Silent has been taking the matter up with the officials of the Los Angeles Railway corporation and reports that much interest is being shown in the proposition. He suggested to the board that in case the corporation does not come through with a request for a franchise, the city still could build the line and lease it to the company. "I think the idea of a municipally owned railway to Griffith Park is worthy of consideration and should be taken seriously," he declared. There was some doubt as to whether the deed to the park would permit the city to either build a railway in the park or grant a franchise through it. This question now is being looked into by the city attorney's office.

MISCELLANEOUS

New Street Signs to Guide Night Wayfarers

Syracuse, N. Y.—New street corner signs which can be seen at night as well as in daylight, are being placed on the new ornamental street light posts in the business center of the city. The signs are made of opal glass set in a metal frame back of a stencil on which is the name of the street. During the day the light-colored glass shows through the letters on the stencil. At night the electric lights back of the glass shine through it, showing the street name plainly. The signs are ornamental and add to the appearance of the electric light posts.

Plans Ordinance to Protect Linemen

Chico, Cal.—An ordinance intended to protect the lives of linemen in the employ of the various power companies doing business in Chico has been presented to the trustees by City Attorney Guy R. Kennedy. It requires the power companies to paint the cross arms of poles carrying high voltage wires a bright yellow, that the linemen may recognize at a glance the deadly wires. The ordinance also requires that the wires be strung at least 26 inches apart and a 4-foot space be allowed at any point where they cross other wires.

Old Street Names to Be Seen

Boston, Mass.—As fast as the present street signs need replacing signs will be placed on all Boston streets which will contain the original names in small letters below the present title. This request has repeatedly been made by the Daughters of the Revolution, and the consent of the street department has been secured. Temple place was once known as "Turn Again alley," and lower Boylston street as "Frog lane." Near the post office the sign on a Devonshire street building reads "Black Jack alley." In the market district will be found "Corn court" where Merchant row now is, and "Fish lane," which was an extension of Corn court.

Compulsory Playgrounds

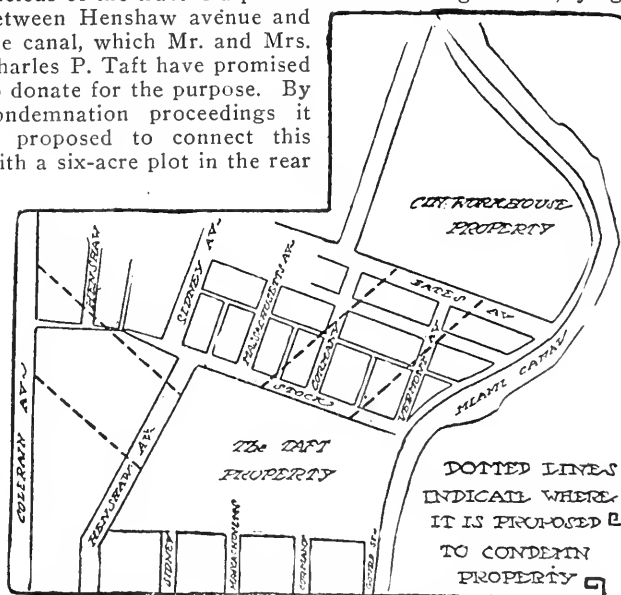
Olympia, Wash.—A bill has been introduced in the Legislature providing for the inclusion of small parks and playgrounds in all future land subdivisions within or adjoining the limits of cities of the first, second and third classes. According to the best available information this is the first attempt based on sound economics arbitrarily to combine parks and playgrounds with street plans in private real estate development.

More Public Playgrounds for Portland

Portland, Ore.—Portland is to be made famous for its children's playgrounds, according to the plans of the City Park Board. Last week it was decided to invite the Playground Association of America to send an expert here to outline a scheme for future developments. The expert will arrive in March and will deliver several addresses on playground activities in other cities. The sum of \$150 was appropriated as a fee for the expert. Contracts were awarded for furnishing playground apparatus for Kenilworth, Brooklyn and Columbia parks to Spaulding & Bros. Work on these playgrounds has already been started, and they will be ready before the Summer vacations. The playgrounds in Peninsula and Sellwood parks, installed last year, are being improved and much additional apparatus will be installed.

Land Donated for Playground

Cincinnati, O.—The largest playground in Cincinnati is being planned by the Camp Washington Business Men's Club for that section of the city. If plans mature the tract devoted to the park will contain nearly sixteen acres. The nucleus of the tract is a plot of more than eight acres, lying between Henshaw avenue and the canal, which Mr. and Mrs. Charles P. Taft have promised to donate for the purpose. By condemnation proceedings it is proposed to connect this with a six-acre plot in the rear



of the workhouse, now owned by the city and occupied by the boys in the neighborhood for baseball diamonds and football gridirons.

Savannah, Ga.—Prof. R. B. Lawrence has presented to the Legislature a suggestion that there should be legislation looking to the extermination of pet animals. It is his opinion that pet animals spread all kinds of disease, and he suggests that all stray animals be exterminated and that a tax of \$100 be placed on the owners of dogs.

Ordinance Regulates Moving of Buildings

Iola, Kan.—An ordinance has been passed prohibiting the moving of buildings, traction engines or other high or heavy structures or machines without a permit having first been obtained. A fine is imposed for non-compliance.

Shade Trees for Long Beach

Long Beach, Cal.—Tentative plans for the beautifying of this city by a general and systematic planting of trees on every street and avenue, so that they will have attained at least shade-giving height by the time visitors come this way either to or from the Panama Exposition, have already been adopted.

Poughkeepsie's Municipal Dinner

Poughkeepsie, N. Y.—A dinner of the municipal officers of the city of Poughkeepsie was held at the Nelson House, February 14. The menu was a handsome booklet containing eight views of attractive features of the city. A brief message from the Mayor, John K. Sague, printed on one of the pages, begins with the quotation, "Where there is no vision the people perish." The general purpose of the message and of the dinner was to cultivate that esprit de corps so necessary to the successful building of a city. The speakers were: Rev. Archy Decatur Ball, John Calhoun Otis, Alderman Thomas F. Mullen and Dr. Herbert E. Mills.

Extensive Improvements for Rochester

Rochester, N. Y.—Rochester is looking forward to a plan of improvements that will ultimately make it one of the finest cities in the world. At the recent dinner of its Chamber of Commerce plans which have been considered for some time were laid before those present and afterward printed in the newspapers. They represent the careful work of a landscape architect, a building architect and a traction expert, all of them of national fame, and comprise a most elaborate scheme for a new city hall as the main feature of a new civic center on Main Street West, as well as such other improvements as a union station for all the steam roads reaching the city, the widening of streets and provision for parks. The street improvement program is a very extensive one and provides for main thoroughfares to be constructed or widened traversing the city from north to south and from east to west. These are to be supplemented by what are termed local streets, the entire number of minor changes suggested being about seventy-five. The park plans contemplate the establishment of small parks of about twenty acres each whenever they are desirable and land can be acquired for the purpose. This great scheme has not been formulated with the idea that it will be carried out at once or that it will be completed for many years. The report simply outlines the artistic possibilities of Rochester.

Anti-Smoke League Discusses Plans

Cincinnati, Ohio.—The annual meeting of the Smoke Abatement League was held last week in the Union Trust Building and, following the election of the Board of Trustees for the ensuing year, short talks on the best means to rid the city of the smoke nuisance were heard. There were 25 members of the league present. In opening the meeting the president said that much improvement had been noted in the condition of the city since the Smoke League had been formed, but that there is still much work to do, and that the railroads are not doing their share in abolishing as far as possible the smoke nuisance, despite the fact that they continually promise to do so.

Condemns City Hall

Marion, O.—Carl Wilcke, state building inspector, has condemned Marion's city building, declaring it the most dangerous municipal edifice in Ohio.

Accident Insurance on City Elevators

Oakland, Cal.—Accident insurance of \$5,000 upon the elevator in the annex to the City Hall in the Braley-Grote Building at 1358 Broadway was recommended by the Board of Public Works at a recent meeting. The matter was brought before the Board by City Attorney B. F. Woolner and the action was taken that the city might be prevented from defending itself in any suits for damages as a result of accidents to passengers in the City Hall elevator.

Licenses for Washers of Clothing

Jacksonville, Fla.—Licenses for washerwomen is the latest plan of Mayor William S. Jordan, who has announced that he would urge upon the City Council the necessity of passing an ordinance requiring persons who take in washing to register with the City Recorder. The Mayor believes such an ordinance is necessary as a sanitary measure, so that clothes may not be taken into homes where contagious diseases exist. The proposed ordinance also contemplates the idea of protecting the public against the loss of clothing. The practice of requiring washerwomen to procure licenses is already in force at Pensacola.

Gift of a Drinking Fountain for Horses and Dogs

Barre, Vt.—The National Humane Alliance of New York, of which Senator Lewis M. Seaver of Williamstown is secretary and treasurer, has presented the city of Barre with a drinking fountain for horses and dogs which has been accepted by the City Council and will be set up in the city square the coming summer. The contract for cutting this fountain has been let to Marr & Gordon of this city.

Trees Will Be Sold for a Penny Each

Knoxville, Tenn.—In conjunction with the City Beautiful League, which is striving to make the city of Knoxville a place of great beauty, the Miller Store Company, through J. H. Anderson, president, has a plan on foot to distribute 1,000 catalpa trees on March 15, to the Junior League of the City Beautiful. This league is composed largely of children of the city schools. The plan is to furnish every child in the city schools a catalpa tree, bearing a card of instructions. The cost will be only one cent. This card, which gives instructions as to the care of the tree from the time it is set out until maturity, was issued by the United States Bureau of Forestry. As may be readily seen, the one cent is only a small portion of the cost of the tree and will about pay for the printing of the instruction card. It was originally intended to give the trees away absolutely free, but it was decided to place the nominal price of one cent on them so that they will be looked upon with value by the children.

Curfew Ordinance Declared Unconstitutional

Altoona, Pa.—The curfew is a thing of the past in this city. After a precarious existence of fourteen years, during which the ordinance providing for a curfew has sometimes been enforced and sometimes not, it has been declared unconstitutional by City Solicitor Thomas C. Hare, and at an early date it will be wiped off the statute books.

Saves Money for City

Trenton, N. J.—Chairman Charles H. Reichert, of the Street Committee of Common Council, has made it possible for the city to save the hire of at least ten men by compelling the drivers of rented teams to assist in loading their wagons. Heretofore it has been the custom for drivers to sit still while the city's laborers did the shoveling. From eight to ten outside teams are employed and Mr. Reichert figured that to have the drivers do their share of the work would result in saving the hire of just so many men. The city pays \$6 per day for a team of two horses, and the Councilmen on the Street Committee agreed with Mr. Reichert that the assistance of the driver was not too much to demand, since the drivers invariably work for individuals who from time to time employ the same teams.

Will Protect Trees

Columbus, O.—With his expenses to be borne jointly by the City and the Park Commission, Supt. James Underwood of Franklin Park may be given the position of tree warden with all of the trees in Columbus under his supervision. The proposition was favored in a meeting of the Franklin Park Commissioners in a meeting they held with Mayor Marshall. Faulty trimming done by owners of trees who failed to appreciate the value of their possessions to the building up of the city beautiful, and alleged careless slashing of limbs by companies wiring the city are some of the malpractices which it would be his office to prevent. His duties would not conflict with that of a landscape architect for whose appointment Mayor Marshall recommends in his annual budget.

LEGAL NEWS

A Summary and Notes of Recent Decisions—Rulings of Interest to Municipalities

Railroads—Construction of Ordinance

Behrman, Mayor, vs. Louisiana Ry. & Nav. Co.—A city desiring the construction of a belt line railroad, to be ultimately owned and controlled by it, contracted for the construction of five miles of the road by the F. Railroad Company, and, pending litigation with reference to the city's right to use a portion of the projected right of way in control of the dock commissioners, passed an ordinance granting to defendant the right to use the road when constructed in consideration of defendant's payment of \$50,000 to be used in further construction, or, in case the F. Company failed "without legal excuse" to construct the portion of the road specified in the prior ordinance, defendant might construct the same and succeed to the F. Company's rights under such ordinance in lieu of the payment required, or in lieu of a pro tanto reduction thereof according to the amount of railroad constructed by defendant in place of the F. Company. Held, that the words "without legal excuse," referring to the F. Company's default in constructing the road, were not inserted solely for defendant's benefit, so that defendant might waive the same and assert his right to construct the F. Company's portion which it failed to build, because the opposition of the dock board precluded construction over a part of the projected right of way.—Supreme Court of Louisiana, 54 S. R., 26.

Injury to Pedestrian—Negligence

Forster vs. Kansas City.—Notwithstanding the opening statement in an instruction that it was the duty of defendant to keep its streets in reasonable repair, whereas the duty is to make a reasonable effort to keep them reasonably safe, yet the instruction, having afterward stated that such duty consisted in an "exercise of reasonable diligence—that is, such care as an ordinary prudent person would exercise"—was not erroneous. While a person walking along a city sidewalk should not be heedless of defects, he is not required to consider that he is treading a dangerous and hazardous way.—Kansas City Court of Appeals, Missouri, 133 S. W. R., 663.

Public Improvement—Notice

Rubin et al. vs. City of Salem et al.—Under City Charter of Salem, requiring the recorder to give a notice "specifying with convenient certainty the street proposed to be improved and the kind of improvement which is proposed to be made," a notice of improvement of a certain street "by grading the same with proper crown and gutters to a point 8 inches below the established grade thereof, and by then macadamizing the same with crushed rock 8 inches deep, the same to be properly spread and rolled," was not insufficient, for not stating that the contractor should remove the crosswalks, and that the curbing should consist of certain sized lumber nailed to posts at certain distances.—Supreme Court of Oregon, 112 P. R., 713.

Ordinances—Validity

Cain vs. Mayor and Common Council of City of Bayonne.—Assuming that some of the provisions of an ordinance regularly enacted by a Common Council are susceptible of an application that would be in excess of the authority granted by the city charter or an unreasonable interference with its provisions, the ordinance will not, on that account and in advance of any such application, be set aside in toto, if in other respects it is unobjectionable.—Supreme Court of New Jersey, 78 A. R., 663.

Suspension Pending Hearing of Charges

Cull et al. vs. Whelple et al.—Where the Constitution gave to the Government no express power to suspend civil officers which the Governor was authorized to remove on conviction on charges preferred against them, the power to spend pending hearing of charges will not be implied from the power to remove. Court of Appeals of Maryland, 78 A. R., 820.

Defective Streets—Sufficiency of Notice

Carter vs. City of St. Joseph.—Under Revised Statutes, 1899, requiring one injured from a defect in a sidewalk, etc., to give written notice to the city, stating the time and place, etc., of the injury, no recovery could be had where the notice of injury stated that it occurred on January 29, 1909, when it in fact occurred on December 29, 1908 the fact that the city knew of the defect in the sidewalk before the injury, and that it had been repaired and was in good condition at the time specified in the notice, not obviating the effect of the erroneous statement in the notice. Kansas City Court of Appeals, Missouri, 133 S. W. R., 851.

Assessments—Corner Lots

City of Covington vs. Schlosser.—Kentucky Statute prohibits any fourth-class city from charging the owner of property abutting on improved streets with more than one-half the value of such ground, after the improvements are made, including the value of buildings and other improvements on the improved property. A section permits the city to assess the entire cost of constructing sewers, including the intersections, to an amount not exceeding \$1 per front foot for the abutting property upon the lots abutting upon the streets, etc., in which the sewers have been constructed; the cost of the construction of sewers not exceeding the sum of \$1 a front foot of the abutting property, to be apportioned equally on the abutting lot owners according to frontage. Another section, which is a part of the charter of fourth-class cities, provides that "public ways," as used in this act, shall mean all public streets, alleys, sidewalks, lanes, roads, avenues, highways and thoroughfares. Held, that, when a corner lot is assessed for the cost of improving one street upon which it abuts, the cost of such improvements should not be considered in estimating the assessment against the lot for improving the other street on which it abuts, but the cost of improving each street independent of the other cannot exceed one-half the value of the ground after the improvement is made, though when the lot is improved on one street the amount assessed against it for improving the other street should be estimated on its value after both streets have been improved. Court of Appeals of Kentucky, 133 S. W. R., 987.

Ordinance Prohibiting Cigarette Smoking—Reasonableness

Hershberg vs. City of Barbourville.—Though Kentucky Statutes gave City Councils power to enact police and sanitary regulations not conflicting with the general laws, an ordinance prohibiting the smoking of cigarettes within the corporate limits, though an attempted exercise of the police power, is void as an unreasonable invasion of personal liberty. Court of Appeals of Kentucky, 133 S. W. R., 985.

Accident to Engineer—Negligence

Essen et ux. vs. City of Philadelphia.—An employee in the engineering department of the city of Philadelphia, while standing on the elevated track of a railroad sketching a semaphore, saw a train approaching, and instead of going upon a platform, which was beside the track, stepped from the track alongside a picket fence between the two tracks, and was struck and killed by the train. There was a platform on each side of the tracks, beside one of which the semaphore stood. It did not appear that the sketch could not have been made from either platform. Held, that there was no evidence to charge the city with negligence which would render it liable for his death. United States Circuit Court of Appeals, 183 F. R., 414.

Police Power—Licensing Hotels

City of Chicago vs. M. & M. Hotel Co.—Under section 62 of the city and village act, providing for the incorporation of cities and villages, and delegating to them police powers over a large number of subjects, but not conferring power to regulate and license the occupation of hotel keeping, no such power exists, the general language of clause 66, giving power "to regulate the police of the city or village and to pass and enforce all necessary police ordinances," which clause must be construed in connection with the other clauses, meaning that the power may only be exercised in reference to such subjects and occupations as are enumerated in other specific sections. Supreme Court of Illinois, 93 N. E. R., 753.

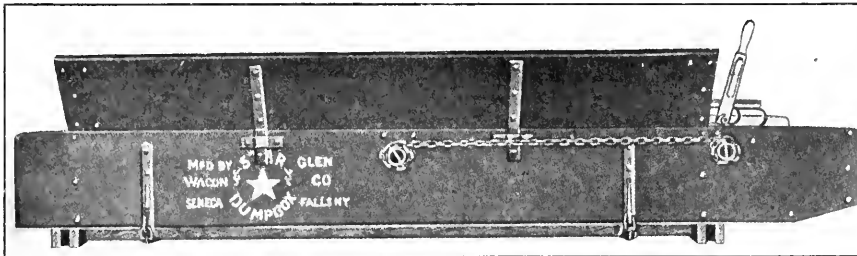
MUNICIPAL APPLIANCES

Substantial Wagon Dump Box

THE Glen Wagon Company, Seneca Falls, N. Y., claims to make the strongest and most practical dump box offered to the contracting trade.

The Star dump box, as it is called, is built of 1½-inch hard white maple sides, 2-inch maple doors. Corners of box are angle ironed. Bolsters fastened to box with heavy angles. Two center doors hung on steel pipe, which steel pipe is bolted to heavy angle iron truss running lengthwise of inside of box; cannot possibly sag or get out of alignment. Load can be controlled to either equipment or with combination spreading and dumping device. The box has a spring seat and wide foot board. It is painted red, striped in black and well varnished. Made to fit any running gear. Weight, 500 pounds. Capacities, 1½ and 2 cubic yards.

The Glen company also makes a 3½ cubic yard dumping wagon for use in trains drawn by a traction engine.



HEAVILY BUILT CONTRACTORS' WAGON DUMP BOX

Large Capacity Continuous Mixer

ONE of the new concrete mixers is the Eureka, No. 90, made by the Eureka Machine Company, Lansing, Mich. The machine was exhibited for the first time at the New York Cement Show last December, where it attracted the favorable attention particularly of paving contractors. While the capacity is large, rated at 25 cubic yards per hour, presumably on gravel or finely broken stone, the weight and dimensions are not such as to prevent its use in positions where small work is usually done or to interfere seriously with its portability. The No. 90 mixer weighs 4,700 pounds complete when equipped with a 6-horsepower gasoline engine. It may also be equipped with motor or steam engine.

The general design is pleasing. It is well balanced and symmetrical. As indicating the strength of the construction, the manufacturers state that over 800 pounds of crucible steel is used in every machine. The feeders and all parts subject to much wear are made of this material. The makers embody in it the same exclusive features of proportioning and mixing used in their other sizes. The length of the No. 90 is 14½ feet; width, 4 feet 7 inches; height to bins, 4 feet 4 inches; length of mixing trough, 7½ feet. The trough is made of 3-16-inch tank steel.

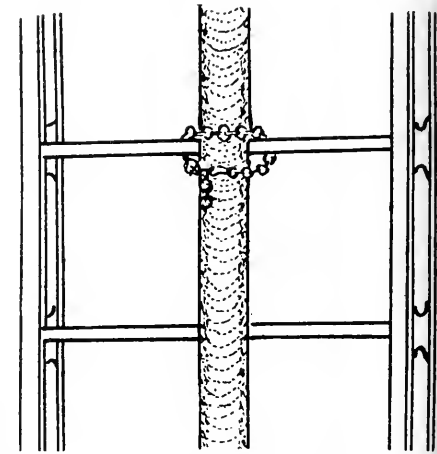
The Eureka is claimed to be the original continuous mixer. The first model appeared in the early nineties. All through the years which have followed the manufacturers have been constantly in touch with the actual field conditions. The new large capacity No. 90 embodies the result of this experience.

Device for Converting Ladder Into Water Tower

A SIMPLE device for holding a hose to a ladder so that the ladder with the line of hose becomes an improvised water tower has been invented by Chief Arthur H. Hope, Asbury Park, N. J.

It consists of a chain fastened around the hose at certain intervals along the ladder which sustains its weight. At present the ladder pipe is used in a great many places where aerial trucks are in service, but the invention of Chief Hope tends to make the pipe more serviceable by holding it secure to the rungs, thus allowing a straight stream with minimum friction to be thrown from the end of the nozzle secured to the upper rung. In order to use the upper part of a ladder on an aerial truck for running hose to feed a ladder pipe, the ladder strap at present used has a large hand grip and when the ladder is being extended this hand grip often catches between the rungs and stops the elevation. By using the

any time. With the use of the turntable the stream may be delivered at any point. In making these chains it will take about 30 inches of chain with a harness snap at one end. The chain link must be large enough to place the snap in any link to fit the hose. In making fast, take the center of chain, place it across the front of hose and over the top of rung on each side, then bring it out under the rung to the front of hose and make fast with the snap to a link in the chain.



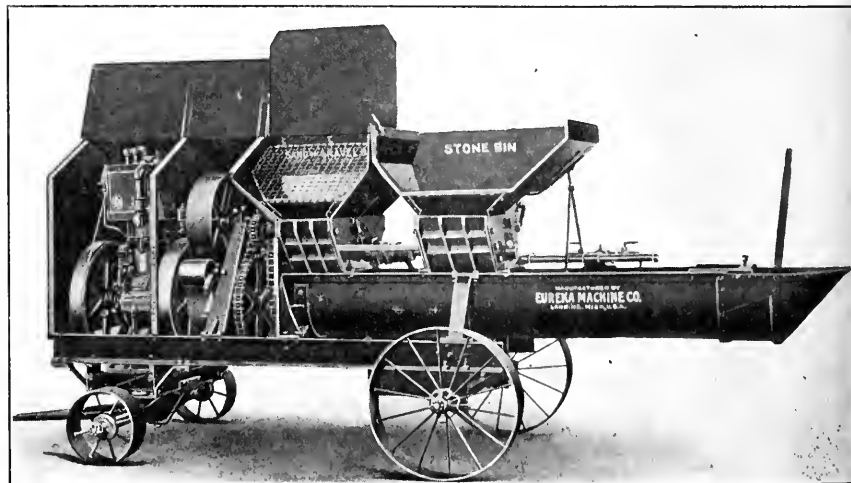
HOSE CHAINED TO LADDER

Roughen Street Gauge

THE Roughen adjustable street gauge, manufactured by P. Roughen, Fond du Lac, Wis., is simple in construction, being built of two planks, steel center mast and steel two-wheel trucks. The planks are attached in the center to the steel mast and on the end to steel extensions at the wheel trucks. By means of these extensions any width of the street can be obtained. On each side of the planks are trestle rods that keep the gauge from swaying and extending from these top of the mast to the planks are two adjusting rods that are provided with locknuts to set and hold the gauge to the desired crown. Each end of the gauge is provided with a small hand wheel by which the gauge may be raised or lowered between the trucks. The whole gauge is built strong throughout, but nevertheless is light and is easily moved. The gauge can be adjusted to any crown of any width of street.

The gauge is used for grading the streets after the curb and gutter are built

chain only about one-half inch of space is occupied and ample room is given to pass the rungs. As shown in the illustration, a four-way grip is formed and with two hundred or more pounds pressure the hose will remain in perfect line, extending to the top of the ladder. This is not the case when using the long, loose strap. In cities where aerial trucks are used they may with small expense be converted into a water tower. Where there are high frame buildings, with this device, an effective stream may be thrown into the fifth story from the top of the ladder and save sending men into a building that is likely to collapse at



CONTINUOUS CONCRETE MIXER—25-YARD CAPACITY

by placing the machine in position by resting the wheel trucks on the gutter and lowering the planks by means of the hand wheels at each end. The gauge is then moved along the street and the excavation is made to the proper depth. No grading stakes are necessary and when the grading is completed the street has the proper grade and crown. This gauge can be used equally as well on single curb as on combined curb and gutters.

By raising the planks, the gauge can be used the same way that it is used for grading to show the depth of the

Portable Pumping Outfit

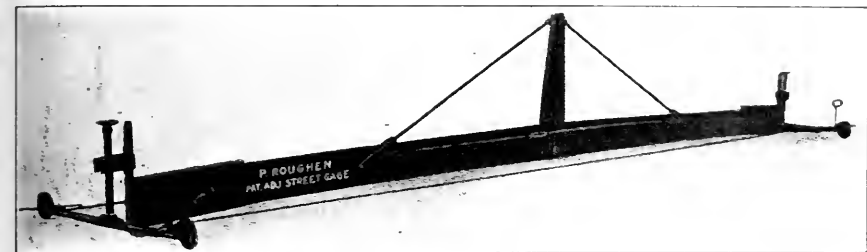
A PORTABLE pumping outfit for special construction work, either steam or electric driven, is made by the Kingsford Foundry and Machine Works, Oswego, N. Y. The platform is sufficiently large to carry a tool box. The illustration shows the steam-driven outfit. The electric apparatus is equipped with a Westinghouse induction motor. The centrifugal pumping is of the side suction type with discharge 3 inches in diameter and suction openings 4 inches in diameter. The openings are provided with flanged couplings to re-

Doherty calorimeter and the feature distinguishing it from all others is the gas under test by the water which that gas heats, thus maintaining absolutely constant the ratio of volumes. The pressure is imparted to the gas by the displacing water; and this water secures its constant pressure from a constant static "head" in the regulator of the calorimeter.

Every cubic inch of water passing the flame is heated by the burning of a cubic inch of gas displaced by it. This being the case, determination of the heating value in b. t. u.'s becomes simply a question of measuring temperatures with suitable corrections for existing conditions bearing upon the problem.

The calorimeter has two essential parts—the absorption chamber and the tank. Both of these are cylinders of annular section, the former being placed within the latter. A heavy insulating layer of non-conducting felt guards against interchange of heat through the walls. The Bunsen flame burns within the absorption chamber. The entire arrangement is thus compact and self-contained and of extreme simplicity. The regulator is simply a standpipe in which a constant head or pressure is maintained by means of a supply of flowing water, part of which escapes to the drain, the remainder keeping the standpipe full as displacement takes place in the tank.

Full instructions for operation are furnished with each calorimeter. The instrument is highly finished throughout in heavy nickel plate. The net weight is 45 pounds.



GAUGE FOR FORMING CONTOUR OF STREET PAVEMENT

concrete and to get an even surface on it.

By raising the planks a little higher, the gauge is used to strike off the top-dressing of cement pavements; the cement is poured in front of the gauge and it is pulled along by a man at each end and the whole street is struck off at the same time. No center boards are then necessary and no sags or hollows are left.

Iron hangers can be dropped over the planks of the gauge and boards laid upon these to form a bridge across the street for men to walk upon while troweling and finishing the surface. By the use of this bridge the finishing work can be done much faster and no board marks are left upon the finished street.

The gauge can be used to strike off the sand cushion for brick pavements to get an even, smooth surface. Experience has taught that there is an unnecessary loss in brick paving caused by the breaking of bricks by the roller. If the sand cushion is trampled upon too much in striking it off, it becomes packed in places and after the bricks are laid and the roller is run over them it will break the bricks which are laid upon the packed places. By the use of this gauge it is not necessary for men to walk upon the sand cushion and this loss by broken bricks is avoided.

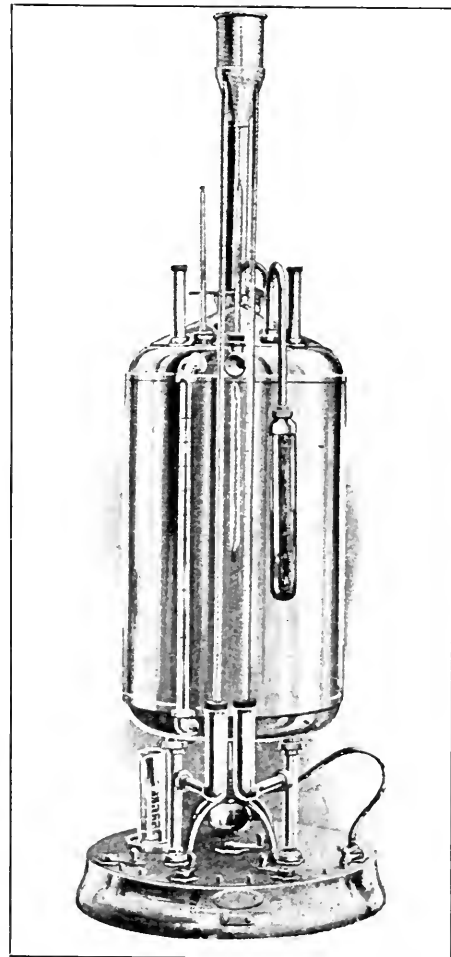
Considerable time can be saved by the use of several gauges.

ceive suction hose or linen house couplings. The reel will carry 400 feet of 3-inch inside diameter linen hose. Twenty-five feet of rubber suction hose accompanies the outfit. Each pump has a capacity of 260 g.p.m. against 35-foot head. Weight of single outfit 2800 pounds. The long length of hose carried allows a contractor in city work to carry his discharge outlet to a catch basin at a considerable distance from his work, thus avoiding the annoyance and perhaps incidental damage of having a large volume of water running along the street. The outfit is, of course, useful for a number of special purposes.

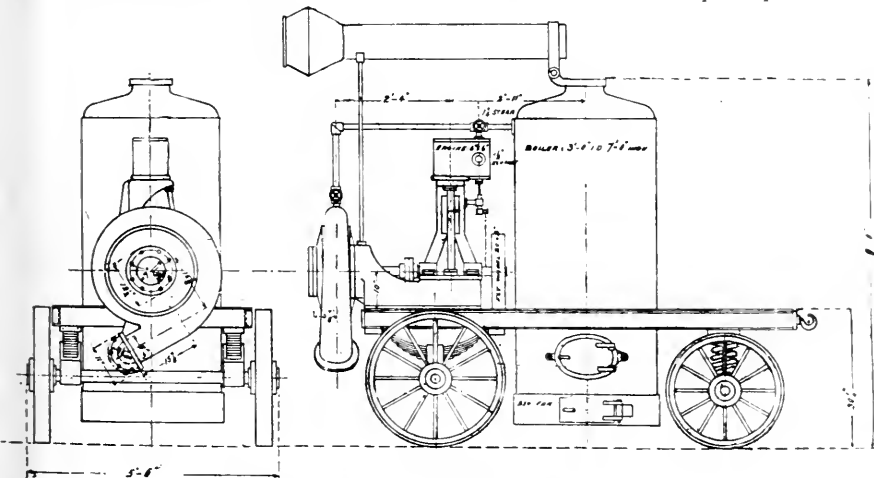
Gas Calorimeter

THE Doherty Gas Calorimeter, manufactured by the Improved Equipment Company, 60 Wall street, New York, is a device for determining the heating value of artificial gas. It is simple in construction and operation, and claimed to be so durable as to maintain its accuracy indefinitely. The unit in which the heating capacity of the gas under examination is determined is the British thermal unit, commonly abbreviated b. t. u., or the amount of heat required to raise the temperature of one pound of water one degree Fahrenheit, under standard conditions of temperature and pressure.

The fundamental principle of the



DOHERTY CALORIMETER



CONTRACTORS PORTABLE STEAM PUMPING OUTFIT

NEWS OF THE SOCIETIES

Society of Chemical Industry.—At a meeting at the Chemists' Club, 108 W. 55th street, New York, February 24, two papers were read and discussed relating to the treatment and purification of boiler feed water. Thomas R. Duggan, London, England, presented a paper on "A New Treatment of Water, Preventing Scale in Boilers Without the Use of Chemicals by the Aid of Aluminium Plates." The invention of Herr Brandes of a process employing a device known as the aluminator, which led to the softening of old scale and the formation of less new scale, was referred to. With this process the boiler feed water runs down an aluminum plate having a certain slope and various widths and depths of corrugations in its surface according to the character of the water to be treated. The theory of the operation of the aluminator is that a current of electricity is induced by the passage of the water over this metallic plate and ionization of the salts present in the water takes place.

The second paper, entitled "Boiler Water Purification," was presented by William M. Booth, who arbitrarily classified waters according to the quantity of dissolved solids present into soft, hard, saline, alkaline and acid waters. Several methods of purifying boiler waters, ranging from mechanical filtration to the use of boiler compounds and various combinations of thermo-physical, thermo-chemical and the electro-chemical methods were discussed.

Illinois Water Supply Association.—The third annual meeting was held, February 21-22, at the University of Illinois, Champaign, Ill. David Kinley, dean of the graduate school, gave an address on "Possible Lines of Service of the University to Municipalities." He advocated the collection of data regarding cities and municipal public works. Laws for the regulation of public utility corporations, he said, would not be unwelcome to them provided the laws were fair and reasonable.

F. C. Jordan, president Indianapolis Water Company, pointed out the great importance of rate making, upon which depends the success of a water system. The rates must be sufficient to provide the operating expenses, maintenance, improvements, interest on fixed charges and depreciation, and, in the case of a private company, a sufficient return on the investment to attract capital. The speaker was opposed to the meter system, and expressed the belief that if the authorities are properly informed a satisfactory rate can be agreed on.

T. C. Phillips, Chicago, presented a paper on water waste surveys in Chicago. It was contended that such surveys or tests are more effective than meters in checking waste.

C. H. Burdick, Chicago, presented a paper on "The Relation of Intakes to the Purity of Water from the Great Lakes." The paper showed the necessity of long intakes to avoid troubles due to turbidity, pollution and the blocking of intakes by ice and sand or clay. The relative cost of long intakes and short intakes, supplemented by filter plants, was discussed.

W. B. Bull, Chicago, described a new and simple electro-mechanical method of purifying water. Caustic soda produced in an electrolytic cell is fed to the pump suction main, and at a little distance beyond an iron chloride solution is introduced. The evaporation is very effective and the process is cheap,

costing only about 45 cents per million gallons.

Prof. E. O. Jordan read a paper on "Bacteriology of the Swimming Pool," and described some experiments made in Germany as to the bacterial contents of the water in such pools, and the effect of the hypochlorite treatment in reducing the bacteria to a minimum.

W. F. Monfort, St. Louis, presented a paper on "Experiments on Water Treatment with Ozone." Prof. E. Barbour presented an abstract of a paper by himself and H. P. Corson on the "Analysis of Chemical Used in Water Treatment." E. MacDonald Lincoln presented a paper on "The Condemnation of Land to Protect Wells," in which he cited court decisions. F. C. Amsbary presented some notes on deep well pumps. Papers on various features of the sewage-disposal problem were presented by Dr. A. Lederer, Frank Bachman, Chicago, and Langton Pearse.

Officers for 1911 were elected as follows: Owen T. Smith, Freeport, president; R. R. Parkin, Elgin; C. H. Cobb, Kankakee, and E. M. Ely, Danville, vice-presidents; Edward Barton, Director of the State Water Supply Survey, Urbana, secretary.

League of Second and Third-Class Cities of New York.—The second annual conference of the Mayors and other city officials of the second and third-class cities of New York State will be held at Poughkeepsie, N. Y., on May 25 and 26, the date having been definitely decided at a recent meeting of the advisory committee. It is planned this year to make the gathering an even larger one than was held in Schenectady a year ago when municipal health was the topic for discussion. The committee is now engaged in securing experts on the various subjects that will be discussed, and there is every indication that the addresses will be of exceptional importance to municipal officials.

The committee has decided to consider the following subjects at the Poughkeepsie conference: "The Essential Framework of Municipal Government," including the usual plan of separating the legislative and executive functions and also the more recent form of municipal administration known as government by commission, "Taxation and Assessment," "The Administration of Public Works Departments in Reference to the Various Methods of Cleaning and Care of Streets."

The question of permanent organization will be discussed at this conference and the advisory committee, to which was referred this question at the first conference, will recommend that no constitution be adopted but that merely such officers be selected as will be necessary to prepare the organization for each meeting and to carry on the conference when in session.

The object of the Mayors' conference is to meet annually to discuss the latest phases of improvements in municipal government and recommendations with the idea that the Mayors and other city officials who attend this conference may receive suggestions which will be of benefit to them in the future.

Engineers' Society of Western New York.—The society has elected these officers: President, George C. Diehl; vice-presidents, Leslie J. Bennett and Frank N. Speyer; directors, John G. Ullman, George T. Roberts, S. M. Kiehl; treasurer, Thomas J. Rogers;

secretary, Helge S. Anderson; librarian, William A. Haven.

International Association of Municipal Electricians.—Active preparations are going forward for the next convention of the association which is to be held in St. Paul, Minn., in September. The place and time of the meeting are wise selections, and, as fire matters in the Twin Cities are, in keeping with the spirit of those communities, held up to the top notch of efficiency, the visiting electricians will find much of interest. The meetings of the municipal electricians result indirectly in greater security from fire to the people of the country at large on account of the advanced knowledge obtained by the members of the latest ideas and appliances. The dates of the meeting have not yet been fixed, but the announcement will soon be made by the executive committee. Clarence R. George, city electrician, Houston, Tex., is secretary of the association.

American Highway League.—The third annual convention was held at the American Hotel, St. Louis, Mo., February 23-25. Members of the association were interested in the private restricted residence districts known in St. Louis as "places," which have no counterpart in any other city, it is said. Another feature of St. Louis which attracted attention was the asphaltic slab pavement invented by Street Commissioner Travilla. Mrs. Frank Degarmo addressed the convention after the reading of technical papers, speaking of good roads as tending to promote the educational welfare of country children. She spoke of demonstrations given in Louisiana where models of good roads are shown with a schoolhouse at one end and the home at the other.

Central Educational Association of Minnesota.—State Highway Engineer George W. Cooley addressed the recent convention on good roads, stating that good roads would do as much as any other one thing to make rural life more desirable, to keep the young people on the farm, and that a course in road-making should be taught in the agricultural schools of the state.

Calendar of Meetings

- March 6-11.
Canadian Cement and Concrete Association.—Annual Convention, Toronto, Ont.—Wm. Snaith, Secretary, 57 Adelaide street East, Toronto, Ont.
- March 8-10.
Engineering Society of Wisconsin.—Annual Meeting, Madison, Wis.—W. G. Kirchoffer, Secretary, Vrooman Building, Madison, Wis.
- March 21-22.
New York State Railroad Association.—Quarterly Meeting, Syracuse, N. Y.—C. Gordon Real, Secretary, Kingston, N. Y.
- May.
City Commission Congress.—Meeting, Galveston, Tex.—Mayor Lewis Fisher, Chairman of Committee, Galveston, Tex.
- May 29-June 3.
National Electric Light Association.—Annual Convention, Engineering Societies Building, New York, N. Y.
- June 6-10.
American Water Works Association.—Thirty-first Annual Convention, Powers Hotel, Rochester, N. Y.—John M. Diven, Secretary, 14 George street, Charleston, S. C.
- June 11-16.
International Association of Chiefs of Police.—Eighteenth Annual Convention, Rochester, N. Y.—Major Richard Sylvester, Superintendent of Police, Washington, D. C., President.
- June 13-18.
New York State Association of Chiefs of Police.—Annual Convention, Rochester, N. Y.
- April 6-8.
American Electrochemical Society.—Annual Meeting at New York City.—Secretary, Joseph W. Richards, Lehigh University, South Bethlehem, Pa.

PERSONALS

ADAMS, ARTHUR A., Superintendent of Streets of Springfield, Mass., has resigned after eleven years' service in the position. He states that it is his intention to engage in other business. Arthur H. Woodward and Howard O. Buck, Assistant Superintendents, are candidates for the position.

BOLTON, JACKSON, Assistant City Engineer of Richmond, Va., is dead.

BRIDGEFORD, WILLIAM E., First Assistant Chief of the Albany Fire Department, who has been Acting Chief for the past eight months, has been nominated by Deputy Commissioner of Public Safety William J. Rice, to succeed Chief Higgins. The nomination is practically an appointment, although an examination will take place. Chief Bridgeford has been a member of the Albany Department for forty years.

CONNELLY, President of the D. Connelly Boiler Works Company, Cleveland, Ohio, died on February 27 from pneumonia.

DICKSON, C. C., has been chosen Superintendent of Lights and Water at Tecumseh, Neb., succeeding Mr. Frank Freemole.

DICKSON, Fred N., a member of the Board of Police Commissioners, has been named by the Governor of Minnesota to fill the vacancy on the Ramsey County District bench.

DOWNEY, I. J., Chief of Police of Sault Ste. Marie, Mich., has resigned.

DUNBAR, DR., Director of the State Hygienic Institute of Berlin, Germany, is visiting the United States for the purpose of studying sewage disposal plants and methods. Dr. Dunbar is the author of "Principles of Sewage Treatment," which was translated into English in 1908 and met with a very favorable reception both by English and American sanitarians. After spending several days in New York as the guest of Dr. Hering, he left last week for a visit to the plant at Cleveland, Ohio, and other Middle and Far Western points.

FELLOWES, F. L., City Engineer of Westmount, Que., has been appointed Supervising Engineer of Vancouver, B. C.

GAMMAGE, ARTHUR L., for several years Assistant Chemist for the Connecticut State Board of Health, has taken a position with Robert Spur Weston, Sanitary Expert of Boston.

HAPGOOD, LYMAN P., has been appointed Assistant Superintendent of the Jamestown, N. Y., water system.

HILGEMAN, HENRY, has resigned from the Board of Public Works of Wayne, Ind.

JIMENEZ, J. J., formerly Superintendent of Public Works, Department of the Interior, Porto Rico, has resigned to enter private practice as consulting and contracting engineer at San Juan, P. R.

KELLY, BENJAMIN A., has been appointed Water Register of the Borough of Manhattan, New York.

LAYFIELD, E. N., formerly Chief Engineer of the Chicago Terminal Transfer R. R., has been appointed a member of the Viaduct Commission of Grand Rapids, Mich.

MANDIGO, CLARK R., has been appointed assistant City Engineer of Kansas City, Mo.

MOORE, CHARLES G., City Engineer of Eau Claire, Wis., has resigned.

STUTLER, BOYD B., of Grantsville, W. Va., is probably the youngest city executive in the United States. He is twenty-one years old. In addition to being Mayor he is also editor of the Grantville News.

TRADE NOTES

Cast Iron Pipe.—Chicago: The demand continues active for all sizes of cast iron pipe. Prices are firm. Quotations: 4-inch, \$25.50; 6 to 12-inch, \$24.50; 16-inch and up, \$24. Birmingham: The prices received for the small lots placed from time to time are very satisfactory, and in view of a stronger pig iron market an advance will no doubt be made. Only about 50 per cent of the available producing capacity is now in operation. Quotations: 4 to 6-inch, \$21; 8 to 12-inch, \$20; over 12-inch, average, \$19. San Francisco: Prices are slightly higher. Requirements of the coming season are very large. New York: Quite a large number of municipal lettings are advertised. Private buying has subsided. Quotations: 6-inch, car loads, \$21 to \$21.50.

Lead.—Lead has weakened. Quotations: New York, 4.40c.; St. Louis, 4.25c.

Cement Sidewalk Paving.—The Vulcanite Portland Cement Company, Land Title Building, Philadelphia, Pa., have published the sixth edition of their pamphlet No. 7, "Cement Sidewalk Paving Suggestions as to Method of Construction," by Albert Moyer. The instructions are clear and are illustrated so fully that a contractor not familiar with this class of work should be able to follow them and lay a good sidewalk. The instructions also contain points of value even to an experienced contractor. The pamphlet is distributed gratuitously.

Pumping Engineer.—The William Tod Company, Youngstown, Ohio, builder of engines and rolling mill equipment, has elected the following officers and directors: John Stambaugh, president; I. H. Reynolds, vice-president and general manager; H. J. Stambaugh, secretary and treasurer; L. A. Woodward, superintendent. Directors: John Stambaugh, I. H. Reynolds, Paul Jones, David Tod and H. H. Stambaugh.

Valves.—The Pittsburgh Valve, Foundry & Construction Company, Pittsburgh, has elected the following directors: Henry M. Atwood, Joseph T. Speer, C. A. Anderson, S. G. Patterson, John McCaffrey, J. G. Anderson and William Price. Mr. Price, who is president of the Diamond National Bank, is the new director, taking the place of C. R. Rhodes, deceased.

New Sewer Pipe Plant.—The Bibb Brick Company, Macon, Ga., will spend \$50,000 in an extension to its plant within the next few weeks, so as to be able to make sewer pipe and terra cotta work as well as brick. This move was decided upon recently by Messrs. W. J. and O. J. Masee, the principal owners of the concern. The necessary machinery has already been ordered.

Cast Iron Pipe.—J. K. Dimmick, Philadelphia, was elected to succeed his son, Fred D. Dimmick, as president of the Dimmick Pipe Company, at a meeting of the directors of the company held in Birmingham, Ala., February 21. Fred D. Dimmick, who has resided at Birmingham, will remove to Philadelphia to take charge of the business of J. K. Dimmick & Co. in that city, and J. K. Dimmick, who has heretofore been at Philadelphia, will remove to Birmingham. James H. Goodapple was elected secretary and treasurer of the company. The directors are James Bowron, Culpepper Exum, Erskine Ramsay, A. J. Goodwin, A. J. Brown, J. K. Dimmick and J. H. Goodapple.

Aerial Ladder.—A public test and demonstration of the new 55-foot Seagrave ladder truck for the Felton fire company, Chester, Pa., was made last week. The exhibition was under the direction of R. B. Storm, manager of the New York office of the Seagrave Company, who is also a former chief of the Fire Department of Long Branch, N. J. After the demonstration the fire committee, J. K. Hagerty, chairman, unanimously accepted the truck.

Fire Protection Company.—For the purpose of increasing the fire protection facilities in their establishments and to reduce the insurance rates nine of the largest wholesale companies in Fort Smith, Ark., recently organized the Citizens' Fire Protection Company, one of the most unique companies to apply for a charter in Arkansas. The company has a capital stock of \$25,000, of which \$12,500 has been subscribed. It has awarded the contract for the erection of a steel tank with a capacity of 100,000 gallons to be erected on a massive steel tower 150 feet high on some elevated part of the city. This tank will be connected with the wholesale houses when automatic sprinklers will be installed.

Valves.—The stockholders of the Chapman Manufacturing Company, Indian Orchard, Mass., are considering a plan proposed by a committee of their number for a financial reorganization of the business, which includes the creation of a new corporation of similar name which would take over the entire stock and business of the present company. The proposition includes increasing the preferred stock from \$300,000 to \$500,000, but also the decreasing of the common stock from \$1,000,000 to \$500,000. The action is taken at the instance of President Adolph W. Gilbert. The consummation of the plan will place the business on a more advantageous basis.

Largest Automobile Plant.—The new Studebaker corporation, recently organized, will combine the interests of the E. M. F. plant of Detroit, Mich., and the Studebaker plant at South Bend, Ind. Clement Studebaker, Jr., states that the new company will erect at Detroit the largest automobile plant in the world.

Road Machinery.—The Climax Good Roads Machinery Company, Hamilton, Ont., has been granted a charter by the Dominion Government, with a capital stock of \$40,000, to manufacture road machinery. Among the directors are John Robinson, Hanlan Robinson and William J. Robinson.

Paving Brick.—The Bessemer Limestone Company, Youngstown, Ohio, manufacturer of paving brick and owner of extensive limestone quarries, has made some changes in its organization. The position of chairman of the board of directors was created, and J. G. Butler, Jr., was elected to that office, retiring from the presidency after a service of 24 years. The resignations of C. S. Crook as treasurer and C. M. Crook as general manager were accepted. John Tod was elected president; C. C. Blair, general manager, and John A. Rowland, secretary and treasurer.

Water Tanks.—R. T. McCormick has been appointed manager of sales of the Petroleum Iron Works Company, builder of steel tanks, etc. This company has discontinued its Pittsburgh office, and will handle Pittsburgh territory business from its general offices at Sharon, Pa. Its branch offices located in various cities will be continued.

THE MUNICIPAL INDEX

In Which Are Listed and Classified by Subjects All Articles Treating of Municipal Topics Which Have Appeared During the Past Month in the Leading Periodicals

It is our purpose to give in the second issue of each month a list of all articles of any length or importance which have appeared in all the American periodicals and the leading English, French and German ones, dealing more or less directly with municipal matters. The index is kept up to date, and the month of literature covered each time will be brought up to within two or three days of publication. Our chief object in this is to keep our readers in touch with all the current literature on municipal matters. In furtherance of this we will furnish any of the articles listed in the index for the price named after each article, except that where an article is continued in two or three issues of the paper, the price given is for each of said issues. In addition to the titles, where these are not sufficiently descriptive or where the article is of sufficient importance, a brief statement of its contents is added. The length also is given, and the name of the author when it is a contributed article.

ROADS AND PAVEMENTS

Road Work in Allegheny, Pa. Illustrated, 2 pp., Engineering-Contracting, Feb. 8. 10 cts.

Good Roads Work in Washington. Paper before American Road Builders' Association. By Frank Terrace. 1 p., Good Roads February, 10 cts.

Dustless Roads of California. Paper before American Automobile Association. By A. B. Fletcher. 2 1-2 pp., Good Roads, February, 10 cts.

Highways of the Northwest. Paper before American Road Builders' Association. By S. H. Lea, State Engineer of South Dakota. 2 pp., Good Roads, February, 10 cts.

Collinsville and East St. Louis Road. Paper before the Illinois Society of Engineers and Surveyors. By A. N. Johnson. Illustrated, 1 p., Engineering Record, Feb. 25. 10 cts.

Organization of Road Building in Canada. By W. A. McLean, Provincial Engineer of Highways for Ontario. 2 pp., Contract Record, Feb. 1. 20 cts.

Roads and Bridges. Annual review of progress. 4 pp., Surveyor, Jan. 27. 20 cts.

Good Roads. Paper before Union of Manitoba Municipalities. By A. McGillivray. 3 pp., Canadian Engineer, Feb. 23. 15 cts.

Meetings, Special Road, of the American Society of Civil Engineers. 4 pp., Good Roads, February, 10 cts.

Commission, Experimental Work of the Illinois Highway. Paper before Illinois Society of Engineers. By T. R. Agg. Illustrated, 4 pp., Engineering-Contracting, Feb. 22. 10 cts.

Concerning the New York State Highway Commission and the Commission Plan of Conducting Public Works. 12-3 p., Engineering News, Feb. 9. 15 cts.

Road Construction in Dry Regions. By C. R. Thomas. 1 p., Good Roads, February, 10 cts.

Road Building in New York State; with Additional Data on Top Course of 2-in. Cubes of Clay and Concrete. By W. G. Harger. 2 pp., Illustrated, Engineering News, Feb. 2. 15 cts.

Building Fall Creek Drive, Indianapolis. Novel Method of Transporting Earth. Illustrated, 2 1-2 pp., Contractor, Feb. 1. 20 cts.

Lake Front Drive in Wisconsin. Illustrated, 1 1-2 pp., Good Roads, February, 10 cts.

Top-Soil Methods of Road Construction Used in Clarke County, Georgia. By C. M. Strahan. Illustrated, 4 1-2 pp., Southern Good Roads, January, 10 cts.

Constructing Macadam Road under Unfavorable Drainage Conditions. Illustrated, 1 1-2 pp., Engineering-Contracting, Feb. 15. 10 cts.

Rocmac Method of Road Construction. Illustrated, 2 pp., Good Roads, February, 10 cts.

Meadow Roads as Constructed in Southern New Jersey Counties. Paper before New Jersey Association of County Engineers. By E. D. Rightmire. 1 p., Engineering-Contracting, Feb. 22. 10 cts. 1 p., Engineering Record, Feb. 11. 10 cts. 2-3 p., Engineering News, Feb. 9. 15 cts.

Bituminous Highway Construction. Paper before Illinois Society of Engineers and Surveyors. By T. R. Agg. 2 1-2 pp., Contractor, Feb. 15. 20 cts.

Definitions and Discussion of Various Bituminous Materials used in Road Construction and Maintenance. 3 pp., Engineering-Contracting, Feb. 8. 10 cts.

Bituminous Concrete Roadways. From discussion before New Jersey State Association of County Engineers. By F. J. Eppele. 1-2 p., Municipal Journal and Engineer, Feb. 15. 10 cts.

Oil Macadam Work in California. Discussion before League of California Municipalities. 16 pp., Pacific Municipalities, January, 20 cts.

Road Maintenance in Cornwall. By A. E. Brookes. 1 1-4 pp., Surveyor, Feb. 3. 20 cts.

Patrol System of Maintenance Adopted by Allegheny County, Pa. By M. O. Eld-

ridge. Illustrated, 3 1-2 pp., Good Roads, February, 10 cts.

Traffic Relation Between Modern, and the Alignment and Profile in Highway Design. Paper before American Association for the Advancement of Science. By H. B. Drowne. 1 p., Engineering-Contracting, Feb. 8. 10 cts.

London Traffic. Board of Trade Report. 1 p., Surveying and Civil Engineer, Feb. 17. 20 cts.

Methods of Taking Traffic Census on Highways. Paper before American Association for the Advancement of Science. By A. H. Blanchard and I. W. Patterson. 2 1-2 pp., Surveyor, Feb. 17. 20 cts.

Comparison of English and American Traffic Regulations. By A. R. Blanchard. 3 pp., Surveyor, Feb. 10. 20 cts.

To What Extent Do Automobiles Destroy Our Roads? By L. W. Page. Illustrated, 2 pp., Southern Good Roads, February, 10 cts.

Forestry, Relation of Good Roads to Economic. By J. S. Holmes, forester North Carolina Geological and Economic Survey. Illustrated, 33 pp., Southern Good Roads, February, 10 cts.

Road Laws and Road Building. Address before Southern Appalachian Good Roads Association. By M. O. Eldridge. Illustrated, 3 1-2 pp., Southern Good Roads, February, 10 cts.

Men in Highway Work, Opportunity for Technically Trained. Paper before American Association for the Advancement of Science. By A. N. Johnson. 2 pp., Good Roads, February, 10 cts.

Opportunity for Engineers in Highway Work. Address delivered before American Good Roads Congress. By A. N. Johnson. 2-3 pp., Engineering News, Feb. 2. 15 cts.

Paving and Lighting a Small City. Description of the kind of pavement laid in Rochelle, Ill., and reasons for selecting foundation and surface material. By P. E. Green. Illustrated, 2 pp., Municipal Journal and Engineer, Feb. 8. 10 cts.

Street Paving in Germany. 1 p., Surveyor, Feb. 10. 20 cts.

Brick Pavement Details. 1-4 p., Municipal Journal and Engineer, Feb. 8. 10 cts.

Motion in Brick Pavements. Investigation to determine causes and extent. 1-4 p., Municipal Journal and Engineer, Feb. 8. 10 cts.

Cracking of Cement Grouted Brick Pavements. Paper before Michigan Engineering Society. By E. R. Whitmore. 1 1-2 pp., Engineering-Contracting, Feb. 15. 10 cts.

Good Roads Talk. Address before National Paving Brick Manufacturers' Association. By Jesse Taylor, Secretary, Ohio Good Roads Federation. 1 p., Brick, Feb. 15. 10 cts.

Concrete Pavements in Kansas City, Mo. 1 p., Engineering Record, Feb. 25. 10 cts.

Asphaltic Oils for the Preservation of Railway Ties. Paper before Wood Preservers' Association, By F. W. Cherrington. 2-3 p., Engineering News, Feb. 2. 15 cts.

Sidewalk, Curb and Gutter Construction, Some New Methods in. Paper before National Association of Cement Users. By J. B. Landfield. 1 p., Concrete, February, 15 cts.

Constructing Asphalt Drive and Peculiar Concrete Curb, Lincoln Park, Chicago. Illustrated, 1 p., Engineering-Contracting, Feb. 15. 10 cts.

Grade Crossings in Cleveland, Ohio, Elimination of Railway. Paper before Cleveland Engineering Society. By Robert Hoffman. 1 p., Engineering News, Feb. 2. 15 cts.

Landscape Point of View, Streets from the. By A. T. Edwin. 2 pp., American City, February, 10 cts.

SEWERAGE AND SANITATION

Sewer Construction. Important Concrete Work in Toronto Sewer System. Illustrated, 1 p., Concrete, February, 15 cts.

Ditching and Trenching Machinery. Paper before Illinois Society of Engineers

and Surveyors. By E. E. R. Tratman. 3 pp., Contractor, Feb. 1. 20 cts.

The Classification of Sewer Trench Excavation. 2-3 p., Engineering-Record, Feb. 11. 10 cts.

Small Dredge for Sewage Channels. By E. S. Rankin, engineer of sewers and drainage, Newark, N. J. Illustrated, 3-4 p., Municipal Journal and Engineer, Feb. 8. 10 cts.

Sewer Pipe, Standard Tests for. 1-3 p., Engineering Record, Feb. 25. 10 cts.

Cost of Constructing Reinforced Concrete Sewer Pipe at Mishawaka, Ind. Paper before Indiana Engineering Society. By W. P. Moore. 1 p., Engineering-Contracting, Feb. 15. 10 cts.

Sewerage District, Threatened Disintegration of the Passaic Valley. 3 pp., Engineering News, Feb. 23. 15 cts.

Sewage Pumping in New Orleans. Operation of six electric automatic stations. Descriptions and cost of plant and cable lines. Efficient and absolutely reliable. Illustrated, 2 1-2 pp., Municipal Journal and Engineer, Feb. 22. 10 cts.

Sewer Cleaning in New Orleans. 1-4 p., Municipal Journal and Engineer, Feb. 22. 10 cts.

Sewage Disposal at Ohio State Tuberculosis Hospital. By Paul Hansen. Illustrated, 2 pp., Engineering Record, Feb. 18. 10 cts.

Sewerage and Sewage Disposal. Annual review of progress in. 7 pp., Surveyor, Jan. 27. 20 cts.

Recent Investigations on Sewage Disposal. Extract from report of Committee on Sewage Disposal, Canadian Society of Civil Engineers. 4 pp., Contract Record, Feb. 1. 20 cts.

Market Harborough Sewage Disposal Works. By H. W. Coles. Illustrated, 4 pp., Surveyor, Feb. 17. 20 cts.

Sewage Purification in Indo-China. By Gabriel Lambert. 6 1-2 pp., La Technique Sanitaire, February, 50 cts.

Irrigation Fields of Berlin. By Dr. Bruno Heine. Illustrated, 2 pp., La Technique Sanitaire, February, 50 cts.

Filter, Chimney for Ventilating Sewage. 3-4 p., Municipal Journal and Engineer, Feb. 22. 10 cts.

Emscher Tanks for Erie. For the classification of sewage to be discharged into Lake Erie. Detail plans for a 15,000,000-gallon plant. Illustrated, 3 1-2 pp., Municipal Journal and Engineer, Feb. 15. 10 cts.

Sprinkling Filter Plant for Suburban Community. By Paul Hansen. From Municipal Journal and Engineer. Illustrated, 5 pp., Canadian Engineer, Feb. 2. 10 cts.

Odors from Sprinkling Filters. 1-2 p., Municipal Journal and Engineer, Feb. 22. 10 cts.

Covered Sprinkling Filter. 1-4 p., Municipal Journal and Engineer, Feb. 22. 10 cts.

Disinfection of Sewage and Sewage Filter Effluents. By Earl B. Phelps. Paper before Boston Society of Civil Engineers. 8 pp., Journal, Association of Engineering Societies, January, 30 cts.

Drainage Improvements at Syracuse. Illustrated, 2 2-3 pp., Engineering Record, Feb. 25. 10 cts.

Drains and Sewers. By H. Lemmoin-Cannon. Illustrated, 1 1-2 pp., Surveying and Civil Engineer, Feb. 10. 20 cts. 1 1-2 pp., Feb. 17. 20 cts.

Sanitation of Small Towns and Villages. Paper before Union of Manitoba Municipalities. By Dr. Simpson. 2 1-2 pp., Western Municipal News, February, 15 cts.

Canadian Public Health Exhibit. To be held at National Fair. 1-4 p., Municipal Journal and Engineer, Feb. 8. 10 cts.

Efficiency and Economy in Municipal Health Work. By W. A. Evans and C. St. Clair Drake. 4 pp., American City, February, 10 cts.

Co-operation in Sanitary Work. Presidential address before Institute of Sanitary Engineers. By A. J. Martin. 3 pp., Surveyor, Feb. 10. 20 cts.

Progress of Sanitation. Address before Conference of Sanitary Inspectors. By W. Urquhart. 4 pp., Journal, Royal Institute of Public Health, February, 60 cts.

Future of Sanitation. From paper be-

fore Institute of Sanitary Engineers. By A. J. Martin. 2 1-2 pp., Surveying and Civil Engineer, Feb. 10. 20 cts.

Typhoid and Tuberculosis—The Public's Responsibility. By Earl Mayo. 6 pp., Outlook, Feb. 11. 5 cts.

Sanitary Law in India. By Colonel W. G. King. 16 pp., Journal, Royal Institute of Public Health, February. 60 cts.

Drinking Fountains, Sanitary. Compilation of laws and health regulations of different States and description of a number of types of fountains. Illustrated, 8 pp., Engineering Review, February. 10 cts.

Baths, Pollution of Water in Public. Investigations in Hamburg, Germany. Pollution of water after various intervals of use; sand filtration effective; aeration unnecessary. 1 1-2 pp., Municipal Journal and Engineer, Feb. 22. 10 cts.

WATER SUPPLY

Water Supply. Annual review of progress in. 6 pp., Surveyor, Jan. 27. 20 cts.

Municipal Water Supply. By A. G. Graves. Paper before Union of Alberta Municipalities. 3 pp., Western Municipal News, February. 15 cts.

Public Water Supplies. By J. W. Hill. 6 pp., Bulletin Ohio State Board of Health, January.

Surface Water Supplies for Small Communities. Paper before Royal Sanitary Institute. By A. P. I. Cotterell. 2 pp., Surveyor, Feb. 17. 20 cts.

Stream Flow in Pennsylvania, Droughts and. By Farley Gannett. 12-3 pp., Engineering Record, Feb. 25. 10 cts.

Determination of Stream Flow During the Frozen Season. By C. R. Adams. 3 pp., Engineering News, Feb. 2. 15 cts.

Conservation of British National Water Resources. By W. R. Baldwin-Wiseman. 5 pp., Surveying and Civil Engineer, Feb. 3. 20 cts. 3 pp., Feb. 10, 20 cts. 4 pp., Feb. 17, 20 cts.

Impure Water, Liability for. Different views taken by State courts. 3-4 pp., Municipal Journal and Engineer, Feb. 22. 10 cts.

State Boards in New York and Other States, Multi-Control of Water Works by. 1 p., Engineering News, Feb. 9. 15 cts.

Water Works, Dayton. 1-4 pp., Municipal Journal and Engineer, Feb. 22. 10 cts.

Toledo Water Works Notes. 1-4 pp., Municipal Journal and Engineer, Feb. 22. 10 cts.

Columbia Water Works. Pumping by hydraulic power plant; turbines and centrifugal and plunger pumps; auxiliary steam plant; purification by mechanical filters of the gravity type. By John McNeal, city engineer. Illustrated, 2 pp., Municipal Journal and Engineer, Feb. 8. 10 cts.

Seattle Water Works System. Illustrated, 11-2 pp., Fire and Water, Feb. 1. 10 cts.

Water Works System of Winnipeg. By R. D. Willison, assistant city engineer. Illustrated, 12-3 pp., Fire and Water, Feb. 8. 10 cts.

London Water Supply. 2-3 p., Contract Journal, Feb. 15. 20 cts.

Reservoir, a Reinforced Concrete, at Kensington, Conn. By Arthur W. Bacon. Illustrated, 11-3 pp., Engineering Record, Feb. 18. 10 cts.

Construction of Brown's Reservoir. 11-3 pp., Engineering Record, Feb. 11. 10 cts.

New Reservoir at Oakland. 2-3 pp., Fire and Water, Feb. 1. 10 cts.

Dam, Design and Computations for a Cellular Reinforced Concrete. Paper before Colorado Scientific Society. By G. J. Bancroft. Illustrated, 3 1-2 pp., Canadian Engineer, Feb. 9. 15 cts.

The Azisochos Reservoir Dam in Maine. Paper before National Association of Cement Users. By S. A. Moulton. Illustrated, 4 pp., Contractor, Feb. 1. 20 cts.

Construction of the New Croton Dam. Paper before American Society of Engineering Contractors. By Edw. Wegmann and J. B. Goldsborough. Illustrated, 61 pp., Journal Society of Engineering Contractors, November.

Standpipe, Concrete of Maximum Density for a. Illustrated, 1 p., Engineering Record, Feb. 11. 10 cts.

Methods Used in Obtaining Concrete of Maximum Density for the Westerly, R. I., Standpipe. Remarks before Boston Society of Civil Engineers. By A. B. MacMillan. Illustrated, 1 p., Engineering-Contracting, Feb. 15. 10 cts.

Pipe, Reinforced-Concrete Pressure, on the Umatilla Project, Ore., U. S. Reclamation Service. By Herbert D. Newell. Illustrated, 22-3 pp., Engineering News, Feb. 16. 15 cts.

Tunnel and Intake Crib, The Construction of the Buffalo Waterworks. By C. H. Hollingsworth. Illustrated, 82-3 pp., Engineering News, Feb. 9. 15 cts.

Aqueduct, Tufa Concrete on the Los Angeles. Paper before National Association of Cement Users. By J. B. Lippincott. Il-

lustrated, 5 pp., Cement Age, February. 15 cts.

Infiltration Plants, Some Features of Design of. Paper before the Ohio Engineers Society. By Philip Burgess. 11-3 p., Engineering Record, Feb. 4. 10 cts.

Water Purification and Its Application at Grand Forks. Paper before North Dakota Civil Engineers. By H. G. Lykken, city engineer, 1 p., Fire and Water, Feb. 15. 10 cts.

Filters, Construction of Springfield. From paper before Boston Society of Civil Engineers. By C. R. Dow, 5 1-2 pp., Contractor, Feb. 15. 20 cts.

Form Work for Arch Reservoir and Conduits, Pittsburg Filtration Works. Paper before Engineers Society of Western Pennsylvania. By J. D. Stevenson. Illustrated, 8 pp., Canadian Engineer, Feb. 16. 15 cts.

Double Filtration of Water. From paper by H. W. Clark before New England Water Works Association. 1-2 p., Municipal Journal and Engineer, Feb. 8. 10 cts.

Sterilization of Public Water Supplies. By Geo. A. Johnson. Paper before Boston Society of Civil Engineers. 12 pp., Journal Association of Engineering Societies, January. 30 cts.

Temporary Water Disinfecting Plant at Brainerd. By Frederick Bass. Illustrated, 1 p., Engineering Record, Feb. 11. 10 cts.

Hypochlorite Treatment of the Omaha Water Supply. By Jay Craven. Illustrated, 1 p., Engineering Record, Feb. 4. 10 cts.

Lime for Water Purification. Paper before Indiana Sanitary and Water Supply Association. By W. R. Copeland, chemist Columbus, O., water purification works. 1 p., Fire and Water, Feb. 22. 10 cts.

Effect of Hypochlorite of Lime Solution on Metals. Paper before New England Water Works Association. By H. C. Stevens. 1 p., Engineering-Contracting, Feb. 8. 10 cts.

The Sterilization of Water by Ultra-violet Rays. By Max von Recklinghausen. Illustrated, 5 pp., La Technique Sanitaire, February. 50 cts.

Electrolytic Purification, Experience in Massachusetts and California. 1-3 p., Municipal Journal and Engineer, Feb. 8. 10 cts.

Water Analysis and the Public Health. Paper before Union of Alberta Municipalities. By D. G. Revell, provincial bacteriologist for Alberta. 5 pp., Western Municipal News, February. 15 cts. 4 pp., Canadian Engineer, Feb. 23. 15 cts.

Memorandum on the Routine Examination of Indian Water Supplies. By Brevet-Colonel R. H. Firth, Royal Army Medical Corps. 5 pp., Indian Public Health, January. 25 cts.

Water Rates. Comment on their meaning and lack of meaning. 1-3 p., Municipal Journal and Engineer, Feb. 15. 10 cts.

Water Rates in Many Cities. An analysis of flat and meter rates in 249 cities. Very wide range of rates. 1 p., Municipal Journal and Engineer, Feb. 15. 10 cts.

Rate of Acquisition of Income for Domestic Water Service from Different Classes of Residential Property. Paper before New England Water Works Association. By F. C. Jordan. Illustrated, 2-3 p., Engineering-Contracting, Feb. 8. 10 cts.

Valuation of the Physical Property of the Peoria Water Company, with the discussion of rate making and of reasonable rates. 3 pp., Engineering-Contracting, Feb. 15; 3 pp., Feb. 22. 10 cts.

Meterage, Strong Plea for. By F. E. Wing. 2-3 p., Fire and Water, Feb. 22. 10 cts.

Labor Saving Devices Found Useful in Water Works Plants. Illustrated, 1 p., Engineering Record, Feb. 25. 10 cts.

Records, Pipe System. By R. D. Gwinn. 1 p., Engineering-Contracting, Feb. 22. 10 cts.

Efficiency in the Department of Water Supply, New York City. An Official Statement Regarding Progress and Increased. 2-3 p., Engineering News, Feb. 16. 15 cts.

STREET LIGHTING AND POWER PLANTS

Street Lighting. Annual review of progress in. 2 pp., Surveyor, Jan. 27. 20 cts.

Chicago Street Lighting. Report of Commission of City Expenditures. 3-4 p., Municipal Journal and Engineer, Feb. 8. 10 cts.

German vs. American Street Lighting. By R. F. Pierce. Illustrated, 3 pp., Public Service, February. 20 cts.

Lamps in New York, Flaming Arc. By H. Thurston Owens. Illustrated, 11-2 pp., Electrical Review, Feb. 25. 10 cts.

Municipal Control of Construction and Maintenance of Pole and Pipe Lines. Paper before Union of Nova Scotia Municipalities. By F. W. W. Doane. 2 1-2 pp., Canadian Municipal Journal, February. 10 cts.

Poles, Some Observations on the Attack of, by Woodpeckers. By Howard F. Weiss.

Illustrated, 1 p., Engineering News, Feb. 23. 15 cts.

Gas Holder, Construction of Reinforced Concrete Tank for. Paper before American Gas Institute. By V. L. Elbert. Illustrated, 9 pp., American Gas Light Journal, Feb. 13. 10 cts.

Meters, Accuracy of Consumers'. Paper before American Gas Institute. By W. A. Castor. 4 1-2 pp., American Gas Light Journal, Feb. 27. 10 cts.

Gas Calorimetry, Technical. Paper before Society of Chemical Industry. By J. H. Coste. Illustrated, 7 pp., Chemical Engineer, February. 25 cts.

Sampling Fuel Gas. Illustrated, 1-2 p., Municipal Journal and Engineer, Feb. 15. 10 cts.

Hydro-electric Development at Ventavon, France. Illustrated, 12-3 pp., Engineering Record, Feb. 18. 10 cts.

Municipal Hydro-electric Power Development at Revelstroke. Illustrated, 3 1-2 pp., Canadian Engineer, Feb. 16. 15 cts.

Water Power in New York State, Reasons for Public Development and Control of. 1 p., Engineering News, Feb. 16. 15 cts.

Boiler Efficiency, Combustion and. By E. A. Uehling. Paper before American Society of Mechanical Engineers. 5 pp., Industrial Engineering, February. 20 cts.

FIRE DEPARTMENT

Fire Hazard, Report on Woonsocket. 1 p., Fire and Water, Feb. 1. 10 cts.

Fire Starting from Steam Pipes. Illustrated, 2-3 p., Fire and Water, Feb. 22. 10 cts.

Report on Fire Conditions at Sacramento, Cal. 2-3 p., Fire and Water, Feb. 22. 10 cts.

Is There Danger of Big Conflagration in New York? 1 p., Fire and Water, Feb. 15. 10 cts.

Fire Resistance, Building Materials from the Standpoint of. Discussion before the American Society of Mechanical Engineers. Illustrated, 6 pp., Cement Age, February. 15 cts.

Evolution of Fire-Resisting Construction. Paper before Surveyors' Institution. By Wm. Woodward. 3 pp., Surveying and Civil Engineer, Feb. 10. 20 cts. 11-2 pp., Surveyor, Feb. 10. 20 cts.

How to Build Chimney. Illustrated, 1 p., Fire and Water, Feb. 22. 10 cts.

Fire Protection at Clarksburg, W. Va. 1-2 p., Fire and Water, Feb. 8. 10 cts.

Report on Fire Protection at Colorado Springs. 3-4 p., Fire and Water, Feb. 22. 10 cts.

High Pressure Fire System for Boston. By the Committee on Fire Prevention of the National Board of Fire Underwriters. 2 pp., Engineering Record, Feb. 18. 10 cts.

Fire Loss and How It Can be Reduced. By W. H. Merrill. 2-3 p., Engineering News, Feb. 9. 15 cts.

Fire Department Improvements at Grand Rapids. 1 p., Fire and Water, Feb. 8. 10 cts.

Report on Fire Service at Stockton. 2-3 p., Fire and Water, Feb. 1. 10 cts.

Repair Shop for Boston, New. Illustrated, 1-2 p., Fire and Water, Feb. 8. 10 cts.

GOVERNMENT AND FINANCE

Commission Government. Cities which have adopted it to date; what is meant by this term; essential features; non-essential features; number of commissioners and length of term. 3 1-2 pp., Municipal Journal and Engineer, Feb. 22. 10 cts.

Will Commission Government Succeed in Large Cities? By R. S. Childs. 3 pp., American City, February. 10 cts.

Government by Commission. By C. R. Woodruff. 11-3 pp., Municipal Journal, Jan. 28. 15 cts.

Municipal Profits in England. 3-4 p., Canadian Municipal Journal, February. 10 cts.

Mayor's Cabinet as Organized in Kansas City, Mo. By Mayor D. A. Brown. 1-2 p., Municipal Journal and Engineer, Feb. 15. 10 cts.

Semi-Official Municipal Body. 1-3 p., Municipal Journal and Engineer, Feb. 15. 10 cts.

Municipal Review, 1909-1910. By C. R. Woodruff. 33 pp., Journal of Sociology, January. 50 cts.

Legislation of 1909 and 1910 in Great Britain in Relation to Municipal Engineering. 6 pp., Surveyor, Jan. 27. 20 cts.

Bonds, Issue of Municipal. Paper before League of Third Class Cities in Pennsylvania. By Park Terrell. 4 pp., American City, February. 10 cts.

Apportionment of Cost of Construction and Maintenance of the Massachusetts Metropolitan Sewerage, Park and Water Systems. By J. Albert Holmes. 2 pp., Engineering News, Feb. 23. 15 cts.

Records, Value of City. 1-3 p., Municipal Journal and Engineer, Feb. 8. 10 cts.

TRAFFIC AND TRANSPORTATION

Urban Transportation Problem. A general discussion. By B. J. Arnold. 11 pp., Annals of the American Academy of Political and Social Science, January. \$1.

City Transportation Problems: A Report by Blon J. Arnold on the Pittsburgh Situation. Illustrated, 3 pp., Engineering News, Feb. 9. Illustrated, 4 pp., Engineering News, Feb. 16. 15 cts.

Presentation of Interurban Problems to the Public. By A. B. D. Van Zandt. 9 pp., Annals of American Academy of Political and Social Science, January. \$1.

Investigation of Traffic Possibilities of Proposed Subway Line. By W. S. Twining. 9 pp., Annals of American Academy of Political and Social Science, January. \$1.

Educating the Public to a Proper Appreciation of Urban Street Railway Problems. By A. W. Warnock. 6 pp., Annals of American Academy of Political and Social Science, January. \$1.

Efficiency of Surface Lines in Large Cities. Methods of Increasing the. By Williston Fish. 16 pp., Annals of American Academy of Political and Social Science, January. \$1.

Financial Returns upon Urban Street Railway Properties, Decreasing. By Thos. Connelly. 17 pp., Annals of American Academy of Political and Social Science, January. \$1.

Express Business on Interurban Lines. By A. Eastman. 4 pp., Annals of American Academy of Political and Social Science, January. \$1.00.

Freight Traffic on Interurban Lines, Possibilities of. By F. S. Cummings. 10 pp., Annals of American Academy of Political and Social Science, January. \$1.00.

Cars for Urban Service, Economic Factors in the Selection of. By S. M. Curwen. Illustrated, 10 pp., Annals of American Academy of Political and Social Science, January. \$1.

Depreciation Problem. By Wm. B. Jackson. 12 pp., Annals of American Academy of Political and Social Science, January. \$1.

Valuations of Interurban Street Railways, Logical Basis for. Paper before Central Electric Railway Association. By C. G. Young. 7 pp., Electrical Review, Feb. 4. 10 cts.

Tramways. Annual Review of Progress in. 2 pp., Surveyor, Jan. 27. 20 cts.

The Year of Tramways. Official returns comparing municipal and company undertaking. 1-2 pp., Municipal Journal, Feb. 11. 15 cts.

Electrification of the Steam Railway Lines Entering Boston. Report of the "Joint Board on Metropolitan Improvements" on the. By A. H. Smith and E. H. McHenry. 2-3 pp., Engineering News, Feb. 2. 15 cts.

Subway System for Chicago. The Proposed. Illustrated, 2-1-3 pp., Engineering News, Feb. 23. 15 cts.

Plans and Estimates for Chicago Subway System. Illustrated, 7 pp., Engineering-Contracting, Feb. 15. 10 cts.

McAdoo and the Subway. The Building and Builder of the Hudson tunnels. By Burton J. Hendrick. Illustrated, 16 pp., McClure's, March. 15 cts.

Franchises—Public and Company Rights. By A. S. Huey. 3-1-2 pp., Public Service, February. 20 cts.

The Indeterminate Permit as a Satisfactory Franchise. By W. O. Morgan. 8 pp., Annals of American Academy of Political and Social Science, January. \$1.

Intangible Street Railway Property. Valuation of. By F. R. Ford. 23 pp., Annals of American Academy of Political and Social Science, January. \$1.

Engineers and Street Railway Service. Supervising. 22 pp., Annals of American Academy of Political and Social Science, January. \$1.

Street Railway Civil Engineer. By C. H. Clark. 3 pp., Cornell Civil Engineer, February. 20 cts.

State Supervision of Electric Railways in Wisconsin. By B. H. Meyer. 20 pp., Annals of American Academy of Political and Social Science, January. \$1.

BRIDGES AND MATERIALS OF CONSTRUCTION

Bridges and Culverts, Construction of Highway. 1-2 p., Contractor, Feb. 15. 20 cts.

Michigan Bridges and Culverts. By E. N. Hines, county road commissioner, Wayne County. 3 pp., Public Officials' Magazine, January. 10 cts.

Designing Concrete Abutments for Steel Highway Bridges. Paper read at the annual meeting of the Illinois Society of Engineers and Surveyors. By H. E. Bilger. Illustrated, 1 p., Engineering News, Feb. 16. 15 cts. Illustrated, 2-1-2 pp., Engineering-Contracting, Feb. 15. 10 cts.

The Grafton Bridge at Auckland, New Zealand. By Walter E. Bush. Illustrated. 3 pp., Engineering Record, Feb. 18. 10 cts.

Bridge Collapse Caused by a Remarkable Abutment Failure. By Cornelius M. Daily. Illustrated, 2-3 p., Engineering News, Feb. 16. 15 cts.

The Hackensack River Bridge Piers. Illustrated, 1-1-3 pp., Engineering Record, Feb. 25. 10 cts.

Concrete Bridges in Augusta County, Va. Illustrated, 1 p., Good Roads, February. 10 cts.

Building a Concrete Bridge under Difficult Conditions. By W. M. Denman. Illustrated, 1-1-3 p., Engineering Record, Feb. 25. 10 cts.

Noteworthy Reinforced Concrete Bridge. By T. A. S. Hay, city engineer, Peterborough. Illustrated, 3 pp., Contract Record, Feb. 1. 20 cts.

Thorough Reinforced-Concrete Arch Bridge. By E. A. Gast. Illustrated, 1-2-3 pp., Engineering News, Feb. 16. 15 cts.

Arch-Bridge with Sidewalks through Abutments. Illustrated, 1 p., Engineering Record, Feb. 25. 10 cts.

The Fifth Avenue Viaduct at Seattle. Illustrated, 1-1-3 pp., Engineering Record, Feb. 18. 10 cts.

Crushed Stone, Items in the Cost of Producing. 2-3 p., Engineering Record, Feb. 18. 10 cts.

Concrete, Some Thermal Properties of. Paper before National Association of Cement Users. By C. L. Norton. Illustrated, 5 pp., Cement Age, February. 15 cts.

Tensile Tests of Large Concrete Specimens. 1-3 p., Engineering Record, Feb. 18. 10 cts.

Notes on Forms for Concrete. Paper before Engineers' Society of Western Pennsylvania. By J. D. Stevenson. 2-1-2 pp., Contractor, Feb. 1. 20 cts.

Tests of Reinforced Concrete Columns with Various Kinds of Transverse Reinforcement. Illustrated, 1-1-3 pp., Engineering News, Feb. 23. 15 cts.

Piles, Over-Driven. Brooklyn Fourth Avenue Subway Construction. By S. P. Brown. Illustrated, 1 p., Engineering News, Feb. 23. 15 cts.

Electrolysis, Effect of, on Metal Imbedded in Concrete. Paper before National Association of Cement Users. By C. M. Chapman. Illustrated, 4 pp., Concrete, February. 15 cts.

Columns, Investigation of Built-up, under load. By A. N. Talbot and H. F. Moore. Illustrated, 64 pp., University of Illinois, Bulletin No. 40.

The Strength of Piers or Columns of Different Materials. Illustrated, 1-3 p., Engineering News, Feb. 9. 15 cts.

Water-Proofing Concrete, Tests of Soft Soap for. 2-3 p., Engineering Record, Feb. 25. 10 cts.

Experiments Made with Waterproofing with Water. Paper before National Association of Cement Users. By C. M. Chapman. Illustrated, 3 pp., Concrete, February. 15 cts.

MISCELLANEOUS

Town Planning, Suggestions for improvement of Southport on a system of radiating boulevards. Illustrated, 3 pp., Municipal Journal, Jan. 28. 15 cts.

A Small City's Plan for Growth. By H. J. Hooker. Description of Altus, Okla. Illustrated, 5 pp., American City, February. 10 cts.

Relation of City Planning to the Municipal Budget. Address before Conference of New England Mayors. By G. A. Ford. 6 pp., American City, February. 10 cts.

The City Practical. Popular discussion of report by Mr. F. L. Olmsted on the improvement of Pittsburgh. By H. F. Howland. Illustrated, 10 pp., Outlook, Feb. 25. 15 cts.

Pittsburgh City Plan. Thoroughfares, civic centers and waterfront. By F. L. Olmsted. Illustrated, 22 pp., Survey, Feb. 4. 25 cts.

City Surveys for Town Planning. Paper before Birkenhead Congress of 1910. By Prof. P. Geddes. Illustrated, 11 pp., Journal Royal Institute of Public Health, February. 60 cts.

Housing Conditions in Chicago: Back of the Yards. By S. P. Brechinridge and Edith Abbott. Illustrated, 34 pp., Journal of Sociology, January. 50 cts.

Housing and Town Planning Progress. Official monthly record. 1 p., Municipal Journal, Feb. 11. 15 cts.

The Housing Awakening. New tenants and old shacks. By R. N. Baldwin, secretary St. Louis Civic League. Illustrated, 3 pp., Survey, Feb. 18. 10 cts.

Municipal Furnished Rooms. A novel proposal for solving the housing problem. By Isaac Priestley, sanitary inspector, Manchester. Illustrated, 2 pp., Municipal Journal, Feb. 11. 15 cts.

Coalition of Pittsburgh's Civic Forces. By A. T. Burns. 7 pp., Survey, Feb. 4. 25 cts.

Regulation in New York, Fruits of Public. By M. R. Maltbie. 21 pp., Annals of American Academy of Political and Social Science, January. \$1.

Ferries, New York's Municipal. More than six million dollars lost in city ownership project. By W. F. Brashears. Illustrated, 2 pp., Public Service, February 20. 15 cts.

Telephone System of Greater New York. Description of the largest plant in the world. From address by President U. N. Bethell. Illustrated, 7 pp., Electrical Review, Feb. 25. 10 cts.

Garage and Automobile Service at St. Louis, Mo., Municipal. Fifteen machines cared for; controlling use to prevent improper use; economies effected by the use of automobiles. By C. C. Casey. Illustrated, 2 pp., Municipal Journal and Engineer, Feb. 15. 10 cts.

Foundations at the Municipal Building, New York, Testing. Illustrated, 1-1-3 pp., Engineering Record, Feb. 18. 10 cts.

Abattoirs, Liverpool. 1 p., Municipal Journal, Feb. 11. 15 cts.

Port Facilities of Philadelphia, Improvement of the 2-3 p., Engineering News, Feb. 16. 15 cts.

Explosives, Danger of Handling. 1-1 p., Fire and Water, Feb. 15. 10 cts.

BOOK REVIEWS

Municipal Chemistry. Edited by Chas. Baskerville. Published by McGraw-Hill Book Company, New York City. 8vo. 526 pages. Price \$5.00 net.

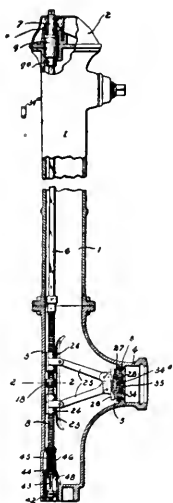
This book comprises a series of lectures delivered under the auspices of the College of the City of New York in 1910, which were open to the public. There are thirty lectures in all, the general subjects treated being water, milk, food, drugs, street city wastes, gas, smoke, ventilation, personal hygiene, combustibles, paint, iron concrete and parks. These thirty lectures were delivered by twenty different authorities, experts and city officials, and might be expected, the nature of the lectures varies greatly. Some are quite general and popular in their nature, while others give exact and technical information. While in general the lectures deal with chemistry as applied to the various functions of complex city life, in some of them this idea is almost entirely obscured by other cases of information concerning the subject; as, for instance, in the case of the lecture on street sanitation, by Wm. I. Edwards, Commissioner of Street Cleaning, of New York City. In another lecture on Waste Disposal, delivered by Mr. Edward D. Very, a great deal of the matter treats of the general method of collecting and disposing of wastes by dumping, the removal of snow and other branches of the subject on which chemistry has practical no bearing.

An idea of how the various subjects are treated can best be conveyed, perhaps, by giving the names of those who delivered the lectures, since most of them and the style of writing are well known. They included the editor, who is a professor of chemistry and director of the laboratory at the College of the City of New York; Professor W. P. Mason, of Rensselaer Polytechnic Institute; Mr. A. D. Flinn, Engineer of the Board of Water Supply; Dr. T. C. Darlington, ex-Commissioner of Health of New York City; Mr. H. V. Wiley, Chief of the Bureau of Chemists of the U. S. Government; Mr. W. A. Hamor, Research Assistant to Professor of Chemistry, College of the City of New York; Mr. Virgil Coblenz, Professor of Chemistry, Columbia University; Dr. L. J. Kebler, Chief, Division of Drugs, U. S. Bureau of Chemistry; Mr. A. S. Cushman, Acting Director, Office of Roads, U. S. Department of Agriculture; Mr. W. I. Edwards, Commissioner of Street Cleaning, New York City; Mr. E. S. Very, Sanitary Engineer, Department of Street Cleaning, New York City; Prof. C. E. A. Winslow of the Massachusetts Institute of Technology and the College of the City of New York; Mr. A. H. Elliott, Engineer Chemist to the New York Consolidated Gas Company; Dr. P. B. Parsons, formerly of the Metropolitan Sewerage Commission, New York City; Mr. H. R. Moody, Associate Professor of Chemistry, College of the City of New York; Prof. T. A. Storey, Director Department of Physical Instruction and Hygiene, College of the City of New York; Prof. L. A. Olney, Professor of Chemistry and Dyeing, Lowell Textile School, Lowell, Mass.; Mr. A. A. Brennan, expert member Municipal Explosives Commission, New York City; Mr. Maximilian Tech, paint expert, and Mr. N. Britton, Director of the Botanical Garden, Bronx Park, N. Y.

The book is profusely illustrated and has an extensive index.

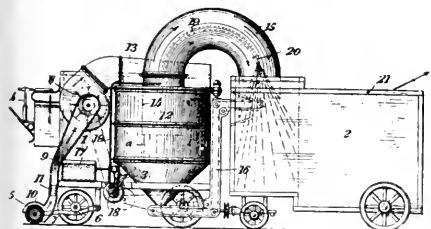
PATENT CLAIMS

983,268. FIRE-HYDRANT. William W. Corey, St. Louis, Mo. Serial No. 573,795.
 In a hydrant, the combination with a stand pipe having a main valve, of a sectional valve operating rod, a sleeve which



receives the adjacent ends of two of the sections of the valve operating rod, and a longitudinally adjustable member within said sleeve and forming a connection between the sections of the valve operating rod.

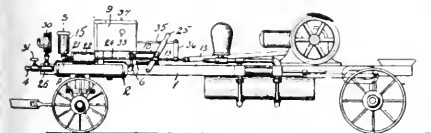
983,293. STREET-DUST-REMOVING MACHINE. Arnold Kündig-Honegger, Zurich, Switzerland. Serial No. 320,778.
 In a machine of the character described the combination with a suction conduit, of a separating chamber communicating therewith provided with a discharge orifice in its bottom, a dust removing conduit hav-



ing its receiving end inside the chamber near the orifice and its discharge end extending out of the chamber, a conveyor beneath the orifice extending to a point near the discharge end of the conduit, and a moistening device in the latter near its discharge end.

984,231. CHEMICAL FIRE-ENGINE. Henry M. Minnis, Wylie, Tex., assignor to Samuel Potts and C. D. Love, Wylie, Tex. Serial No. 560,782.

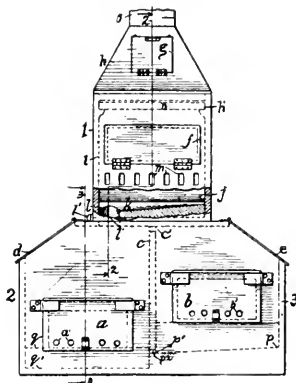
In a chemical fire-engine, the combination with a frame, of a charging tank mounted on the frame and provided with an outlet, a receptacle for receiving soda water mounted adjacent the tank, a pump cylinder interposed between the tank and receptacle, a pipe connection from the tank to the receptacle to which the cylinder is also connected, a pair of check valves in the pipe connection, a valve being located on each side of the point of connection with cylinder, an acid receptacle, a



hand operated pump interposed between the acid receptacle and the tank, a pipe connecting the said acid receptacle with the tank and to which the hand pump is also connected, a pair of check valves in the last named pipe, a valve being disposed on each side of the point of connection to the hand pump, a piston working in the first named pump cylinder, a swinging agitator operating in the soda water receptacle, and an operating connection between the piston and the agitator.

983,765. GARBAGE-CREMATORY. Chas. A. Raggio, Chicago, Ill., assignor of one-half to Louis G. Raggio, Chicago, Ill. Serial No. 466,302.

In combination with garbage and ash receptacles, a rubbish furnace on said receptacles, said rubbish furnace provided with a floor having therein a draft opening



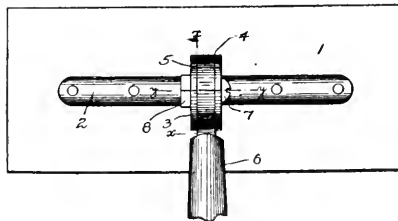
ing and means for air draft above said floor, the rubbish furnace being in communication with the ash receptacle through the aforementioned draft opening whereby a draft will be created by the rubbish furnace through said draft opening to carry off foul odors from the ash receptacle, substantially as described.

984,543. COMPOUND FOR FORMING PAVING. David Crockett, Birmingham, Ala. Serial No. 565,024.

A compound, comprising tar, lime, sand, cracked stone and acetic acid in the proportion specified and commingled in the manner set forth.

985,074. TOOL FOR CEMENT WORK. Ralph L. Sohn, Arrowsmith, Ill., assignor of one-third to Henry M. Scott and one third to Walter A. Scott, Arrowsmith, Ill. Serial No. 553,863.

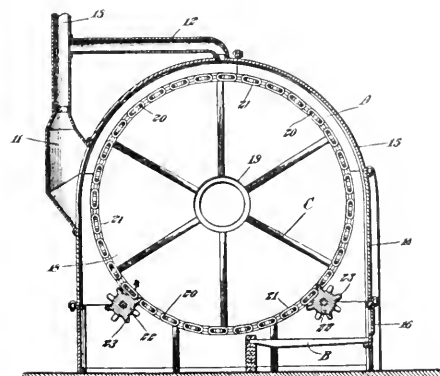
The combination, with a tool of the character described, having a bifurcated post, of a handle provided with a radially slotted disk at its end fitting the bifurcation in said post, said slot being accurate



and having a more decided turn at its inner extremity forming a shoulder for the purpose specified, and a bolt passed through said post and engaging the slot in said disk for clamping the latter in the post.

984,646. INCINERATOR. Pierre Isidore Bois, Ottawa, Ontario, Canada. Serial No. 542,614.

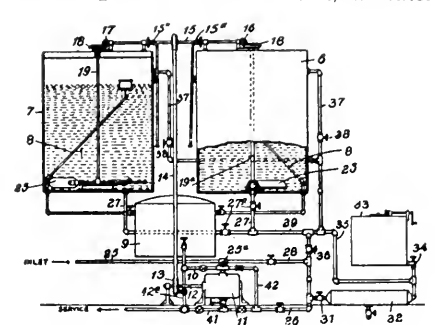
An incinerator comprising in combination a drum formed with frusto conical side members connected at the periphery by transverse cross-bars and chain links connecting the cross-bars, a casing inclosing the drum having a flue leading



therefrom, a cylindrical member journaled in the casing and being adapted to support the drum and having teeth entering the spaces between the links, means for driving said cylindrical member and a grate in the casing beneath the drum.

984,635. WATER-PURIFYING APPARATUS. Edwin S. Woods, Chicago, Ill., and John C. W. Greth, Pittsburg, Pa., assignors to Wm. E. Scaife & Sons Company, Pittsburg, Pa., a Corporation of New Jersey. Serial No. 414,266.

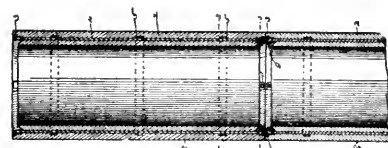
The combination in a water-purifying system of a plurality of treatment tanks, a stirring device in each tank, a water



motor connected in the outlet line from all said tanks, a water inlet pipe having also a connection to said motor, and connections from the motor to the stirring devices whereby the latter may be continuously operated, the motor being driven either by incoming or outflowing water.

984,847. SOLID-JOINT, CEMENT, REINFORCED PIPE. Craig Poling, Nebraska City, Neb., assignor of one-half to Frank M. Neville. Serial No. 544,750.

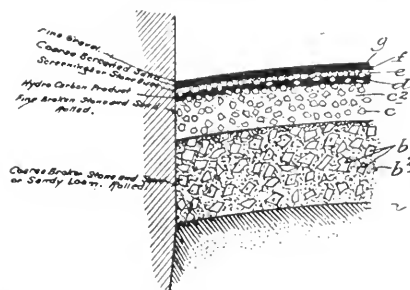
In a cement pipe of the kind described, comprising pipe sections joined together, each of said sections provided with longitudinal strips, each pipe section provided with a concavity in each of its ends, each metallic strip having its ends protruding into its respective concavity, a longitu-



dinal perforation provided in each of the ends of each strip, an inwardly projecting lug provided with a key received by each longitudinal perforation in each strip, said lugs having their faces parallel to each other when in normal position, each of said lugs provided with a corresponding perforation, means comprising a nut and bolt connection to connect the lugs of the meeting ends of each two corresponding strips in the adjacent pipe sections, the bolt of said nut and bolt connection passing through the perforations in each two corresponding lugs.

984,801. METHOD OF MAKING PAVEMENTS. Cloyd Davis, Mineola, N. Y. Serial No. 545,388.

The herein described method of making pavements consisting of first providing a road bed, covering the same with a layer of broken stone, filling said layer of broken stone with sand or sandy loam, rolling the surface thus produced, covering said surface with another layer of broken stone, the stone being of less dimensions than those of the first layer, filling in said layer with sand to within a predetermined point of the top thereof and rolling the same, then placing thereon a layer consisting of a hydrocarbon product, the thickness of which is not sufficient to thoroughly



cover the last layer of stone, then covering the said last layer of stone and the layer consisting of a hydrocarbon product with screenings or stone dust, sufficient to cover the broken stone, then covering the screenings or stone dust with a thin layer of coarse screened sand, then brooming until the screenings and sand are thoroughly mixed and then rolling the surface thus produced.

THE WEEK'S CONTRACT NEWS

Relating to Municipal and Public Work—Street Improvements—Paving, Road Making, Cleaning and Sprinkling—Sewerage, Water Supply and Public Lighting—Fire Equipment and Supplies—Bridges and Concrete Work—Sanitation, Garbage and Waste Disposal—Police, Parks and Miscellaneous—Proposals and Awards

To be of value this matter must be printed in the number immediately following its receipt, which makes it impossible for us to verify it all. Our sources of information are believed to be reliable, but we cannot guarantee the correctness of all items. Parties in charge of proposed work are requested to send us information concerning it as early as possible; also corrections of any errors discovered.

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREET IMPROVEMENTS				
Ohio	Cincinnati	Mar. 10, noon	Building culvert	J. H. Sundmaker, Dir. Pub. Serv.
Indiana	LaFayette	Mar. 10, 10 a.m.	Constructing gravel road	Geo. W. Baxter, Auditor.
New York	Buffalo	Mar. 10, 11 a.m.	Paving and repaving various streets	Francis G. Ward, Commissioner.
New York	New York	Mar. 10, 2 p.m.	Regulating and repaving portions of various streets	Geo. McAneny, Boro. President.
Washington	Spokane	Mar. 10, 2 p.m.	Grading, curbing, parking and sidewalk. West Grove Addition	J. C. Argall, Secy. Bd. Pub. Works.
Michigan	Bay City	Mar. 11	Furnishing creosoted blocks, plank etc.	J. H. Bloomfield, County Engr.
Indiana	Muncie	Mar. 11	Paving various streets	J. Kelly, City Clerk.
Indiana	Brazil	Mar. 11, 11:30 a.m.	Constructing 7,655 ft. of gravel road; 10,000 ft. limestone road	W. E. Staggs, County Auditor.
Ohio	Bowling Green	Mar. 13	Constructing stone road	Wood County Commissioners.
Pennsylvania	Youngwood	Mar. 13	Paving about 2 miles of street with brick blocks	Warren Mitchell Greensburg, Bor. E.
Minnesota	Worthington	Mar. 13, 2 p.m.	Grade approx. 10,066 yards of streets	E. C. Pannell, Co. Aud.
Kansas	Fort Scott	Mar. 13, 5 p.m.	Grading and macadamizing portion of First street	J. O. Brown, City Clerk.
Kansas	Topeka	Mar. 13, 2:30 p.m.	Paving 21 blocks with vitrified brick, necessary storm sew. &c.	C. B. Burge, City Clerk.
Ohio	Youngstown	Mar. 13, 1:30 p.m.	Improving various roads	Frank Agnew, Secy.
Indiana	Lebanon	Mar. 13, 7:30 p.m.	Grading, graveling and sewerage Baronne Street	Edmon Connor, City Clerk.
New York	Brooklyn	Mar. 13, 11 a.m.	Curbing, paving, grading etc., several streets	Lawrence Gresser, Boro. President.
Tennessee	Memphis	Mar. 14, noon	Paving about 8,500 sq. yds. with vitrified brick; about 80,000 sq. yds. with tar macadam and 10,000 sq. yds. with wood blks	J. H. Weatherford, City Engineer.
Indiana	Indianapolis	Mar. 14	Furnishing 5-ton road roller for asphalt plant	Christian Schrader, Pres. Bd. P. Wks.
Iowa	Red Oak	Mar. 15, 10 a.m.	Grading approximately 6,000 cu. yds.; 25,411 yds. brick paving; 3,312 yds. concrete paving	Richard Roberts, City Clerk.
Pennsylvania	Meadville	Mar. 15, 8 p.m.	Grading, curbing and paving portion of Market Alley	Fred C. Kribort, City Clerk.
Alberta, Can.	Calgary	Mar. 15, noon	Constructing concrete sidewalks	W. D. Spence, City Clerk.
Washington	Olympia	Mar. 15, 2 p.m.	Grad., drain and pave with asphaltic mac. por. of State Aid Rd	Henry L. Bowlby, Secy. Hwy. Bd.
Kansas	Topeka	Mar. 16, 2:30 p.m.	Paving 20 blocks with vitrified brick, nec. stm. sew. &c.	C. B. Burge, City Clerk.
New Jersey	Jersey City	Mar. 16, 3:30 p.m.	Reconstructing certain sections of Hudson Boulevard	J. C. Sweeney, Clk. Blvd. C. H. Co.
Indiana	Paoli	Mar. 17, 2 p.m.	Constructing gravel road	A. B. Ham, County Auditor.
Ohio	Cincinnati	Mar. 17, noon	Improving portion of Third Avenue	Stanley Struble, Pres. Bd. Comrs.
Ontario, Can.	Oshawa	Mar. 18	Constructing 4,300 lin. ft. asphalt block pave. on two streets	Frank Chappell, Town Engr.
Indiana	Anderson	Mar. 20, 10 a.m.	Constructing various County roads of gravel	Wm. T. Richards, County Auditor.
Virginia	Portsmouth	Mar. 20, noon	Paving various streets	L. P. Slater, City Clerk.
Indiana	Greenfield	Mar. 20, 10 a.m.	Grad. gravel road in Sugar Creek	C. H. Troy, County Auditor.
Kansas	Topeka	Mar. 20, 2:30 p.m.	Grading 11 blocks, cement curb and gutter	C. B. Burge, City Clerk.
New York	Albany	Mar. 20, 22, 24	Building state roads, 66 pieces	State Highway Commission.
Virginia	Newport News	Mar. 20, noon	Constructing concrete curb and gutter	George E. Via, Chm., Com. on Highways and Sewers.
Virginia	Fort Monroe	Mar. 21, 10 a.m.	Constructing macadam walks and roads	Capt. R. B. McBride, Con. Q. M. U.S.A.
Ohio	Cincinnati	Mar. 24, noon	Improving Broadwell road	Stanley Struble, Pres. Co. Comrs.
Wisconsin	Racine	Mar. 25, 10 a.m.	Paving and grading various streets	P. H. Connolly, Chm. Bd. P. Wks.
Ohio	Cleveland Hgts.	Mar. 28	Improving Berkshire Road	H. H. Canfield, 309 Beckman Bldg., Cleveland, Village Clerk.
Indiana	Logansport	Apr. 1	Constructing 50,000 sq. yds. of sheet asphalt	William Pickett, City Clerk.
Washington	Coupeville	Apr. 5	Improving Hinman Road No. 32	H. T. Wanamaker, Aud. Island Co.
Maryland	Cambridge	Apr. 6, 11 a.m.	Grading, paving and curbing various streets	Henry Lloyd, Chm. St. Imp. Comn
SEWERAGE				
Oregon	Silverton	Mar. 10	Constructing sewer system	City Clerk.
Wisconsin	Racine	Mar. 11, 10 a.m.	Constructing sewers and appur. in various streets	P. H. Connolly, Chm. Bd. Pub. Wks.
Nebraska	University Place	Mar. 11, 7 p.m.	Constructing lateral sewers in Districts 21-22	C. C. Gates, City Clerk.
Pennsylvania	Glassport	Mar. 13, 8 p.m.	Constructing sewers in various streets	M. E. Randall, Boro. Secy.
Georgia	Atlanta	Mar. 14	Constr. intercepting sewer and disp. plant	R. M. Clayton, Com. Pub. Wks.
Colorado	Fort Logan	Mar. 14, 10 a.m.	Constructing sewage disposal plant	Capt. Chase Doster, Con. Q. M. U.S.A.
Ontario, Can.	Toronto	Mar. 14	Furnishing concrete pipe for main drainage	G. R. Geary, Mayor.
Florida	Jacksonville	Mar. 15, 3 p.m.	Constructing sewers and drains	R. N. Ellis, Supt.
Texas	Cameron	Mar. 15	Constructing sewer system	D. L. Wilson, City Secretary.
Maryland	Baltimore	Mar. 15, 11 a.m.	Constructing storm drains	J. Sewall Thomas, City Registrar.
Pennsylvania	Williamsport	Mar. 17, noon	Building sewer in East End; Penn St. and Grafius run route	John B. Otto, City Engr.
Maryland	Ft. Washington	Mar. 20, 1:30 p.m.	Constructing sewer outlet and outfall	Capt. R. B. Kelton, C. Q. M. U.S.A.
Connecticut	Stamford	Mar. 20, 8 p.m.	Constructing various sewers	Jos. H. Provost, City Clerk.
Ohio	Grandview Hgts	Mar. 21	Constructing sewer and outlet	John Hinterschied, Village Clk.
West Virginia	Moundsville	Mar. 21, 10 a.m.	Constructing 26 miles of sewers	Oscar B. Bonar, City Clerk.
Ohio	Columbus	Mar. 21	Constructing sewer and outlet at Grand View	John Hinterschied, Clerk.
California	San Jose	July 3	Construct-septic tank for County hospital	City Clerk.
WATER SUPPLY				
South Dakota	Vermillion	Mar. 10, 2 p.m.	Drilling Artesian well	Irwin D. Aldrich, Secy. Re. Educa.
New Jersey	Spring Lake	Mar. 10, 2 p.m.	Furn. and install artesian water works plant	E. V. Patterson, Boro. Clerk.
Kentucky	Owensboro	Mar. 10, noon	Constructing water softening plant	E. B. Anderson, Chm. Elec. Lt. Com.
Massachusetts	Pt. Andrews	Mar. 10	Extending water mains and changing sewers	Ct. A. M. Miller, 263 Sumner St. Bos.
Iowa	Arlair	Mar. 10, 10 a.m.	Bldg. wtr. & light. system, W. K. Palmer Co., K. C., Mo., Engrs.	S. H. Wark, Mayor.
Oregon	Silverton	Mar. 10	Constructing water system	City Clerk.
Ohio	Zanesville	Mar. 10	Furnish 4,100 ft. 16, 10, 8 and 6-in. water pipe and specials	M. L. J. Logsdon, Secy. B. P. Serv.
W. Virginia	Wheeling	Mar. 11, 9 a.m.	Erection of pump house and foundations for tanks	D. G. Brown, Clk. Bd. Control.
Ohio	Troy	Mar. 11, 10 a.m.	Constructing water mains	A. E. Sinks, County Auditor.
South Dakota	Pierpont	Mar. 12	Furnishing cast-iron pipe, hydrants and fittings	City Clerk.
Pennsylvania	Pittsburg	Mar. 13, 10 a.m.	Constructing pumping station building and appurtenances	City Comptroller.
Ohio	Canton	Mar. 13, 10 a.m.	Furnishing water piping	J. H. McConnell, Auditor.
North Carolina	Jonesboro	Mar. 13	Constructing water works	D. H. Arnold, Mayor.
Ohio	New Lexington	Mar. 13	Constructing water works system	City Clerk.
Ohio	Cincinnati	Mar. 13	Laying water pipe, special castings, etc.	John A. Wenner, Dir. Pub. Serv.
Ohio	Lexington	Mar. 13	Receiving bids for 10-year franchise to install water works	City Clerk.
Texas	Jacksboro	Mar. 15, 2 p.m.	Constructing system of water works	H. C. McClure, Mayor.
Alberta, Can.	Gleichen	Mar. 16	Drilling well; furnishing cast-iron pipe, etc.; erecting steel tank; supplying manhole castings	B. S. Corey, Secretary-Treasurer.
New York	Troy	Mar. 16	Constructing reservoir and spillway	Eugene S. Osborne, Supt. W. Wks.
New Mexico	Fort Bayard	Mar. 18, 11 a.m.	Furnishing motor driven submerged type centrifugal or impeller type pump capacity 200 gals a minute	J. R. McAnirews, Con. Q. M. U.S.A.
Wisconsin	Watertown	Mar. 18, 7 p.m.	Laying c. i. pipe and spec. and construct. manholes for w. wks.	Wm. F. Voss, Secy. Bd. W. Comrs.
Pennsylvania	Bristol	Mar. 20	Constructing water works and filtration plant	Jos. R. Grundy, Chm. Com.
Ohio	Fernbank	Mar. 20, noon	Furnishing water pipe and special castings	W. Eilwood, Wynn, Clerk.
South Dakota	Gettysburg	Mar. 20	Constructing water works	F. M. Wright, City Auditor.
New York	Westbury	Mar. 20	Constructing water works	Thos. J. McCorl, Chm. B. W. Comrs.

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
WATER SUPPLY (Continued)				
Manitoba, Can.	Souris	Mar. 20	Laying out 31,500 ft. standard c. i. water pipe and similar amount vit. sewer pipe; construct. building, furn. pumps, machinery etc.	V. H. Williams, Town Engr.
New York	New York	Mar. 21, 11 a.m.	Constructing drainage equipment for underwatering the shafts and tunnel of the Rounlout siphon of the Catskill Aqueduct	Chas. Straus, Pres. Bd. Water Sup. Mayor.
Texas	San Augustine	Mar. 21	Furnishing mat. for construction of w. w. system.	P. W. Guiney, Con. Q.M. U.S.A.
Texas	Ft. Sam Houston	Mar. 21, 11 a.m.	Furnishing compound or triple expansion pumping engine capacity 1,000,000 gals in 24 hours.	John Hinterschiel, Clerk.
Ohio	Columbus	Mar. 21	Laying water mains and water pipes at Grand View.	W. A. Clement, City Engineer.
British Col, Can	Vancouver	Mar. 22	Furnishing water pipe, fire hydrants and pig lead.	J. W. Sanlerson, Treas.
Indiana	Nat. Mil. Home	Mar. 25	Install. mach. for imp. water sup. at Marion Bch., N.H.D.V.S.	H. H. Canfield, 309 Beckman Bldg., Cleveland, Village Clerk.
Ohio	Col'bus Heights	Mar. 28	Constructing water mains.	H. Z. Walpole, Secy, Water Co
Pennsylvania	West Telford	April 1	Constr. water works; approx. cost \$30,000.	A. T. Dickey, City Engineer.
Texas	Galveston	Apr. 3, noon	Installing 10,766 lin. ft. of water main.	J. B. Mace, Pres. B.J. Water Comrs
New York	Keesville	Apr. 5	Constructing reservoir, laying water pipe, etc.	Capt. Jos. F. Gohn, Con. Q.M. U.S.A.
Maine	Ft. McKinley	Apr. 15	Constructing chemical water softening plant.	
BRIDGES				
Colorado	Trinidad	Mar. 10, 2 p.m.	Constructing concrete or steel bridge.	G. F. Harlan, Chm. Bd. Co. Comrs.
Ohio	Hamilton	Mar. 11, 10 a.m.	Construction of bridge and road fill.	J. E. Brate, County Auditor.
Kansas	Lawrence	Mar. 11, noon	Constructing 70 ft. bridge and furnishing extra beams.	W. R. Green, Co. Clerk.
Indiana	Winchester	Mar. 11, 10 a.m.	Constructing twelve concrete and steel bridges.	H. F. Wood, County Auditor.
Nebraska	Grand Island	Mar. 14	Constructing and repairing bridges for one year.	G. E. Neumann, Co. Clk.
Michigan	Ypsilanti	Mar. 15	Constructing single span reinforced concrete bridge.	Frank Joslin, City Clerk.
Wisconsin	Oakwood	Mar. 15, 2 p.m.	Constructing reinforced concrete one beam bridge.	John A. Davitz, Town Clerk.
Iowa	Cedar Rapids	Mar. 15, 10 a.m.	Constructing 6-span bridge on Third Ave. and re-erection of bridge on Eighth Ave.	L. J. Storey, City Clerk.
Pennsylvania	Chambersburg	Mar. 15, 5 p.m.	Constructing concrete bridge and concrete culvert.	Wm. A. Laird, Jr., Boro. Clerk.
New York	Ellicott	Mar. 15, 2 p.m.	Constructing various bridges.	Samuel Ely, Town Supt.
Pennsylvania	York	Mar. 16	Constructing concrete bridge.	County Commissioners.
Nebraska	Benkelman	Mar. 20	Constructing wooden wagon bridge.	Dund County Commissioners.
Indiana	Greenfield	Mar. 20, 10 a.m.	Constructing four bridges.	C. H. Troy, County Auditor.
Ohio	Cambridge	Mar. 21, noon	Building two stone piers and stone abutments for bridge.	W. D. Deselm, County Auditor.
Ohio	Coshocton	Mar. 21, 10 a.m.	Constructing bridge; repairing and painting bridge.	Frank Mowley, County Auditor.
Ohio	Cleveland	Mar. 22, 11 a.m.	Bridge and road work.	John F. Goldenbogen, Clk. Comrs.
Ohio	Cincinnati	Mar. 24, noon	Constructing concrete bridge.	Stanley Struble, Pres. Co. Comrs.
Kansas	Hill City	Apr. 4, noon	Constructing bridge.	Ben. S. Smith, Co. Clerk.
LIGHTING AND POWER				
Iowa	Adair	Mar. 10, 10 a.m.	Bldg. light. & wtr. system; W. K. Palmer Co., K. C., Mo., Engrs.	S. H. Wark, Mayor.
Pennsylvania	Etna	Mar. 13, 5 p.m.	Constructing light plant.	J. C. Armstrong, Boro. Clerk.
Arkansas	Monticello	Mar. 15, 3 p.m.	Constructing electric light plant.	N. C. Roe, Chairman.
Iowa	Webster City	Mar. 21	Constructing electric light and power plant.	City Clerk.
Indiana	Columbia City	Mar. 25	Furnishing machinery for electric light plant.	City Clerk.
Alberta, Can	Calgary	Mar. 22, noon	Furnishing one 1,500 KW. turbo-generator with condenser; three 1,000 KVA single transf. 12,000 to 2,300 volts with switch gear etc.	W. D. Spense, City Clerk.
Indiana	Columbia City	Mar. 27	Furnishing day current for power purposes.	City Clerk.
FIRE EQUIPMENT				
New York	New York	Mar. 13, 10:30 a.m.	Furnishing 150 fire alarm boxes; 100 iron shells for fire alarm boxes and 200 keyless doors.	R. Waldo, Fire Comr.
Ontario, Can.	Ottawa	Mar. 14, noon	Furn. comb. automobile fire engine of pump. capacity of 700 to 800 gallons a minute.	John Henderson, City Clerk.
New Jersey	Jersey City	Mar. 16, 8 p.m.	General alteration of 2 engine houses and a school house.	Board of Fire Commissioners.
New Jersey	Princeton	July 5	Furn. auto pumping engine.	E. M. Uplike, Chm. F. & W. Com
MISCELLANEOUS				
Massachusetts	Holyoke	Mar. 10, 2 p.m.	Receiving proposals for collection and disposal of garbage.	Oscar C. Ferry, Asst. Clk. Bd. P. W.
Minnesota	Mankato	Mar. 13, 10 a.m.	Furnishing 2 street sprinklers.	A. H. Scherer, City Clerk.
Pennsylvania	McKees Rocks	Mar. 13	Constructing garbage disposal plant.	City Clerk.
New York	New York	Mar. 13, 2:30 p.m.	Repairing freight dock at Randalls Island.	Michael J. Drummond, Comr.
Nebraska	Madison	Mar. 14, noon	Erecting brick addition to county jail.	S. R. McFarland, Co. Clk.
Massachusetts	Ft. Andrews	Mar. 15, 1 p.m.	Constructing, plumbing wiring &c. one fire station.	Capt. A. M. Miller, Con. Q.M., U.S.A.
Washington	Spokane	Mar. 17, 2 p.m.	Furnishing 5-passenger automobile.	John Gifford, City Purchasing Agt.
New York	Troy	Mar. 29	Erecting county jail.	The Rensselaer County Jail Comn.

STREET IMPROVEMENTS

Fairfield, Cal.—Trustees are planning to macadamize eight blocks of street in business section during coming spring.

Hermosa Beach, Cal.—Bids will soon be received for paving of about six streets with asphalt at cost of \$60,000.

Oroville, Cal.—Supervisors have ordered construction of road near Swede's Flat.

Trinidad, Col.—Council is considering establishment of Nevada ave. and Animas st. Paving District No. 8.

Jacksonville, Fla.—City Engineer Pred-leau has submitted estimates for paving Riverside ave., Roselle to King sts., with asphalt blocks; estimate will be prepared for paving Riverside ave., King st. to city limits, with asphalt macadam.

Post Falls, Ida.—Hauser Lake Booster Club has decided to build auto road from Hauser Lake to Newman Lake, distance of 1½ miles.

Bloomington, Ill.—City is considering brick paving on Evans st., South Center.—Elmer Folsom, City Engineer.

Silvis, Ill.—Village Board has passed ordinance providing for pavement of First ave. with sandstone curbing and best vitrified paving brick; plans also include a system of storm drains; estimated cost, \$61,685.

Springfield, Ill.—City will construct 6 blocks of brick paving on Pasfield st., also on 14th st.; will soon let contract for brick paving on Laurel st.—Frank H. Hamilton, City Engineer.

Sterling, Ill.—Road Commissioner Thomas McCue is securing estimates of the cost of paving portion Galt road.

Sterling, Ill.—Board of Local Improvements will secure estimate of cost of paving W. 10th st., from Locust st. to Ave G, with either asphalt, creosote block or brick.

Boonville, Ind.—Bids will soon be received by Bd. of Commissioners, Warrick County, for gravel road improvements.—N. M. Spradley, County Auditor.

Elkhart, Ind.—Board of Public Works is receiving bids for paving portions of four streets with asphalt, brick, wooden block or bitulithic, laid on a 6-in. gravel or broken stone foundation.

Mt. Vernon, Ind.—Bids will soon be received by Board of Commissioners, Posey County, for 22 miles of gravel road improvements.—Paul Maier, County Auditor; T. J. Johnson, Engineer.

Villisca, Ia.—Council has decided to lay 16,505 sq. yds. brick paving, 4,953 lin. ft. combined curb and gutter, and 1,195 lin. ft. of curb.—Geo. B. Sexton, City Clerk; Theo. S. Delay, Creston, Engineer.

Newport, Ky.—Mayor Craig has recommended resurfacing of asphalt streets.

Shelbyville, Ky.—Mayor Gruber has recommended street paving work at cost of \$30,000.

Shreveport, La.—Citizens will vote Apr. 4 on \$250,000 paving bonds.

Baltimore, Md.—Bids will be readvertised by Park Board for paving walks in public parks with vit. brick.

Baltimore, Md.—Plans have been approved for widening Belair road from North

ave. to the city limits, at estimated cost of \$70,000; plans have been prepared for constructing section of boulevard between Druid Hill and Gwynn Falls Park, at cost of \$80,000.—James H. Smith, President Commissioners for Opening Streets.

Haverhill, Mass.—Council is considering order for \$75,000 bond issue for permanent street and sidewalk work.

Haverhill, Mass.—Boulevard to extend from State highway, near the Haverhill-Lawrence line and thence along river to sea, is proposed by Municipal Council.

New Bedford, Mass.—Blodgett & Co. have secured \$186,000 bond issue; \$150,000 will be used for block paved streets and \$20,000 for additions to city stables.

Pittsfield, Mass.—Board of Public Works has recommended paving of Columbus ave. and other streets; also macadam on Wahconah st.

Worcester, Mass.—Olmstead Bros., Boston, have prepared plans of beautifying Washington square.

Detroit, Mich.—Bids are being received for paving Colbourn, Forsyth, McDougal, Stanley and Superior sts. with cedar block and Third, Palmer and Winford ave. with sheet asphalt; Department of Public Works has been directed to ask bids for paving with cedar block on concrete foundation using Medina, Berea or other approved curbing, Spruce st., 26 ft. wide, Wabash ave. to 12th st., at estimated cost of \$1,920, and Hazel st., 24 ft. wide, Wabash to National ave., \$8,736; Montclair ave., \$7,920, and Chalmers ave., \$8,496.—J. J. Haarer, Commissioner.

Ludington, Mich.—All bids received on Feb. 20 for constructing pavements have been rejected; new bids will be asked.—Dean Thompson, City Clerk.

St. Paul, Minn., County Commissioners will readvertise for bids for road rollers with double-speed engines. P. J. Ryan, Assistant County Attorney.

Kansas City, Mo.—Bids will soon be received by Board of Public Works for 32 blocks of asphalt paving on 15th st.—L. R. Ash, City Engineer.

St. Louis, Mo.—Widening of Washington ave. is being considered by Council.

Omaha, Neb.—City will soon let contracts for nearly \$500,000 worth of street paving and curbing.

Haddon Heights, N. J.—Citizens have voted \$60,000 bonds to macadamize streets.

Jamesburg, N. J.—Board of County Freeholders will ask for new bids for building retaining wall at this place.

Morristown, N. J.—Paving of Speedwell ave. and Morris st. will be considered. A. S. Pierson, Mayor.

New Brunswick, N. J.—Board of County Freeholders has adopted resolution for repairing South River and Cranbury turnpike roads.

Binghamton, N. Y.—Following towns considering the purchase of road machinery: Sanford, Windsor, Fenton, Colesville, Union and Vestal.

Fort Plain, N. Y.—Town Board of Minden has voted to appropriate \$6,176.15 for highways in town during present year.

New Rochelle, N. Y.—Widening of North ave., Grand st. to Wynyan ave., at cost of \$60,000, is being considered.

North Hempstead, L. I., N. Y.—Board of Supervisors of Nassau County has authorized North Hempstead to issue \$46,500 bonds for road improvements.

Poughkeepsie, N. Y.—Board of Public Works is planning to improve Jefferson st.; has decided to macadamize portion of Church st.

Rochester, N. Y.—Bids will be asked by Board of Contract and Supply for building macadam roadway and cement sidewalks at Exposition Park.

Seneca, N. Y.—Village Trustees will receive bids Mar. 15 for \$40,000 paving bonds; State is ready to ask bids on contract.

Utica, N. Y.—Board of Contract and Supply is considering plans for paving Hickory, Knox, North Genesee, Kirkland and Alary streets, Humbert avenue and Young place.

Charlotte, N. C.—Citizens will vote on \$150,000 bonds for street improvements and extensions.

Wadesboro, N. C.—Anson County will vote on \$300,000 of bonds for road construction.

Whiteville, N. C.—Bids will be received Mar. 20 for \$10,000 street improvement bonds.—W. Ross Davis, Mayor.

Cincinnati, O.—City Engineer Shipley has estimated cost of paving Knowlton street with brick at \$16,112.60 and Mozart avenue with brick at \$15,391.65.

Cincinnati, O.—City Engineer Shipley has submitted a recommendation to Director Sundmaker advising that supplementary contract be entered into in connection with improvement of Young st. for building of retaining walls; estimated cost \$3,465.

Lima, O.—Plans are being prepared by City Engineer A. L. Metheny for 10,000 sq. yds. of macadam pavement, with curbing and catch basins; will be ready for bids in about six weeks.

Portsmouth, O.—Council has passed an ordinance for grading, curbing, paving and improving Adams st., 5th to 8th st.—Wm. N. Gableman, Clerk.

Sandusky, O.—Council is considering construction of retaining walls at foot of Jackson road and Wayne st.

Toledo, O.—Bids will be received by Board of Public Service for paving 13 streets, in all 31,200 sq. yds. brick, 31,000 sq. yds. asphalt or creosoted wood, 4,000 sq. yds. macadam.—Geo. Tonson, Chief Engineer.

Prineville, Ore.—Council is planning grading and improvement of number of streets.

Du Bois, Pa.—Village is considering paving of several streets.

Greenville, S. C.—Greenville County will pave Buncombe road to Five Mile Post.—J. P. Goodwin, Supervisor.

Cookeville, Tenn.—Putnam County has voted \$100,000 pike bonds.

Crockett, Tex.—Houston County will vote Mar. 25 on \$150,000 bonds for construction of roads in Dist. No. 3.

Dallas, Tex.—Specifications have been approved and bids will be asked for paving portion of 16 streets.

Galveston, Tex.—Board of County Commissioners will advertise for bids for re-grading and shelling of four and one-third miles of road connecting main road with Texas City from Lamarque; also for 3,500 cubic yds. of mudshell with which to repair roads down island between third and seventh mile post; Road Engineer and Road and Bridge Committee will look into

matter of shelling or resurfacing county roadway between causeway and end of Broadway.

Hempstead, Tex.—Precinct No. 6, Waller County, will vote Apr. 1 on \$10,000 bonds for road construction.

Houston, Tex.—Paving of Chartres st. is being considered.

Lockhart, Tex.—Citizens will vote Mar. 30 on \$50,000 bonds to build roads.

Memphis, Tex.—Precinct No. 1 will vote on \$25,000 bond issue for good roads.

Pecos, Tex.—Reeves County Commissioners have called for bids to construct sidewalks around court house in this city.

Alexandria, Va.—Council is considering resolution appropriating \$15,000 to pave Washington st. with vit. brick.

Roanoke, Va.—Bids will soon be asked for street paving estimated at \$250,000.—F. L. Gibboney, City Engineer.

Staunton, Va.—Board of Supervisors of Augusta County is considering holding of election to bond county for \$1,000,000 for roads.

Williamsburg, Va.—James City County Board of Supervisors has appropriated \$1,350 out of county and district road funds as its proportion of cost of the Newport News-Richmond sand and clay road.

Pasco, Wash.—Construction of cement sidewalks is being considered; cost, \$40,000.

Port Townsend, Wash.—City is considering installation of about 48,000 sq. ft. of concrete sidewalk in residence part of city; cost \$10,000.—W. J. Sadler, City Engineer.

Seattle, Wash.—Board of Public Works has received following estimates: Grading 10th ave., \$2,500; filling, planking, etc., Railroad ave. South, \$7,525; concrete walks on Weller st., \$5,500; wooden walks on 5th ave. South, \$10,600.

Madison, Wis.—Council has passed resolutions for about six miles of brick and creosote paving, to cost \$200,000.—John F. Icke, City Engineer.

Montreal, Que., Can.—Paving of St. Antoine, Dorchester, Notre Dame, Lagache-riettes sts. and Mt. Royal ave. is being considered.

Sydney, N. S., Can.—Citizens have voted \$75,000 bonds for permanent street work, curb and gutter, sidewalks and paving.—D. McD. Campbell, City Engineer.

Victoria, B. C., Can.—Cost of asphaltting Esquimault road has been estimated at \$18,346.

CONTRACTS AWARDED

Eutaw, Ala.—Building streets, sidewalks and curbing on four of the principal streets to Tuscaloosa Concrete & Construction Co., about \$12,000.

Los Angeles, Cal.—To Paonessa & Taylor, Story Bldg., for grading and constructing sidewalks and curb on Deuger ave., \$8,000.

Riverside, Cal.—To Johnson Shea Co. for macadamizing and constructing curbs and gutters on Park ave., \$29,173; other bidders: Shull, Tucker Co., \$29,727; Star Cement Co., \$30,987; E. H. Kellogg, \$31,290.

Oak Park, Ill.—Street improvements, as follows: Granite top macadam pavement on Erie st., to Alexander Todd, 514 N. Hamlin ave., \$2,840.20; asphalt concrete pavement and Portland cement granite concrete, combined curb and gutter on East ave., to Standard Pavement Co., 145 La Salle st., Chicago, \$8,529.50.

Maywood, Ill.—To A. M. Todd for paving portions of N. 6th, 9th and 11th aves. with Bessemer block, \$65,531.

Franklin, Ind.—Grading and graveling road between Johnson and Sheiby counties, to C. W. Folger & Co., Columbus, \$10,950; other bidders: T. H. Gilbert, Martinsville, \$10,963; R. G. Porter, Edinburg, \$10,962.

Logansport, Ind.—Constructing Sheety road in Jefferson Township, to J. H. Nulls, Winfield, \$6,743.

Portland, Ind.—To Daniel Wallace and Levi Schlecty, Ridgeville, to build Richard Cummins gravel road, on Jay and Randolph county line, \$17,749. Other bidders: Sisk & Rupel, \$18,600; Mannix & Hall, \$19,920; Weston Bros., \$21,023.25; Sprinkle & Griffith, \$22,600; Fishbaugh, Karsh & Appenzeller, \$22,025; North & Bunman, \$18,960.

Corning, Ia.—Bids received Feb. 20 for paving and curbing: Capital City Concrete Construction Co., successful bidder.—Theo. S. Delay, Creston, Engineer.

Sullivan, Mason & Sullivan, \$19,600; Buckley & Gardner, \$19,801; J. W. Mangus, \$20,987; Tetter & Tetter, \$19,270.

Hutchinson, Kan.—Furnishing two car of Portland cement for pavements, to D. J. Fair Lumber Co.

Wichita, Kan.—To John Ritchie & Sons, Topeka, for 25 blocks of brick pavement with cement and asphalt filler, \$1,93 an \$1.83 per sq. yd.; total cost about \$16,000.

Shebysville, Ky.—Furnishing 1,000 yds. of crushed stone, to Jas. W. Tucker, of Jefferson County, \$1.10, spread on streets.

Detroit, Mich.—Paving Superior st., 3 and Wreford aves., 26 ft. wide with cedar block on concrete foundation, with Ambers curbing, to Julius Porath, McGraw Bldg., \$30,905; \$1,854 and \$5,889; Columbus pl., Ambers curbing, and Forsyth ave., Berea curbing, to J. A. Mercier, 211 Hammond Bldg., \$9,571 and \$9,792; McDougal ave. Amherst curbing, to T. E. Currie, McGraw Bldg., \$6,657.

Detroit, Mich.—By J. J. Haarer, Commissioner Public Works: To C. H. Little & Co. Penobscot Bldg., for all sand required by asphalt plant for the year ending Jan. 3, 1912, 70c. per cu. yd.; to Barber Asphalt Paving Co., for all asphalt required by the asphalt plant, for year ending Jan. 3, 1912, \$21.60 per ton for Trinidad brand and \$29.10 for Bermudez; to R. F. Conway & Co., \$22.60 for Cubanel; to Union Oil Co., \$23.38; for all binder stone for same time to Fairview Coal and Supply Co., Kercheval and Hart aves.

Barker, N. Y.—Furnishing two-cylinder roller, to the Buffalo Traction Company at cost of about \$1,800.

Maine, N. Y.—Furnishing Marathon combination roller and engine, at outlay of about \$1,800, to Climax Road Machine Company of Marathon.

Mineola, L. I., N. Y.—Constructing Babylon-Hempstead turnpike and centennial, to Twombly & Eldert, Jamaica, \$40,017.

New Bern, N. C.—To Georgia Engineering Co., Augusta, Ga., for paving, "Augusta block," \$1.44 with sand filler and \$1.48 with cement filler; East Front st. and a section of Pollock st. will be paved with asphalt.

Wapakoneta, O.—Paving Mechanic st., to J. E. Conley & Co., Dayton, \$38,065.65.

Hillsboro, Tex.—Paving several streets with Hassam concrete, to Ocklander Bros., \$80,000.

Seattle, Wash.—Grading Meridian ave. and N. 78th st., to John Kalberg, 5204 10th ave. N. E., \$8,101.

Waterville, Wash.—Construction of nine miles of county road, to J. J. McNeerney Wenatchee, \$38,000.

Belleville, Ont., Can.—To the Schuste Company for supply of 1,000 barrels, more or less, of cement, \$1.57¼ per barrel.

BIDS RECEIVED

Cumberland, Md.—Furnishing and delivering 1,800 tons of Manantico Bridge wanted 1,800 tons of gravel; Richard Craig, Cedarville, work to be completed by July 1 at \$1,224¼ per ton; Furman Waller to be completed in 65 days from time work began, 88 c. per ton; Sheppard Clark, to be completed by July 1, 74½ c. per ton.

Boston, Mass.—Constructing walks at F. Andrews, as follows: Thomas Fitzgibbon, \$6,630; C. Bevilacqua, \$7,228; Frank Williams, \$7,263; James H. Fannon, \$7,900; Thomas Whelan & Co., \$8,275; L. C. Archia, \$8,508; John A. Costello, \$8,719; Anthony Cefalo, \$9,700; G. Porter, \$11,500.

Albany, N. Y.—Construction of highway adjacent to the Delta Reservoir in Oneida County; James Anderson, Caledonia, N. Y., \$51,037; Theodore C. Hales, Jr., Albany, N. Y., \$40,834; Cunningham-Woodward Co. Hudson Falls, \$47,712.

New Bern, N. C.—Street paving; Warner Quinland Asphalt Co., Syracuse, N. Y. sheet asphalt on a concrete base, California \$1.60 per sq. yd., Trinidad \$1.65, Bermudez \$1.69, provided they were awarded 30,000 sq. yds.; asphalt macadam, California asphalt with a 4-in. concrete base \$1.39 per sq. yd., Trinidad \$1.42, Bermudez \$1.43; Stitzer Engineering and Construction Co.

	Hamilton & Schwartz Shenandoah	Jas. Horabin Des Moines	Evan J. Evans Red Oak	J. W. Turner Imp. Co. Des Moines	Capital City Cons. Co. Springfield, Ill.	Creston Cons. Co. Creston
Brick paving.....	12000 s.y.	\$1.91	\$2.04½	\$2.06	\$2.09½	\$1.93
Comb. Curb & Gutter	2375 l.f.	.79	.95	.86	.69	\$2.07
Gutter laid to old curb	1875 l.f.	.55	.60	.70	.66	.97
Concrete alley paving	189	1.39	1.39	1.63	1.57	1.54
Extra grading.....	Under 1000 ft.	.44	.45	.49	.40	.50
Overhaul grading....	Over 1000 ft.	.02	.02	.03	.02	.02

Philadelphia, made the following proposition: Mack brick \$1.68 per sq. yd.; bid thrown out because check for \$250 did not accompany the bid; Peters Bros. Paving Co., Dayton, O., sheet asphalt on a concrete base, \$1.43 per sq. yd.; H. S. Hancock, New Bern, made the following bids: Baltimore block, cement filler, \$1.49 per sq. yd., laid flat \$1.39 per sq. yd.; Baltimore paver \$1.42² for sand filler deduct 6c. per yd.; asphalt macadam \$1.51, Tarvia filled macadam \$1.41; T. J. McGuire, on Porter block, cement filler \$1.72, Peebles \$1.70, Mack \$1.77, Baltimore \$1.55, Baltimore paver \$1.47; same laid flat \$1.42; deduct 6c. if sand filler is used; tarvia macadam \$1.15, asphalt macadam \$1.45, asphalt macadam, Bermuda \$1.35, M. Bermuda \$1.40; Georgia Engineering Co., Augusta, Ga., on Augusta block, sand filler \$1.44, cement filler \$1.48; Bove & Page, Charleston, S. C., on Baltimore block, sand filler \$1.46², Peebles \$1.54, Bessemer \$1.59, Mack \$1.59; cement grout and 3/4c. per yd.; asphalt macadam \$1.60, Bithma macadam \$1.27, with emulsion surface 89²c.; Bessemer paver 3/2c., sand filler \$1.58, cement 3/2c. extra; Atlantic Bitulithic Co., on bitulithic on 1/2-in. foundation \$2.06.

Portland, Ore.—Paving East Glisan st. district, embracing several miles of streets in Laurelhurst, which is to be improved with asphalt; Barber Asphalt Paving Co. only bidder, \$163,719; paving of Mason st. district in Albina with bitulithic pavement, Warren Construction Co., lowest bidder, \$107,977; same company submitted a bid for paving the West Park and 9th st. district or \$24,027; paving with bitulithic pavement of the Williams ave. district, Pacific Bridge Co., lowest bidder, \$70,535; same company submitted the lowest bid for paving of 13th st., \$34,327; Pacific Bridge Co. submitted a bid for filling East 2d st. from East Oak to Hawthorne ave., \$46,214; East Morrison st. from Water to Union ave. is to be paved with wooden blocks, Montague O'Reilly Co., lowest bidder, \$24,691; M. J. Conley, to improve the Congress st. district for \$31,086; Swinton district, Kern & Field, lowest bidder, \$31,809; Oregon Independent Paving Co., underbid Barber Asphalt Co. for laying asphalt paving on number of short streets.

SEWERAGE

Long Beach, Cal.—Plans have been submitted by City Engineer Dewey for complete sewerage of city at following estimated cost: outfall pipe, \$1,022.52; outfall pier and bulkhead, \$2,286.66; weir chamber, 1,496.55; septic tank, \$29,265.81; twin sewer, Water st. to Ocean Park ave., \$32,421.75; and trap, \$1,123.30; twin sewer from 2d and 3d sts., alley to 5th st., \$21,916.94; excavation about 5th st., \$108,010.60; manholes and specials, \$79,046.44; laying pipe, 2,587.39; incidentals, \$44,378.49; engineering, \$3,219; total, \$343,450.18.

Orange, Cal.—City Trustees have rejected all bids for the work on "inside" sewer system; bids were 50 per cent higher than the estimates placed on the work by City Engineer C. L. Bates.

Willows, Cal.—Trustees have decided to divide unsewered part of city into two sections; it is proposed to hold bond elections in these sections to extend sewer system.

Bridgeport, Conn.—Board of Apportionment and Taxation is favorable to \$100,000 bond issue for construction of sewers in accordance with plans as prepared by Ludolph Hering, of New York.

Waterbury, Conn.—City Engineer Cairns as estimated cost of constructing sewer in Myrtle ave. at \$1,300.

Americus, Ga.—Citizens will vote April 4 on \$40,000 bonds for sewerage extension.

Cartersville, Ga.—City is considering election on bonds for construction of sewer system.

Marietta, Ga.—Citizens will vote May 1 on \$15,000 bonds to extend sewer and water mains.

Pelham, Ga.—Citizens will vote on \$25,000 of bonds for improvements of sewer system and for other work.

Dixon, Ill.—City will expend \$3,000 on vit. pipe sanitary sewers on Galena ave. and 8th st.

Galva, Ill.—Plans are being prepared by engineers W. S. Shields Co., 140 Dearborn st., Chicago, for sewage purification plant; cost about \$5,000.

Hillsboro, Ill.—City proposes to pave school st. at cost of \$28,600.—J. A. Tremble, Charleston, Engineer.

Madison, Ill.—City will build a new sewer on river, draining North Venice.

Danville, Ind.—Board of Town Trustees as selected John O. Kain, Danville, and Curtis Gross, Martinsville, to prepare surveys, plans and estimates for sanitary sewer system.

Manning, Ia.—Engineer P. A. Edquist, \$2-54 American National Bank Bldg.,

Omaha, Neb., is preparing plans for sanitary sewer system.

Nevada, Ia.—Plans and Specifications are being prepared by Engineer Sam Steigerwald, 327 6th st., Boone, for construction of sanitary sewer and disposal plant; estimated cost \$40,000.

Abilene, Kan.—City Engineer Guy Haid has prepared plans and specifications for construction of a storm sewer of concrete to the river.

Dodge City, Kan.—Citizens have defeated proposition to issue bonds to install sanitary sewer.

Mansfield, La.—Plans are being prepared by C. M. Robinson for construction of sewer system.—W. E. Singleton, City Clerk.

Fitchburg, Mass.—Sewer Commission is preparing for early start on big sewer, which it is estimated will cost about \$1,000,000.

Greenfield, Mass.—Town is considering \$3,000 appropriation to build sewer along Silver st.

Henderson, Minn.—City is considering construction of sewers.

De Soto, Mo.—B. H. Colby, St. Louis, is preparing plans for sewer system.—W. Cunningham, Mayor.

St. Louis, Mo.—Council is considering bill authorizing election on \$2,500,000 bonds to build sewer to carry River des Peres in tunnel under Art Hill in Forest Park.

Unionville, Mo.—Consulting Engineer Hiram Phillips, Third National Bank Bldg., St. Louis, Mo., will prepare plans and estimates for system of sewers; trunk sewer will cost \$20,000 and district sewers, \$40,000.

Warrensburg, Mo.—Council has passed ordinance creating Sewer District No. 1.

Nebraska City, Neb.—Plans and specifications for sanitary sewer have been prepared by City Engineer Chas. A. Shannon; cost about \$80,000.

Omaha, Neb.—City will soon let contracts for \$100,000 worth of brick or concrete main sewers.

Reno, Nev.—City will purchase site for installation of septic tank.

Cliffside, N. J.—Plans have been prepared by McClare & McClare for the construction of sewers estimated to cost \$80,000; work includes main line, laterals and disposal plant; election on proposition will be held.—S. Wood McClare, Mayor.

Ocean City, N. J.—Local sewer company has had plans prepared for installation of sewage disposal plant. R. W. Edwards and W. E. Massey are interested.

Las Vegas, N. M.—Council has decided to install sewer system in certain streets.—Geo. Morrison, Engineer; Chas. Jammie, City Clerk.

Binghamton, N. Y.—City Engineer John A. Giles has made plans and estimates at \$8,500 cost of proposed storm water sewer in First Ward.

Oswego, N. Y.—Assembly Committee on Affairs of City has decided to report favorably on bill providing for building of a sewer system, which was introduced at the suggestion of Mayor John Fitzgibbons.

Charlotte, N. C.—Citizens will vote on \$150,000 bonds for sewerage extensions.

Smithfield, N. C.—Citizens have voted \$35,000 of bonds for construction of sewer system, electric light plant and water works.

Amherst, O.—W. E. Sarver, Canton, is preparing plans for gravity sewers and disposal plant; cost about \$25,000.—C. G. Aschenback Village Clerk.

Cincinnati, O.—City Engineer Shipley has estimated cost of constructing sewer in Jonathan and Brewster aves. at \$10,750.

Beaver Falls, Pa.—Engineer Leo Hudson, Haverstraw, N. Y., has been selected as Engineer for preliminary work in installation of sewerage system and disposal plant.

Blairsville, Pa.—Edw. J. O'Brien, City Bldg., Latrobe, is preparing comprehensive set of plans for sewerage system and sewage disposal plant.

Grove City, Pa.—Bids will soon be asked for the construction of the proposed sewers; cost about \$15,000.—L. E. Burnside, Borough Engineer.

Nashville, Tenn.—Bids will be received March 22, 3 p. m., for \$500,000 trunk sewer bonds.

Cuero, Tex.—Council is considering installation of \$10,000 sewerage system as proposed by F. R. Perkins.

Dallas, Tex.—Bids will be re-advertised for construction of six-story sanitary sewer.

Rockdale, Tex.—Council is ascertaining authority of town to issue bonds for sewerage purposes.

Spokane, Wash.—Plans for Fourth Ward Trunk Sewer No. 4, to cost \$44,115, have been completed to-day by City Engineer Morton Macartney.

Cranbrook, B. C., Can.—Council has voted \$100,000 for installation of a sewerage system; plans will be prepared at once.

Niagara Falls, Ont., Can.—City Engineer Carl Gardner has prepared plans for reinforced concrete tube, into which principal sewers of city will empty; cost, \$75,000.

CONTRACTS AWARDED

New Britain, Conn.—Furnishing sewer pipe, to City Coal and Wood Co., 29² per cent off on 10-in. to 24-in. pipe and 80³ per cent off on 8-in. pipe; furnishing about 35 catch basins, to Duplex Mfg. Co., Cleveland, O., \$15, shipped f.o.b. city; manhole covers, to Sessions Foundry Co., \$7.40 delivered on street.

Paris, Ill.—To Frank Payne for furnishing and laying approximately 710 ft. of 36-in. and 3,381 ft. of 60-in. reinforced concrete or brick sewer, with 10 manholes, \$1,080.

Elkhart, Ind.—To F. J. Miller, representing Frank Brumbaugh and J. M. Fishley, for the Morehous addition sewer, \$5,290.95, and for the Oakland ave. sewer north from Indiana ave. to Harrison st., \$1,490.80.

Mount Vernon, Ia.—Installation of 7 1/2 miles of sanitary sewers, 6 to 15-in. pipe, with necessary accessories, a septic tank and filter beds, (a) town sewers, (b) outlet sewers, (c) septic tank and dosing chamber, (d) filter beds, to Hanning-Vineyard Co., Evansville, Ind., (a) \$18,818, (b) \$3,288, (c) \$2,634, (d) \$3,851; other bidders: Geo. M. King Construction Co., Des Moines, (a) \$20,935; Independent Construction Co., Davenport, (a) \$23,620, (b) \$3,525, (c) \$3,344, (d) \$3,322; Blackhawk Construction Co., Waterloo, (a) \$23,632; J. C. Griffith & J. F. Whalen, Anamosa, (a) \$24,502, (b) \$3,729, (d) \$3,728; Dearborn & Jackson, Cedar Rapids, (a) \$25,442, (b) \$3,127, (c) \$3,752, (d) \$4,840; Lytle Construction Co., Sioux City, (a) \$25,708, (b) \$3,469, (c) \$3,570, (d) \$3,727; J. W. Turner Improvement Co., Des Moines, (a) \$25,946; John Brogan, Green Bay, Wis., (a) \$26,093, (b) \$4,256, (c) \$4,333, (d) \$2,981; J. R. McCormick, Ft. Dodge, (a) \$26,295, (b) \$4,301, (c) \$3,587, (d) \$3,166; M. A. Camery, Harlan, (a) \$26,550, (b) \$3,500, (c) \$4,257, (d) \$4,785; W. D. Yeager Co., Cedar Rapids, (a) \$27,306, (b) \$3,516, (c) \$3,596, (d) \$3,888; R. C. De la Hunt, Cedar Rapids, (a) \$28,677, (b) \$3,702, (c) \$3,670, (d) \$3,934; C. B. McNamera & Co., Dubuque, (a) \$29,820, (b) \$3,944, (c) \$3,913, (d) \$3,564; Guy E. Smith, Indianola, (a) \$32,098, (b) \$4,069, (c) \$4,114, (d) \$3,463; Thomas Carey & Son, Clinton, (b) \$3,703, (c) \$4,413, (d) \$4,065; W. W. Cooley, Clinton, (b) \$3,838, (c) \$3,554, (d) \$3,525; Engineer's estimate, (a) \$21,987, (b) \$3,588, (c) \$3,046, (d) \$2,956.

Sigourney, Ia.—To Bush & Gray, Joplin, Mo., for constructing septic sewer system, including 49,505 ft. vit. pipe, 3 disposal plants, 31 flush tanks and 111 manholes, about \$39,000.

Baltimore, Md.—Laying trunk sewer on Pratt st., to McCay Engineering Co., \$85,751.73; lateral sewers in District 15, to William McCarthy & Co., \$75,187; water piping and steam heating work at sewerage pumping station will be done by Louis F. Andrea Co., \$3,052.15.

Detroit, Mich.—Building Fairview Station inlet and outlet, to Langley & Jaynes, city, \$19,200; building vit. brick lateral sewers, to T. G. Whittaker, 2281 W. Grant Blvd.; to J. A. Mercier, 211 Hammond Bldg.; to Wm. Blanck, 26 Waverly ave., and to Wm. Porath, 5 Rich st.

Melrose, Minn.—To M. V. Dueber, St. Cloud, for constructing 9,165 ft. of pipe sewers 10 to 24-in., \$11,414.—Samuel S. Chute, St. Cloud, Engineer.

St. Louis, Mo.—Building Cherokee Sewer, District No. 12, to Manegold & Monohan, \$1,168.59.

St. Louis, Mo.—Construction of Baden Sewer No. 1, to Fruin-Coulon Contracting Co., Merchants' Ladele Bldg.; to the W. F. Riley Construction Co., Navarre Bldg., for second section of the Baden public sewer, \$162,016.

New Bern, N. C.—Laying sewers on streets to be paved, to Frank Hackney.

Clinton, Okla.—Construction of 26,200 ft. of 8-in. lateral sewers of the first quality vit. pipe, together with manholes, lamp-holes and other appurtenances, to J. W. Rooks, \$23,751; other bidders: Hunter & Hunter, \$30,535; E. M. Eby, \$31,614; Stone Construction Co., \$31,262; Connelly Construction Co., \$31,706.

Charleston, S. C.—Extending sewerage system, to Guild & Co., Chattanooga, Tenn., \$51,629.70.

Corpus Christi, Tex.—Contracts for sewerage material have been approved by Council as follows: Manholes, to Hardwick-Abbott Mfg. Co.; alternating gear, to Cameron Septic Tank Co.; steel sheeting, to Carnegie Steel Co.; lumber, to the H. D. Taylor Lumber Co.

Oconomowoc, Wis.—To Mulholland & Son, Kaukauna, to install 2 1/2 miles of sewers.

BIDS RECEIVED

Long Beach, Cal.—Sewer construction in 24 and other streets: Peter Gihovach, \$7,900; S. Zarubica, \$7,889.50, both of Los Angeles; Frank H. Thomas, \$10,963; White & Gaskill, \$15,952.

Sigourney, Ia.—Construction of sanitary sewers: W. J. Lams, Harlan, \$11,326; John W. Scott, Ottumwa, \$55,877; Zitteral & Sullivan, Webster City, \$11,819; Henry Rees, Quincy, Ill., \$46,474; J. W. Turner Improvement Co., Des Moines, \$15,932; Blackhawk Construction Co., Waterloo, \$51,216; M. A. Camery, Harlan, \$12,231; Hamilton Bros., Chicago, Ill., \$49,219; Omaha Construction Co., Omaha, Neb., \$13,977; Bash & Grey, Joplin, Mo., \$39,741; Dearborn & Jackson, Cedar Rapids, \$50,253; McGuire & Stanton, Leavenworth, Kan., \$11,112; C. R. McKay, Omaha, Neb., \$46,279; George M. King, Des Moines, \$33,447; Burlington Construction Co., Burlington, \$49,776.

Melrose, Minn.—Building sewer system from plans by S. S. Chute, Engineer, St. Cloud; Illstrup & Olson, Minneapolis, \$17,135; Cook Construction Co., Des Moines, Ia., \$15,549; C. H. Prett, Fargo, N. D., \$15,810; William B. Bosworth, Ada, \$14,684; F. E. Kaminski, Watertown, Wis., \$13,309; Frazier & Danforth, Rochester, \$14,919; P. McDonnell, Duluth, \$13,146; Pastoret Lawrence Co., Duluth, \$14,959; L. W. Schrueth, Fargo, \$15,204; Thos. E. Woolley, La Crosse, Wis., \$15,794; G. S. Redmon, Pipestone, \$17,852; V. D. Dueber, St. Cloud, \$11,418.

St. Louis, Mo.—Constructing the Forest Park foul water sewer, requiring 9,670 ft. 42-in. and 1,959 ft. 30-in. brick sewer and 1,400 ft. 12 and 18-in. pipe sewer, with manholes, etc.; concrete pump well; also equipping the pumping plant, including furnishing and installing duplicate sets of direct-connected centrifugal pumps and motors, with valves, pipes, etc.; lowest bidder on each contract, 1st section, R. D. Salsbury, \$18,069; 2d section, Wm. F. Riley Construction Co., \$21,960; 3d section, Wm. F. Riley Construction Co., \$27,258; equipment of pumping station to be operated in connection with the system, Reeves & Skinner Machinery Co., lowest bidder, \$4,776.

Toledo, O.—Constructing sewers, E. A. Sandrock, lowest bidder, \$3,094.15; 980 ft. 15-in. d.-s. pipe, \$1.65; 284 ft. 12-in., \$1.60; 340 ft. 10-in., \$1.50; 36 ft. 12-in. c.-i. pipe, \$2.10; 650 ft. 6-in., 30c.; all clay material to be excavated; manholes, \$20; Albert Graybowski, \$3,207.24; John McMahon, \$3,228.14; Wm. McMahon, \$3,327.34.

WATER SUPPLY

Dorris, Cal.—Citizens have voted \$12,500 bonds to install water system.

Fresno, Cal.—National Board of Fire Underwriters has recommended erection of pumping station, capacity 10,000,000 gals.; station to contain two pumps, operated by steam, gas or oil engines; also extension of water mains.

Fl. Lupton, Cal.—Installation of water works is being considered.

Kingsburg, Cal.—Plans have been completed by Olmstead & Gillean, Wright & Callender Bldg., Los Angeles, for proposed water works; cost about \$36,000.

San Francisco, Cal.—Board of City Supervisors authorized expenditures as follows for materials for use in construction of auxiliary water-supply system for fire protection: \$20,000 for bolts, nuts and washers and \$13,000 for gate and check valves.

San Luis Obispo, Cal.—Plans have been prepared for construction of 5,700,000-gal. earthen reservoir.

Suisun, Cal.—Trustees have adopted plans and specifications for enlarging of storage reservoir of municipal water system whereby its capacity will be increased 13,000,000 gals.

Colorado Springs, Col.—City has selected Hiram Phillips, Consulting Engineer, Third National Bank Bldg., St. Louis, Mo., to prepare plans for improving water works system.

New Britain, Conn.—P. J. Egan, Clerk Water Board, is asking bids for about 10,000 ft. of 6-in. and 3,000 ft. of 8-in. water pipe.

Waterbury, Conn.—City Engineer Cairns has estimated cost of laying 6-in. water main in Fleet st. at \$1,450 and in Pilgrim ave. at \$1,700.

Waterbury, Conn.—Board of Public Works has authorized John R. Walker, Superintendent of Water, to purchase 20,000 ft. of water pipe of various sizes.

Milton, Del.—Citizens will vote Mar. 4 on municipal water works proposition.

Americus, Ga.—Citizens will vote April 4 on \$25,000 water works improvements.

Marietta, Ga.—Citizens will vote May 1 on \$15,000 bonds to extend water and sewer mains.

Pelham, Ga.—Citizens will vote on \$25,000 bonds for improvements to water system and for other work.

Flora, Ill.—Cost of constructing proposed water works and sewer system of vi4 pipe has been estimated at \$87,000.—J. S. Spoker, Vincennes, Ind., Engineer.

Toulon, Ill.—Engineers W. S. Shields Co., 140 Dearborn st., Chicago, are preparing plans for installation of c.-i. water pipe system.—A. Shinn, City Clerk.

South Bend, Ind.—Plans are being prepared by City Engineer A. J. Hammond for Bowman Creek sewer; pipes to be 10 ft. in diameter at intake and 12 ft. at the outlet.

Burlington, Ia.—Citizens' Water Co. contemplates making improvements at its plant this summer that will aggregate over \$13,000; improvements consist in installing a new pumping engine to pump water from the river to settling tanks and placing of two new filters; engine will cost \$7,711.30 and the filters will cost \$5,830.30.

Garden Grove, Ia.—Election on bonds for installation of water works is being considered.

Luray, Kan.—Citizens have voted \$20,000 bonds for construction of water works.—Rollins Westover, Kansas City, Mo., Engineers; P. E. Moss, City Clerk.

McPherson, Kan.—Council is considering installation of water mains on Main st.

Cumberland, Md.—Council has appointed Advisory Committee to act with it in installing proposed water supply.

Frederick, Md.—William H. Boardman, Philadelphia, Hydraulic Engineer, has been appointed to go over water situation in this city and make recommendation for increase of water supply.

Andover, Mass.—Town will vote on \$20,000 bond issue to extend and improve water system.

Springfield, Mass.—Town of East Meadow has again asked that town be connected with Little River system.

Uxbridge, Mass.—Town will expend \$20,000 on installation of water mains.

Wayne, Mich.—Village Council has voted to construct water plant.

Arlington, Minn.—Plans and specifications are being prepared by the Oscar Claussen Engineering Co., 514-515 National German American Bank Bldg., St. Paul, for installation of water works system.

Clara City, Minn.—Plans are being prepared by the Oscar Claussen Engineering Co., 514-515 National German-American Bank Bldg., St. Paul, for construction of water works system.

Fergus Falls, Minn.—City Engineer Hans Blegen has prepared plans for small filter for water works.

Madison Lake, Minn.—City will install water plant, including 60,000-gal. steel tank and about 3,000 ft. of 6 and 8-in. mains.

St. Joseph, Mo.—City is considering laying of water mains to northeast suburbs.

Havre, Mont.—Sinking of additional wells has been recommended.

Bath, N. Y.—City is considering construction of water mains in Morris, Steuben, William and Haverling sts.

Jamestown, N. Y.—Municipal Water Commission has engaged experts to prepare plans and estimates for improving local water plant so as to secure more water and increase the pumping facilities.

Mt. Morris, N. Y.—Citizens have voted \$100,000 bonds to construct water system by securing water near Portage; rights of way will be secured and correct estimate of work will be made at once.

Rochester, N. Y.—Board of Contract and Supply will ask bids for furnishing water pipes, valves and stop gates for Water Department.

Rochester, N. Y.—Council is considering ordinances for extension of water pipes on 23 streets; City Engineer Fisher has estimated cost at \$175,000.

Rutherfordton, N. C.—Citizens have voted \$25,000 bonds for construction of water works and electric light plant.

Smithfield, N. C.—Citizens have voted \$55,000 bonds for construction of water works, electric light plant and sewer system.

Centerburg, O.—H. L. Maddocks, Consulting Engineer, 504 Trust Bldg., Newark, has been selected by Village Council to prepare plans and specifications for construction of water supply system.

East Liverpool, O.—City has selected Chester & Fleming, Pittsburg, Pa., to act as engineers in connection with proposed improvements to water system and installation of pumping station.

Niles, O.—City Engineer Brewer has received plans for substructure of the filtration plant from Burgess & Long.

North Brewster, O.—North Brewster Water Co. has been organized and will install plant.—J. W. Lamoreaux, President.

Ada, Okla.—Bids will be received about April 15 for construction of water works from plans of Goodwin & Harper, Kansas City, Mo.; cost about \$110,000.

Jacksonville, Ore.—Bids will be received March 15 for purchase of \$30,000 bonds to construct water works system.

Lebanon, Pa.—Water Board will ask for bonds for installing pump at pumping station.

Medla, Pa.—Water Committee is considering installation of water main on South Orange st.

Pottstown, Pa.—Citizens of West Pottsgrove, township adjacent to city, will petition Supervisors to provide number of fire plugs.

Manchester, Tenn.—Legislature has authorized issuance of \$25,000 water and electric light bonds.

Denison, Tex.—State National Bank of Denison has been awarded Shawnee Lake pipe line bond issue of \$50,000.

Electra, Tex.—City is considering installation of water system. S. Walker is interested.

Fort Worth, Tex.—Citizens will vote April 4 on \$30,000 bonds for establishment of water works system for Polytechnic Heights.

San Antonio, Tex.—Finance Committee is considering \$10,000 appropriation for sinking one or more artesian wells at head of San Antonio River.

Winters, Tex.—Citizens have voted \$2,000 bonds to install water works; O'Neill Engineering Co. has prepared plans.

Salt Lake City, Utah.—Council has passed resolution authorizing \$1,000 expenditure for construction of wooden dam across Jordan River at 12th South st.

Rockford, Wash.—Plans are being prepared for additional construction of 1,600 ft. of new iron mains.

Seattle, Wash.—Plans and specifications have been approved by Board of Public Works for pumping station for Interbay district.

Tacoma, Wash.—City Commissioners have adopted resolution to call for bids for completion of two divisions of Green River gravity water system.

New Lisbon, Wis.—Citizens have voted \$20,000 of bonds for the construction of water works plant.

Battleford, Sask., Can.—Town has decided to install \$100,000 water works system.

Goderich, Ont., Can.—City will expend \$30,000 on water works this year.

Melville, Sask., Can.—Plans are being prepared for construction of water system. Leon Benoit, city, is interested.

Montreal, Que., Can.—Hering & Fuller, New York, N. Y., are preparing plans and specifications for proposed filtration plant, cost about \$1,250,000.

Ridgetown, Ont., Can.—F. W. Farcombe, London, Ont., will prepare plans for installation of water works system.

St. Boniface, Man., Can.—Plans are being prepared for installation of reservoir, capacity, 1,000,000 gals.

CONTRACTS AWARDED

Dalton, Ga.—Following firms have secured contracts for installation of proposed water works and electric light plant: The Casey-Hedges Company, the International Steam Pump Company, Platt Iron Works Company, United States Cast Iron Pipe & Foundry Company, Columbia Iron Works, M. F. Flynn & Co., Bingham Taylor, John W. Ashe, Westinghouse Company and Ball Engine Company.

Gainesville, Ga.—Furnishing of pumps, or each of steam and electric to Henry J. Worthington, through their Atlanta office, standpipe and boiler to R. D. Vole Manufacturing Co., Newnan; filters, to the New York; c.-i. pipes, to United States Cast Iron Pipe and Foundry Co., Chattanooga, Tenn.; terra cotta pipes, to Stevens Sons Co., Macon; hydrants and valves, to R. D. Wood & Co., Philadelphia; pumping station, which is the erection of the brick building, to Prater & Loder, Gainesville.

South Bend, Ind.—To the H. Mueller Manufacturing Co., Decatur, Ill., for furnishing 1,200 brass connections, \$937.75; approximately 700 tons of pipe and fittings, 4 Glamorgan Pipe and Foundry Co., Lynchburg, Va., 6 and 8-in. pipe \$23.50 per ton, 10 and 12-in. pipe \$23 per ton, 14 and 24-in. pipe, \$22 per ton, and standard special castings \$17 per ton.

Jefferson, Ia.—To C. W. Roland & Co., Des Moines, Ia., for constructing water works, \$6,200.

Ottumwa, Ia.—Water works improvements: To New York Continental Jew Filtration Co., New York, for filter, \$38,240; to American C. I. and Pipe Co., Birmingham, Ala., for pipe, \$24.10 per ton, f.o.b. city; concrete work, to Wm. Horabin, Iowa City.

Duluth, Minn.—By Board of Water and Light Commissioners, for 3,571 tons of c.-water and gas pipe to be used coming year, to United States Cast Iron Pipe and Foundry Co., Chicago, which bid average price, \$23.83 a ton, or \$85.112.60; American Cast Iron Foundry Co., Detroit, bid average of \$24.10 per ton, or \$86,954.85, and R. D. Wood

Co., Philadelphia, bid average of \$24.56 a ton, or \$87,716.95.

Bozeman, Mont.—Enlarging water works system, to Fred Birch, Fargo, \$40,000.

Great Falls, Mont.—To American Cast Iron Pipe Co., for 135 tons of 12-in. water pipe and specials, \$6,116.

Wymore, Neb.—Construction of municipal water and lighting plant, to Elkhorn Construction Co., Fremont, laying water mains, \$3,150; to Frank Wheeler, Havelock, constructing electric line, \$1,150; to St. Mary's Machine Co., Ohio, machines for general power, \$4,250.

Schenectady, N. Y.—Supply 180 tons of c. i. pipe, to Chas. Miller & Co., Utica; turning two tons of pig lead, to same company, \$97 per ton.

Silver Springs, N. Y.—Sinking test well, to New York and New Jersey Well Co.

Erie, Pa.—Furnishing iron pipe, to Standard C. I. Pipe Co., Bristol, \$21.95 per ton; special connections, \$50 per ton; furnishing 18 tons of lead, to John Wahl Company, St. Louis, \$4.37½ per 100 lbs.

Temple, Tex.—Installing equipment of proposed modern filtration plant, to Pittsburg Filter Mfg. Co., Pittsburg, Pa.; building and other work connected with the plant, to W. C. Rettiger, Belton, Tex.; plant will cost \$27,190, and will have a capacity of 2,000,000 every 24 hours.

Ogden, Utah.—Building Coldwater Canon conduit, to J. P. O'Neil, \$67,463.17.

Colville, Wash.—Furnishing 3,200 ft. wood pipe and quantity of wrapped copper pipe, to Geo. Van Tuij, city, \$1,120.

Burnaby, B. C., Can.—To W. Thomas, 731 Jervis st., Vancouver, to construct lap weld steel pipe water system.

Ottawa, Ont., Can.—Supplying c. i. pipe, to Canadian Iron Corporation, Ltd., Montreal, \$11,579.

BIDS RECEIVED

Webb City, Mo.—Construction of reinforced concrete reservoir, of 1,500,000 gals. capacity: Redmond, Putnam & Co., city, \$14,850; O. B. Vanderpool, Joplin, \$12,200; F. W. Keller, city, \$11,995; Oklahoma City Construction Co., Oklahoma City, Okla., \$11,450; J. C. Barr & Co., Joplin, \$11,444; S. M. Kerns, Denver, Col., \$9,990; Webb City Granolithic Co., city, \$9,975; F. W. Caulkins, city, \$9,676; Joseph Schneider, Monett, \$8,495; J. O. Williams, Aurora, \$7,400.

Spokane, Wash.—J. M. Yoeman, 04223 Howard st., was lowest of six bidders for contract for building new Lincoln Heights auxiliary pumping station, \$4,247. Other bidders: Shirley & Martin, \$4,678; Auld Bros., \$4,588.75; Alverson & Koepfer, \$5,697; Cox & Parker, \$4,575, and R. C. Alloway, \$5,950; estimate of Water Engineer Alexander Lindsay was \$5,000.

LIGHTING AND POWER

Albertville, Ala.—Citizens have voted issuance of \$7,000 of bonds for construction of electric light plant.

Eufaula, Ala.—Council has decided to install municipal electric light plant. C. M. Gammage, Chairman Finance Committee, is interested.

Huntsville, Ala.—Huntsville Gas Light Co. has sold its plant and franchise to a Philadelphia corporation; new company will make extensive improvements after taking charge, about the middle of next month.

Clarksville, Ark.—E. J. Connell will rebuild electric light plant.

Newport, Cal.—Resolution has been passed by Council providing for construction of a municipal electric light plant.—L. S. Wilkinson, City Clerk.

Turlock, Cal.—La Grange Water and Power Co. will install street electric lighting system.—A. Scott, La Grange, Superintendent.

Denver, Col.—Denver Gas and Electric Co. is preparing plans to improve system, including installation of lighting system for the boulevard and extension of gas mains; also ornamental lamp standards for several boulevard streets; this work will cost about \$400,000 and will be under contract with city.—W. J. Barker, General Superintendent.

Marietta, Ga.—Citizens will vote May 1 on \$20,000 of electric light bonds.

Pelham, Ga.—Citizens will vote on \$25,000 of bonds for improvement of light system.

Sandoval, Ill.—Installation of municipal electric light plant is being considered. R. R. McCall and W. J. McNally are interested.

Fort Wayne, Ind.—Cost of installing ornamental lighting system on Calhoun st. has been estimated by City Electrician Frank Dix at \$864 per block.

Kendallville, Ind.—Council will purchase additional dynamos for lighting plant.

Warsaw, Ind.—Winona Electric Light and Water Co. is considering improvements,

including new pumps.—Theo. Frazer, Manager.

Dodge City, Kan.—Citizens have defeated proposition to build municipal electric light plant.

Severy, Kan.—Council has granted W. H. and Earl J. Mathis, Wichita, franchise for electric light plant.

Lagrange, Ky.—City has granted electric light franchise to J. C. Emmick, Lewisport.

Maysville, Ky.—Maysville Public Service Co. will take over Maysville Gas and Electric Light Co. and will enlarge plant; gas house may be erected; connections will be at once laid from National gas pipe line to this city.

Georgetown, Mass.—Town will vote on improved lighting system.

South Framingham, Mass.—Town will consider subject of municipal ownership of electric lighting and power.

Grand Rapids, Mich.—Grand Rapids Gas Light Co. will expend \$50,000 in extending mains.

Chillicothe, Mo.—Contract will be let this spring for construction of a municipal electric light plant; plans by Fuller-Coult Co., Chemical Bldg., St. Louis; cost about \$50,000.—John H. Taylor, Mayor.

Monett, Mo.—Plans and specifications have been prepared by Rollins & Westover, Engineers, Beals Bldg., Kansas City, for proposed electric light plant.

Lavina, Mont.—E. F. Fullmer, Lewiston, has decided to install electric light plant.

Binghamton, N. Y.—Council is considering two ordinances, one directing the Board of Contract and Supply to advertise for bids for street lighting on five and ten-year contracts; other requesting Board of Contract and Supply not to make street lighting contract for period longer than one year.

Brockport, N. Y.—Additional stationary transformer of 600 h.p. capacity will be installed in substation of the Buffalo-Lockport and Rochester Railway Co.—J. H. Cain, Rochester, Superintendent.

Richfield Springs, N. Y.—Richfield Springs Electric Light & Power Company will soon commence erection of \$40,000 model plant.

Rutherfordton, N. C.—Citizens have voted \$35,000 bonds for construction of electric light plant and water works.

Smithfield, N. C.—Citizens have voted \$55,000 of bonds for construction of electric light plant, sewer system and water works.

Barberton, O.—Council will consider petition asking installation of proper equipment at pumping station to make it municipal lighting plant.

Greenfield, O.—Board of Public Works has advertised for bids for the reconstruction of electric light system at cost of \$20,000.

North Brewster, O.—North Brewster Electric Light, Heat and Power Co. has been organized and will erect plant.—J. W. Lamoreaux, President.

Lock Haven, Pa.—Bids are wanted for lighting the city with 10 arc lamps and 25 incandescents.—C. E. Oberheim, City Clerk.

Royersford, Pa.—Town is considering establishing of a municipal electric light system, and Councilman Saylor is investigating similar enterprises at Pennsburg.

Hayti, S. D.—S. M. Ellis and J. A. Snyder, Watertown, are interested in proposed construction of electric light plant.

Jackson, Tenn.—City Council, R. L. Beare, Chairman Special Committee, is interested in ornamental street lighting fixtures for business section.

Seattle, Wash.—Specifications have been submitted to Board of Public Works for 22,000 ft. of 2, 3, 4, 8, 12, 20, 30 and 40-conductor cable for use of city electrician's department; bids will soon be called for.

Spokane, Wash.—Panhandle Electric Railway and Power Co. will erect \$2,000,000 plant and transmission line to bring power from Priest River to Spokane and will enter into active competition with the Washington Water Power Co.—A. J. Smith, Local Agent.

Calgary, Alta., Can.—Natural Gas Company, Calgary, will lay piping from Gleichen, 55 miles distant, at approximate cost of \$3,500,000; work will start this spring.

Fort William, Ont., Can.—Kaministiquia Power Company has voted to spend \$250,000 this summer for enlarging power plant. R. S. Kelsch, Construction Engineer.

CONTRACTS AWARDED

Staunton, Ill.—Installing electrical apparatus in municipal electric light plant, to Wesco Supply Co., St. Louis, Mo., \$6,725.

Chesteron, Ind.—By Northern Indiana Gas and Electric Co., for two 350-KVA. steam turbines, to Westinghouse Machine Co., Pittsburg, Pa.; turbines will be connected to a 7.0-KVA., 13,200-volt, 3-phase, 60-cycle Westinghouse generator and will operate on a steam pressure of 75 lbs. and will exhaust into a vacuum of 28-in.

Trenton, N. J.—Lighting streets for next

five years, to the Public Service Corp., \$80 per year for arc and \$27 for incandescent lamps.

Georgetown, Tex.—Building of \$3,000 power house, to James Waterson.

Chase City, Va.—To John L. Livers, Grotoes, for construction of electric light plant; estimated cost \$20,000.—J. Kent White, Engineer.

Seattle, Wash.—Third ave. et al, cluster lights, Subdivision No. 2, to Olympic Foundry Company, \$3,824.

Fort Frances, Ont., Can.—To Nelson & Cassaday to supply electric light poles for the town lighting system, \$1.75 per pole for 30 ft. 6 in. top and \$3.25 per pole for 35 ft. 7 in. top.

BIDS RECEIVED

Springfield, Mass.—Furnishing and installing cable for underground conduit system for municipal lighting and power plant: Safety Insulated Wire and Cable Co., Boston and New York, \$11,655.03 for the paper insulation cable and the Standard Underground Cable Co., Pittsburg, Pa., \$13,511.45 for the same kind of cable; latter company also put in bid of \$16,614.76 for varnished cambric insulation cable.

FIRE EQUIPMENT

Montgomery, Ala.—City will erect fire station in southern section.—A. R. Gilchrist, City Engineer.

Fresno, Cal.—National Board of Fire Underwriters has recommended purchase of auto chemical engine equipped with two 60-gal. tanks and 4 salvage covers, modern first-size engine, auto combination hose wagon, auto for fire chief and minor equipment, also installation of following apparatus for fire alarm system: Six-circuit non-interfering, automatic repeater, additional 4-circuit charging board, motor generator set for charging battery, etc.

Los Angeles, Cal.—Fire Chief A. J. Eley has asked Council to purchase fast auto.

Terryville, Conn.—Town has appropriated \$1,800 to purchase hose carriage and 800 ft. of hose. Alfred Blakeslee is interested.

East St. Louis, Ill.—Building Commissioner Hamler has been requested by Mayor Cook to submit plans for additions to and alteration of Fire Department Headquarters Bldg. on Main st.; work is to cost \$6,000.

Prairieburg, Ia.—Purchase of fire apparatus is being considered.

Bridgewater, Mass.—Town will erect fire house.

Cliftondale, Mass.—Town is considering purchase of auto chemical.

Conway, Mass.—Town has decided to purchase chemical engine.

Northampton, Mass.—Fire Chief F. E. Chase is urging purchase of \$5,000 auto combination chemical and hose wagon.

Wakefield, Mass.—Chief Code is urging purchase of auto fire engine.

Central City, Neb.—Council has decided to purchase fire engine.

Elizabeth, N. J.—Finance and Fire Committees are considering installation of fire engine house with suitable apparatus in Tenth Ward, purchase of auto fire engine or engines and relocation of some fire houses.

Flemington, N. J.—Fire Department is securing funds for erection of fire house.

Millville, N. J.—Fire Committee will purchase site for erection of hose house in West Millville.

New Brunswick, N. J.—Hibernia Fire Co. No. 6 will erect \$13,000 station.

Paterson, N. J.—Fire and Police Committee is considering following improvements for fire department: Converting two first-size engines, \$9,000; converting two supply wagons, \$7,000; one gasoline propelled truck, \$9,000; purchase and improvement of property on Temple Hill, \$7,500; auto engine, \$7,500; erection of fire house in West Paterson, \$4,500; converting chemical engine, \$3,000.

Salem, N. J.—Council has decided to secure bids for placing boiler in old steam fire engine.

Binghamton, N. Y.—Fire Commissioner J. M. Henwood will purchase 500 ft. of fabric fire hose.

Scotia, N. Y.—Assistant Fire Chief E. C. Hoyt has submitted plans for fire alarm system for village, costing about \$2,500.

Syracuse, N. Y.—Erection of hose house in vicinity of Butternut and Manlius sts. is being urged.

Yonkers, N. Y.—Council has passed resolution for purchase of motor cars for Fire Chief and his two assistants; also two ambulances.

Astoria, Ore.—Fire Chief C. E. Coster has recommended purchase of auto combination chemical truck and hose; also installation of additional fire alarm boxes and equipping of two tugs with fire pumps.

Erie, Pa.—Fire Commissioners Hogan, Walker and Hass have decided immediate request should be made of Councils to provide for rebuilding of No. 7 fire engine and the replacing of No. 5 fire engine and purchase of additional hose.

Mahoney City, Pa.—Alert Fire Co. will erect \$10,000 engine house.

Selinsgrove, Pa.—Borough Council has voted to purchase chemical fire engine.

Wanamie, Pa.—Architect Emery, of Wilkes Barre, will prepare plans for erection of three fire houses.

Weldon, Pa.—Weldon Fire Co. is receiving bids for erection of fire house.—Geo. Natress & Son, 12th and Walnut sts., Philadelphia, Architects.

Providence, R. I.—Fire Commissioners have been authorized by Board of Contract and Supply to purchase Knox motor fire vehicle for department; vehicle will carry 1,000 ft. of hose; chemical engine and 150 ft. of chemical hose, and will also accommodate a crew of 10 men.

Madison, Wis.—Plans are being prepared for erection of proposed No. 2 fire station.

Fort William, Ont., Can.—Canadian Fire Underwriters' Inspector has recommended purchase of two additional fire engines; also chemical engine to be placed in No. 3 station.

CONTRACTS AWARDED

Bridgeport, Conn.—Converting horse-drawn hose wagon into auto chemical, to Locomobile Co., \$2,000.

Hartford, Conn.—Furnishing auto chemical combination car, also auto for officers of fire department, to Pipe Manufacturing Co.

Duluth, Minn.—Auto combination chemical and hose wagon, to American-La France Engine Co., Elmira, N. Y., \$5,000.

Millville, N. J.—Furnishing fire hose: 500 ft., to Eureka Fire Hose Co., Boston, \$1 per ft. for Paragon brand; 500 ft., to New Jersey Car Spring and Rubber Co., Jersey City, \$1 per ft.

White Plains, N. Y.—Furnishing Locomobile combination auto chemical and hose wagon, to Chas. Paul, \$6,000; Machine will be made at Bridgeport, Conn.

Portland, Ore.—To Bowers Rubber Co., San Francisco, and Columbia Hardware Co., city, for furnishing 1,000 ft. of 2½-in. hose, 90c. per ft., and Eureka Fire Hose Co. and A. G. Long, for 1,000 ft. each, \$1 per ft.; A. G. Long also received the order for 600 ft. of 1½-in. hose, 67c. per ft.

Oshkosh, Wis.—Building hose house at West New York and Central aves., to J. T. Raycraft, city, \$9,500.

BIDS RECEIVED

Pueblo, Col.—Furnishing auto fire truck: Victor Fire Auto Co., Buffalo, N. Y., 60-70 hp., four cylinders, \$1,500 cash and the remainder at 4 per cent interest, \$4,228; Anderson Fire Supply Co., Kansas City, by George Jackson Carriage Co., Pueblo, 78 hp., four cylinders, delivery in 90 days, \$4,900 on time and \$4,802 cash; Seagrave Motor Truck Co., Columbus, O., by Pueblo Auto Co., Pueblo, 70 hp., four-cylinders, 90 day delivery, \$4,875; American-La France Auto Fire Engine Co., Elmira, N. Y., by Ideal Motor Co., city, 70 hp., 90 days delivery f.o.b. Pueblo, with forfeiture of \$100 per day for failure to deliver after that time; four cylinders and expert from factory to instruct in use, \$5,750; Webb Motor Fire Appliance Co., St. Louis, by Pueblo Auto Goods Co., two bids: No. 1, for six-cylinder, 90 hp. car, speed 60 miles per hour with equipment and men, four speeds forward, 120 days delivery, \$5,750; bid No. 2, four cylinders, 70 hp. f.o.b. Pueblo, \$5,400; Robinson Fire Auto Co., St. Louis, 80 hp., 120 days delivery, no figure named.

Haverhill, Mass.—Furnishing fire hose: Cornelius Callahan Co., 65c.; Eureka Fire Hose Co., 65c.; Combination Ladder Co., 82c., 75c., 80c., 77c. and 85c.; Triple C, 59½c. and 64½c.; La France, 61¾c. and 60c.; Boston Woven Hose, 68c. and 62c.; Voorhees Co., 70c., 65c. and 60c.; Mineralized Rubber, 75c.; Jersey Rubber, 65c., 55c., 65c.

BRIDGES

Phoenix, Ariz.—State Engineer J. B. Girard has prepared plans for erection of reinforced concrete bridge near this city.

Los Angeles, Cal.—Engineers Mayberry & Parker, Pacific Electric Bldg., have been retained by County Board of Supervisors of Ventura County to prepare plans for 11 reinforced concrete bridges and to act as Consulting Engineers for the erection of 9 steel bridges.

Denver, Col.—Construction of a bridge over the Platte River at Alameda ave. is being considered at cost of about \$30,000.

South Bend, Ind.—Board of Public Works is planning to build bridge across river at Washington ave.

Waterloo, Ia.—City will co-operate with the Waterloo, Cedar Falls and Northern Railway in erecting bridge at out-off next spring.

Elizabethtown, Ky.—Bridge to cost \$60,000 will be erected between Illinois Central and Henderson Route bridges, over Salt River.

Shreveport, La.—Plans have been prepared for building of traffic bridge over Red River, 1,900 ft. below site of the present combination railroad and traffic structure, which is largely owned by Vicksburg, Shreveport & Pacific Railway; new bridge will land on high bluff between Jones and Lake sts. in this city; estimated cost is \$225,000.

Monson, Mass.—Town is considering replacing of wooden bridges with concrete structures.

Menominee, Mich.—By Joint Bridge Committee of Menominee and Manette, to erect bridge to Wausau Iron Works, \$24,000.

Republic, Mich.—Bids, accompanied by detail plans and specifications, will be received for building a bridge over Michigan River; bridge is to be of reinforced concrete or steel truss with concrete floor.—A. Siebenthal, Republic Township, Super-visor.

Duluth, Minn.—Bids will soon be asked for erection of four bridges, two of steel construction with concrete decking, and two of all concrete construction.—H. J. Hammerbeck, Chairman Commissioners of Roads and Bridges.

Port Clinton, O.—Bids will soon be asked by County Commissioners for the construction of drawbridge over Portage River; cost \$15,000.

Washington Court House, O.—Payette County will build five new bridges at estimated cost of \$25,000.

Kittanning, Pa.—City is considering construction of bridge over Rough Run, near Winfield; plans have been prepared.

Philadelphia, Pa.—Council has adopted resolution requesting Director of Public Works to confer with United States Engineer officers and authorities of Delaware County relative to construction of bridge on line of 84th st. over Darby Creek.

Lynchburg, Va.—Street Committee is considering erection of \$200,000 concrete bridge at foot of 9th st.

Tacoma, Wash.—Waddell & Harrington, Kansas City, will prepare vertical lift and bascule bridge plans for structures city contemplates erecting over city waterway and Puyallup River.

CONTRACTS AWARDED

Fairmount, Ill.—To R. C. Spandau, Danville, for constructing bridge over Salt Fork River, near Fairmount, \$6,995.

Kingston, N. Y.—Building Eddyville bridge, to Lane Bridge Co., Corning, \$16,950; additional concrete, \$6; other bidders: E. J. Doyle & Co., Albany, to construct as per specifications, \$24,500; additional concrete, \$13 per cu. yd.; Owego Bridge Co., Owego, \$21,245; additional concrete, \$10; York Bridge Co., York, Pa., \$20,551; additional concrete, \$12; Lupfer & Remick, Buffalo, \$24,290; additional concrete, \$20; United Construction Co., Albany, \$25,152; additional concrete, \$20; Penn Bridge Co., Beaver Falls, Pa., \$20,361; additional concrete, \$15.

BIDS RECEIVED

San Jose, Cal.—Erection of bridge on Meridian road: Estery Construction Co., \$6,993; John Doyle, \$5,967; J. W. Williams, \$6,845; L. M. Scott, \$5,250; J. W. McReynolds, \$7,749; Charles P. Nott, \$6,357; James Casley, \$5,850; William Radtke, \$4,780.

MISCELLANEOUS

Douglas, Ariz.—Mayor Meguire is planning for laying out of public park and playground on five acres owned by city.

Pelham, Ga.—Citizens will vote on bonds for erection of municipal building.

Hutchinson, Kan.—Citizens will vote March 27 on \$125,000 bonds to erect auditorium.

Hutchinson, Kan.—City Commission has decided to ask for bids for installation of \$1,000 incinerating plant.—G. L. McLane, City Engineer.

Newport, Ky.—Police Committee will ask for bids for installation of patrol system.

Hagerstown, Md.—Citizens will vote March 23 on \$50,000 bonds to purchase public park.

Boston, Mass.—Derby, Robinson & Shepard will prepare plans for proposed \$20,000 Parkman bandstand.

Fitchburg, Mass.—Police Committee is considering purchase of automobile.

Lawrence, Mass.—Mayor Cahill and Board of Health are gathering information on garbage collection.

Detroit, Mich.—Architect G. A. Mueller, Bretmeyer Bldg., has prepared plans for erection of \$37,000 branch library building at King and Woodward aves.

Saginaw, Mich.—Citizens will vote April 3 on erection of central police station.

North Platte, Neb.—Plans are being prepared for erection of proposed Carnegie library on Court House Square.

Yonkers, N. Y.—Council has passed resolution for purchase of two auto ambulances and three motor cars.

Cherryville, N. C.—Town will issue \$8,000 bonds to erect city hall.

Cincinnati, O.—Fire has practically destroyed plant of the Cincinnati Reduction Co. near Anderson's Ferry in western part of city, causing loss of \$50,000; company had the contract for the collection, removal and disposal of the garbage of city, and other means of disposing of city's refuse will have to be provided for until plant is rebuilt.

Klamath Falls, Ore.—Citizens will again vote on \$30,000 bonds for erection of city hall and \$25,000 bonds for purchase of garbage site.

Union City, Tenn.—Architect H. D. Whitfield, 160 5th ave., New York City, has prepared plans for erection of \$10,000 Carnegie library.

Roanoke, Va.—Citizens have voted \$230,000 bonds to purchase site and erect public building and \$120,000 to purchase eight acres for public library, playgrounds and park.

Seattle, Wash.—Board of Park Commissioners, Central Bldg., will take bids soon for the erection of an aviary and monkey house at Woodland Park; estimated cost, \$15,000. Frank Allen, Inc., Architects.

Seattle, Wash.—Construction of five comfort stations to be established on playgrounds throughout city is contemplated by Park Board; no architect chosen. R. W. Cotterill, Secretary.

Snohomish, Wash.—Council is considering erection of municipal building at 2d st. and Ave. A.

Niagara Falls, Ont., Can.—Plans are being prepared for enlarging city hall.

CONTRACTS AWARDED

Gadsden, Ala.—To Southern Structural Steel Co., San Antonio, Tex., to erect \$25,000 jail.

Schenectady, N. Y.—Furnishing street flushing machine, to Chas. Hvass & Co., New York, \$850; street sprinkler, to Austin Western Co., New York, \$317.50; refilling brooms in street sweep, to Chas. Hvass & Co., \$7.50 per broom.

BIDS RECEIVED

Oakland, Cal.—Construction and maintenance of levees in Key Route basin by Board of Public Works; for levee extension along 14th st. in Key Route basin and for dredging of the channel along pier near line on the west side of north arm of harbor; first proposition the bidders were The Vulcan Dredging Co., Marshall C. Harris and the California Reclamation Co. On the second proposition: The California Reclamation Company and M. C. Harris. On the third proposition: M. C. Harris, San Francisco Bridge Co. and the Charles Nelson Co. Dredging of channel in the Oakland harbor, Charles Nelson Co. was lowest bidder, 7 cts. per cu. yd. and will probably receive contract; on the other two propositions, in which there were a number of specifications, the bids will be tabulated and contract soon awarded.

Holyoke, Mass.—Construction, plumbing and heating and ventilating of tuberculosis hospital by Board of Public Works. Lowest bidders were as follows: General construction, V. V. Goddard, \$8,700; plumbing, D. J. Bowler, \$681; heating and ventilating, M. J. Moriarty, \$766 and \$1,020. Bids other than the lowest, are as follows: General construction, Joseph Lalibertie, \$12,800; L. B. Smith, \$9,500; Israel Ducharme, \$8,888; Contractor Walsh, \$9,840; L. Carreau & Son, \$9,270; plumbing, M. J. Moriarty, \$770; Sullivan & Carmody, \$869; C. P. Lyman, \$737. Heating and ventilating, D. J. Bowler, \$1,047; Holyoke Supply Co. \$739 and \$1,259; Holyoke Valve & Hydrant company, \$1,029 and \$1,326; P. J. Donnelly, \$985 and \$1,250.

Spokane, Wash.—Installing police signal alarm system: Fred A. Wood, local representative of the Gamewell Fire Alarm Telegraph Co., \$10,180 for system with ordinary equipment; for complete equipment \$17,000 was bid by the same company. Signaphone Alarm Co., Milwaukee, \$10,220 through C. E. Stillwell, their local representative; N. G. Carhart, representing Western Electric Co., Seattle, \$7,470; Deal Electric Co., Myrtle O., through their representative, Merton J. Corwin, offered to place their "Flashlite" system in at \$6,400.

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READE STREET, NEW YORK. A TYPICAL WOOD BLOCK PAVED STREET

DEVELOPMENT OF WOOD BLOCK SPECIFICATIONS

History of the Use of Treated Wood Blocks in the East—Early Creo-Resinate Process—Evolution of Specifications in New York—Character of Preservative Oil—Antiseptic and Waterproofing Qualities

By GEORGE W. TILLSON, Chief Engineer of Highways, Borough of Manhattan, New York City

Probably no material for street pavements has caused as much interest over the entire country since the introduction of asphalt as have creosoted wood blocks.

In the '80's brick was introduced and a large amount of it used in the central west, but as most of the clays that will make suitable paving brick are found in that locality its use has been somewhat restricted on account of the high cost of transportation. But wood is a material that is used all over the country and can be obtained at a reasonable price.

The first creosoted wood blocks were laid in Indianapolis about twelve years ago. The material was pine, and the timber was treated with about twelve pounds of oil per cubic foot. No particular attention was paid to the character of the oil. These pavements were quite satisfactory, although they swelled and bulged, making it often necessary to relay them

to quite an extent. The officials in charge of the work were almost ridiculed, and certainly laughed at to quite an extent, for their apparent folly in persisting in using wood as a paving material. But they continued their efforts, and the results obtained there were recognized finally by officials from other cities.

The first treated wood block pavement laid in the east was on Tremont Street, Boston, in 1900, in front of the Common, where one-half the street was laid with sheet-asphalt and the other half with wood. These blocks were treated by the so-called creo-resinate process, being impregnated with a mixture composed of one-half creosote oil and the other half resin. This pavement has been in use now for ten years with very little repair, and is in good condition at the present time.

The first pavement of this character in New York was laid

on State Street, Brooklyn, in 1902 at the expense of the contractor, the city setting the curb and laying the concrete base. The authorities were so well pleased with it that specifications were adopted and other streets paved during that and the following year. These specifications required the material to be long-leaf yellow pine, and that it should be treated with a compound composed of one-half creosote oil and the other half resin or some other suitable waterproofing material. They also provided that the blocks should sink in water, and after being dried at a temperature of 100° F. for twenty-four hours should not absorb more than three per cent. when immersed in water for another twenty-four hours.

The first pavements of this character in Manhattan were laid in 1904, with the same specifications as given above, on Warren Street west of Broadway, 20th Street between Broadway and



LOWER NEW YORK, WOOD BLOCK PAVEMENTS SHOWN IN HEAVY LINES

Fifth Avenue, and 98th Street between Central Park West and Columbus Avenue. The object in selecting these three streets was to have one of heavy, another of medium and the third of light traffic. These streets have now been laid nearly seven years and have been out of guarantee two years. They have required practically no repairs, although Warren Street, the heavy traffic street, does need some at the present time.

In 1904 other streets in the lower business section of the borough were paved with wood, the material with which the blocks were treated being composed of 50 per cent of creosote oil and 50 per cent of resin. The specifications required that the blocks should be impregnated with twenty pounds per cubic foot of this material, and should show an absorption test of not more than 3 per cent after being immersed for twenty-four hours and dried as above.

The pavements laid in 1906 were laid under the same specifications.

In 1907, however, the specifications were materially changed. The specifications for timber, which had previously called entirely for yellow pine, were modified by admitting either long-leaf yellow pine, Norway pine, black gum, or tamarack, and the requirements for the preservative were changed so that it should be composed of 75 per cent of oil and 25 per cent of resin, the specific gravity of the oil to be 1.12. The absorption test still remained the same.

In 1908 another modification was made, requiring that treated gum blocks should weigh not less than fifty-five pounds per cubic foot; in other words, not less than twenty pounds per cubic foot more than the recognized weight of such blocks when untreated.

The depth of the blocks in all of the above specifications in Manhattan was 3½ inches.

On account of the modifications, as set forth above, a few streets were laid with gum blocks instead of yellow pine, but no Norway pine or tamarack blocks have been used.

The oil referred to in all of the above specifications was required to be a direct product of coal-tar.

In 1909 the claim was made to the city authorities that on account of the high specific gravity required for the oil free competition was not obtained, and a change in the specifications was called for. The matter was referred to a committee composed of the Chief Engineer of the Board of Estimate and Apportionment, the Chief Engineer of the Finance Department, and the Chief Engineers of the Bureaus of Highways of the different boroughs for an investigation and report. The committee examined into the matter very carefully, having several hearings and calling before it different manufacturers of wood block in an endeavor to obtain the best results with as great competition as possible.

The committee recognized that two properties were required of the preservative: one, to keep the block absolutely from decay; and the other, to keep it stable in size so that it would not contract when dry or swell when wet, thus bulging and causing a deformation of the pavement.

A plea was made before the committee for the adoption of an oil manufactured from water-gas tar, it being claimed that such an oil would be just as good, and could be obtained at much less expense than from coal-tar. After a careful investigation the committee adopted a specification for oil as follows:

The oil with which the blocks are to be treated shall be a stable, antiseptic and waterproofing oil from which the water has been removed by distillation, and which shall have a specific gravity of not less than 1.12 at 38° C. When distilled in the manner hereinafter described, the oil shall lose not more than thirty-five per cent. up to a temperature of 315° C. The distillate between 255° C. and 315° C. shall have a specific gravity not less than 1.02, the said specific gravity being taken at a temperature of 60° C.

The committee felt that with its then knowledge of the use of water-gas tar oil it was not willing to permit it to be used entirely. As it was claimed before the committee that the 1.12 oil that had been previously used was not a pure creosote, but was manufactured by adulterating the 1.03 creosote oil with coal-tar pitch, the committee was willing to allow the coal-tar creosote oil to be adulterated with the water-gas product to an extent not to exceed 50 per cent. By providing that the distillate between 255 and 315° C. should not be less than 1.02, this point was covered and these specifications have been in use in Manhattan ever since.

In February of 1910, a convention of officials from the different cities of the country was held in Chicago, and this same matter was again given careful consideration. The committee was made up of representatives of some ten different cities, practically all that had been using wood block to any extent. The specifications adopted there varied from the New York specifications as relate to oil in that they required that the oil should be a coal-tar product free from adulteration of any kind; should have a specific gravity of at least 1.10 at a temperature of 38° C.; that not more than 3 per cent of the oil should be insoluble by hot continuous extraction with benzol and chloroform; that on distillation the distillate should not exceed 2 per cent up to 150° C. and 35 per cent up to 315° C.; the mean of three determinations to be taken.

In October, 1910, a sub-committee for standardizing paving specifications of the American Society of Municipal Improvements reported on wood block specifications. These specifications were the same as the Chicago specifications except that they required that not more than 4 per cent of the oil should be insoluble in hot benzol and chloroform.

In New York City, in February, 1911, at another meeting of the City Officials for Standardizing Paving Specifications the committee on creosoted wood block practically reaffirmed its former specifications, but modified the specific gravity by making a maximum of 1.14 for the specific gravity at a temperature of 38°, leaving the minimum at 1.10; and provided that not more than 3½ per cent of the oil should be insoluble by hot continuous extraction with benzol and chloroform instead of 3 per cent as in former specifications.



BROADWAY, NEW YORK, SOUTH FROM CITY HALL.
Granite in foreground; wood block in distance, where traffic is heavy

The consideration of the specifications thus far has been regarding the character of the wood and its treatment rather than how the blocks should be laid.

In Brooklyn all wood blocks have been laid on a cement mortar cushion made of one part of cement and three parts of sand, one-half inch thick. The joints have been filled with clean fine sand. The pavement was guaranteed for five years.

In Manhattan the first three streets enumerated herein were laid in the same way and with the same guarantee. But subsequent pavements had a Portland cement grout joint and a ten-years' guarantee.

This matter also was considered in the city's engineer committee, and a guarantee of five years only recommended.

The principal changes made by the committee, in addition to making the preservative a 1.12 specific gravity product, not necessarily produced from coal-tar, without any admixture of resin, were making the depth of blocks four rather than three and a half inches, and making the guarantee period five rather than ten years. The preservative and guarantee changes would reduce, and the depth of block change would increase, the cost of the pavement. As an actual result the average cost of wood pavement in Manhattan in 1909, after the changes were adopted, was \$3.34 per square yard as against \$4.27 in 1908. Probably not all the reduction was on account of the specifications, but the most of it undoubtedly was.

The Borough of Manhattan is still using the 1909 specifications, except that sand has been substituted for both the mortar cushion and the grout joint.

At the present time the question most discussed in connection with wood block specifications is the character of the oil, and the following points are made by the opponents of such an oil as has been described in this article. One party objects entirely to the heavy oil on principle, believing the 1.03 to 1.06 specific gravity oil to be better than the heavier. The other objects not to the weight of the oil, but to the requirement that provides for its being a coal-tar product, claiming that an oil made from water-gas tar is just as good, and is much cheaper and more easily obtained.

It is generally admitted that the preservative must contain not only antiseptic but waterproofing qualities, although

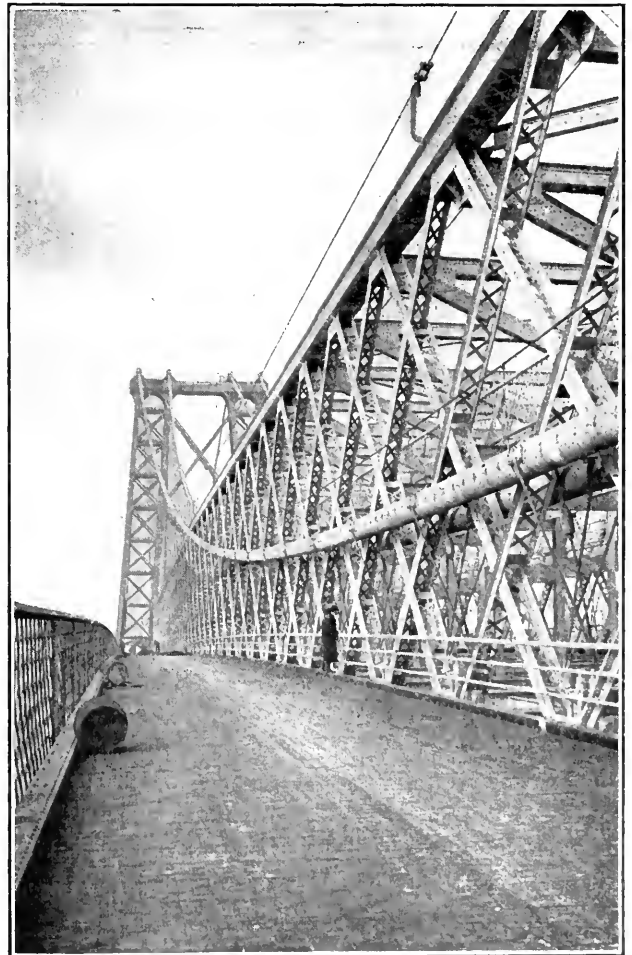
it is possible that if the water could be kept entirely from the block it would not decay. The above qualities should be maintained as long as possible, as the pavements on most of the streets where wood is used would naturally rot out before they would wear out. In London and Paris it is different, the traffic in those cities being so great that the blocks are actually worn down thin by the traffic. Accordingly the blocks are given what would be considered in this country a superficial treatment only.

It is well known that creosote oil is a volatile substance, and it seems reasonable that whatever will increase its stability should also increase its value as a preservative.

The early advocates of treated wood blocks recognized this and sought to remedy the instability of the oil by mixing with the light oil an equal part of resin, the idea being that the mixture would be stable and act both as an antiseptic and as a waterproofing material. As the cost of resin increased, the one-to-one mixture was changed to one composed of three parts of 1.12 oil to one part of resin, and in 1909 the New York City engineers' committee, heretofore referred to, decided that a 1.12 oil was sufficient in itself, but did not feel justified in recommending an oil made wholly from water-gas tar.

The two important questions then seem to be: First, is a 1.03 to 1.06 specific gravity oil sufficiently stable to preserve a pavement for twenty or twenty-five years, both as to the durability of the wood itself and the liability of the surface to become deformed on account of swelling caused by undue absorption? Second, is a 1.12 specific gravity oil, made entirely from water-gas tar, as good a preservative, as outlined above, as one that is a straight coal-tar product?

All engineers should strive for the best work possible as well as the greatest competition in attaining this result. If either of the above questions can be answered in the affirmative wood block specifications should be changed accordingly. With



WOOD BLOCK PAVING, WILLIAMSBURG BRIDGE, NEW YORK

the present knowledge of the subject it seems doubtful if they can be so answered. From the present practice of the cities now using wood for street pavements it also seems that their engineers concurred in the above conclusion. But the matter is an important one, and one that should be investigated and a determination reached only after careful experiment. This work should be done only once, but by a careful and disinterested party.

In 1907 the Forest Service of the U. S. Department of Agriculture laid a wood pavement on Nicollet Avenue, Minneapolis, Minn., of seven different varieties of wood, the idea being to determine the relative values of each for paving purposes. The varieties used were hemlock, Southern pine, fir, Western larch, birch, tamarack, and Norway pine. Sufficient time has not elapsed to enable one to draw final conclusions, but the result must be valuable. If, now, this same department would undertake a series of experiments to determine the relative preservative properties of the different oils proposed for treating wood paving blocks, it would be performing a service that could be done by few if any municipalities, and one that could not fail to be of great value. Its conclusions, too, would be generally accepted.

COMMITTEES ON PAVEMENT SPECIFICATIONS

Owing to the interest felt by paving men generally in the specifications formulated and adopted by the Organization of City Officials for the Standardizing of Paving Specifications, many inquiries have been addressed to this Journal for the names of the members composing these committees. A list of these names will serve the double purpose of informing such interested parties whom to correspond with in connection with the several specifications and also will serve to indicate the standing of the men responsible for the specifications. This list of committees is as follows:

ASPHALT PAVEMENT

George W. Craig, City Engineer, Chairman, Omaha, Neb.
William R. Benson, Chief Bureau of Highways, Vice-Chairman, Philadelphia, Pa.
George W. Tonson, Chief Engineer, Toledo, O.
Felix Kleeborg, Chemist, Bureau of Highways, New York, N. Y.
E. N. Bingham, City Chemist, Spokane, Wash.

BITUMINOUS CONCRETE PAVEMENT

Linn White, Engineer South Parks, Chairman, Chicago, Ill.
L. W. Rundlett, City Engineer, Vice-Chairman, St. Paul, Minn.
W. H. Connell, Assistant Commissioner Public Works, New York, N. Y. (Bronx).
George W. Roberts, City Engineer, South Omaha, Neb.
G. F. McGonigal, City Engineer, Salt Lake City, Utah.

BONDS AND GUARANTEES

W. J. Hardee, City Engineer, Chairman, New Orleans, La.
Henry C. Allen, City Engineer, Vice-Chairman, Syracuse, N. Y.
E. A. Kingsley, City Engineer, Little Rock, Ark.
A. F. Damon, Consulting Engineer, Chester, Pa.
W. A. Hogue, City Engineer, Charleston, W. Va.

CEMENT, CONCRETE AND CONCRETE PAVEMENTS

N. E. Murray, Superintendent of Sidewalks, Chairman, Chicago, Ill.
George S. Smith, Commissioner Public Works, Vice-Chairman, New Orleans, La.
J. M. Burrows, Assistant Engineer, Des Moines, Ia.
Montgomery Schuyler, St. Louis, Mo.
John W. Paine, City Engineer, Akron, O.

CREOSOTED WOOD BLOCK PAVEMENT

Andrew Rinker, City Engineer, Chairman, Minneapolis, Minn.
J. C. Travilla, Street Commissioner, Vice-Chairman, St. Louis, Mo.
N. S. Sprague, Superintendent Bureau of Construction, Pittsburgh, Pa.
W. Purvis Taylor, Assistant Engineer of Tests, Philadelphia, Pa.
Walter M. Cross, City Chemist, Kansas City, Mo.

MACADAM PAVEMENT

L. Darnell, Consulting Engineer, Chairman, Kansas City, Mo.

Walter C. Leininger, Assistant Superintendent of Streets, Vice-Chairman, Chicago, Ill.

Edwin H. Thomes, Assistant Engineer, New York, N. Y. (Borough of Queens).

W. F. Brooke, City Engineer, Norfolk, Va.

Wright Smith, City Engineer, Mobile, Ala.

STONE BLOCK PAVEMENT

B. T. Fendall, City Engineer, Chairman, Baltimore, Md.
M. R. Sherrerd, Chief Engineer, Board Public Works, Vice-Chairman, Newark, N. J.
M. F. McKenna, City Engineer, Bridgeport, Conn.
S. W. Hoag, Jr., Assistant Engineer, Department of Docks, New York, N. Y.
John E. Ramsey, Consulting Engineer, Salisbury, N. C.

VITRIFIED BRICK PAVEMENT

E. H. Christ, member Board of Public Works, Chairman, Grands Rapids, Mich.
H. W. Klausmann, City Engineer, Vice-Chairman, Indianapolis, Ind.
James H. Sullivan, Deputy Superintendent of Street, Boston, Mass.
F. J. Cellarius, City Engineer, Dayton, O.
J. L. Meyers, City Engineer, Ardmore, Okla.

The specifications of this organization covering these various subjects are now in the printer's hands, and will probably be ready for distribution in a few weeks. No authorized copy of them can be furnished before that time, as it is the purpose of the organization to copyright them to prevent their being used by manufacturers of, and dealers in, paving materials in an unwarranted manner.

NEW STANDARD BRICK RATTLER

Recommended by National Paving Brick Manufacturers' Association—Exact Instructions for Constructing Rattler and Abrasive Charge—Method of Testing

The National Paving Brick Manufacturers' Association has formally adopted and recommended for use a rattler for testing brick practically identical with that described in our issue of November 16, 1910; also the spherical shot which the experiments referred to in that article indicated were preferable to cubical shot. As this rattler has now been formally recommended by the association, and we presume will be adopted by the several societies interested in the matter and by most cities using paving brick, we are presenting herewith the complete specifications for rattler and for shot.

The association will furnish without cost to probable users of paving brick complete drawings of the machine described in these specifications. In order that they might have definite information to give as to the cost of these machines, Mr. W. P. Blair, the secretary of the association, obtained from Hetherington and Berner, of Indianapolis, an offer to construct the machine for the following prices: Barrel, including plate liners and head liners, \$76.65; frame and mechanism generally, \$73.35; or \$150.00 for the rattler complete. For the plate liners they charge \$8.40 for a set of fourteen; and for the head liners \$16.25 for a set of two. For a set of 25 large spheres and 325 small spheres they charge \$22.50, or 4½ cents a pound.

Secretary Blair informs us that the Board of Control of the association has appointed a committee to carefully consider and revise the "Directions No. 1" brought out by the association two or three years ago for laying vitrified brick street pavements, with a view to correcting any failures in the original directions to clearly and concisely express their ideas as to the best method of laying brick pavements.

THE RATTLER

The machine shall be of good mechanical construction, self-contained, and shall conform to the following details of material and dimensions, and shall consist of barrel, frame and driving mechanism as herein described.

THE BARREL

The barrel of the machine shall be made up of the heads, head liners and staves.

The heads shall be cast with trunnions in one piece. The trunnion bearings shall not be less than two and one-half inches ($2\frac{1}{2}$) in diameter or less than six inches (6) in length.

The heads shall not be less than three-fourths inch ($\frac{3}{4}$) thick nor more than seven-eighths inch ($\frac{7}{8}$). In outline they shall be a regular fourteen-sided (14) polygon inscribed in a circle twenty-eight and three-eighths inches ($28\frac{3}{8}$) in diameter. The heads shall be provided with flanges not less than three-fourths inch ($\frac{3}{4}$) thick and extending outward two and one-half inches ($2\frac{1}{2}$) from the inside face of head to afford a means of fastening the staves. The flanges shall be slotted on the outer edge, so as to provide for two (2) three-fourths inch ($\frac{3}{4}$) bolts at each end of each stave, said slots to be thirteen-sixteenths inch ($\frac{13}{16}$) wide and two and three-fourths inches ($2\frac{3}{4}$) center to center. Under each section of the flanges there shall be a brace three-eighths inch ($\frac{3}{8}$) thick and extending down the outside of the head not less than two inches (2). Each slot shall be provided with recess for bolt head, which shall act to prevent the turning of the same. There shall be for each head a cast-iron head liner one inch (1) in thickness and conforming to the outline of the head, but inscribed in a circle twenty-eight and one-eighth inches ($28\frac{1}{8}$) in diameter. This liner or wear plate shall be fastened to the head by seven (7) five-eighths inch ($\frac{5}{8}$) cap screws, through the head from the outside. These wear plates, whenever they become worn down one-half inch ($\frac{1}{2}$) below their initial surface level, at any point of their surface, must be replaced with new. The metal of which these wear plates are to be composed shall be what is known as hard machinery iron, and must contain not less than one per cent (1%) of combined carbon. The faces of the polygon must be smooth and give uniform bearing for the staves. To secure the desired uniform bearing the faces of the head may be ground or machined.

THE STAVES

The staves shall be made of six-inch (6) medium steel structural channels twenty-seven and one-fourth ($27\frac{1}{4}$) inches long and weighing fifteen and five-tenths pounds (15.5) per lineal foot.

The channels shall be drilled with holes thirteen-sixteenths inch ($\frac{13}{16}$) in diameter, two (2) in each end, for bolts to fasten same to head, the center line of the holes being one inch (1) from either end and one and three-eighths inches ($1\frac{3}{8}$) either way from the longitudinal center line.

The space between the staves will be determined by the accuracy of the heads, but must not exceed five-sixteenths inch ($\frac{5}{16}$). The interior or flat side of each channel must be protected by a lining or wear plate three-eighths inch ($\frac{3}{8}$) thick by five and one-half inches ($5\frac{1}{2}$) wide by nineteen and three-fourths inches ($19\frac{3}{4}$) long. The wear plate shall consist of medium steel plate, and shall be riveted to the channel by three (3) one-half inch ($\frac{1}{2}$) rivets, one of which shall be on the center line both ways and the other two on the longitudinal center line and spaced seven inches (7) from the center each way. The rivet holes shall be countersunk on the face of the wear plate and the rivets shall be driven hot and chipped off flush with the surface of the wear plate. These wear plates shall be inspected from time to time, and if found loose shall be at once riveted, but no wear plate shall be replaced by a new one except as the whole set is changed. No set of wear plates shall be used for more than one hundred and fifty (150) tests under any circumstances. The record must show the date when each set of wear plates goes into service and the number of tests made upon each set.

The staves when bolted to the heads shall form a barrel twenty inches (20) long, inside measurement, between wear plates. The wear plates of the staves must be so placed as to drop between the wear plates of the heads. These staves shall be bolted tightly to the heads by three-fourths inch ($\frac{3}{4}$) bolts, and each bolt shall be provided with lock nuts, and shall be inspected at not less frequent intervals than every fifth (5th) test and all nuts kept tight. A record shall be made after each such inspection, showing in what condition the bolts were found.

THE FRAME AND DRIVING MECHANISM.

The barrel should be mounted on a cast-iron frame of sufficient strength and rigidity to support same without undue vibration. It should rest on a rigid foundation and be fastened to same by bolts at not less than four (4) points.

It should be driven by gearing whose ratio of driver to driven should not be less than one (1) to four (4). The counter shaft upon which the driving pinion is mounted should not be less than one and fifteen-sixteenths inches ($1\frac{15}{16}$) in diameter, with bearings not less than six inches (6) in length and belt driven, and the pulley should not be less than eighteen inches (18) in diameter and six and one-half inches ($6\frac{1}{2}$) in face. A belt of six-inch (6) double-strength leather, properly adjusted so as to avoid unnecessary slipping, should be used.

THE ABRASIVE CHARGE

(a) The abrasive charge shall consist of two sizes of cast-iron spheres. The larger size shall be three and seventy-five-hundredths inches (3.75) in diameter when new and shall weigh when new approximately seven and five-tenths pounds (7.5) (3.40 kilos) each. Ten shall be used.

These shall be weighed separately after each ten (10) tests, and when the weight of any large shot falls to seven pounds (7) (3.175 kilos) it shall be discarded and a new one substituted; provided, however, that all of the large shot shall not be discarded and substituted by new ones at any single time, and that so far as possible the large shots shall compose a graduated series in various stages of wear.

The smaller size spheres shall be when new one and eight hundred and seventy-five thousandths inches (1.875) in diameter and shall weigh not to exceed ninety-five hundredths pounds (0.95) (0.430 kilos) each. Of these spheres so many shall be used as will bring the collective weight of the large and small spheres most nearly to three hundred pounds (300), provided that no small sphere shall be retained in use after it has been worn down so that it will pass a circular hole one and seventy-five hundredths inches (1.75) in diameter, drilled in a cast-iron plate one-fourth inch ($\frac{1}{4}$) in thickness or weigh less than seventy-five hundredths (0.75) pounds (or 0.34 kilos). Further, the small spheres shall be tested by passing them over such an iron plate drilled with such holes, or shall be weighed after every ten (10) tests, and any which pass through or fall below specified weight shall be replaced by new spheres, and provided, further, that all of the small spheres shall not be rejected and replaced by new ones at any one time, and that so far as possible the small spheres shall compose a graduated series in various stages of wear. At any time that any sphere is found to be broken or defective it shall at once be replaced.

(b) The iron composing these spheres shall have a chemical composition within the following limits:

Combined carbon—Not less than 2.50%.

Graphitic carbon—Not more than 0.10%.

Silicon—Not more than 1%.

Manganese—Not more than 0.50%.

Phosphorus—Not more than 0.25%.

Sulphur—Not more than 0.08%.

For each new batch of spheres used the chemical analysis must be furnished by the maker, or be obtained by the user, before introduction into the charge, and unless the analysis meets the above specifications, the batch of spheres shall be rejected.

THE BRICK CHARGE

(a) The number of brick per charge shall be ten (10) for all bricks of the so-called "block size" whose dimensions fall between from eight (8) and nine (9) inches in length, three (3) and three and three-fourths ($3\frac{3}{4}$) inches in breadth and three and three-fourths ($3\frac{3}{4}$) and four and one-fourth inches ($4\frac{1}{4}$) in thickness. No block should be selected for test that would be rejected by any other requirements of the specifications.

The brick shall be clean and dried for at least three hours (3) in a temperature of one hundred (100) degrees Fahr. before testing.

THE TEST

The rattler shall be rotated at a uniform rate of not less than $29\frac{1}{2}$ nor more than $30\frac{1}{2}$ revolutions per minute, and 1,800 revolutions shall constitute the standard test.

A margin of not to exceed ten (10) revolutions will be allowed for stopping.

STOPPING AND STARTING

Only one (1) start and stop per test is regular and acceptable.

A counting machine shall be attached to the rattler for counting the revolutions.

THE RESULTS

The loss shall be calculated in percentage of the original weight of the dried brick composing the charge. In weighing the rattler brick any piece weighing less than one (1) pound shall be rejected.

RECORDS

(a) The operator shall keep an official book, in which the alternate pages are perforated for removal. The record shall be kept in duplicate, by use of a carbon paper between the first and second sheets, and when all entries are made and calculations are completed the original record shall be removed and the carbon duplicate preserved in the book. All calculations must be made in the space left for that purpose in the record blank, and the actual figures must appear. The record must bear its serial number and be filled out completely for each test, and all data as to dates of inspection and weighing of shot and replacement of worn-out parts must be carefully entered, so that the records remaining in the book constitute a continuous one. In event of further copies of a record being needed, they may be furnished on separate sheets, but in no case shall the original carbon copy be removed from the record book.

GRANITE BLOCK SPECIFICATIONS

A CONTRACT has just been let for paving fifteen blocks of Fourth Avenue, New York City, with granite blocks under specifications which "are quite a departure," says Chief Engineer Tillson, "from any that have been used before in this city, and the department thinks that they will give the best granite pavement that has ever been laid in the country." The most noticeable clauses of the specifications are as follows:

Paving Cement

The paving cement to be used in filling the joints between and around the paving blocks and bridgestones, as hereafter provided, shall be of the best pitch, obtained either from the distillation of coal tar or from asphaltic oils, and must have the following properties:

Paving Filler from Coal Tar.—Its specific gravity shall not be less than 1.23 at 60 deg. Fahr. Its melting point shall be not less than 130 deg. nor more than 140 deg. Fahr. It shall contain not less than 22 per cent nor more than 35 per cent of free carbon.

Paving Filler from Asphaltic Oils.—Melting point not less than 195 deg. Fahr. nor more than 210 deg. Fahr. Shall be soluble in carbon tetrachloride to the extent of 99.5 per cent. Shall have a penetration at 77 deg. Fahr. when tested with a No. 2 needle and 100-gram weight for five seconds of not less than 30 nor more than 40, and shall have a penetration at 32 deg. Fahr. when tested with a No. 2 needle and a 200-gram weight for one minute of not less than 18 nor more than 30.

The above determinations are to be made in accordance with the standard methods adopted by the laboratory of this bureau, descriptions of which methods are on file in the office of the Chief Engineer.

The Blocks

Where the contract calls for improved granite the stones shall be of equal quality as that specified for the ordinary granite. The size of the blocks, however, shall be as follows: not less than 7 nor more than 11 inches in length; not less than 3½ nor more than 4½ inches in width, and 5 inches in depth. A variation of ¼ of an inch each way will be allowed in the depth of the blocks. The blocks are to be rectangular, with tops and sides uniform in thickness, to lie close and with a fair and true surface; free from bunches and so cut or dressed that when laid stone to stone the joints shall not exceed ⅜ of an inch in width. The head of the block shall be so cut that it shall not have more than ¼ of an inch depression from a straight edge laid in any direction across the head and held parallel to the general surface of the block. Over special constructions the blocks may be of dimensions other than above specified when approved by the engineer.

The stones from each quarry shall be piled and laid separately in different sections of the work, and in no case shall the stone from different quarries be mixed. The blocks must be separated before they are brought upon the work into two classes, one from 3½ to 4 inches and the other from 4 to 4½ inches in width, and so delivered on the street.

Laying

On a sand bed one inch in thickness placed upon the concrete shall be laid the stone blocks at right angles as may be directed. Each course of blocks shall be of the same width and laid straight and regularly, making with the end joints a lap of at least 3 inches, and in no case shall stones of different widths be laid in the same course except on curves. The blocks shall be laid stone to stone, so that the joints may be as small as possible. After the blocks are laid dry sand shall be spread over the surface of the pavement and broomed into the joints in such quantity as to fill same to within 3 inches from the top.

Ramming

The blocks must then be thoroughly rammed and the ramming repeated until they are brought to an unyielding bearing with a uniform surface, true to the given grade and crown. No ramming shall be done within 20 feet of the face of the work that is being laid.

Temperature of Paving Cement

The boiling paving cement, heated to a temperature of 300 deg. Fahr. and of the composition hereinbefore described, shall then be poured into the joints until the same are full and remain full. The joints shall be poured a second and third time, if necessary, so that they shall remain permanently filled with the paving cement.

The appliances for heating paving cement shall be sufficient in number and of such efficiency as will permit the pourers to closely follow the back rammers, and all joints of the finally rammed pavement shall have been filled with paving cement, as above noted, before the cessation of the work for the day or any other cause.

No Carting on Pavement

No horse, cart, truck or vehicle of any description shall be permitted to stand on, or pass over, the pavement until the joints have been finally poured with cement as above and the same has had time to harden, and, by car tracks, the contractor shall furnish men to pass cars thereover.

Maintenance

The contractor shall immediately repair and make good to the satisfaction of the engineer any settlement or any depression in the pavement which shall occur at any time during the period of one year from the date of the acceptance of the whole work; * * * and if the termination of the said period of maintenance shall fall within the months of December, January, February or March, then, and in that case, the said months of December, January, February and March, or such part thereof as the president may determine, shall not be included in the computation of the said period of one year during which the work is to be kept in repair by the contractor, and in that case the payment to be made under the provisions of this contract shall not be made before the first of April next thereafter, unless otherwise specially permitted by the president.

In case there are railroad tracks in any street or public place within the limits of this contract, then this maintenance clause shall not apply to those portions of the street or public place between such tracks, between the rails of the tracks and for 2 feet in width outside of the tracks.

The Borough President reserves the right to allow any railroad company to pave the railroad area by special contract.

The contractor shall have the right, in the case of trenches, to provide against settlement by covering the surface of the cut with broken stones and maintaining the surface for six days.

During the period of maintenance the contractor shall, within five days after the receipt of notice so to do, restore the pavement over all openings made by corporations or plumbers for making new service connections, or repairing, renewing or removing the same, and over all trenches made for carrying sewers, water or gas pipes, or any other subsurface pipes or conduits, for the building or laying of which permits may be issued by the president, for the sum of \$3.50 per square yard for all openings less than 10 square yards in area, and \$3 per square yard over all trenches measuring more than 10 square yards in area, and \$3.50 per square yard for restoring the pavement over all openings between or alongside of surface railroad tracks which shall exceed 10 square yards in area, except that in case of an injury to the surface of the pavement, caused by fire or accident, it shall be replaced for the sum of \$2.50 per square yard. The concrete foundation as relaid shall be 6 inches in thickness. It shall consist of 1 part of the best quality of Portland cement, 3 parts of sand and 6 parts of broken stone. All materials to be of the same quality and mixed in the same manner as specified in this contract. The contractor shall not demand additional or further payment on account of repairing any injured or sunken pavement laid over the repairs above described.

The period of maintenance shall be in force through the year, irrespective of any changes that may occur in traffic conditions, on or across said streets, whether due to the widening of said roadway or to the construction, reconstruction or rearrangement of new or existing surface or subsurface constructions thereon, or to any other cause.

The amount included in this contract is 22,190 square yards. It was awarded to the Republic Construction Company, the lowest bidder, at \$3.55 per square yard; the highest bid being about 37 per cent greater.

It will be noticed that the blocks specified are to have no greater variation from a plane surface than ¼ inch on the head, and practically the same on the sides. This is a much more regular block than that heretofore specified and used.

With these narrow joints gravel could not be used for filling them, and sand and pitch or asphaltic filler will be used. It is considered impracticable to use Portland cement filler, since this would require the closing of the street to all traffic for a week or ten days and this the department does not believe the citizens would "stand for," nor could it be enforced without a squad of police at every cross street.

OILING SHELL ROADS

In his annual report for 1910, city engineer J. H. Dingle, of Charleston, S. C., states that one of the shell roads of that city was oiled at a cost of 5½ cents per square yard, but the results of this were not as satisfactory as of oiling macadam. The shell, after being thoroughly compacted by rolling and traffic, absorbs the oil to a very limited depth only, and the shell is soon abraded to this depth and blows away.

WOOD BLOCK PAVEMENTS OF ATLANTA

The Earlier Pavements—Modern Treatment and Construction —Statistics Showing Extent and Cost of Pavements and General Conclusions

By JAMES NISBET HAZLEHURST, Consulting Engineer

ATLANTA'S first advertisement and entry into national notice came through Sherman's famous march to the sea. The torches which lighted the desolation of war focused general attention to this section. This unsolicited and gratuitous advertisement was followed by an influx of new population and in 1880 Atlanta's civic pride and the first industrial exposition, following that of the Centennial at Philadelphia, resulted. These two occurrences were epochs commemorating an awakened spirit and progressive tendencies growing like the proverbial mushroom. Pressing demand for better roadways resulted in the laying of many miles of Belgian block pavements, quarried from the famous "Stone Mountain," one of the most remarkable granite formations in the United States, and located less than twenty miles from the city of Atlanta. This stone pavement was laid only on a sand cushion and cost less than \$1.50 per square yard. It was badly laid and maintained, and during the past ten years the imperative need for better streets to accommodate increasing traffic resulted in the laying of the first modern rectangular treated block pavements. Some ten or twelve years before the present time a pioneer citizen of Atlanta succeeded in enlisting the sympathy of the city officials in a wood block pavement on one of the principal avenues of the city. The construction of this pavement followed that then in vogue at Paris, France, and other continental cities, but also partook of some of the features of the old Nicholson block. The material consisted of untreated timber sawed into cubes of about 6-inch dimensions; these were laid upon board foundations, were grouted in with a tar filler and then heavily coated with sand sprinkled over the top and rolled to a smooth surface. As might be expected at this time, this street is in bad condition and will shortly have to be entirely relaid.

The first creosoted wood block pavement was placed in 1904

upon one of the highway bridge floors, but it was not until 1905 that a well prepared and well laid wood pavement was introduced into the city of Atlanta. This came about through a private enterprise. The Candler Investment Company, then completing a marble seventeen-story office building, said to be second only in attractiveness and general utility to the Frick Building of Pittsburgh, determined to take up at their own expense the granite block which surrounded two sides of this structure and to replace this material with the best and most modern type of pavement. The materials were purchased by



HOUSTON STREET, CANDLER BUILDING ON THE LEFT

the Investment Company and were laid under the direct supervision of Hon. Henry L. Collier, then Commissioner of Public Works of the city. The blocks were of the long leaf yellow creosote-resinate process of treatment. They were laid upon six inches of 1-3-6 concrete, upon a thin mortar bed, the blocks being pressed to position by templet. (An illustration shows this section of pavement, the street being elsewhere surfaced with granite.) The traffic at this corner is hardly so great as that upon the streets adjacent, but still the pavement is subject to considerable travel. A careful examination shows no visible deterioration or evidence of wear.

Below appears a table giving the statistics of Atlanta's modern wood block pavements, and from which it will be noted that

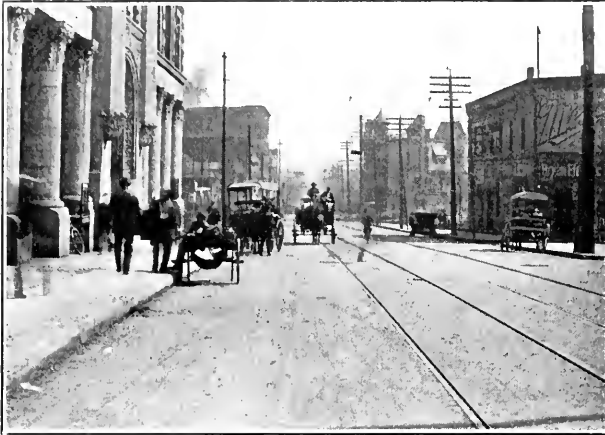


MARIETTA STREET AT INTERSECTION WITH NORTH FORSYTH STREET

since 1907 there has been laid by the city approximately 434 miles of creosoted wooden block pavements totaling 92,418 square yards, at an average price of \$2.75 per yard, making a total expenditure of \$252,301.11 during the past four years:

STATISTICS OF WOOD BLOCK PAVEMENTS

Name of Street.	Year.	Length, Feet.	Width, Feet.	Yards.	Price.
Edgewood Avenue.....	1907	5,263	40	24,305	\$3.10
Forsyth Street.....	1907	715	40	3,315	3.20
Broad Street.....	1908	2,290	50	12,859	3.29
Marietta Street.....	1910	1,250	100	10,237	2.449
Marietta Street.....	1910	7,128	100	71,280	2.46
Forsyth Street.....	1910	503	40	2,186	2.56
Decatur Street.....	1910	5,015	40	22,675	2.499
Madison Avenue.....	1910	736	32	2,700	2.58
Peter Street.....	1910	545	32	1,938	2.68
N. Boulevard.....	....	930	..	2,675	2.56
N. Forsyth Street.....	....	752	..	2,400	2.66
Total		25,127		92,418	\$2.73



EDGEWOOD AVE., LOOKING EAST FROM PRIOR ST.

An analysis of the table will show a radical difference in the cost of the pavement since the year 1910, and this can be accounted for largely by the fact that at this time there is in operation a local treatment plant, whereas before the blocks were shipped from creosoting works along the Gulf coast.

CONSTRUCTION

The foundations for the pavement under the existing specifications require the base to be of Portland cement concrete in proportions 1-4-8, to be mixed and laid in the usual manner. They reserve the right to lay the block at such angles with the curb as the engineer may elect, but except at intersections the practice is to place them in parallel courses at right angles to

the curb, the blocks in adjoining courses breaking joints. Three courses are laid next to and parallel with the curb, at which point three expansion joints 1/2 inch in width are provided for, to be filled with No. 6 coal tar paving pitch poured at a temperature of 300 deg. Fahr. Other expansion joints may be constructed as directed by the engineer, and in general such joints are placed along the line of the street at intervals of about 50 feet. The blocks are laid upon a cushion of clean sand evenly spread over the foundations to a depth of 1/2 inch and rolled to a surface with a steam roller. After rolling a sand filler is swept into the joints.

The surfacing material must consist of wood blocks of the following dimensions: 3 or 3 1/2 inches in depth, 3 inches in width and from 6 to 8 inches in length, with the fiber of the wood running in the direction of the depth. The wood from which the blocks are to be made must be long leaf yellow pine, 90 per cent of which shall be heart, the blocks shall be well manufactured and free from the usual objectionable defects. No block shall vary in width and depth more than 1/16 of an inch from other blocks used on the same street or contract. The specifications provide that all blocks shall be treated with creosote or some approved antiseptic or waterproof mixture, and each block shall contain at least 20 pounds of such compound per cubic foot of wood, provided that where a block contains much natural pitch it shall receive as much of the mixture as can be forced into it under the usual treatment. The preservative specified is the dead oil of coal tar or coal tar product. It must not contain more than 3 per cent of water and a correction shall be made in the amount of creosote used to correspond to the water found in the oil. Only traces of acids are permitted. Its specific gravity at 68 deg. Fahr. shall be not less than 1.12 nor more than 1.15; the oil with which the blocks are treated shall not contain more than 2 per cent free carbon, nor more than 2 1/2 per cent insoluble in benzole.

The crown of the streets paved with wood ranges from 6 inches on 40-foot streets to 12 inches on 100-foot roadways. There is no maximum grade limit for wood pavements, but so far as known no such pavement has been laid upon grade steeper than 4 per cent. In observing the traction conditions during wet weather, the writer has noted the fact that where a team is approaching a steep grade, as for instance the maximum 4 per cent, the tendency to slip and to slide does not seem to be in the direction of the pull, but at right angles thereto. On a street 40 feet wide with 6 inches crown the slope is 3 feet per 100 at right angles to the line of direction, and as the animals are pulling against each other as they go up the rise, the



BROAD STREET, LOOKING NORTH FROM VIADUCT

tendency seems for one or the other to slip so as to fall under its companion. In other words, the slip is toward the side of the roadway rather than in its direction. From this it might be argued that the cross-section should be considerably modified where wood block pavement is used as a surfacing material.

Captain R. M. Clayton, M. Am. Soc. C. E., is city engineer and prepared the specifications and supervised the construction of this work. It might be mentioned that up to about a year ago the standard specifications provided for an oil of 1.07 gravity. There was a conflict over this provision in which rival companies and interested citizens succeeded in holding up the work and securing an investigation, the net result being a change in the specifications as hereinbefore written.

At the present time the negro is the prevailing unskilled laborer with ruling wages for such work of \$1.50 per day of ten hours. Broken stone delivered along the street may be had for \$1.50 per cubic yard; concrete sand, \$1 per cubic yard, and cement, \$1.25 net per barrel. Teams are worth \$4 per day with able drivers; foremen, \$4 for ten hours' time.

CONCLUSION

According to the United States census of 1910 the city has a population of 154,000. The business streets are generally from 40 to 50 feet in width, but one of them, Marietta Street, is 100 feet between curb lines. Traffic upon these streets is generally shown by the illustrations, although no statistics are available showing the extent and character of same. The street work included in the table has been laid within the congested district of the city and has been subject to the heaviest traffic due to this fact. There has been no expense for maintenance to this time and no repair work done beyond removing and replacing a small amount of this work on Edgewood Avenue along the street railway tracks, which have rails of the 7-inch grooved girder type. The blocks abut directly against the rail and an insufficient foundation to these tracks at this particular point is given as the cause of the slight trouble.

Since the commencement of the modern wood block pavement in this city no other type has been used so far as known, with the exception of certain streets which are paved by the County Commissioners with a bituminous pavement and a few streets which have been cherted or laid with a tar macadam in outlying districts. In general both the city officials and the taxpayers are entirely satisfied with the materials furnished and work performed, and at this time wood block is the most popular of the street surfacing materials in this city.

OIL MACADAM IN CALIFORNIA

AN interesting discussion on the construction of oiled macadam roads was held at the thirteenth annual convention of the League of California Municipalities. Mr. John Beyer, of Pasadena, opened the discussion by describing the method employed in that city. They put in 6 inches of material for the foundation, experience having shown that it will roll down one-third or to 4 inches. While the base is being rolled, screenings are thrown on the surface to fill all the voids and make it quite dense, but not so much so that the second course will not readily unite with it. Three-fourths of a gallon of oil per square yard is applied to the base after the first rolling, following which it is rolled again and No. 2 rock (from 3/4-inch to 1 1/4-inch size) is spread and graded perfectly to a smooth surface. Following this, three-fourths of a gallon of oil to the square yard is applied to the second course. It is then rolled and a 3/4-inch top surface is put on and graded. "If you have a competent man on your grader he can make almost as true a surface of the street as a board run through a planer in a mill." On this, again, oil is applied to the extent of 1/4 to 3/8 gallon, on which screenings are spread and the street is given a final rolling and is then ready for traffic.

In response to questions, Mr. Beyer stated that they sprinkled the oil with water, "More, perhaps, so that we can get right into it with the roller without picking it up at all. I think it also has a tendency to spread oil throughout the base. At any rate, we can go right into the base with a wagon without the

oil sticking to the roller and that gives us a chance to put on the succeeding layers and run our roller without trouble." Replying to another question as to whether there was not a tendency to use too much oil, Mr. Beyer stated that this was often the case, instancing one street where the property owners insisted on the use of more oil, which was finally consented to, but the contractor was told to keep his oil good and hot and leave as little on the street as possible. Although he carried out these instructions, in less than two weeks it was necessary to apply more sand, and two or three weeks later the grader with its blade ground perfectly sharp was used to shave off some of the oil.

The cost of such a road in Pasadena, 6 inches thick was 10 cents a square foot. The work cost \$1.90 a cubic yard, delivered on the street. The oil used had a gravity of 10 to 11 and carried less than 75 per cent asphalt.

WOOD BLOCK PAVING IN ABERDEEN

Tamarack with Sixteen-Pound Creosote Treatment—Laid at Angle with Curb—Low Crown—Swelling of Blocks—Laying Along Rails

By R. B. EASTON, Jun. Am. Soc. C. E., City Engineer

ABERDEEN, S. D., is a thriving western metropolis of approximately 11,000 inhabitants as shown by the latest United States census and is fast becoming a great jobbing and distributing point for all the western country recently opened up by the Puget Sound line of the Chicago, Milwaukee and Puget Sound Railroad, and all of that vast new country which is rapidly springing into prominence looks toward Aberdeen for its supplies of every description. Nine lines of railroad, a clearing house record of over \$20,000,000.00 for 1909, which was exceeded in 1910, together with a wholesale business of \$12,000,000.00 in 1909, and which also was exceeded in 1910, are all evidence of the vast amount of business done in the city.

The importance of the city as a transfer point for freight, together with the progressive attitude of citizens, led to the first paving, which was laid in 1907 under the supervision of Mr. D. C. Washburn, Mem. Am. Soc. C. E., then city engineer, and the writer, then assistant city engineer. The material was a three-inch block of Norway pine or tamarack having a sixteen-pound creosote treatment. The blocks were laid on a five-inch foundation of 1:6 pit run sand and gravel concrete on top of which was a one-inch sand cushion of sifted sand. The crown of the pavement laid in 1907 is about 2 per cent of the width of the street between curbs and the transverse section is a parabola. The blocks were laid at an angle of about 22 1/2° with the curb and were rolled to a true crown with a five or six-ton steam roller, after which pitch was poured on hot so as to entirely fill all the joints as well as an expansion joint of about one inch along either curb. This pitch was spread with an ordinary hand scraper under rigid inspection. After the pitch had cooled a thin layer of fine sand was spread over the entire pavement to take up the surplus pitch on top of the blocks.

During the block laying two inspectors were kept busy searching for poor blocks having rotten centers or wind shakes, and these together with all blocks whose length was less than three inches were thrown to one side and not used.

The 1907 paving, amounting to 31,125.1 square yards, was laid by the Kettle River Company, of Minneapolis, Minn., at a cost to the city of \$92,888.55. The cost per yard was \$2.84, to which was added a ten-year guarantee of 5 per cent, making the actual cost to the city \$2.98 per square yard. The cost of the paving, with the exception of the street intersections which were paid out of a general fund, was assessed on the abutting property in the manner common to special assessments.

In 1908 other business streets were paved under practically the same specifications by Messrs. Flinn and Hanlon, of Sioux City. The total amount laid in 1908 was 14,336 square yards and the cost to the city was \$39,280.55. The cost per square

yard was \$2.74 and there was no guarantee. The cost of paving the intersections was paid from a general fund.

In the year 1909 the people, not yet being satisfied, asked for still more paving and accordingly some 42,600 square yards were laid of creosote block as before and under about the same specifications. A portion of the work was given a crown of about 2½ per cent. The total cost of the 1909 paving was about \$112,040.00 or at the rate of \$2.63 per square yard. The entire cost was assessed against the abutting property and none was paid for from the general fund.

In 1910 paving was laid under the supervision of the writer and some departure was made from the specifications of former years. Considerable trouble had been experienced from the slippery condition of the older paving, particularly that laid in 1909 and crowned about 2½ per cent, which paving was often extremely slippery in cold weather or when the streets were being sprinkled. At either time pedestrians occasionally fell and many horses and teams secured hard falls, in some cases injuring the horses severely. Accordingly the crown was not allowed to exceed 2 per cent of the width of the street between curbs and was made slightly less wherever possible. This, while not draining the street quite so rapidly, secures a roadway every foot of which is a driving way and which is free from danger to pedestrians and horses.

Another change also was made in the filler used and in the expansion joints. The pitch used on the older pavement becomes very sticky in warm weather and fails to provide the necessary expansion during late winter when the days are warm and the nights quite cold. Accordingly "Pioneer Asphalt" filler was used, being put on in the same way as the pitch filler. A transverse expansion joint at every hundred feet was added in addition to the usual expansion joint along the curb. Considerable trouble was experienced in heating the asphalt sufficiently to thoroughly enter all the joints, the melting point of the asphalt filler being much higher than for the pitch. While the asphalt filler is yet new it seems to be the superior of the two classes of filler, during recent warm days this filler being soft and elastic, while the pitch was yet hard and glassy, and in addition the asphalt tends to make the street still more noiseless than does the other filler. It was noticed recently that the asphalt had been crowded out of the expansion joints by the expansion of the blocks so that it stood up in ridges, showing that it was performing its function in proper manner. While it is too early to tell which will be found the superior filler in the long run the asphalt so far shows several points of advantage. Taken altogether, the low-crowned street with the asphalt filler seems to please those who use it more than the older streets, and they more than any one else deserve a careful hearing.

It is contended by some that the lower crown will not provide rapid enough drainage to the gutter, but it would seem that the traffic using the street should receive prior consideration, for it is with this traffic in view that the streets are paved; and if it is found that the paving will not drain satisfactorily and prevent decay then a change must be made for another kind of paving which will meet the requirements.

However, the question of the longevity of the pavement and the maintenance expense is worthy of serious consideration; 108,607 square yards of pavement representing an investment of \$207,424.00 is no small item of expense in the development of a city of this size and its life and maintenance cost become vital factors in the determination. While our pavement is all too new to decide from it the advisability of its use, the following observations may prove interesting. Traffic over our streets is large; the immense amount of transfer and wholesale freight shipped in and out of the city is all teamed over this pavement and as a result traffic on our streets compares favorably in amount with that in many larger cities. So far no wear whatever is apparent on any of the blocks. In one case, along the side of a railroad freight house a gutter was formed some five or six feet from the building, the paving being sloped upward from the gutter toward the building rather too sharply so that heavy teaming which took place along the side of the

freight house crushed and misplaced some of the blocks, but this was due to too sharp a slope rather than to the fault of the blocks themselves.

A considerable amount of trouble has been and is being experienced with the bulging of the 1907 and 1908 paving during wet weather, and also at the present season when the days, being warm, allow the ice and snow to melt, while the nights are cold. The street department is kept busy at such times taking up and re-laying these places and while the blocks themselves do not seem to be injured the expense is considerable. It might seem that the blocks were laid too closely when first put down, but such was not the case. The real cause seems to be a combination of rather sluggish drainage combined with the considerable expansion of wood upon becoming wet. Our topography is very flat, necessitating gutters on grades of one-third of one per cent and sometimes less. The only remedy or partial remedy for the trouble during the present season of the year would seem to be in carting the snow from the streets after each storm, thereby preventing the formation of ice which must remain and melt on top of the pavement.

During the past year street car tracks have been laid through a considerable part of the 1907 and 1908 paving. During the progress of this work opportunity was afforded for the inspection of the sub-grade and in a few cases settlement was noted in the material in house connection ditches showing the need for extreme care in back-filling and tamping these.

In re-laying the blocks between the car tracks the blocks in contact with the "T" rails, being three inches thick, fitted into the channel between the head and base of the rail and were laid in that manner, the balance of the blocks being laid so that the section of the pavement between the rails was crowned slightly between them. It is expected that this arrangement will prove unsatisfactory, for placing the block in contact with the rail in the channel formed by the head and base of the rail forms too deep a groove in the pavement inside the rail, causing teams much trouble in getting the wheels out of the groove and endangering light or old wheels. The solution of the trouble will perhaps be in a block specially cut to fit alongside the track and preventing so deep a groove.

From our experience here it is quite evident to the writer that the street to be paved should be prepared one season and the paving laid the next. Adequate ordinances should be passed specifying when and how public corporations should perform their work in the streets; sufficient help should be afforded the engineering department to see that the ordinances are enforced; the city should see to it that all public sewers and water mains are in; power should be given the engineering department to have curbing changed and re-built where necessary to make a more perfect street gradient, and with this necessary work done a season ahead of the paving the resulting street when paved would be better in every respect and the economy in the long run be considerable.

WOOD JOINTED GRANITE BLOCKS

DURING the year 1910 there was tried in several cities, including Boston, Mass.; Baltimore, Md.; Jersey City, N. J., and Brooklyn, N. Y., a pavement which is believed to be novel in one of its features. This consists of a granite block paving in which the blocks are wedged apart and held in place by oak wedges driven into the joints. According to Mr. L. K. Rourke, Commissioner of Public Works, then Superintendent of Streets, of Boston, old granite blocks were used and these, when being laid, were left with joints sufficiently open to permit the use of the white oak wedges, and these wedges were driven into the joints between the blocks of successive rows until the top of the wedge projected about ¼ inch above the tops of the blocks, the projecting part of the wedge being broomed down by the traffic so as to more or less fill the depressed parts of the pavement formed by the rounded edges of the blocks. It was thought that these wedges would serve several purposes, not only preventing the blocks from rocking, but also making the pavement much less slippery and deadening the noise to a considerable extent.

TERMS USED IN BITUMINOUS ROAD WORK

Definitions by United States Office of Public Roads of the Various Bitumens Used for Road Treatment, Their Essential Constituents and Characteristics — Terms Used in Testing and Distillation

ONE of the most welcome pamphlets which has been issued recently by the Department of Agriculture is Circular No. 93, of the Office of Public Roads, in which Mr. Prevost Hubbard, chemist of the office, defines the various terms used in bituminous road construction and maintenance, especially the materials used therein. Certain of the terms therein defined are those over which committees on bituminous nomenclature have been struggling for a year past, among them being *artificial asphalt*, *artificial bitumen*, *asphalt*, *bitumen* and *bituminous*. Most of them are terms which are continually appearing in articles treating of bituminous road construction, the meaning of some of which is probably not well understood by many engineers; among these being *Baumé*, *carbènes*, *malthas*, etc. Of so much value is this that that we offer no apology for publishing it entire, as we believe that a great many of our readers will be glad to have a brief and authoritative glossary of terms of this nature for reference.

Mr. Logan Waller Page, Director of the Office of Public Roads, states in reference to these definitions: "In view of the newness of the subject and lack of complete data, some of the statements made may in the future require modification. This circular will, therefore, be revised from time to time in order to keep it abreast with the latest information possible."

GLOSSARY OF BITUMINOUS ROAD CONSTRUCTION

So much confusion exists among road engineers and others interested in bituminous road binders concerning the meaning of certain terms as applied to these materials that it has seemed advisable to present in brief form the definitions of such terms as at present used by the United States Office of Public Roads. It should be understood, however, that these definitions are at present more or less arbitrary, owing to wide differences of opinion held by those who are considered authorities on the subject of bitumens. Notwithstanding these facts, it is hoped that this circular will furnish highway engineers and other interested persons with a foundation for acquiring and systematically classifying further information along the lines herein indicated. To aid them in this matter a brief discussion of the value of the various materials used in road construction has been given in addition to the definitions.

Acid Sludge.—A mixture of sulphonated hydrocarbons resulting from the treatment of bitumens with sulphuric acid; usually a waste or by-product obtained in this manner from the purification of tar and oil distillates. When sufficiently concentrated these sulphonated products become viscous and gummy. They are readily attacked by water and are therefore unsuitable for use as enduring road binders.

Anthracene.—A waxy crystalline hydrocarbon having the chemical formula $C_{14}H_{10}$, found in tars, principally coal tars which have been produced at high temperatures. Anthracene is believed to be of no practical value in road binders.

Artificial Asphalt.—See *Asphalts* and *Oil Asphalts*.

Artificial Bitumens.—Hydrocarbon distillates and residues produced by the partial or fractional distillation of bitumens, and hydrocarbon distillates produced by the destructive distillation of bitumens, pyrobitumens, and other organic materials, such as wood, bone, etc. Native bitumens which have been treated merely for the removal of water and extraneous organic and inorganic materials should not be classed as artificial products, but as refined native bitumens.

Asphalts.—Solid or semisolid native bitumens, consisting of a mixture of hydrocarbons of complex structure, largely cyclic and bridge compounds, together with a small proportion of their sulphur and nitrogen derivatives, but free from any appreciable amount of solid paraffins, melting* upon the application of heat and evidently produced by nature from petroleum containing little or no solid paraffins. Solid or semisolid residues produced from probably similar oils by artificial processes are sometimes called asphalts, but should more properly be termed oil asphalts. The more common types of native asphalts are known by the name of the locality in

which they occur, such as Trinidad, Bermudez, Maracaibo, Cuban, California, etc. Native asphalts with few exceptions contain water, extraneous organic or vegetable matter, and inorganic matter, such as clay, sand, etc. A large proportion of these impurities is removed by a rough refining process without otherwise changing the character of the asphalt.

Native asphalts are usually too hard to be used as road binders without first fluxing them with a heavy petroleum residuum and thus producing an asphaltic cement. Artificial asphalts are, as a rule, brought to suitable consistency during the process of manufacture.

Asphaltenes.—A term commonly applied to those hydrocarbons in petroleum, petroleum products, malthas, asphaltic cements, and solid native bitumens which are soluble in carbon bisulphide but insoluble in paraffin naphtha. As a rule paraffin naphthas of different specific gravities and boiling points dissolve different amounts of hydrocarbons in a given bitumen, and the heavier the naphtha and the higher its boiling point the greater is its solvent action. It is evident, therefore, that the percentage of asphaltenes will vary with the gravity and boiling point of the naphtha, and for this reason it would seem well to substitute for the term asphaltenes, "bitumen insoluble in paraffin naphtha," with a statement of the gravity of the naphtha used and the temperatures between which it boils. The presence of naphtha insoluble hydrocarbons is supposed to give body to the product in which they occur and to be accountable to a great extent for its binding value. They show no binding value, since many of them are hard and brittle, but they produce adhesive mixtures when fluxed with certain heavy oils. As a rule, for a given type of bitumen hardness increases with the percentage of bitumen insoluble in a given naphtha. The so-called asphaltenes are not found to any extent in native bitumens with a paraffin base, but occur principally in asphalts, malthas, asphaltic petroleum, and in blown petroleum residues. They vary chemically and physically with the products in which they occur, and, therefore, do not represent definite chemical compounds.

Asphaltic Petroleum.—Asphaltic petroleum, or asphaltic oils, are petroleum containing an asphaltic base, i. e., they are capable of producing residues very similar to native asphalts if evaporated or distilled down to the consistency of such asphalts. They contain little or no solid paraffins and are thus differentiated from paraffin petroleum. Native asphalts are probably produced from such oils by natural processes.

Asphaltic Cement.—The term asphaltic cement was originally applied to a product obtained by fluxing an asphalt with a sufficient quantity of heavy residual oil or flux to produce a binder of suitable consistency for paving purposes. In its broadest sense it may be applied to all semisolid bitumens of an asphaltic nature which are of suitable consistency for use as binders in street or road construction, whether prepared by fluxing a solid native or artificial bitumen or by reducing an asphaltic or semiasphaltic petroleum by distillation or other process.

Baumé Gravity.—An arbitrary scale of specific gravity or density of liquids, usually expressed as degrees Baumé or ° B. This scale is commonly used in connection with oil products. For liquids lighter than water the scale begins at 10° B., which represents the specific gravity of water, or 1.0000. As the Baumé degrees increase the specific gravity decreases. The following formulæ are used in converting Baumé degrees for liquids lighter than water into direct specific gravity and vice versa:

$$\text{Sp. gr.} = \frac{140}{130 + \text{° B}}$$

$$\text{° B} = \frac{140}{\text{Sp. gr.}} - 130 \text{ at } 17.5\text{° C}$$

For liquids heavier than water the scale begins at 0° B., which represents the specific gravity of water, or 1.0000. In this scale the degrees Baumé increase with the specific gravity. The following formulæ are used in converting Baumé degrees for liquids heavier than water into direct specific gravity and vice versa:

$$\text{Sp. gr.} = \frac{145}{145 - \text{° B}}$$

$$\text{° B} = 145 - \frac{145}{\text{Sp. gr.}} \text{ at } 15.5\text{° C}$$

*See Bitumens.

Benzol.—A volatile colorless fluid hydrocarbon of characteristic odor having the chemical formula C_6H_6 . It occurs mainly in crude coal tars and water-gas tars, and boils at $80.4^\circ C$, so that it is removed in the first fraction when these tars are subjected to the process of distillation. Benzol is an active solvent for most bitumens. It is sometimes called benzene, but should not be confused with benzine, which is the term applied to the lighter and more volatile fractions of petroleum.

Bitumen.—Bitumens are mixtures of native or pyrogenetic hydrocarbons and their derivatives, which may be gases, liquids, viscous liquids, or solids. If solids, they melt more or less readily upon the application of heat and are soluble in carbon bisulphide, chloroform, and similar solvents. They may be divided into two main classes: (1) native bitumens and (2) artificial bitumens. Bitumens, being mixtures of hydrocarbons, can have no melting point, although this term is often used to denote the temperature at which they soften sufficiently to flow.

Bituminous.—A term applied not only to materials or objects which contain bitumen, such as bituminous rock, bituminous macadam, etc., but also to certain pyro-bitumens, such as bituminous coal, which give rise to the formation of bitumens upon being subjected to the process of destructive distillation.

Blown Petroleum.—Blown petroleum, which are often called blown oils, are petroleum residuums through which a jet of air has been passed during or just after distillation. The blowing process causes certain chemical reactions of a complicated nature to take place and results in thickening or increasing the consistency of the oil to an extent depending upon its temperature and the amount of blowing which it receives. Semi-solid and solid products are thus often formed from fluid residuums. If the oil is asphaltic or semiasphaltic in nature, asphaltic cements may be produced in this manner. Blown oils are characteristically short or nonductile when semi-solid, although they may possess considerable binding value if not originally of a paraffin nature. Blowing an oil usually increases its percentage of hydrocarbons insoluble in any given paraffin naphtha.

Carbenes.—A term commonly applied to those hydrocarbons in petroleum, petroleum products, malthas, asphaltic cements, and solid native bitumens which are soluble in carbon bisulphide but insoluble in carbon tetrachloride. The presence of an appreciable amount of these hydrocarbons indicates that the material in which they occur has been subjected to unnecessarily high temperatures. Cracked oil residuums show an increase in carbenes in proportion to the extent of cracking and the formation of these products is evidently a near step to coking. But little is known of their effect upon the value of a bitumen for road construction, but they are generally looked upon with suspicion and, in certain specifications for asphaltic cements, their presence has been limited to a low percentage.

Carbon Bisulphide.—This substance, sometimes called carbon disulphide, is a volatile and extremely inflammable compound of carbon and sulphur, boiling at $47^\circ C$. and having the chemical formula CS_2 . Pure carbon bisulphide is a colorless mobile liquid having an ethereal odor. It is one of the most active solvents for bitumens and is commonly employed for this purpose in the determination of total bitumen.

Carbon Tetrachloride.—A volatile non-inflammable compound of carbon and chlorine, boiling at $76^\circ C$. It is a colorless mobile liquid with an odor similar to that of chloroform, to which it is closely related, and has the chemical formula CCl_4 . It is an excellent solvent for bitumens, but is not usually as powerful as carbon bisulphide. It is employed in bitumen analysis for the determination of carbenes or hydrocarbons soluble in carbon bisulphide but insoluble in carbon tetrachloride.

Coal Tar.—A mixture of hydrocarbon distillates, mostly unsaturated ring compounds, produced in the destructive distillation of coal. Crude coal tar is a black, more or less viscid fluid having a gassy odor and varying in specific gravity from 1.10 to 1.25 and sometimes higher. It always contains a certain amount of ammoniacal water which makes it unsuitable for use as a road binder. When reduced to proper consistency by distillation, coal tar makes an excellent bituminous road binder, providing it does not carry too high percentages of free carbon and naphthalene. The composition of coal tar varies according to the coal from which it is produced and the method of distillation. Tars produced at high temperatures contain a large amount of free carbon and usually run high in naphthalene, while those produced at low temperatures carry less free carbon and as a rule less naphthalene. Low temperature coal tars are therefore most suitable for the preparation of road binders.*

Coke-Oven Tar.—Coal tar produced from by-product coke ovens in the manufacture of coke from bituminous coal. This

*See refined tar.

process of coke manufacture is essentially the same as that of coal gas. Larger charges of coal are, however, carbonized in the former, and as a rule carbonization is conducted at a lower temperature than in the manufacture of coal gas. The resulting tar therefore contains a smaller amount of free carbon, averaging from 3 to 10 per cent, and is better suited for the preparation of road binders than most gas-house coal tars.

Cracked Oil.—The term cracked oil, as applied to road binders, refers to petroleum residuums which have been overheated in the process of manufacture. Overheating causes a breaking down of certain constituents of the oil, which results first in the formation of carbenes and later of coke or free carbon. Badly cracked residuums are believed to be inferior road binders.

Cracking.—The process of breaking down a hydrocarbon molecule by the application of heat. This may result either in the formation of other hydrocarbon molecules, at least one of which is unsaturated and shows a higher ratio of carbon to hydrogen than the original molecule, or else in the disruption of the molecule into its elements, hydrogen and carbon. In the latter case the process is said to be destructive. The more volatile and chemically stable hydrocarbons can be cracked only at temperatures above their boiling points. In the distillation of oils this is accomplished by causing condensation to take place in the still and allowing the condensed oils to fall back into the residue, the temperature of which is considerably higher than their boiling points. In carbureted water-gas manufacture, oils are cracked by vaporizing them at a much higher temperature than their boiling points. The heavier oils will, however, crack at temperatures below their normal boiling points, and this is particularly true of asphaltic oils, which have to be distilled very carefully, sometimes under reduced pressure, in order to produce residuums which are not cracked.

Cut-Back Products.—Petroleum or tar residuums which are cut back, or fluxed, to the desired consistency with a distillate. Volatile distillates are employed for this purpose in the preparation of road binders, when it is desired to have the binder increase in consistency or become harder after application. In such cases a residuum of proper consistency for a road binder is cut back merely for the purpose of facilitating application.

Dead Oils.—Heavy oils distilled from tars at between 170° and $270^\circ C$. with a density greater than water. These oils, if free from naphthalene, serve as an excellent flux in the preparation of cut-back road binders from tar pitches, which are too brittle for this purpose.

Destructive Distillation.—A process of distilling organic materials in which the identity of the material distilled is destroyed, resulting in the formation of tarry distillates and a coke residue.

Dehydrated Tar.—Crude tar from which all water has been removed by distillation and mechanical contrivances known as separators.

Emulsions.—Oily substances made miscible with water through the action of a saponifying agent or soap. Petroleum and tars may be emulsified by this means and such emulsions, if properly prepared from good materials, are often serviceable in the treatment of roads. The majority of road emulsions can be considered only as dust palliatives and temporary binders.

Fixed Carbon.—The residual coke obtained upon burning hydrocarbon products in a covered vessel in the absence of free oxygen, according to an arbitrary method. As applied to bituminous road materials, the determination of fixed carbon would seem to be of value in connection with petroleum and asphaltic products only. Paraffin hydrocarbons produce little or no fixed carbon, while those of asphaltic character show a very considerable amount, depending upon the percentage of asphaltic compounds present and the consistency of the material. The fixed carbon determination therefore indicates the mechanical stability and body of such materials. It is not, however, an extremely accurate determination and should not be too strongly relied upon. Since fixed carbon is a product formed by ignition, it should not be confused with free carbon, which is a material already existing in suspension. The presence of any considerable quantity of free carbon vitiates a fixed carbon determination.

Flux.—As applied to road binders, this term covers fluid oils and tars which are incorporated with asphalts and semi-solid or solid oil and tar residuums for the purpose of reducing their consistency. Fluid petroleum residuums are commonly employed as fluxes in the preparation of asphaltic cements. A good flux produces an absolutely homogeneous bituminous mixture. Both petroleum and tar fluxes will produce such mixtures with native and artificial asphalts, but most fluid petroleum products will not flux tar pitches satisfactorily.

Free Carbon.—Organic matter in tars which is insoluble in

carbon bisulphide. This material is an inert black powder, which is held in suspension by the tar proper, and probably consists, not only of free carbon, but also of hydrocarbons extremely rich in carbon. It has no binding value and serves no useful purpose in a road binder other than to act as a filler. It gives the tar in which it occurs a false consistency, reduces the binding capacity of the tar, and probably interferes with its penetration into and absorption by the road stone or road surface. The maximum allowable limit of free carbon in road binders would seem to be about 20 per cent.

Gas-House Coal Tar.*—Coal tar produced as a by-product in the manufacture of illuminating gas from coal. The modern gas-house coal tar is usually produced at high temperatures and therefore carries a percentage of free carbon varying from 20 to 30 per cent and higher. Unless it is produced at low or medium temperatures and contains less than 20 per cent free carbon, it is not well suited for the preparation of a dust palliative or road binder by direct distillation. High-carbon tars may, however, be combined with low-carbon tars in such proportion as to produce, when distilled to proper consistency, excellent road binders carrying less than 20 per cent free carbon.

Gilsonite.—A very pure solid native bitumen possessing many of the characteristics of asphalt. It differs from most of the native asphalts by being more brittle, having a higher melting or softening point, and being much less soluble in 86° B. paraffin naphtha. When fluxed with certain petroleum residuums it produces excellent asphaltic cements. In the preparation of road binders it is extensively used for the purpose of reinforcing blown oils, with which it combines to form rubbery semisolid mixtures. Such preparations are sometimes termed mineral rubber.

Grahamite.—A pure solid native bitumen, black and brittle, which does not melt readily, but intumesces at high temperatures. It is differentiated from gilsonite and the native asphalts by the fact that it is almost insoluble in paraffin naphtha. It has been produced at high temperatures, as evidenced by the percentage of carbenes which it contains, and some varieties closely approach the pyro-bitumens in characteristics. It has been used to some extent in the preparation of asphaltic cements, but up to the present has been little used in the manufacture of road binders.

High-Carbon Tars.—Tars containing a high percentage of free carbon—above 20 per cent. High-carbon tars are produced at high temperatures during the destructive distillation of coal and are of inferior quality for use as dust palliatives and road binders.

Hydrocarbons.—Chemical compounds composed of the elements hydrogen and carbon. There is practically an unlimited number of such compounds, which vary greatly in physical and chemical characteristics. Complex mixtures of hydrocarbons constitute by far the greater proportion of all bitumens.

Low-Carbon Tars.—Tars containing a low percentage of free carbon—less than 10 per cent. Low-carbon tars are produced at comparatively low temperatures during the destructive distillation of coal, and also by cracking oil vapors during the manufacture of carbureted water gas. As a rule they are more suitable than high-carbon tars for use as dust palliatives and road binders, or for the preparation of such substances.

Malthas.—Malthas are very viscous semiasphaltic or asphaltic native bitumens holding an intermediate position between the petroleum of an asphaltic nature and the native asphalts. As a rule they possess excellent binding properties. They constitute the binding material of many bituminous rocks or rock asphalts, and in this capacity often serve as valuable road binders. Many malthas have a tendency to harden rapidly when exposed to atmospheric conditions, and this property, while accountable for an increase in binding value, makes them unsuitable for use as a flux in the preparation of asphaltic cements.

Malthenes.—A term commonly applied to those hydrocarbons in petroleum, petroleum products, malthas, asphaltic cements, and solid native bitumens soluble in both carbon bisulphide and paraffin naphtha, but not readily volatile at temperatures lower than 163° C. (325° F.). This class of hydrocarbons serves as a valuable permanent fluxing medium for the so-called asphaltenes or naphtha insoluble bitumen in asphaltic cements, giving the cement any desired degree of softness when present in the right amount. It is evident, therefore, that the consistency of asphaltic bitumens, and particularly stable asphaltic cements, is largely dependent upon the relative proportion of naphtha soluble and naphtha insoluble hydrocarbons. The same objection to the use of the term "asphaltenes"† applies to the use of the term "malthenes."

Mineral Rubber.—A term sometimes applied to artificial bitumens of rubbery consistency, usually composed of a mixture of gilsonite and blown petroleum residuum.

Naphthas.—Mixtures of hydrocarbons of low boiling points occurring rarely in nature, commonly obtained from the fractional distillation of certain bitumens. When this term is applied to low-boiling coal-tar distillates, it is usually prefixed by the words "coal tar." The word "naphtha" by itself is generally applied to low-boiling petroleum products. Different grades of naphtha are differentiated not only by their boiling points but also by their specific gravities, which are commonly given in Baumé degrees. Those of very low boiling points and specific gravities are called petroleic ethers. Naphthas vary not only in the two properties above mentioned but also with the type of petroleum from which they are obtained. Those derived from paraffin petroleum are quite different chemically from naphthas obtained from asphaltic petroleum. The former are much less powerful solvents for asphaltic substances than the latter. Paraffin naphtha is used as a solvent for the separation of certain classes of hydrocarbons in asphaltic substances.

Naphthalene.—A solid crystalline highly volatile hydrocarbon occurring principally in coal tars and having the chemical formula $C_{10}H_8$. Its presence in excessive quantities in road tars is believed to be detrimental, as it possesses no binding value and gradually volatilizes from the tar, leaving it hard and brittle.

Native Bitumens.—Mixtures of hydrocarbons occurring in nature, which may be gases, liquids, viscous liquids, or solids, but if solid melting* more or less readily upon the application of heat and dissolving in carbon bisulphide, chloroform, and similar solvents. The native bitumens that are of use as road materials are petroleum, malthas, asphalts, and other solid products such as gilsonite and grahamite. Native bitumens often contain impurities such as water, inorganic matter in the form of clay, silt, sand, etc., and extraneous organic or vegetable matter.

Oil Asphalts.—Artificial oil pitches or asphaltic cements produced as a residuum in the distillation of semiasphaltic and asphaltic petroleum. Many of these products are blown and are therefore known as blown oils.

Oil Pitches.—More or less hard oil asphalts.

Oil Tars.†—Mixtures of hydrocarbon distillates, mostly unsaturated ring compounds, produced in the cracking of oil vapors at high temperatures. Oil tars are usually by-products of the manufacture of oil gas or carbureted water gas.

Paraffin Naphthas.—Naphthas consisting of a mixture of light volatile hydrocarbons of the paraffin series, ordinarily obtained as light distillates of paraffin petroleum.

Paraffin Petroleum.—Petroleum the base of which is composed principally of the paraffin or open-chain series of hydrocarbons; it is thus differentiated from asphaltic petroleum which are composed largely of cyclic or ring hydrocarbons. Paraffin petroleum and the unaltered residues produced by their distillation are of inferior value as dust palliatives and road binders.

Paraffin Scale.—Solid paraffins recovered by distillation and precipitation of the distillates of petroleum and similar materials. The percentage of paraffine in bitumen is usually determined in this manner.

Paraffine.—The term paraffine covers a number of greasy crystalline hydrocarbons of the paraffin series occurring as dissolved wax in certain classes of petroleum. When these products are recovered from petroleum they constitute the commercial product paraffine. Paraffine is believed to be detrimental to road binders in which it occurs, and it is certain that its presence in excessive amounts indicates inferiority in the binding value of the material. It is probable, however, that heavy liquid hydrocarbons of the same chemical series as solid paraffine exert a much more injurious effect.

Petrolenes.—An ambiguous term sometimes applied to those hydrocarbons described under malthenes, which are soluble in carbon bisulphide but insoluble in paraffin naphtha, and sometimes to hydrocarbons in petroleum and petroleum products volatile at or below 163° C. (325° F.). Owing to misconceptions which may occur, it would seem advisable to eliminate the use of this term.

Petroleums.—Petroleums, or mineral oils, are fluid native bitumens of variable composition, depending largely upon the locality in which they occur. There are three general types of petroleum found in the United States: (1) Paraffin petroleum, (2) semiasphaltic petroleum and (3) asphaltic petroleum. Paraffin petroleum occurs mainly in the eastern part of the United States and are typified by the Pennsylvania oils. The semiasphaltic variety occurs in the Southern and Middle Western parts of the United States. Texas is one of the main sources of this type. Asphaltic petroleum occurs in the western part of the United States, particularly in California. Petroleum, if of semiasphaltic or asphaltic character, may make excellent dust palliatives and road binders when properly treated.

*See Coal tar.

†See Asphaltenes.

*See Bitumens.

†See Water-gas tar.

Petrolic Ethers.—Very light volatile naphthas obtained from petroleum.

Pitches.—Semisolid or solid residues produced in the evaporation or distillation of bitumens. This word is often prefixed by the name of the material from which it is derived, such as oil pitch, coal tar pitch, etc. As a rule, the term pitch is confined to the harder residuums, most of which are too hard for use as road binders unless fluxed with a more fluid product.

Pyrobitumens.—Mineral organic substances which are but slightly acted upon by the solvents for the bitumens, but which, upon being subjected to destructive distillation, give rise to the formation of bitumens. Pyrobitumens are derived in nature both from bitumens and direct metamorphosis of vegetable matter. Among the former class may be mentioned Albertite and Wurtzilite, and among the latter peat, lignite and bituminous coal.

Pyrogenetic.—Originating from the action of heat. Coal tar is thus a pyrogenetic bitumen.

Reduced Petroleum or Reduced Oils.—Residual oils produced from crude petroleum by the removal of water and the more volatile oil constituents, without chemically altering the base by cracking or other means. These residues are often made by distilling the crude oil under reduced pressure. Such products are of little value for road treatment unless formed from semiasphaltic or asphaltic oils.

Refined Tar.—A more or less viscous tar which is produced by evaporation or distillation of crude tar until the residue is of the desired consistency. This term also includes blown tars and cut-back products produced by fluxing tar pitches with volatile or non-volatile distillates. Refined tars are of value both as dust palliatives and as road binders in the treatment of macadam roads. Their binding value is proportional to their hardness within certain limits.

Residual Petroleum or Residual Oils.—Heavy viscous residues produced by the evaporation or distillation of crude petroleum until at least all of the burning oils have been removed and often some of the heavier distillates as well. Residual oils grade into the artificial asphalts and oil pitches as their hardness and viscosity increase. The more fluid products, if obtained from semiasphaltic or asphaltic petroleum, serve as excellent dust palliatives and semipermanent road binders for the surface treatment of roads. The more viscous products are often suitable for the surface treatment of roads if applied hot, but are seldom of value in road construction unless produced from semiasphaltic or asphaltic oils.

Residual Tars.—Heavy viscous residues produced by the evaporation or distillation of crude tar until all of the light oils have been removed. Residual tars grade into the tar pitches as their hardness and viscosity increase. If they do not contain an excess of free carbon they are, as a rule, well adapted for use as binders in the construction of macadam roads.

Rock Asphalt or Bituminous Rock.—A term applied to a great variety of sandstones and limestones more or less impregnated with maltha. Deposits of such material are widely distributed over the United States and vary from rock which is friable and wholly dependent upon the bitumen to hold the mineral fragments together to solid rock having merely its interstices filled with bitumen. The former type is of value for use as a surface binder in the construction of roads when the maltha shows good binding value and amounts to not less than 6 per cent of the weight of rock asphalt.

Semiasphaltic Petroleum.—Semiasphaltic petroleum or semi-asphaltic oils are petroleum containing a semiasphaltic base, i. e., petroleum whose residues produced by evaporation or distillation, while composed mainly of asphaltic hydrocarbons, contain also a certain percentage of paraffin wax. They thus show a mixed base. If their percentage of heavy paraffin hydrocarbons is not excessive they may be made to produce good dust preventives and road binders.

Short.—A term applied to bituminous materials which are non-ductile.

Tar Pitches.—Semisolid or solid residual tars. Owing to the general brittleness of tar pitches, only the softer varieties are of value in their natural conditions as road binders. The harder pitches may, however, be used for this purpose if fluxed to suitable consistency with heavy or dead oil distillates of tar.

Tars.—Tars are artificial or pyrogenetic bitumens produced as distillates by the destructive distillation of bitumens, pyrobitumens and other organic material.

Water-Gas Tars.—Mixtures of hydrocarbon distillates, mostly unsaturated ring compounds, produced by cracking oil vapors at high temperatures in the manufacture of carbureted water gas. Crude water-gas tar is a thin, oily liquid having a specific gravity lying usually between 1 and 1.10. As a rule, it contains a considerable quantity of water, which is, however, largely removed by mechanical devices before the tar is placed upon the market. This water is not ammoniacal, as in the case of crude coal tars. The composition of water-gas tar varies with the character of the oil which is carbureting and with varying conditions attending the carbureting process. It always shows a low percentage of free carbon, usually less than 2 per cent, and contains little or no naphthalene unless previously used for scrubbing coal gas. Crude water-gas tar has practically no binding value and is serviceable only as a dust palliative in the surface treatment of roads. When reduced to proper consistency by distillation, however, it shows certain desirable properties for use as a road binder both for surface treatment and macadam construction. Water-gas tar may also be used in the preparation of road binders from high-carbon coal tars. When this is done the two crude tars are mixed in such proportion that when distilled to the desired consistency the mixture will contain less than the maximum limit of free carbon allowable.

PAVING IN 1910 AND 1911

Data Collected This Month from Four Hundred and Sixty Cities — Amounts of Various Kinds of Pavements Laid Last Year—What Is Contemplated This Year—Grades—Guarantees

As has been its custom for several years past, MUNICIPAL JOURNAL AND ENGINEER has collected for this number figures concerning the amount of paving done in the United States during the past year, and in addition such figures as are yet available concerning the work which the various cities are expecting to do during the year 1911. Naturally the latter figures are incomplete, since a great many of the cities have not yet decided upon what paving work they will carry out this year.

Reports were received from about 460 cities. Table No. 1 contains the figures of 350 of these, the remaining cities having replied that no paving work had been done by them during the year 1910. The other tables do not contain the additional data from all these cities, since the information was not furnished in many cases, probably because in most of these it was not available.

In obtaining this information cards were sent to the city engineers or street officials of all cities of the country, a reproduction of which card is presented herewith. We have chosen this particular card in order to call attention to the remarkable neatness with which the figures have been filled in. The cards returned to us from time to time vary in this respect, some being hardly legible or intelligible, but we believe this is the best piece of work of this kind which has reached our office.

These data show that in the cities represented approximately

1,000 miles of paving was done last year. This table includes most of the larger cities, and it is probable that fully 75 per cent of the work done is represented therein.

Reports from some of the States indicate that practically every city did more or less paving, while in other States a considerable percentage did no paving last year. Of nineteen cities in Massachusetts all report doing more or less paving, and the same is true of the seven Oklahoma cities, five Oregon cities, the three Rhode Island cities, the four Tennessee cities and the ten Connecticut cities. Of twelve California cities only one had done no work, and of the seventeen New Jersey cities only two. Of thirty-one Illinois cities seven had done no paving and three of the twenty-four in Indiana, six of the twenty-three in Iowa, four of the seventeen in Kansas, six of the thirty-one in Michigan, six of the seventeen in Minnesota, six of the nineteen in Missouri, seven of the thirty-two in Ohio, twelve of the forty-two in Pennsylvania and ten of the thirty-three in New York reported no paving during 1910.

Although but three cities of the twenty-four reporting from Indiana reported no paving, one or two references were made to the unsatisfactory paving law in that State, and it was said that had this law been more satisfactory a considerably larger amount of paving would have been done in that State during the year; and that this law would also limit to a minimum the

TABLE No. 1—PAVEMENTS LAID IN 1910

	Sheet Asphalt.	Asphalt Block.	Stone Block.	Brick or Clay Block.	Treated Wood Block	Bit. Macadam or Bit. Concrete.	Plain Macadam.	Gravel.	Other Kinds.	Dust Layers
CALIFORNIA:										
Benicia.....	.....	.....	.....	.....	.....	23,000 Yc	.....	.....	.....	.....
Fresno.....	.....	.....	.....	.....	.....	1 30 Mc	.....	.....	.....	.....
Long Beach.....	2.75 Mc	.....	.....	.....	.....	5.5 M	.....	.....	.....	.....
Los Angeles.....	17.8 Mc	.....	.....	0.52 Mc	.....	3.64 Mc	.....	12.2 Mc	.....	.....
Oakland.....	8.52 M	.....	.....	0.13 M	.....	5.57 M	22.5 M	.....	Hassam 0.18 M	25.00 M
Pasadena.....	0.95 Mc	.....	.....	.....	.....	3.16 Mc	.....	.....	.....	13.28 Mc
San Jose.....	116,383 Yc	.....	.....	.....	.....	.....	.....	.....	.....	.....
Santa Cruz.....	.....	.....	.....	.....	.....	.....	48 700 Yc	.....	.....	.....
Santa Monica.....	5,811 Yc	.....	.....	.....	.....	1 Mc	.....	.....	Concrete 9,333 Yc	.....
Stockton.....	1,000 Yc	.....	.....	.....	.....	.....	22,000 Yc	.....	.....	1,500 Yc
Visalia.....	4,600 Yc	.....	.....	.....	.....	.....	.....	.....	.....	9 M
	10,700 Yc§	.....	.....	.....	.....	13,904 Y	.....	.....	.....	.....
COLORADO:										
Boulder.....	.....	.....	.....	.....	.....	4,000 Yc	3,000 Ym	30,000 Ym	.....	.....
Denver.....	11,425 Ym§	.....	22,706 Yc	.....	.....	7,315 Ym	.....	92,368 Ym	14,133 Y	40,000 Ym
CONNECTICUT:										
Ansonia.....	.....	.....	670 Yc	.....	.....	.....	.....	.....	.....	10 M
Greenwich.....	.....	.....	.....	1,000 Yc	.....	.....	.....	.....	.....	134,000 Y
Hartford.....	14,488 Yc	.....	.....	.....	.....	.....	29,178 Ym	.....	.....	0.5 M
Meriden.....	.....	.....	.....	.....	.....	0.1 M	.....	.....	.....	.....
Middletown.....	.....	.....	10,883 Yc	.....	.....	.....	4,530 Ym	.....	.....	.....
New London.....	.....	.....	.....	5,500 Yc	.....	21,770 Ym	6,205 Ym	.....	.....	.....
Norwalk.....	.....	.....	.....	.....	.....	.....	.....	0.25 Mm	.....	.....
Putnam.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	10 Mm
So. Norwalk.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Waterbury.....	.....	.....	2,529 Yc	.....	.....	.....	.....	.....	.....	.....
DIST. OF COLUMBIA:										
Washington.....	58,552 Yc	52,402 Ycm	630 Ycm	.....	.....	12,090 Yc	74 244 Ycm	.....	.....	.....
	60,290 Yc§	.....	.....	.....	.....	.....	.....	.....	.....	.....
FLORIDA:										
Sarasota.....	.....	.....	3.75 Mm	.....	.....	.....	.....	.....	.....	.....
GEORGIA:										
Cartersville.....	.....	.....	.....	.....	.....	2,130 Ym	18,640 Ym	.....	.....	.....
Covington.....	.....	.....	.....	800 Y	.....	.....	.....	.....	.....	.....
Dublin.....	.....	.....	.....	20,000 Yc	.....	.....	.....	.....	.....	.....
Macon.....	.....	.....	.....	57,000 Yc	.....	.....	.....	.....	.....	.....
Savannah.....	140,814 Yc	217,342 Ym	88,597 Ym	350,131 Yc	.....	.....	14,912 Ym	21,249 Ym	174 710 Y	.....
IDAHO:										
Lewiston.....	.....	.....	.....	.....	.....	66,000 Yc	.....	.....	.....	.....
ILLINOIS										
Batavia.....	.....	.....	.....	1,693 Yc	.....	29,799 Yc	.....	1 M	.....	3 blks
Bloomington.....	15,104 Yc	.....	.....	49,850 Yc	.....	.....	.....	.....	.....	.....
Chicago.....	946,085 Yc	.....	259,987 Yc	374,601 Yc	63 857 Yc	.....	234,605 Yc	.....	10,123 Yc	.....
Decatur.....	.....	.....	.....	3 Mc	2,100 Yc	.....	.....	.....	.....	.....
East St. Louis.....	.....	.....	.....	6 Mc	1.1 Mc	.....	.....	.....	.....	.....
Elgin.....	.....	.....	.....	25,649 Yc	.....	4,500 Ym	8,700 Ym	11,460 Ym	.....	16.69 Mm
Evanston.....	.....	.....	.....	20,285 Yc	.....	8,070 Yc	3,380 Ym	.....	.....	3.31 Mc
Galena.....	.....	.....	.....	300 Yc	.....	.....	4,245 Yc	.....	.....	.....
Highland Pk.....	.....	.....	.....	500 Yc	.....	29,000 Yc†	5 800 Yc	.....	.....	.....
Kankakee.....	.....	.....	.....	.....	.....	8,200 Yc	.....	.....	.....	13 Mc
Lake Forest.....	.....	.....	.....	.....	.....	.....	2 Mm	.....	.....	.....
Marion.....	.....	.....	.....	11,826 Yc	.....	.....	1.5 Mc	.....	.....	.....
Mattoon.....	.....	.....	.....	12.37 Mc	.....	.....	.....	.....	.....	.....
Normal.....	.....	.....	.....	64,000 Yc	.....	.....	.....	.....	.....	.....
Oak Park.....	18,123 Yc	.....	.....	35,089 Yc	.....	.....	16,630 Yc	.....	.....	24 Mm
Ottawa.....	.....	.....	.....	21,000 Yc	.....	.....	.....	.....	.....	.....
Paris.....	.....	.....	.....	6,500 Yc	.....	.....	.....	0.75 Mc	.....	.....
Pontiac.....	.....	.....	.....	6 Mc	.....	.....	.....	.....	.....	.....
Rockford.....	.....	.....	.....	1,320 Yc	.....	.....	2.1 Mc	.....	.....	6 Mm
Sterling.....	.....	.....	.....	6,000 Yc	.....	.....	.....	.....	.....	.....
Streator.....	.....	.....	.....	2.5 Mc	.....	.....	.....	2 Mm	.....	.....
Taylorville.....	.....	.....	.....	7,896 Y	.....	.....	.....	.....	.....	.....
Waukegan.....	.....	.....	.....	46,000 Yc	.....	13,700 Yc	.....	.....	.....	.....
INDIANA:										
Anderson.....	.....	.....	.....	1.86 Mc	.....	.....	.....	.....	.....	.....
Bedford.....	.....	.....	.....	8,873 Yc	.....	.....	.....	.....	.....	.....
Bloomington.....	.....	.....	.....	24,000 Yc	.....	.....	2 Mc	.....	.....	.....
Butler.....	.....	.....	.....	33,500 Yc	.....	.....	.....	.....	.....	.....
Columbus.....	.....	.....	.....	7,028 Yc	.....	.....	.....	.....	.....	.....
Evansville.....	32,010 Yc	.....	.....	25,240 Yc	.....	.....	.....	.....	.....	.....
Fort Wayne.....	51,161 Yc	2,055 Yc	.....	35,682 Yc	.....	9,281 Yc	.....	.....	.....	.....
Hammond.....	.....	.....	.....	7,556 Yc	.....	52,515 Yc	2,000 Yc	.....	.....	.....
Kokomo.....	12,620 Yc	.....	.....	17,904 Yc	.....	.....	.....	.....	.....	.....
Logansport.....	50,000 Yc	.....	.....	3,000 Yc	.....	.....	.....	10,000 Yc	.....	22,430 Ym
Madison.....	.....	.....	.....	.....	.....	.....	13,183 Ym	15,007 Ym	.....	.....
Michigan City.....	.....	.....	.....	4,500 Yc	.....	.....	.....	.....	.....	.....
Mishawaka.....	.....	.....	.....	.....	.....	9,097 Yc	.....	.....	.....	.....
Monticello.....	.....	.....	.....	.....	.....	0.5 Mc	.....	.....	.....	.....
Muncie.....	.....	.....	.....	21,964 Yc	.....	.....	.....	.....	.....	.....
New Albany.....	.....	.....	.....	14,500 Yc	.....	.....	.....	.....	.....	.....
Peru.....	.....	.....	.....	2.75 Mc	.....	0.5 Mc	.....	.....	.....	.....
Plymouth.....	.....	.....	.....	1,400 Yc	.....	.....	.....	.....	.....	.....
Portland.....	.....	.....	.....	.....	.....	.....	0.18 Mc	.....	.....	.....
South Bend.....	8,551 Yc	.....	.....	32,503 Yc	.....	30,101 Yc	.....	.....	.....	.....
W. Lafayette.....	.....	.....	.....	.....	.....	10,200 Yc	16,000 Yc	.....	.....	.....

NOTE.—M = miles. Y = square yards. c = laid by contract. m = laid by municipal labor.
 * Probably total pavement to date. † With concrete base. § Resurfacing ‡ Concrete base, cement grout filler.

TABLE No. 1—PAVEMENTS LAID IN 1910—Continued

	Sheet Asphalt.	Asphalt Block.	Stone Block.	Brick or Clay Block.	Treated Wood Block.	Bit. Macadam or Bit. Concrete.	Plain Macadam.	Gravel.	Other Kinds.	Dust Layers.
IOWA:										
Ames				1,262 Yc	23,473 Yc				Concrete 1,255 Yc	
Burlington				13,522 Yc		2,927 Yc				
Cedar Rapids				44,132 Yc		25,660 Yc				
Centerville				22,000 Yc						
Chariton				19,000 Yc						
Clinton				3,000 Yc	6,000 Yc					
Creston						25,096 Yc				
Dubuque				5,954 Yc		7,216 Yc	14,996 Yc			50,000 Ym
Grinnell				0.7 Mc		77,000 Yc				
Hampton										
Iowa City				15,240 Yc						
Marshalltown									Concrete 1,500 Yc	
Muscatine				23,724 Yc						
Ottumwa				22,000 Yc	1,200 Yc					
Perry					33,600 Yc	22,600 Yc		4Mm		
Sioux City				9,000 Y						
Waterloo	54,027 Yc									
KANSAS:										
Argentine				5,340 Yc		3,900 Yc				
Arkansas City				12,200 Yc			1 M	10 Mm		
Atchison				13,899 Yc						
Chanute				22,880 Yc		5,403 Yc				
Emporia						1.75 Mc				
Hutchinson				40,000 Y						
Independence				88,457 Yc						
Leavenworth				5,956 Yc						33,070 Yc
Ottawa				11,670 Yc					Concrete 9,125 Yc	
Pittsburg				30,352 Yc						
Salina				26,000 Yc		30,000 Yc			Concrete 0.1 Mmc	
Wichita	12.88 Mc			3.5 Mc	0.1 Mc	4.17 Mc				5,000 Yc
Winfield				19,200 Yc						
KENTUCKY:										
Louisville	4.77 Mc		0.49 Mc	4.40 Mc	0.26 Mc					
Maysville				7,000 Yc						
LOUISIANA:										
Alexandria				5,908 Yc		5,693 Yc		16,268 Yc		
Baton Rouge						28,000 Yc		4 Mm		
New Orleans	13.3 Mc		0.4 Mc		0.1 Mc	6.3 Mc		1.1 M	7.0 M	
Shreveport						7,000 Yc				
MAINE:										
Portland			4,831 Ym			21,561 Ym 6,398 Yc	1,847 Ym		Concrete 991 Yc	15,000 Y
MARYLAND:										
Annapolis				2,740 Yc						7,432 Yc
Baltimore	42,515 Yc		10,105 Yc	23,269 Yc		1,460 Yc	3,020 Yc			
MASSACHUSETTS:										
Arlington						4,500 Y	8,000 Y	2,000 Y		200,000 Y
Boston	479 Yc			42,591 Yc 364 Ym 6,222 Ym	3,188 Yc	4,650 Yc 22,072 Ym 10,550 Yc 4,900 Ym	73,300 Yc 7,070 Ym 1,979 Ym			5,845,178 Ym
Cambridge						0.88 Mm	1.22 Mm	2.5 Mm		11 Mm
Concord						5,808 Ym	0.1 Mm	0.1 Mm		0.62 Mm
Everett				6,201 Ym	1,216 Ym				930 Ym	8,804 Ym
Greenfield				5,968 Yc			11,250 Ym 25,038 Yc	6,560 Ym	Hassam 22,821 Yc	
Haverhill				6,559 Ym 20,400 Ym		35,129 Ym	21,081 Ym			
Lawrence					2,187 Ym	6,875 Ym	18,600 Ym			4,922 Ym
Lowell				53,316 Yc 0.17 Mm§ 0.27 Mm 0.65 Mm†			1.89 Mm	0.5 Mm		2.75 Mm
Medford						10,057 Ym	28,012 Ym			30 Mm
New Bedford						13,264 Yc	38,898 Ym			76.25 Mm
Newton						2 Mm	50 Mm			50 Mm
Somerville				18,083 Ymc	557 Y	1.88 Mm				Much
Springfield		712 Ym			6,153 Ym	35,979 Yc	86,457 Ym 36,925 Ym	34,181 Y 7,265 Ym		93,074 Ym 363,682 Ym 112,865 Ym
Waltham							8,280 Ym			2.5 Mm
Watertown							10 Mm*	60 Mm*		
Westfield	8,211 Yc									
Woburn										
Worcester				0.74 Mc 2.35 Mm		0.82 Mm	3.39 Mm			7.0 Mm
MICHIGAN:										
Albion						0.5 Mm				
Battle Creek				23,507 Ym						
Cadillac						1,800 Ym	4,000 Ym			
Coldwater				6,000 Ym						
Crystal Falls						17,000 Yc				
Detroit	219,883 Ym	5,190 Ym	20,906 Ym	176,130 Ym	26,148 Ym				Cedar block 150,384 Ym	
Dowagiac						7,119 Yc			Concrete	4,855 Y
Escanaba							17,884 Yc	2,500 Yc		
Flint	7,400 Yc	7,503 Yc		55,510 Yc						
Grand Rapids		10,516 Yc		78,222 Yc		35,786 Yc		62,879 Yc		
Holland				9,000 Yc						
Ionia				5,850 Ym						
Kalamazoo	9,443 Yc			14,894 Yc						
Lansing				18,932 Yc		7,163 Yc				
Ludington						1,500 Y				

NOTE.—M = miles, Y = square yards, c = laid by contract, m = laid by municipal labor.

‡ Probably total pavement to date. † With concrete base § Resurfacing. ‡ Concrete base, cement grout filler.

TABLE No. 1—PAVEMENTS LAID IN 1910—Continued

	Sheet Asphalt.	Asphalt Block.	Stone Block.	Brick or Clay Block.	Treated Wood Block	Bit. Macadam or Bit. Concrete	Plain Macadam.	Gravel.	Other Kinds.	Dust Layers.
MICHIGAN:										
<i>Continued</i>										
Manistee.....	.....	.....	.....	.....	.....	7,776 Ym	3,982 Ym	.....	.....	2,800 Ym
Monroe.....	.....	.....	.....	3,000 Yc	.....	.....	.....	.....	.....	2 M
Muskegon.....	.....	.....	.....	.....	.....	13,752 Yc	.....	.....	.....	.....
Negaunee.....	.....	.....	.....	.....	.....	.....	7,000 Ym	.....	.....	.....
Petosky.....	.....	.....	.....	.....	.....	6,000 Yc	.....	5,000 Ym	.....	.....
Pontiac.....	.....	.....	.....	15,000 Yc	.....	.....	.....	.....	.....	.....
Port Huron.....	.....	.....	.....	4,590 Yc	.....	.....	.....	.....	.....	.....
Saginaw.....	22,042 Yc	.....	.....	26,240 Yc	.....	.....	.....	.....	.....	25,901 Y
St. Joseph.....	.....	.....	.....	2,500 Y	.....	.....	.....	.....	.....	.....
Sault St. Marie.....	.....	.....	.....	.....	.....	5,080 Ym	14,000 Ym	.....	.....	.....
MINNESOTA:										
Albert Lea.....	.....	.....	.....	4,770 Yc	44,017 Yc	.....	4,445 Ym	75,000 Ym	.....	1,871 Mm
Alexandria.....	.....	.....	.....	.....	.....	.....	.....	7c Mm	.....	.....
Crookston.....	.....	.....	.....	.....	1,444 Y	.....	.....	13,300 Y	.....	.....
Little Falls.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	7,000 Y
Mankato.....	.....	.....	.....	21,245 Y	.....	.....	.....	.....	.....	.....
Minneapolis.....	.....	.....	30,488 Ym	4,568 Ym	155,921 Ym	62,394 Ym	.....	15,300 Yc	.....	.....
New Ulm.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Red Wing.....	.....	.....	1,844 Yc	3,383 Yc	4,381 Yc	.....	.....	.....	.....	.....
St. Paul.....	2.21 Mc§	.....	0.41 M	0.42 M	.....	.....	4.47 M	.....	.....	305,000 Y
So. St. Paul.....	.....	.....	.....	.....	.....	.....	0.6 Mc	.....	.....	.....
Winona.....	.....	.....	.....	5,005 Yc	.....	.....	.....	.....	.....	20,155 Yc
MISSISSIPPI:										
Vicksburg.....	2.25 Mc	.....	.....	0.75 Mc	.....	.....	.....	.....	.....	.....
MISSOURI:										
Butler.....	.....	.....	.....	0.75 Mc	.....	.....	.....	.....	.....	.....
Cape Girardeau.....	.....	.....	.....	6,168 Yc	15,000 Yc	1. M	1.5 M	.....	.....	5,650 Yc
Columbia.....	.....	.....	.....	34,170 Yc	.....	.....	.....	.....	.....	.....
De Soto.....	.....	.....	.....	.....	.....	.....	2,000 Ym	2,000 Ym	.....	8,400 Y
Fulton.....	.....	.....	.....	.....	.....	7,600 Y	.....	.....	.....	.....
Jefferson City.....	.....	.....	.....	.....	.....	.....	8,266 Yc	.....	.....	.....
Liberty.....	.....	.....	.....	9,544 Yc	.....	.....	.....	.....	.....	.....
Mexico.....	.....	.....	.....	13,005 Yc	.....	.....	.....	.....	.....	.....
Moberly.....	.....	.....	.....	1.25 Mc	.....	.....	.....	.....	.....	.....
St. Joseph.....	26,085 Yc	.....	1,914 Yc	21,034 Yc	1,300 Yc	6,000 Yc	458 Yc	.....	Hassam	218,410 Ym
St. Louis.....	88,986 Yc	.....	33,898 Yc	298,034 Yc	27,939 Yc	60,120 Yc	23,936 Yc	.....	88,017 Yc	.....
Sedalia.....	2.5 Mc	.....	.....	10.5 Mc	.....	.....	8.5 Mc	.....	.....	.....
Webb City.....	.....	.....	.....	710 Yc	.....	22,574 Yc	.....	9,614 Yc	.....	.....
MONTANA:										
Billings.....	.....	.....	.....	32,505 Yc	36,614 Yc	.....	.....	.....	Concrete	3,313 Yc
Bozeman.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Butte.....	.....	.....	1,190 Yc	2,300 Yc	.....	.....	.....	.....	.....	.....
Helena.....	.....	.....	.....	1,848 Yc	.....	.....	.....	.....	.....	.....
NEBRASKA:										
Lincoln.....	27,954 Yc	.....	.....	16,227 Yc	.....	.....	.....	.....	.....	.....
Norfolk.....	.....	.....	.....	23,280 Yc	.....	.....	.....	.....	.....	.....
So. Omaha.....	20,219 Yc	.....	.....	25,526 Yc	14,742 Yc	58,174 Yc	.....	.....	.....	.....
York.....	.....	.....	.....	2 Mc	.....	.....	.....	.....	.....	.....
NEVADA:										
Reno.....	18,000 Yc	.....	.....	.....	.....	23,000 Ym	20,000 Ym	60,000 Ym	.....	.....
NEW HAMPSHIRE:										
Concord.....	.....	.....	.....	.....	.....	.....	3/4 M	3/4 M	.....	1 1/2 M
Keene.....	.....	.....	.....	6,700 Yc	.....	.....	1.5 Mmc	.....	.....	20,000 Ym
Laconia.....	.....	.....	1,667 Ym	.....	.....	13,969 Ymc	.....	.....	.....	.....
NEW JERSEY:										
Bayonne.....	41,203 Yc	.....	.....	8,874 Yc	.....	15,854 Yc	14,455 Yc	.....	.....	15 Mm
Bloomfield.....	.....	.....	.....	.....	.....	.....	5 Mm	.....	.....	.....
Boonton.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Camden.....	19,357 Yc	.....	2,531 Yc	.....	.....	.....	.....	.....	.....	1 M
Dover.....	.....	.....	.....	.....	.....	.....	0.5 Mc	.....	.....	26.8 M
East Orange.....	1.4 Mc	1.4 Mc	.....	.....	.....	2.4 Mc	66,766 Ym	.....	.....	.....
Elizabeth.....	.....	.....	1.15 Mc	0.95 Mc	.....	.....	.....	.....	.....	16 Mc
Glen Ridge.....	.....	.....	.....	.....	.....	.....	4,600 Yc	.....	.....	5 M
Montclair.....	.....	.....	.....	.....	.....	.....	1.5 M	.....	.....	25 M
Newark.....	.....	0.11 Mc	4.47 Mc	4.60 Mc	.....	16,860 Y	0.65 Mc	.....	.....	.....
Paterson.....	7,082 Yc	.....	3,400 Yc	.....	27,035 Yc	0.73 Mc	25,900 Yc	.....	.....	.....
Phillipsburg.....	.....	.....	.....	.....	.....	.....	5,000 Ym§	.....	.....	11,000 Ym
Rutherford.....	.....	.....	.....	.....	.....	2,000 Ym	1.5 Mc	.....	.....	0.5 Mm
Summit.....	.....	.....	.....	.....	.....	0.5 Mc	1,800 Yc	.....	.....	.....
W. New York.....	.....	.....	.....	7,000 Yc	.....	.....	.....	.....	.....	.....
NEW YORK:										
Albany.....	.....	.....	3,249 Yc	22,167 Yc	.....	.....	3 Mm	.....	.....	15 Mm
Auburn.....	3,000 Yc	.....	.....	33,214 Yc	.....	.....	.....	.....	.....	.....
Binghamton.....	.....	.....	.....	11,455 Yc	.....	8,311 Yc	.....	.....	.....	.....
Corning.....	.....	.....	.....	1,200 Yc	.....	.....	.....	.....	.....	.....
Dunkirk.....	18,000 Yc	.....	.....	7,012 Yc	.....	.....	.....	.....	.....	.....
Fishkill L'd'g.....	.....	.....	.....	3,310 Yc	.....	13,215 Yc	.....	.....	.....	.....
Fulton.....	.....	.....	.....	0.33 Mc	.....	0.75 Mc	.....	0.75 Mm	.....	.....
Herkimer.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hudson.....	.....	.....	.....	.....	.....	.....	11,200 Ym	.....	.....	5 M
Kingston.....	.....	.....	.....	27,000 Yc	.....	.....	.....	.....	.....	.....
Middletown.....	.....	.....	.....	0.75 Mm	.....	.....	2 Mm	2 Mm	.....	.....
New York.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bronx.....	0.95 Mc	6.06 Mc	0.49 Mc	.....	.....	.....	.....	.....	.....	.....
Manhattan.....	10.39 Mc	5.75 Mc	6.95 Mc	.....	3.57 Mc	.....	.....	.....	.....	.....
Richmond.....	.....	11,947 Yc	6,450 Yc	39,628 Yc	12,957 Yc	54,441 Ym	136,754 Ym	.....	Slag block	306,703 Ym
Niagara Falls.....	.....	17,726 Yc	1,485 Yc	.....	.....	12,950 Yc	.....	.....	6,680 Yc	.....
Oneonta.....	.....	.....	.....	25,410 Ym	.....	.....	.....	.....	Hassam	12,055 Yc
Poughkeepsie.....	.....	.....	.....	.....	.....	.....	24,000 Ym	.....	.....	.....

NOTE.—M = miles. Y = square yards. c = laid by contract. m = laid by municipal labor.
 * Probably total pavement to date. † With concrete base. § Resurfacing. ‡ Concrete base, cement grout filler.

TABLE No. 1—PAVEMENTS LAID IN 1910—Continued

	Sheet Asphalt	Asphalt Block	Stone Block	Brick or Clay Block	Treated Wood Block	Bit Macadam or Bit. Concrete	Plain Macadam	Gravel	Other Kinds	Dust Layers
NEW YORK:										
<i>Continued</i>										
Rochester	1 27 Mc		0.27 Mc	4.64 Mc 7,268 Yc	3,300 Yc	1 Mc				
Saranac				1,356 Ym						
Schenectady	112,526 Yc			6,317 Yc						
Syracuse	2 39 Mc			3 30 Mc						
Troy	4,219 Yc		16,369 Yc	1,880 Yc			4,419 Yc			
Utica	11,822 Yc				2,315 Yc					
Watertown					6,500 Yc	1 Mm	4 Mm			2 Mm
Watervliet			5,000 Yc							
NORTH CAROLINA:										
Asheville						46,760 Yc				10,220 Yc 0.2 Mm
Raleigh	1 Mc			1 M						
NORTH DAKOTA:										
Grand Forks					16,541 Yc	58,380 Yc		2,000 Yc	Blome 20,756 Yc	2,000 Yc
Valley City										
OHIO:										
Ashtabula				23,115 Yc						
Bellefontaine				19,300 Yc			4,700 Yc 0.5 Mc			9.5 Mc
Bowling Green									Concrete 0.21 Mc 0.3 M	
Bucyrus				2.0 Mc			0.82 Mcm			
Cincinnati	0.42 M		5.6 M	3.12 M	2.6 M		2.56 M			
Cleveland	0.61 M		0.62 M	16.34 M						
Columbus	27,892 Y			154,908 Y			0.43 M			
Coshocton				0.57 Mc						
Delaware				14,000 Yc						
E. Palestine				1.25 Mc						
Hamilton				7,300 Yc						
Lancaster				21,000 Yc						
Leotoma				11,000 Yc						
Lima				13,000 Yc						
Lockland				4,274 Yc						
Marietta				35,310 Yc						
Newark				0.85 Mc						2,000 Yc
Oberlin				1,475 Yc						
Painesville				4,100 Yc						
Portsmouth				64,577 Yc						
Sandusk	21,208 Yc			3,142 Yc			3,000 Ym			5 Mm
Springfield*	2.83 Mc	1.26 Mc	0.59 Mc	11.51 Mc			17.48 Mc	48.09 Mc		
Van Wert				19,835 Yc	0.02 Mc					10 Mm
Warren				4,200 Yc						
Zanesville										
OKLAHOMA:										
Bartlesville				15,000 Yc		18,451 Yc				
Chickasha	98,458 Yc									
Durant				26,000 Yc						
El Reno	137,021 Yc									
Lawton	100,000 Yc									
Muskogee	8 Mc			1 Mc		1 Mc	2 Mc			
Tulsa	21.8 Mc			1.2 Mc			0.2 Mc			
OREGON:										
Albany						20,497 Yc				
Baker						66,522 Yc				
Grant's Pass						42,000 Yc	16,000 Y			
Oregon City							3 M			3 M
The Dalles						37,500 Yc				
PENNSYLVANIA:										
Allentown	32,900 Yc			3,080 Yc						60,000 Ym 50,000 Ym
Bethlehem						2,000 Ym	400,000 Ym*			
Carlisle				3,000 Ym			10,000 Ym			
Easton				1,712 Yc		8,924 Ym	2,712 Ym			
Eric	56,214 Yc			38,148 Yc						
Gallitzin				8,000 Yc						
Girardville				5,600 Yc						
Harrisburg	17,876 Yc									
Lansford				9,460 Yc						
Lebanon							38.46 Mm*			
McKeesport				19,941 Yc						
McKees Rocks			350 Yc	11,150 Yc						
Minersville				11,604 Yc						3,000 Ym
New Castle				2 Mc						
Norristown				1,500 Ym						
No. Braddock				2,126 Yc			2,400 Ym			
North East				1 M						
Oil City				47,021 Yc						
Philadelphia	25.0 Mc		0.1 Mc	2.2 Mc	0.7 Mc	2.7 Mc	6 Mc			
Pottstown				6,265 Ym						
Punxsutawney				1,794 Yc						
Reading			0.08 Mc	0.62 Mc		0.21 Mm				0.09 Mm
St. Mary's				6,500 Ym		0.14 Mc	0.86 Mm			
Scranton	59,419 Yc		6,554 Yc	2,000 Yc						
Sharon										
Shenandoah			2,000 Yc							
So. Bethlehem						1,240 Ym				
Tyrone				4,700 Yc						
Wilkes-Barre	9,382 Yc		998 Yc	8,793 Yc						
William sport				6,900 Yc						
RHODE ISLAND:										
Pawtucket						0.75 Mm	1.56 Mm	0.25 Mm		59.5 Mm 28.81 Mc
Providence			8,980 Ym	457 Ym			2.94 Mm			
Woonsocket			1,150 Y							

NOTE: M = miles. Y = square yards. c = laid by contract. m = laid by municipal labor.
 * Probably total pavement to date. † With concrete base. ‡ Resurfacing. † Concrete base, cement grout filler.

	Sheet Asphalt.	Asphalt Block.	Stone Block.	Brick or Clay Block.	Treated Wood Block.	Bit. Macadam or Bit. Concrete.	Plain Macadam.	Gravel.	Other Kinds.	Dust Layers.
SOUTH CAROLINA:										
Columbia.....	.....	.....	400 Y	25,000 Y	.....	1.8 Mc	6 Mm	.....	Sand Clay 78 Mm*	.....
Greenwood.....	.....	.....	.....	5,500 Ym	.....	.....	.....	.....	0.5 Mm	.....
Orangeburg.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
SOUTH DAKOTA:										
Aberdeen.....	.....	.....	.....	.....	20,546 Yc	.....	.....	.....	.....	.....
Lead.....	.....	.....	.....	.....	.....	2,500 Ym	.....	.....	.....	.....
Sioux Falls.....	.....	.....	3,400 Yc	.....	.....	.....	.....	.....	.....	.....
TENNESSEE:										
Bristol.....	.....	.....	.....	.....	1,900 Y	.....	1 M	.....	.....	0.5 M
Clarksville.....	.....	.....	.....	.....	.....	.....	1.25 Mm	3,000 Ym	.....	1 Mm
Knoxville.....	.....	.....	.....	1,400 Yc	.....	.....	4 Mm	.....	309 Ym	1 Mm
TEXAS:										
Austin.....	.....	.....	.....	0.2 Mc	.....	.....	.....	.....	.....	.....
Denison.....	.....	.....	.....	3,431 Ym	.....	.....	.....	.....	.....	.....
San Antonio.....	.....	.....	.....	.....	.....	84,070 Ym	.....	14 Mm	.....	.....
Waco.....	.....	.....	.....	5,000 Yc	.....	18,000 Yc	.....	25,000 Ym	.....	20,000 Ym
UTAH:										
Ogden.....	19,121 Yc	.....	.....	.....	.....	.....	.....	.....	.....	.....
Salt Lake.....	8.58 Mc	.....	.....	.....	.....	.....	.....	.....	.....	.....
VERMONT:										
Barre.....	.....	.....	.....	.....	.....	.....	13,485 Ym	.....	.....	.....
St. Albans.....	.....	.....	.....	.....	.....	4,011 Yc	25,500 Ym	4,444 Ym	.....	5,268 Ym
VIRGINIA:										
Danville.....	.....	.....	.....	.....	.....	28,500 Yc	.....	.....	.....	.....
Hampton.....	.....	1,800 Yc	.....	31,000 Yc	.....	.....	2,000 Yc	.....	.....	.....
Norfolk.....	35,000 Yc	9,100 Yc	24,000 Ymc	.....	27,000 Yc	158,125 Yc	.....	.....	Shell 10,000 Ym 16,000 Ym	.....
WASHINGTON:										
Bellingham.....	22,949 Yc	.....	.....	11,332 Yc	.....	.....	.....	3.07 Mc	Plank 0.62 M	.....
No. Yakima.....	48,000 Yc	.....	.....	14,000 Yc	.....	.....	.....	.....	.....	.....
Seattle.....	344,557 Yc	.....	52,500 Yc	118,808 Yc	694 Yc	.....	.....	.....	.....	.....
Spokane.....	10.63 Mc	.....	.....	3.19 Mc	.....	2.75 Mc	.....	.....	Concrete 2.39 Mc	.....
Tacoma.....	257,492 Yc	.....	18,148 Yc	58,094 Yc	.....	.....	1,291 Yc	.....	3.15 Mc	.....
WEST VIRGINIA:										
Martinsburg.....	.....	.....	.....	.....	.....	.....	2 Mm	.....	.....	.....
WISCONSIN:										
Appleton.....	25,700 Yc	.....	.....	.....	.....	.....	.....	.....	Concrete 18,871 Yc	.....
Baraboo.....	.....	.....	.....	.....	.....	.....	3,500 Ym	.....	.....	.....
Beloit.....	.....	.....	.....	45,000 Yc	1,200 Ym	.....	.....	.....	.....	.....
Burlington.....	.....	.....	.....	12,058 Y	.....	.....	.....	4,200 Y	.....	.....
Chippewa Falls.....	.....	.....	.....	2,000 Yc	.....	.....	.....	.....	.....	.....
Fond du Lac.....	.....	.....	.....	.....	.....	.....	.....	.....	Concrete 44,296 Yc	.....
Ft. Atkinson.....	.....	.....	.....	.....	.....	3,100 Y	2,100 Y	5,200 Y	.....	1 M
Kenosha.....	.....	.....	.....	10,737 Y	.....	.....	.....	.....	.....	.....
La Crosse.....	.....	.....	.....	1,287 Yc	.....	.....	.....	.....	.....	.....
Menomonie.....	.....	.....	.....	.....	.....	12,518 Yc	.....	.....	.....	.....
Portage.....	.....	.....	.....	.....	.....	.....	1 Mm	.....	.....	.....
Racine.....	39,718 Yc	.....	.....	19,383 Yc	.....	.....	.....	.....	1,404 Yc	.....
Watertown.....	.....	.....	.....	11,352 Yc	325 Yc	2,000 Ym	.....	.....	.....	.....
Waukesha.....	.....	.....	.....	4,892 Yc	.....	43,938 Yc	.....	.....	.....	.....
WYOMING:										
Laramie.....	.....	.....	.....	.....	.....	.....	.....	1 M	.....	.....

NOTE.— M = miles. Y = square yards. c = laid by contract. m = laid by municipal labor
 * Probably total pavement to date. † With concrete base. § Resurfacing. ‡ Concrete base, cement grout filler.

TABLE No. 2—PAVEMENT WHICH IT IS INTENDED TO LAY IN 1911

City	Sheet Asphalt.	Asphalt Block.	Stone Block.	Brick or Clay Block.	Treated Wood Block.	Bit. Macadam or Bit. Concrete.	Plain Macadam.	Gravel.	Other Kinds.	Dust Layers.
ARIZONA:										
Phoenix.....	5 M	.....	.....	.....	.....	.....	10 M	.....	.....	.....
CALIFORNIA:										
Benicia.....	.....	.....	.....	.....	.....	86,000 Y	.....	.....	.....	.....
Fresno.....	.....	.....	.....	.....	.....	1 M	.....	.....	.....	.....
Long Beach.....	3 M	.....	.....	.....	.....	5 M	.....	.....	.....	.....
Los Angeles.....	25 M	.....	.....	.....	.....	10 M	.....	20 M	.....	.....
Oakland.....	10 M	.....	.....	.....	.....	15 M	30 M	.....	.....	.....
Pasadena.....	0.18 M	.....	.....	0.42 M	.....	9.72 M	.....	.....	.....	3.04 M
San Jose.....	3.5 M	.....	.....	.....	.....	.....	.....	.....	.....	.....
Santa Cruz.....	.....	.....	.....	.....	.....	.....	.....	.....	Bit Rock 6,000 Y	.....
Santa Monica.....	25,000 Y	.....	.....	50,000 Y	.....	2 M	.....	.....	.....	.....
Stockton.....	.....	.....	.....	.....	.....	.....	100,000 Y	.....	.....	57,000 Y
Visalia.....	.....	.....	.....	.....	.....	16,000 Y	.....	.....	.....	.....
COLORADO:										
Boulder.....	.....	.....	.....	.....	.....	12,000 Y	.....	25,000 Y	.....	.....
Denver.....	40,000 Y	.....	.....	.....	6,000 Y	22,000 Y	15,000 Y	.....	.....	.....
Longmont.....	.....	.....	.....	.....	.....	15,000 Y	.....	10,000 Y	.....	10,000 Y
Pueblo.....	.....	.....	.....	.....	.....	55,960 Y	.....	.....	.....	.....

TABLE No. 2 PAVEMENT WHICH IT IS INTENDED TO LAY IN 1911—Continued

City	Sheet Asphalt.	Asphalt Block.	Stone Block.	Brick or Clay Block.	Treated Wood Block.	Bit. Macadam or Bit. Concrete.	Plain Macadam.	Gravel.	Other Kinds.	Dust Layers.
CONNECTICUT:										
Ansonia							2 M			
Hartford	0.5 M						49,000 Y			750,000 Y
Norwalk				5,500 Y						
Putnam								0.5 M		
FLORIDA:										
Sarasota			0.75 M							
GEORGIA:										
Americus					20,000 Y					
Cartersville						4,500 Y	2,900 Y			
Covington			800 Y							
Dublin				7,000 Y						
Macon				56,000 Y						
ILLINOIS:										
Batavia						6,654 Y				
Bloomington	1,870 Y			44,313 Y						
Chicago	900,000 Y		260,000 Y	375,000 Y	64,000 Y		235,000 Y			
Decatur				3 or 4 M						
East St. Louis				12 M						
Elgin						25,439 Y				
Evanston				0.5 M		0.75 M	1 M			20 M
Highland Pk.						3 M††				
Kankakee				2 66 Y		21,300 Y				
Lake Forest						2 M				
Marion				25,000 Y		18,000 Y			Concrete	
Mattoon				2.5 M					2,100 Y	
Normal				23,000 Y						
Oak Park				1.5† M		1.75† M	1.5† M			30 M
Ottawa				17,000 Y						
Paris				12,000 Y						
Pontiac				5,746 Y						
Streator				1 M						
Taylorville				12,111 Y**		1,407 Y				
Vandalia				18,300 Y		4,000 Y				
Watseka						2 M				
Waukegan						37,000 Y§§				
INDIANA:										
Anderson				1 M						
Auburn				1,000 Y						
Bloomington				1.75 M						
Butler								0.12 M		2 M
Columbus				20,000 Y						
Evansville	30,000 Y			25,000 Y						
Fort Wayne	30,000 Y			27,000 Y						
Hammond				10,000 Y		40,000 Y	7,000 Y			
Kokomo	6,720 Y									
Logansport	1.5 M			5,000 Y				10,000 Y		
Muncie				2.5 M						
Peru				1 M				1 M		
Plymouth				0.4 M						
W. Lafayette						5,000 Y		5,000 Y		
IOWA:										
Cedar Rapids				60,200 Y						
Centerville				3,000 Y						
Clinton				12,000 Y						
Hampton				0.5 M						
Muscatine				2 M						
Sioux City	20,000 Y			5,000 Y					Concrete	
Waterloo	50,000 Y								50,000 Y	
KANSAS:										
Argentine	0.25 M			1 M						
Atchison				10,000 Y						
Beloit									Concrete	
Chanute				3,910 Y		22,166 Y			500 Y	
Emporia						2 M				
Hutchinson				†	3,000 Y					
Independence				47,000 Y						
Leavenworth				1.33 M						
Manhattan				12,000 Y		16,800 Y				
Ottawa				11,420 Y		27,753 Y				
Pittsburg				13,000 Y*		13,000 Y*				
Salina						60,000 Y				
Wichita				15 M						
KENTUCKY:										
Louisville	5.25 M		0.25 M	4.5 M						
Ludlow				11,500 Y						
Maysville				10,000 Y						
Pineville							1.5 M			
LOUISIANA:										
New Orleans	2.6 M		0.5 M		0.7 M	2.1 M			2 M	
Shreveport									15 M††	
MARYLAND:										
Annapolis						6,197 Y				
MASSACHUSETTS:										
Concord						1.5 M				
Greenfield						10,000 Y	10,000 Y	5,000 Y		20,000 Y
Haverhill			2,050 Y							
New Bedford			15,000 Y				40,000 Y			1,000,000 Y
Newton						3 M				50 M
Westfield			15,500 Y							
MICHIGAN:										
Albion						0.5 M				

* One or the other. § Kind not decided. † Quantity not decided on.

** 8,660 yards contracted. 2 miles more petitioned for. †† With concrete base. §§ 30,000 of this is resurfacing with bituminous macadam. ††† Various kinds.

TABLE No. 2—PAVEMENT WHICH IT IS INTENDED TO LAY IN 1911—Continued

City	Sheet Asphalt.	Asphalt Block.	Stone Block.	Brick or Clay Block.	Treated Wood Block.	Bit. Macadam or Bit. Concrete.	Plain Macadam.	Gravel	Other Kinds.	Dust Layers.
MICHIGAN:										
<i>Continued</i>										
Coldwater.....				4,200 Y						
Detroit.....	220,000 Y	5,000 Y	20,000 Y	175,000 Y	25,000 Y				Concrete 0.5 M	
Escanaba.....									10,000 Y§	
Hancock.....	3,500 Y									
Hillsdale.....										
Holland.....						20,000 Y				
Ludington.....						11,200 Y				
Munroe.....				20,000 Y						
Negaunee.....					11,000 Y					
Petosky.....						6,000 Y			1 M§	
Port Huron.....									50,000 Y§	
Saginaw.....										
St. Joseph.....				7,500 Y*		17,000 Y	7,500 Y*			
MINNESOTA:										
Albert Lea.....					53,000 Y					
Cloquet.....							5,000 Y			
Crookston.....						21,372 Y				
Little Falls.....					1,144				Concrete 1,241 Y	
Mankato.....				12,900 Y		6,600 Y				
Minneapolis.....			22,000 Y	5,000 Y	150,000 Y	60,000 Y				3,500 Y
Montevideo.....						2,000 Y		4,000 Y		
New Ulm.....								5,750 Y		
Winona.....				7,040 Y						
MISSISSIPPI:										
Vicksburg.....									1 M§	
MISSOURI:										
Butler.....				1 M						
Columbia.....				30,000 Y						
De Soto.....							25,000 Y			
Fulton.....				10,000 Y		2,500 Y				15,000 Y
Jefferson City.....						30,000 Y*	30,000 Y*			
Liberty.....				1 M						
Moberly.....				1.5 M					Hassam 2 M	25 M
St. Joseph.....	1.5 M			1 M		2 M				
St. Louis.....	88,000 Y		26,400 Y	246,400 Y	123,400 Y	70,400 Y	70,400 Y			
Sedalia.....				36,000 Y			+			
Webb City.....				1,360 Y		35,000 Y				
MONTANA:										
Billings.....					20,000 Y					
Butte.....				4,000 Y						
Missoula.....				135,000 Y*	135,000 Y*	135,000 Y*				
NEBRASKA:										
Lincoln.....	32,000 Y			32,347 Y						
Norfolk.....				45,000 Y					Concrete 16,045 Y	
South Omaha.....				82,525 Y		67,365 Y				
NEW HAMPSHIRE:										
Laconia.....						15,000 Y				
NEW JERSEY:										
Bloomfield.....							5 M			20 M
Boonton.....							5 M			
Camden.....	†		†							
Dover.....				5,000 Y						5 M
Glen Ridge.....							1,100 Y			
Millville.....				23,000 Y						1.75 M
Montclair.....										
Newark.....	†	†	†	†		†				10,000 Y
Phillipsburg.....				3,600 Y			3,000 Y			
Rutherford.....							2 M			
Summit.....							3,000 Y			
W. New York.....				9,000 Y						
NEW YORK:										
Albany.....				75,000 Y						
Auburn.....			3,100 Y	5,900 Y						
Binghamton.....				36,500 Y*	36,500 Y*					
Canajoharie.....				4,825 Y						
Corning.....				15,000 Y						
Dunkirk.....	28,000 Y			28,000 Y		3,000 Y				
Elmira.....	4,000 Y*			4,000 Y*	4,000 Y*					
Fishkill L'd'g.....				1,400 Y						
Fulton.....				6,500 Y		6,000 Y				
Kingston.....			9,200 Y	18,188 Y		10,691 Y			Hassam 12,100 Y	5 M
Niagara Falls.....		23,372 Y	12,100 Y				35,000 Y			
Poughkeepsie.....				19,000 Y	2,200 Y					
Salamanca.....				8,000 Y					3 M§	
Syracuse.....										
Watertown.....				1 M*	1 M*	1.5 M*	4 M			3 M
NORTH CAROLINA:										
Asheville.....						14,000 Y				
Raleigh.....							3 M			5 M
NORTH DAKOTA:										
Grand Forks.....									50,000 Y§	
OHIO:										
Ashtabula.....			3,777 Y	22,216 Y						
Bellefontaine.....				7,000 Y						
Bowling Green.....						1.5 M				
Bucyrus.....				3,000 Y						

* One or the other. § Kind not decided. † Quantity not decided on. †† With concrete base. ‡‡ Various kinds.

TABLE No. 2 — PAVEMENT WHICH IT IS INTENDED TO LAY IN 1911—Continued

City	Sheet Asphalt.	Asphalt Block.	Stone Block.	Brick or Clay Block.	Treated Wood Block.	Bit. Macadam or Bit. Concrete.	Plain Macadam.	Gravel.	Other Kinds.	Dust Layers.
OHIO:										
<i>Continued</i>										
Chillicothe				6,800 Y						
Cincinnati			5 M	0.12 M	2.85 M	1 M	1 M			
Cleveland	0.5 M		3.35 M	30.53 M						
Coshocton	9,560 Y									
Delaware				10,000 Y						
E. Palestine				0.75 M						
Findlay				22,000 Y						
Hamilton	2.5 M									
Leetonia				13,377 Y						
Lima	12,000 Y					20,000 Y				
Lockland				29,430 Y						
Lorain				1,800 Y		10,000 Y				25,000 Y
Marietta				6,310 Y						
Marion				816 Y	2,600 Y	240 Y				
Newark				3 M						
Oberlin				7,800 Y						
Painesville				4,100 Y						
Pomeroy				1.1 M						
Portsmouth				47,475 Y						
Sandusky	10,000 Y			10,000 Y			3,000 Y			5 M
Springfield	42,000 Y*	42,000 Y*		42,000 Y*						
Van Wert				5,000 Y						
Warren				0.5 M			1 M			10 M
Zanesville				29,477 Y						
OKLAHOMA:										
Bartlesville				28,000 Y		6,200 Y				
Chickasha	35,000 Y									
Durant				8,000 Y						
El Reno	50,000 Y									
Lawton	120,200 Y									
Muskogee	3 M			1.5 M		6 M	2 M			
Tulsa	15 M			2 M						
OREGON:										
Albany						22,470 Y				
Baker						83,500 Y		71,000 Y		
Grant's Pass						30,000 Y	50,000 Y			3 M
Oregon City							4 M			4 M
The Dalles						58,000 Y				
PENNSYLVANIA:										
Allentown	27,500 Y									20,000 Y
Blossburg				21,475 Y						
Carlisle				‡		7,000 Y				
Erie	25,000 Y			25,000 Y						
Franklin				25,000 Y						
Girardville				12,000 Y						
Harrisburg	250,335 Y			2,055 Y						
McKeesport				14,500 Y						
McKees Rocks				15,000 Y						
Meadville				11,050 Y						
New Castle				2 M						
Norristown				9,000 Y*		9,000 Y*	10,000 Y			10,000 Y
Oil City				27,750 Y	4,060 Y*	4,060 Y*				
Punxsutawney				5,767 Y						
Reading				0.93 M		5 M	2 M			1 M
St. Mary's				‡						
Scranton	87,907 Y		3,752 Y	1,680 Y						
Shamokin				2,000 Y						
Sharon				4,000 Y						
Sharpsville				9,000 Y						
Williamsport				2,500 Y						
RHODE ISLAND:										
Pawtucket			2,600 Y	‡		‡	‡			60 M
Providence			14,942 Y							70 M
SOUTH CAROLINA:										
Orangeburg				3,500 Y					Sand Clay 2 M	
SOUTH DAKOTA:										
Lead						0.5 M				
TENNESSEE:										
Knoxville	50,000 Y		4,000 Y				4 M			2 M
TEXAS:										
Austin				1 M		1 M				
Denison				3,000 Y						
San Antonio						100,000 Y		16 M		‡
Waco				15,000 Y				‡		
UTAH:										
Salt Lake	2 M									
VIRGINIA:										
Hampton									Shell 10,000 Y	
WASHINGTON:										
Bellingham	28,264 Y			12,462 Y				0.62 M		
N. Yakima	8,000 Y					58,000 Y				
Seattle	220,000 Y		30,000 Y	150,000 Y					Concrete 5.6 M	
Spokane	8.5 M			4.6 M		7.5 M				
WEST VIRGINIA:										
Martinsburg						1 M	3 M			5 M

One or the other. \$ Kind not decided. ‡ Quantity not decided on. †† With concrete base. †‡ Various kinds.

TABLE No. 2—PAVEMENT WHICH IT IS INTENDED TO LAY IN 1911—Continued

City	Sheet Asphalt.	Asphalt Block.	Stone Block.	Brick or Clay	Treated Wood Block.	Bit. Macadam or Bit. Concrete.	Plain Macadam.	Gravel.	Other Kinds.	Dust Layers.
WISCONSIN:										
Appleton.....	25,000 Y	.....	.....	.....	.....	.....	.....	.....	Concrete 2,000 Y	.....
Baraboo.....	5,000 Y	.....	.....	.....
Beloit.....	25,000 Y	.....	.....	.....	.....	.....	.....
Chippewa Falls	3,500 Y	.....	.....	.....	.....	.....	.....
Fond du Lac	9,500 Y	.....	.....	.....	.....	Concrete 11,000 Y	.....
Kenosha.....	17,000 Y	.....	14,000 Y	.....	.....	.....	.....
Menomonie.....	9,000 Y	.....	.....	.....	.....
Racine.....	44,000 Y	.....	2,324 Y	.....	.....	.....	.....
Watertown.....	7,500 Y	.....	.....	.....	.....	.....	.....
Waukesha.....	5,000 Y	.....	.....	.....	.....
WYOMING:										
Laramie.....	2 M	.....	.....

‡ Quantity not decided on.

amount done this year.

A glance at table No. 1 shows that of the permanent pavements brick is by far the most popular, asphalt being second, wood block third, stone block fourth and asphalt block fifth. Bituminous macadam (with which are included bitulithic and bituminous concrete pavements), which may be considered as a semi-permanent pavement, is seen to have been used quite generally in all sections of the country. In fact, there would appear to have been fully as much of this kind of paving as of plain macadam during the past year.

The above statement refers to the number of cities using the pavements rather than to the total amounts of pavements laid. If the latter be made the basis of comparison, the large quantities laid by the larger cities will cause those pavements to take precedence which are most popular for streets in such larger cities. On this basis of quantity laid we find the order somewhat changed, asphalt leading, with brick a close second, after which, but with a long interval, come stone block, wood block and asphalt block in the order named.

In figuring up the total quantities of the several kinds of pavements it has been necessary to reduce all to either miles or square yards, since some officials reported the quantities in one unit and some in the other. In doing so it was necessary to make some assumption concerning the average width of roads. We have assumed this to be 36 feet, on the more or less common basis of a 60-foot street with two 12-foot sidewalks, leaving a 36-foot roadway. On this basis we find the following results:

The total amount of asphalt paving done in 1910 in the cities reporting was 341 miles; of brick, 316 miles; of stone block, 68 miles; of wood block, 36 miles, and of asphalt block, 31 miles. Of the less permanent pavements, plain macadam leads with 260 miles, bituminous macadam follows with 149 miles and gravel with 91 miles. Of the miscellaneous pavements there

were 58 miles, practically all of these being permanent pavements, of which concrete formed a considerable percentage. This gives a total of about 850 miles of permanent pavements and 500 miles of bituminous and plain macadams and gravel.

The figures for the three less permanent pavements would undoubtedly be greatly increased were the figures for county and state work included. The same also is true of the use of dust layers, which the cities reported using on about one thousand miles of streets.

BY CITY LABOR

Of this 1910 work the amount which was performed by the municipalities by day labor rather than by contract was as follows, the pavements being considered in the order of the percentage done by the municipality: Of the gravel roads 70 per cent was done by city labor, or 64 miles out of 91. Of plain macadam 61 per cent was done by day labor, or 159 miles. Of asphalt block 39 per cent was done by city labor or 12 miles. Of stone block 28 per cent was done by city labor or 19 miles. Of wood block 25 per cent was done by city labor, or 9 miles. Of bituminous macadam, bitulithic, etc., 23 per cent was done by city labor, or 34 miles. Of brick pavements 4¾ per cent was done by city labor, or 15 miles. The smallest percentage done by city labor was sheet asphalt, the amount being 11 miles, or 3¼ per cent of the total.

MAXIMUM GRADES

The table of grades gives the grades of the pavements which were laid in 1910, and thus is not a correct indication of the grades of all the paved streets to be found in the several cities. It is believed, however, that it is even more valuable than a statement of the grades of old as well as of new pavements, since it would seem to more probably represent the conclusions which

(Continued on page 376.)

City ST. LOUIS State MISSOURI Information furnished by JAS. C. TRAVILLA Street Commisr.

Kind of pavement	Pavements laid in 1910						Amount which it is intended to lay in 1911; Miles [M] or Square Yards [Y]	
	By municipality [M] or by contract [C]	Amount, in Miles (M) or Square Yards (Y)		Maximum Grade	Guarantee period	Traffic light or heavy?	Estimated	
		Miles	Sq. Yds.				Miles	Sq. Yards
Sheet asphalt	Contract	4.55	88986	upto 4%	5 years	medium	5.00	88000
Asphalt block								
Granite, sandstone or other stone block	" "	2.02	33898	" " 6%	10 "	heavy	1.50	26400
Brick or clay block	Vitrified block	16.49	298034	" " 5%	5 "	medium	14.00	216400
Creosoted wood block		1.81	27939	" " 3%	5 "	heavy	7.00	123400
Untreated wood block								
Bitulithic, bituminous macadam or		3.22	60120	" " 4%	5 "	medium	4.00	72000
Telford	bituminous concrete	1.36	23936	" " 6%	none	light	4.00	72000
Plain or water bound macadam								
Gravel								
Other kinds								
Treated with dust layers								



TABLE No. 3—MAXIMUM GRADES LAID IN 1910

City	Sheet Asphalt. %	Asphalt Block. %	Stone Block. %	Brick. %	Treated Wood Block. %	Bituminous Macadam. %	Plain Macadam. %	Gravel. %	City	Sheet Asphalt. %	Asphalt Block. %	Stone Block. %	Brick. %	Treated Wood Block. %	Bituminous Macadam. %	Plain Macadam. %	Gravel. %	
CALIFORNIA:									IOWA—Cont'd.									
Long Beach.....	6					5 1/2			Chariton.....				1 1/2					
Oakland.....	3								Creston.....						6			
Pasadena.....	1								Grinnell.....					2 1/2				
San Jose.....	0.4					0.4	0.5		Iowa City.....				10					
San Antonio.....	1					1			Muscateine.....				16 1/2					
Visalia.....									Ottumwa.....				6					
COLORADO:									Perry.....					4				
Boulder.....						8	6	6	Sioux City.....					3			1	
CONNECTICUT:									KANSAS:									
Ansonia.....			3						Argentine.....				16					
Greenwich.....	2.75			3					Arkansas City.....				12.73		1		4	
Hartford.....							7		Chanute.....				7 1/2		0.8			
Middletown.....			3			6	5		Independence.....				6.2					
New London.....			0						Leavenworth.....				1.47					
Norwalk.....									Ottawa.....				0.25					
Putnam.....									Pittsburg.....				0.5					
Waterbury.....									Salina.....				0.5					
DISTRICT OF COLUMBIA:									Winfield.....				4					
Washington.....	6	6	6			6	6		KENTUCKY:			5	14	1				
FLORIDA:			2						Louisville.....			3 1/2						
Sarasota.....									Ludlow.....									
GEORGIA:									LOUISIANA:									
Americus.....					4	3	4		Baton Rouge.....						7		3 1/2	
Cartersville.....									Shreveport.....						6			
Dublin.....									MAINE:									
Macon.....									Portland.....									
ILLINOIS:									MARYLAND:				2.62					
Bloomington.....	3.80								Annapolis.....			4.6	6.7					
Decatur.....									Baltimore.....									
East St. Louis.....									MASSACHUSETTS:									
Egan.....									Arlington.....			0	1.5					
Evanston.....						1.0	3.0		Cambridge.....						1.5		2	
Galena.....						2.0	4.0		Concord.....			2.8	4.8		9			
Highland Park.....						4.3	5.0		Everett.....						4		14	
Kankakee.....							5.0		Greenfield.....			2			4		8	
LaSalle.....									Haverhill.....						7.2		6	
Marion.....									Lawrence.....			3.4		0.7				
Matteson.....									Lowell.....			4.36						
Mt. Carmel.....									New Bedford.....			4.5						
Oak Park.....									Newton.....						2.28		3	
Sresator.....									Springfield.....						3		10	
Taylorville.....						0.6			Walham.....						4		10	
Waukegan.....						1.5			Westfield.....						4.7		4.5	
INDIANA:									MICHIGAN:									
Bedford.....									Albion.....						0.2			
Bloomington.....									Battle Creek.....				2					
Butler.....									Cadillac.....								7 1/2	
Evansville.....									Coldwater.....				0.2					
Fort Wayne.....						4.40			Crystal Falls.....									
Logansport.....									Dowagiac.....									
Madison.....									Escanaba.....									
Michigan City.....									Flint.....			3.3						
Mishawaka.....						4.0			Grand Rapids.....			3.66						
New Albany.....									Holland.....									
Peru.....									Kalamazoo.....									
Plymouth.....						0.2			Lansing.....									
Portland.....						6.25			Manistee.....									
W. Lafayette.....									Monroe.....				0.05					
IOWA:									Muskegon.....									
Ames.....									Petoskey.....									
Burlington.....									Pontiac.....									
Centerville.....						4			Port Huron.....									

* For foot travel only. Max. for teams, 11%. † All pavements practically level.

TABLE NO. 3—MAXIMUM GRADES LAID IN 1910—(Continued)

City	Sheet Asphalt. %	Asphalt Block. %	Stone Block. %	Brick. %	Treated Wood Block. %	Bituminous Macadam. %	Plain Macadam. %	Gravel. %	City	Sheet Asphalt. %	Asphalt Block. %	Stone Block. %	Brick. %	Treated Wood Block. %	Bituminous Macadam. %	Plain Macadam. %	Gravel. %
<i>Mich.—Cont.</i>									New York	3	6	6+	.....	2.5	.....	.....	.....
Saginaw.....	0.25	.....	.....	0.25	.....	.....	.....	.....	Bronx.....	.....	.....	.....	.....	.....	.....	.....	.....
St. Joseph.....	1.5	.....	.....	1.5	.....	.....	.....	.....	New York	.....	.....	.....	.....	2	.....	.....	.....
Sault St. Marie.....	.....	.....	.....	.....	.....	.....	0.8	.....	Manhattan.....	.....	.....	.....	.....	2	.....	.....	.....
MINNESOTA:									New York	.....	.....	.....	.....	.....	.....	.....	.....
Albert Lea.....	.....	.....	.....	3	7	.....	4	14	Rochester.....	.....	.....	.....	.....	.....	.....	.....	.....
Alexandria.....	.....	.....	.....	.....	.....	.....	.....	5.4	Niagara Falls.....	.....	.....	.....	.....	.....	.....	6	.....
Crookston.....	.....	.....	.....	1	.....	4.87	.....	2	Oneonta.....	.....	2.5	0.4	3.5	.....	.....	.....	.....
Mankato.....	.....	.....	.....	.....	4.2	.....	.....	.....	Fongkeepsie.....	.....	.....	.....	.....	.....	.....	.....	.....
Minneapolis.....	.....	.....	.....	.....	.....	.....	.....	1	Salamanca.....	2	.....	2.3	1.2	.....	.....	4	.....
New Ulm.....	.....	.....	.....	.....	.....	.....	.....	.....	Schenectady.....	5.1	.....	.....	5.8	.....	.....	.....	.....
Red Wing.....	.....	.....	6	1	.....	.....	.....	.....	Troy.....	1.5	.....	3	1	.....	.....	.....	.....
S. St. Paul.....	.....	.....	.....	2	.....	.....	1.21	.....	Watertown.....	.....	.....	.....	.....	4	.....	16.2	.....
Winona.....	.....	.....	.....	.....	.....	.....	.....	.....	Watervliet.....	.....	.....	1	.....	.....	.....	5	.....
MISSISSIPPI:									NORTH CAROLINA:								
Vicksburg.....	8.5	.....	.....	3	.....	.....	.....	.....	Asheville.....	.....	.....	.....	.....	.....	.....	.....	.....
MISSOURI:									Raleigh.....	1	.....	.....	.....	.....	.....	.....	.....
Cape Girardeau.....	.....	.....	.....	1	3	.....	6	.....	OHO:	.....	.....	.....	.....	.....	.....	.....	.....
Columbia.....	.....	.....	.....	5	.....	15.3	.....	.....	Ashtabula.....	.....	.....	.....	.....	.....	.....	.....	.....
Fulton.....	.....	.....	.....	.....	.....	.....	.....	1	Bellefontaine.....	.....	.....	.....	.....	.....	.....	.....	.....
Jefferson City.....	.....	.....	.....	.....	.....	.....	.....	.....	Bucyrus.....	.....	.....	.....	.....	.....	.....	.....	.....
Liberty.....	.....	.....	.....	8	.....	.....	.....	.....	Cincinnati.....	3	.....	.....	.....	.....	.....	.....	.....
Mexico.....	.....	.....	.....	4.2	.....	.....	.....	.....	Coshocton.....	.....	.....	.....	.....	.....	.....	.....	.....
Moberly.....	.....	.....	.....	.....	.....	.....	.....	.....	Delaware.....	.....	.....	.....	.....	.....	.....	.....	.....
St. Joseph.....	.....	.....	2	5	.....	.....	.....	.....	E. Palestine.....	.....	.....	.....	.....	.....	.....	.....	.....
St. Louis.....	.....	.....	.....	.....	.....	.....	.....	.....	Hamilton.....	.....	.....	.....	.....	.....	.....	.....	.....
Sedalia.....	.....	.....	.....	.....	.....	.....	.....	.....	Lincoln.....	.....	.....	.....	.....	.....	.....	.....	.....
Webb City.....	.....	.....	.....	.....	.....	.....	.....	.....	Leetonia.....	.....	.....	.....	.....	.....	.....	.....	.....
MONTANA:									Lima.....	.....	.....	.....	.....	.....	.....	.....	.....
Billings.....	.....	.....	.....	0.7	0.05	.....	.....	.....	Lockland.....	.....	.....	.....	.....	.....	.....	.....	.....
Butte.....	.....	.....	.....	.....	.....	.....	.....	.....	Lorain.....	.....	.....	.....	.....	.....	.....	.....	.....
Helena.....	.....	.....	.....	.....	.....	.....	.....	.....	Marietta.....	.....	.....	.....	.....	.....	.....	.....	.....
NEBRASKA:									Newark.....	.....	.....	.....	.....	.....	.....	.....	.....
Lincoln.....	.....	.....	.....	.....	.....	.....	.....	.....	Oberlin.....	.....	.....	.....	.....	.....	.....	.....	.....
Norfolk.....	.....	.....	.....	.....	.....	.....	.....	.....	Painesville.....	.....	.....	.....	.....	.....	.....	.....	.....
S. Omaha.....	.....	.....	.....	.....	.....	.....	.....	.....	Portsmouth.....	.....	.....	.....	.....	.....	.....	.....	.....
NEW HAMPSHIRE:									Sandusky.....	.....	.....	.....	.....	.....	.....	.....	.....
Keene.....	.....	.....	.....	.....	.....	.....	.....	.....	Springfield.....	.....	.....	.....	.....	.....	.....	.....	.....
Laconia.....	.....	.....	.....	.....	.....	.....	.....	.....	Van Wert.....	.....	.....	.....	.....	.....	.....	.....	.....
NEW JERSEY:									Zanesville.....	.....	.....	.....	.....	.....	.....	.....	.....
Bayonne.....	.....	.....	.....	.....	.....	.....	.....	.....	OKLAHOMA:	.....	.....	.....	.....	.....	.....	.....	.....
Bloomfield.....	.....	.....	.....	.....	.....	.....	.....	.....	Bartlesville.....	.....	.....	.....	.....	.....	.....	.....	.....
Boonton.....	.....	.....	.....	.....	.....	.....	.....	.....	Chickasha.....	.....	.....	.....	.....	.....	.....	.....	.....
Camden.....	.....	.....	.....	.....	.....	.....	.....	.....	Durant.....	.....	.....	.....	.....	.....	.....	.....	.....
Dover.....	.....	.....	.....	.....	.....	.....	.....	.....	El Reno.....	.....	.....	.....	.....	.....	.....	.....	.....
East Orange.....	.....	.....	.....	.....	.....	.....	.....	.....	Lawton.....	.....	.....	.....	.....	.....	.....	.....	.....
Elizabeth.....	.....	.....	.....	.....	.....	.....	.....	.....	Muskogee.....	.....	.....	.....	.....	.....	.....	.....	.....
Glen Ridge.....	.....	.....	.....	.....	.....	.....	.....	.....	Tulsa.....	.....	.....	.....	.....	.....	.....	.....	.....
Newark.....	.....	.....	.....	.....	.....	.....	.....	.....	OREGON:	.....	.....	.....	.....	.....	.....	.....	.....
Paterson.....	.....	.....	.....	.....	.....	.....	.....	.....	Albany.....	.....	.....	.....	.....	.....	.....	.....	.....
Phillipsburg.....	.....	.....	.....	.....	.....	.....	.....	.....	Baker.....	.....	.....	.....	.....	.....	.....	.....	.....
Rutherford.....	.....	.....	.....	.....	.....	.....	.....	.....	Grant's Pass.....	.....	.....	.....	.....	.....	.....	.....	.....
Summit.....	.....	.....	.....	.....	.....	.....	.....	.....	Oregon City.....	.....	.....	.....	.....	.....	.....	.....	.....
West New York.....	.....	.....	.....	.....	.....	.....	.....	.....	The Dalles.....	.....	.....	.....	.....	.....	.....	.....	.....
NEW YORK:									PENNSYLVANIA:								
Auburn.....	.....	.....	.....	.....	.....	.....	.....	.....	Allentown.....	.....	.....	.....	.....	.....	.....	.....	.....
Binghamton.....	.....	.....	.....	.....	.....	.....	.....	.....	Bethlehem.....	.....	.....	.....	.....	.....	.....	.....	.....
Corning.....	.....	.....	.....	.....	.....	.....	.....	.....	Carlisle.....	.....	.....	.....	.....	.....	.....	.....	.....
Fishkill Landing.....	.....	.....	.....	.....	.....	.....	.....	.....	Lebanon.....	.....	.....	.....	.....	.....	.....	.....	.....
Fulton.....	.....	.....	.....	.....	.....	.....	.....	.....	Easton.....	.....	.....	.....	.....	.....	.....	.....	.....
Herkimer.....	.....	.....	.....	.....	.....	.....	.....	.....	Erle.....	.....	.....	.....	.....	.....	.....	.....	.....
Hudson.....	.....	.....	.....	.....	.....	.....	.....	.....	Gallitzin.....	.....	.....	.....	.....	.....	.....	.....	.....
Kingston.....	.....	.....	.....	.....	.....	.....	.....	.....	Girardville.....	.....	.....	.....	.....	.....	.....	.....	.....
Middletown.....	.....	.....	.....	.....	.....	.....	.....	.....	Harrisburg.....	.....	.....	.....	.....	.....	.....	.....	.....
									Lansford.....	.....	.....	.....	.....	.....	.....	.....	.....
									McKeesport.....	.....	.....	.....	.....	.....	.....	.....	.....
									McKees Rocks.....	.....	.....	.....	.....	.....	.....	.....	.....
												20	11.5	.....	.....	.....	.....
													10	.....	.....	.....	.....

TABLE NO. 3—MAXIMUM GRADES LAID IN 1910—(Continued)

TABLE No. 3—MAXIMUM GRADES LAID IN 1910—Continued

City	Sheet Asphalt.	Asphalt Block.	Stone Block.	Brick.	Treated Wood Block.	Bitumi-nous Macadam.	Plain Macadam.	Gravel.	City	Sheet Asphalt.	Asphalt Block.	Stone Block.	Brick.	Wood Block.	Bitumi-nous Macadam.	Plain Macadam.	
PENNSYLVANIA—Cont.																	
Meadville.				4.2					Fresno.								
New Castle.				6					Oakland.	None					None		
Norristown.				6			3		Pasadena.	None							
N. Braddock.				12					San Jose.	None							
Oil City.				12					Stockton.	None							
Pottstown.				5					COLORADO:								
Panxutawney.				0.43					Boulder.								
Reading.				1.5					Denver.			5					None
St. Marys.				1.7					CONNECTICUT								
Stratton.				6					Ansonia.								
S. Bethlehem.				3.2					Greenwich.			None					
Tyone.				9.9					Hartford.	5							
Wilkes-Barre.	4.2			3					New London.			5					
Williamsport.									Norwalk.				5				
									Waterbury.			1					
RHODE ISLAND:																	
Pawtucket.				1					DISTRICT OF COLUMBIA:								
Providence.									Washington.	5							
SOUTH DAKOTA:																	
Lead.									Washington.								
TENNESSEE:																	
Bristol.					2				Florida:								
Clarksville.				3					Sarasota.			None					
Knoxville.	6								Americus.					5			
TEXAS:																	
Denison.				2					Dublin.				5				None
San Antonio.				1					Macon.				5				
Waco.						1.5			Savannah.	5			5				
UTAH:																	
Ogden.	1								Batavia.				5				1
Salt Lake.	5.7								Bloomington.				10				
VERMONT:																	
Barre.									Chicago.				5				2
St. Albans.									Decatur.				5				None
VIRGINIA:																	
Danville.									East St. Louis.				1				
Hampton.		3							Elgin.				5				
Norfolk.	0.4				0.4				Evanston.				5				3
WASHINGTON:																	
Bellingham.	9			8					Marion.				None				
Seattle.	7		19.5	13	0.6				Mattoon.				None				
Spokane.	4			14					Normal.				1				
Tacoma.	5		18	1					Oak Park.				5				2
WEST VIRGINIA:																	
Martinsburg.									Paris.				1				
INDIANA:																	
INDIANA:																	
Bellingham.	9			8					Taylorville.				None				2
Seattle.	7		19.5	13	0.6				Waukegan.				2				
Spokane.	4			14					ILLINOIS:								
Tacoma.	5		18	1					Batavia.				5				
INDIANA:																	
Martinsburg.									Bloomington.				10				
INDIANA:																	
Bellingham.	9			8					Chicago.				5				
Seattle.	7		19.5	13	0.6				Decatur.				5				None
Spokane.	4			14					East St. Louis.				1				
Tacoma.	5		18	1					Elgin.				5				
INDIANA:																	
Martinsburg.									Evanston.				5				
INDIANA:																	
Bellingham.	9			8					Marion.				None				
Seattle.	7		19.5	13	0.6				Mattoon.				None				
Spokane.	4			14					Normal.				1				
Tacoma.	5		18	1					Oak Park.				5				2
INDIANA:																	
Martinsburg.									Paris.				1				
INDIANA:																	
Bellingham.	9			8					Taylorville.				None				2
Seattle.	7		19.5	13	0.6				Waukegan.				2				
Spokane.	4			14					INDIANA:								
Tacoma.	5		18	1					Anderson.				None				
INDIANA:																	
Martinsburg.									Bedford.				5				
INDIANA:																	
Bellingham.	9			8					Bloomington.				5				5
Seattle.	7		19.5	13	0.6				Butler.				2				
Spokane.	4			14					Columbus.				2				
Tacoma.	5		18	1					Evansville.				2				
INDIANA:																	
Martinsburg.									Fort Wayne.				2				
INDIANA:																	
Bellingham.	9			8					Hammond.				3				5
Seattle.	7		19.5	13	0.6				Kokomo.				3				
Spokane.	4			14					Legansport.				None				
Tacoma.	5		18	1					Michigan City.				None				
INDIANA:																	
Martinsburg.									Mishawaka.				None				5
INDIANA:																	
Bellingham.	9			8					Muncie.				None				
Seattle.	7		19.5	13	0.6				New Albany.				10				5
Spokane.	4			14					Perry.				5				
Tacoma.	5		18	1					Plymouth.				5				
INDIANA:																	
Martinsburg.									Portland.				1				1
INDIANA:																	
Bellingham.	9			8					W. Lafayette.								
Seattle.	7		19.5	13	0.6				IOWA:								
Spokane.	4			14					Ames.				5				
Tacoma.	5		18	1					Burlington.				2				
INDIANA:																	
Martinsburg.									Cedar Rapids.				3				
INDIANA:																	
Bellingham.	9			8					Centerville.				3				

TABLE No. 4—GUARANTEE PERIOD, YEARS

TABLE No. 4—GUARANTEE PERIOD, YEARS—Continued

City	Sheet Asphalt.	Asphalt Block.	Stone Block.	Brick.	Wood Block.	Bituminous Macadam.	Plain Macadam.
UTAH:							
Ogden.....	7	.....	.....	.....	.....	.....	.....
Salt Lake.....	5	.....	.....	.....	.....	.....	None
VERMONT:							
St. Albans.....	5	.....	.....	.....	.....	5	.....
VIRGINIA:							
Danville.....	.....	.....	.....	.....	.....	.....	.....
Hampton.....	5	None	.....	None	5	.....	None
Norfolk.....	.....	5	.....	.....	.....	.....	.....
WASHINGTON:							
Bellingham.....	10	.....	.....	10	.....	.....	.....
North Yakima.....	5	.....	.....	.....	.....	.....	.....
Seattle.....	5 and 10	.....	.....	5	.....	.....	.....
Spokane.....	5	.....	.....	.....	.....	.....	.....
WISCONSIN:							
Appleton.....	5	.....	.....	.....	.....	.....	.....
Beloit.....	.....	.....	.....	None	.....	.....	.....
Chippewa Falls.....	.....	.....	.....	None	.....	.....	.....
Kenosha.....	.....	.....	.....	5	.....	.....	.....
Racine.....	.....	.....	.....	None	.....	.....	.....
Watertown.....	5	.....	.....	5	.....	.....	.....
Waukesha.....	.....	.....	.....	5	.....	.....	.....

had been reached by past experience as to grades permissible or unobjectionable. The steepest grades reported were paved with stone block, these being 20 per cent at McKees Rocks, Pa.; 19.5 per cent at Seattle, and 18 per cent at Tacoma and Ashtabula, O.

The next steepest grades were found on macadamized streets, there being a 17 per cent grade at Springfield, O., 16 at Troy, N. Y.; 14 at Everett, Mass., and 13 at De Soto, Mo. Brick is found on streets almost as steep, however, there being a 16.5 per cent grade at Ottumwa, Ia., 14 per cent at Spokane, 13 per cent at Seattle and Atchison, Kan.; 12 per cent at N. Braddock and Oil City, Pa., and 11.5 at McKeesport, Pa. Bituminous macadam also was laid on one street with a 15 per cent grade at Cape Girardeau, Mo.; 13 per cent at Phillipsburg, N. J., and 12 at Asheville, N. C.

There is very little difference between the maximum grades used for wood block and sheet asphalt, respectively, the maximum grades given the latter being 8.7 at Scranton, Pa.; 8.5 at Vicksburg, 7 at Seattle, 6.8 at East Orange, N. J., and 6 per cent in Oakland, Cal.; Washington, D. C.; Louisville, Knoxville and Appleton, Wis.; while wood block was laid on an 8 per cent grade in South Omaha and 7 per cent in Albert Lea, Minn. Aside from those two, however, wood block was not laid on grades greater than 3 or 4 per cent, 4 per cent grades being found at Americus, Ga.; Ottumwa, Ia.; Minneapolis, Cincinnati, and Watertown, N. Y.; while 3 per cent grades were found at Ames and Perry, Ia.; Cape Girardeau, Mo.; Paterson, N. J., and St. Louis. The flattest maximum grades are found on the asphalt block streets, the maximum being 6 per cent in Bronx Borough, New York City, and in Springfield, Mass.; 5.1 per cent at Springfield, O., and 4 per cent at East Orange, N. J.

LENGTH OF GUARANTEES

The data concerning guarantees indicates that the move toward the abolishing of guarantees for pavements has already

TABLE No. 4—GUARANTEE PERIOD, YEARS—Continued

City	Sheet Asphalt.	Asphalt Block.	Stone Block.	Brick.	Wood Block.	Bituminous Macadam.	Plain Macadam.
OHIO—Continued							
Cincinnati.....	5	.....	5	2	5	5	.....
Cleveland.....	10	.....	5	3	.....	.....	None
Columbus.....	5	.....	.....	3	.....	.....	.....
Coshocton.....	.....	.....	.....	3	.....	.....	.....
Delaware.....	.....	.....	.....	3	.....	.....	.....
E. Palestine.....	1	.....	.....	1	.....	.....	.....
Hamilton.....	.....	.....	.....	1	.....	.....	.....
Leetonia.....	.....	.....	.....	1	.....	.....	.....
Lima.....	.....	.....	.....	1	.....	.....	.....
Lockland.....	.....	.....	.....	1	.....	.....	.....
Lorain.....	.....	.....	.....	1	.....	.....	.....
Marietta.....	.....	.....	.....	1	.....	.....	.....
Marion.....	.....	.....	.....	1	.....	.....	.....
Obertown.....	.....	.....	.....	1	.....	.....	.....
Oberlin.....	.....	.....	.....	2	.....	.....	.....
Portsmouth.....	.....	.....	.....	2	.....	.....	.....
Portsmouth.....	.....	.....	.....	2	.....	.....	.....
Sandusky.....	5	.....	.....	3	.....	.....	.....
Springfield.....	5	.....	5	5	5	.....	2
Van Wert.....	.....	.....	.....	5	.....	.....	.....
Zanesville.....	.....	.....	.....	2	.....	.....	.....
OKLAHOMA:							
Bartlesville.....	.....	.....	.....	5	.....	5	.....
Chickasha.....	.....	.....	.....	.....	.....	.....	.....
Durant.....	5	.....	.....	.....	.....	.....	.....
El Reno.....	10	.....	.....	.....	.....	.....	.....
Lawton.....	5	.....	.....	.....	.....	.....	.....
Muskogee.....	5	.....	.....	5	.....	5	5
Tulsa.....	5 and 10	.....	.....	5	.....	.....	.....
OREGON:							
Albany.....	.....	.....	.....	.....	.....	10	.....
Baker.....	.....	.....	.....	.....	.....	5	.....
Grant's Pass.....	.....	.....	.....	.....	.....	5	.....
PENNSYLVANIA:							
Allentown.....	1	.....	.....	1	.....	.....	8
Bethlehem.....	.....	.....	.....	.....	.....	.....	.....
Erie.....	5	.....	.....	5	.....	.....	.....
Gallitzin.....	.....	.....	.....	5	.....	.....	.....
Girardville.....	.....	.....	.....	5	.....	.....	.....
Harrisburg.....	5	.....	.....	.....	.....	.....	.....
Lansford.....	.....	.....	.....	5	.....	.....	.....
McKees Rocks.....	.....	.....	1	3	.....	.....	.....
Meadville.....	.....	.....	.....	1	.....	.....	.....
New Castle.....	.....	.....	.....	3	.....	.....	.....
N. Braddock.....	.....	.....	.....	1	.....	.....	.....
North East.....	.....	.....	.....	1	.....	.....	.....
Oil City.....	.....	.....	.....	None	.....	.....	.....
Philadelphia.....	5	.....	5	5	10	.....	3
Punxsutawney.....	.....	.....	.....	3	.....	.....	.....
Reading.....	.....	.....	.....	1	.....	1	.....
Scranton.....	5	.....	.....	5	.....	.....	.....
Sharon.....	.....	.....	.....	5	.....	.....	.....
S. Bethlehem.....	.....	.....	.....	5	.....	.....	.....
Tyrone.....	.....	.....	.....	5	.....	.....	.....
Williamsport.....	.....	.....	.....	1	.....	.....	.....
SOUTH CAROLINA:							
Columbia.....	.....	.....	.....	.....	.....	5	.....
Greenwood.....	.....	.....	.....	.....	.....	.....	.....
SOUTH DAKOTA:							
Aberdeen.....	.....	.....	.....	.....	.....	.....	.....
TENNESSEE:							
Charlottesville.....	.....	.....	.....	.....	.....	.....	.....
Knoxville.....	5	.....	5	.....	.....	.....	None
TEXAS:							
Austin.....	.....	.....	.....	.....	.....	.....	.....
Waco.....	.....	.....	.....	5	.....	5	.....

produced results in a considerable number of cities. Twenty-one states contain some cities which called for no guarantee at all on the pavements laid last year, and in California, Florida and South Dakota this was true of all the cities reporting. In certain other cities guarantees were not demanded on certain classes of pavements but were on others. In one case the abolishing of guarantees applied to stone block only, in two cases to brick only, in one case to wood block only and in six cases to macadam only. Altogether 72 cities reported requiring no guarantee, four of these, or 6 per cent, being for sheet asphalt; one, or 7 per cent, for asphalt block; 7, or 19 per cent, for stone block; 27, or 17 per cent, for brick; 6, or 18 per cent, for wood block; 14, or 20 per cent, for bituminous macadam, and 13, or 43 per cent, for plain macadam.

Five-year guarantees are still required in the great majority of cities, there being 242 of these, as against 72 requiring no guarantee, 49 requiring one year, 17 requiring two years, 16 requiring ten years, 14 requiring three years, 3 requiring seven years and one requiring eight years. It is perhaps significant that plain and bituminous macadam lead in the percentage of pavements for which no guarantee is asked, while sheet asphalt and brick lead in those for which ten year guarantees are asked. There does not seem to be any geographical distribution of the several periods of guarantee, each being pretty generally distributed all over the country. For instance, all the California cities reported asking no guarantee, while two Washington cities report ten year guarantees and three report five year guarantees. One New Jersey city reports a six months' guarantee.

TRAFFIC CARRIED

Information was also collected concerning the traffic on the streets in question, those replying being requested to state whether this was "heavy" or "light." These terms, of course, are not subject to definition or limitation, since our knowledge concerning street traffic is as yet in its infancy. It was therefore necessary to leave the decision as to what was light and what was heavy traffic to the individuals themselves. While there would undoubtedly be great differences of opinion on this point, depending upon the experience which each had had with the heavy traffic of large cities, it is believed that these would to a certain extent average up, although it is probable that the kinds of pavement which are found in greatest abundance in the smaller cities would be given credit for a heavier traffic than those more common in the larger cities. For instance, an engineer in Chicago or Minneapolis might report the traffic on a certain stone block pavement as being moderately light, which traffic, if it occurred in a small city, would be reported as very heavy. One engineer only gives any definite figures as to traffic, City Engineer Christopher Harrison of Everett, Mass., reporting the traffic on a stone block pavement as amounting to 40 tons per lineal foot per hour. Possibly a few others might have been able to give figures, but such figures are so few in this country that it seemed not worth while to ask for them from cities generally.

Taking up the data classified under the heads of the several pavements, we find that traffic on the sheet asphalt pavements was reported to be heavy in 19 per cent of the cities, medium in 34 per cent, and light in 47 per cent. Traffic on asphalt block was reported to be heavy in no case, to be medium in 47 per cent and light in 53 per cent. Of the stone block pavements 65 per cent were reported to carry heavy traffic, 21 per cent medium traffic, and 14 per cent light traffic. Of the brick pavements 31 per cent were reported to carry heavy traffic, 33 per cent medium traffic and 36 per cent light traffic. Of the wood block pavements 51 per cent were reported to carry heavy traffic, 25 per cent medium traffic and 24 per cent light traffic. Of the bituminous macadam pavements 25 per cent were reported to carry heavy traffic, 28 per cent medium traffic and 47 per cent light traffic. Of the plain macadam roads 18 per cent were reported to carry heavy traffic, 18 per

cent medium traffic and 64 per cent light traffic. Of the gravel roads 21 per cent were reported to carry heavy traffic, 17 per cent medium traffic, and 62 per cent light traffic. An inspection of these figures shows that stone block and wood block pavements seem to be considered especially adapted to heavy traffic, the macadams to light traffic, sheet asphalt and asphalt block to light and medium traffic; while brick seems to be considered equally well adapted to all classes.

Arranging the several pavements in the order in which they are chosen for heavy traffic we find them classified as follows: Stone block, wood block, brick, bituminous macadam, gravel, sheet asphalt, plain macadam, asphalt block. If, on the other hand, we arrange them according to their preference for light travel, giving such preference in the inverse order so as to make it more comparable with the other list, we have the following order: Stone block, wood block, brick, bituminous macadam, sheet asphalt, asphalt block, gravel, plain macadam. It is seen that so far as permanent pavements are concerned the two lists give exactly the same order to the several pavements.

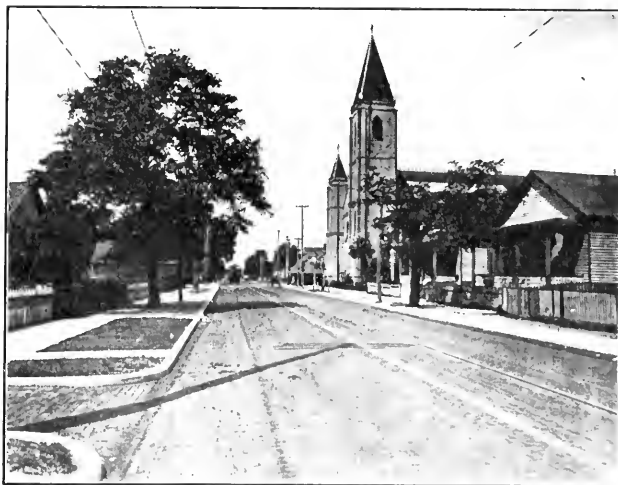
While there is nothing novel or startling in the conclusions just stated, it serves to confirm the general impression that not only stone block but also wood block are especially adapted to heavy traffic, and that brick, while not generally chosen for the heaviest traffic, is quite popular as a general all-around pavement; this being especially true in the Mississippi Valley. The table from which these conclusions were drawn we are expecting to publish in next week's issue.

WOOD BLOCK PAVING IN PENSACOLA

Streets with Flat Grades on Low Ground—Cement Mortar Cushion—Expansion Joints Between Tracks—Settled with Light Roller

By GEORGE ROMMEL, JR., Pensacola, Fla.

Pensacola, Fla., is a city of approximately 30,000 people situated on the Gulf of Mexico. Prior to 1909 the only permanent pavement in the city was a small stretch of brick approximately one-half mile in length which was laid in 1896. All of the other streets were of sand, with a few exceptions which had been hardened with clay. Under a bond issue the city advertised for bids on various kinds of pavements, the total work to be done being approximately 175,000 square yards. Contracts were awarded to the United States Wood Preserving Company of New York for wood block and to the Southern Paving and Construction Company of Chattanooga, Tenn., for brick, each company securing about half the work. The work has now been completed and Pensacola has about 11.5 miles of permanent pavement. Contracts will soon be let for an additional 10 miles so that the major portion of the city will be well provided for.



PENSACOLA STREET CONTAINING CAR TRACKS

Prior to the letting of the contracts, a great deal of opposition to wood block arose, owing to the experiences of our neighboring cities. The climate here is quite damp, as the prevailing winds are from the Gulf, and it was thought that the conditions were such that a wood block pavement could never be a success. Again, the lower part of the city is quite flat and low—the mean elevation 3500 feet from the harbor being only 0.4 above the mean low water. This section was originally a swamp and as the drainage facilities were not of the best the argument was advanced that this wet sub-soil would be very injurious to a wood block pavement. However, considerable of this opposition was overcome and practically all of the pavements laid in this district were of wood block. No trouble has been experienced from swelling or expansion, although the pavement has been down for about a year. The surface is as good, if not better, than when it was laid, and I see no reason to believe that we will ever have any trouble whatsoever. The traffic conditions are favorable, as 80 per cent of the streets are 25 feet wide, except that where there are car tracks the width is 30 feet. There have been no definite traffic records kept, but the hauling is of the mean business class, no great amount of heavy hauling being done here. Of course, with these widths, the pavement gets a uniform service which tends to keep the surface in good condition.

The blocks are of first growth long leaf yellow pine, $3\frac{1}{2}$ inches deep, by 6 to 8 inches long by 3 to 4 inches wide. The original specifications called for 90 per cent heart, but it was found that it was almost impossible to secure this grade of timber, so the requirements were changed to 75 per cent heart, which gave very satisfactory results. The blocks were subjected to a treatment of heavy creosote oil in the amount of 20 pounds per cubic foot of wood and no charge was accepted which absorbed more than 3 per cent of water after 24 hours drying and 24 hours immersion. A very rigid inspection was maintained at the plant and also on the work and an excellent quality of block was obtained. The blocks were made and treated by the Southern Creosoting Company of Slidell, Miss.

The blocks were laid on concrete foundation 4 inches in thickness, the concrete being in the proportion of 1:3:6. A very good grade of gravel was used in the concrete, gravel being much cheaper than crushed stone in this locality. The cushion coat consisted of a mixture of one part of Portland cement to three of sand, mixed dry and spread on the concrete to a depth of $\frac{1}{2}$ inch or greater. This cushion coat was formed by a template so that its surface was parallel with the finished surface of the pavement. The mortar was dampened with sprinkling cans immediately in advance of the block laying, care being taken not to have it too wet. After the block had been laid and before any initial set had taken place in the mortar bed, the surface was rolled with a light roller until all irregularities had been rolled out. Tamping was tried at first, but much more satisfactory results were obtained by rolling. A sand cushion was also tried but was soon abandoned as the mortar cushion gave much better results.

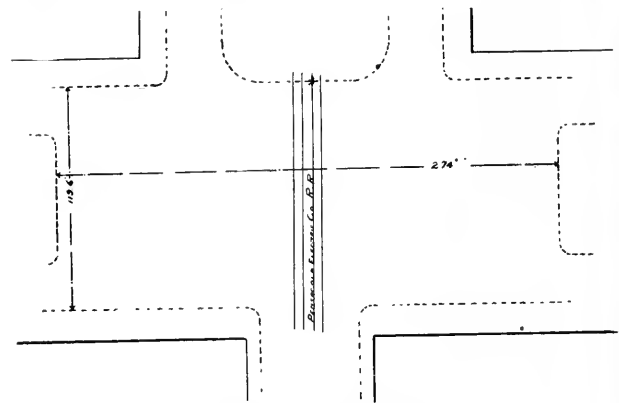


INTERSECTION WITHOUT EXPANSION JOINTS

The blocks were laid at right angles to the curb, with two longitudinal courses next to each curb. Expansion was taken care of by three expansion joints along each curb and transversely by one joint every 50 feet. The greatest trouble was experienced around these transverse joints. The expansion between the rails was provided for by staggering block-end expansion joints diagonally from one rail to the other and back to the first, with about 10 feet between apexes.

This method was tried as an experiment and gave such satisfactory results that we have adopted it in all our work.

One rather remarkable piece of work is an intersection shown in photograph and illustrated by accompanying sketch. This intersection contains about 2700 square yards and the grades at this point are very flat. The intersection was laid



SKETCH OF INTERSECTION

in small sections due to the fact that the blocks did not arrive fast enough to complete the whole section in one operation. The only expansion provided in the entire intersection is that along the rails and along the curbs. The surface to-day is perfect and no water stands anywhere in the whole section.

In conclusion, I wish to state that wood block pavement in Pensacola has been an unqualified success and many of those who were originally doubtful of this pavement are now its strongest advocates. I have no hesitation whatever in stating that the wood block pavement in climates such as Pensacola will be perfectly satisfactory, if care is taken in the selection of timber, proper treatment, and rigid inspection both at the plant and on the work.

UNTREATED WOOD BLOCKS

While most cities have abandoned the laying of the old round cedar blocks, there are still a few being laid in the country. Detroit, Mich., in 1910 laid 144,586 square yards of such pavement as new paving and 5,798 as resurfacing. This was laid on 6 inches of concrete, covered with a $1\frac{1}{2}$ -in sand cushion, and consisted of cedar blocks 4 inches long, of the best quality of sound, selected, live timber, stripped of all bark, between $4\frac{1}{2}$ and 9 inches in diameter. The spaces between these was filled with broken stone or gravel, which was thoroughly tamped into place. The pavement was then rolled and the spaces between the stones filled with pitch. One-half-inch of fine, sharp gravel was then spread over the surface.

IRON-CONCRETE PAVING BLOCKS

A novel French pavement consists of blocks made by filling moulds with matted iron shavings, or iron excelsior, and then pouring in cement sufficiently fluid to penetrate the entire mass. The blocks have great strength, resistance to abrasion and elasticity under blows or jarring. Tests have shown a resistance of 150,000 pounds per square inch, and a strength four times as great as that of ordinary cement. It is claimed that joints may almost be eliminated in this paving—an important advantage, as this takes away the parts of greatest wear and destruction.

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F. E. PUFFER, Assistant Editor

Business Department

S. W. HUME, President

J. T. MORRIS, Manager. A. PRESCOTT FOLWELL, Secretary

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MARCH 15, 1911.

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Best Pavements in Demand

Street paving interests are given exclusive attention in the general reading pages of this issue, and among the articles will be found specifications for modern stone block pavements and for the latest improved brick rattler, and a glossary of practically all terms in common use relating to bituminous materials used in road construction and treatment. The statistics of pavements constructed and to be constructed this year give a very accurate birdseye view of the paving work of all kinds which is being done throughout the country. The greatest amount of space, however, it will be noticed, is given to descriptions of wood block pavements and specifications for them. This is not because they are the most important or most generally used pavement, but because this class of pavement seems to be coming into general use in the larger and some of the smaller cities, and because there are certain questions concern-

ing both the material to be used and the method of using it which are open to and are receiving more discussion possibly than any other kind of pavement at the present time. This again is an indication of the fact that cities are reaching the point where they are willing to spend more money on their pavements; wood block pavement being among the most expensive of any in common use. Another indication of the same thing is found in New York City, where it is said that the Borough President of Manhattan proposes substituting for asphalt, which costs \$3.34 a square yard, smoothly dressed stone block pavements at a cost of 20 cents per square yard greater.

Cost of Pavements

THE latest report of the Census Bureau dealing with the expenditures of American cities is that for the year 1908, and a few figures from this may be of interest as showing the amount of money spent by American cities for street construction during that year. These figures include only cities of more than 30,000 population, but it is probable that the total expenditures of cities smaller than those would add only a small per cent—probably not more than ten—to these totals.

The total expenditures for highway construction by cities of more than 30,000 population was \$87,442,195, which was an average amount of \$3.63 per capita. In the sixteen cities having more than 300,000 population the per capita outlay was \$3.78; in the thirty cities having between 100,000 and 300,000 population the outlay per capita was \$4.14; in the forty-seven cities having between 50,000 and 100,000 population the per capita outlay was \$2.80, and in the sixty-five cities having between 30,000 and 50,000 population the per capita outlay was \$3.03.

The variation between the average per capita outlays in these four groups is about 50 per cent between the second and third groups, which show the extremes, but when we examine the figures for the individual cities we find much greater variations. Among the cities of the first group the maximum per capita outlay was that of Washington, D. C., \$7.04. Pittsburgh was second with a rate of \$5.83, with Cincinnati a close third with \$5.62. Chicago's expenditures were only \$2.02 per capita, while New Orleans had a minimum rate of \$1.06.

In the second group the variations were still greater, Portland, Ore., having a maximum rate of \$16.29 and Providence, R. I., a minimum of \$0.54. It is possible that Seattle, Wash., should have been given a rate higher than that of Portland, the total expenditures for the year having been \$3,199,270, but no per capita rate was determined by the Census Bureau "because no reliable estimate of population could be made." It is probable that these and some of the other high rates were due largely to expensive grading and opening up of new streets fully as much as to the construction of pavements.

In the third group Salt Lake City leads with a rate of \$7.23 per capita, and the minimum rate in this group is that of Hoboken, N. J., 25 cents per capita.

In the fourth group we find the greatest variation of all, the maximum rate being that of Oklahoma City, Okla., \$19.18, and the minimum being 8 cents, which is attributed to Macon, Ga., the total expenditure for the year in that city being only \$2,507. Here again it is probable that the high rate in Oklahoma City was due to the rapid growth and enormous amount of new streets opened up and graded.

While these figures do not distinguish between money spent in opening up streets and that spent in paving them, it is probable that in the largest cities, at least, much the greater part of the expenditure was for paving and pavement repairing, and it is probably a conservative estimate that \$75,000,000 was spent on paving streets of cities of more than 30,000 population in 1908. If we allow for the amount spent by the smaller cities and also for the increased amount of the more permanent and expensive pavements being put down each year, it probably would not be far out of the way to estimate that about \$100,000,000 will be spent this year for paving purposes in the United States.

The total amount of outlays by the cities included in the Census Report of 1908 was \$275,000,000, or a little more than three times the amount spent on highways. It is probable, therefore, that the expenditures for pavements constitute approximately 25 per cent of the total outlays of all such cities. The Census Bureau defines outlays as being "the accrued costs, paid or payable, of lands and other properties more or less permanent in character, and thus available for more than a single use, which are owned or used by municipalities in the exercise of their governmental functions or in connection with the business undertakings conducted by them." They, therefore, do not include such items as street cleaning, the maintenance of schools, etc., although they would include school buildings. For comparison it may be noticed that the only other class of outlays which at all approached those for highways is the amount spent for public service enterprises such as water works, street lighting, etc., which amounted to \$80,260,139; school buildings and other educational investments coming third with a little over \$40,000,000.

PAVEMENTS IN GRAND FORKS

First Pavements of Untreated Round Cedar Blocks—Modern Wood Block, Blome and Bitulithic Now Used—Methods of Construction

By H. G. LYKKEN, City Engineer

The first pavement laid in Grand Forks, N. D., was 12.6 miles of cedar blocks put down in 1898 to 1900. This pavement consisted of a 3-inch sand base on top of the heavy clay which constitutes the soil of the city, next a 2-inch pine planking on top of which the cedar blocks were placed. These blocks were cut 6 inches long (or high, as laid in the pavement), of material varying from 5 to 10 inches in diameter. The round blocks were placed as close together as possible, with the fibers vertical and with the spaces between filled with sand and gravel.

This pavement did good service for about six years before any repairs became necessary. Where the traffic was heaviest the blocks wore round at the edges, giving a cobble-stone effect to the street. After about eight years repairs were no longer possible in the business portion of the city. Decay as much as anything else brought about a total failure at about this period in the life of the pavement. The rate of deterioration seemed to be about the same for both the block covering and the plank foundation. The pavement did not fail on account of the rotting out of the plank, yet, on the other hand, the planks were fit only for firewood when removed.

As a general conclusion, the untreated cedar block gives a rough pavement even with moderate traffic after five years' service. I have seen them tried on concrete foundation with no better result than on the untreated plank foundation used in Grand Forks. After about eight years the pavement breaks down completely and is almost impassable after ten years, even in the light traffic of a residence district.

In 1908 the city instituted a policy of putting all pavements on a 6-inch concrete foundation mixed one part of cement to from eight to nine parts of gravel aggregate. The first year 44,000 yards of creosoted blocks were laid to which 50,000 yards have been added since. In addition, the city has constructed in the past three years 20,756 yards of R. S. Blome concrete pavement, and 75,837 yards of bitulithic and similar pavements.

The creosoted block used is 3½ inches deep and treated with 20 pounds of oil to the cubic foot of wood. Both Norway pine and tamarack wood have been used, with no perceptible difference noticed. The blocks are laid on a sand cushion about 1 inch thick. A filler of coke oven pitch tempered with a lighter tar has been used altogether. After the blocks are laid and rolled and the filler poured while as hot as possible a layer of sand is spread over the surface. This sand is kept on for several weeks, being sprinkled with water from time to time to keep it from blowing off. This seems to have eliminated all trouble from bleeding of the blocks and from the tar filler.

The first pavement laid gave much complaint from the tracking of tar onto the sidewalks and into the houses, as the precaution of keeping the sand on was not observed. Later experience leaves no doubt, however, that the sand overcomes this difficulty.

The streets are perfectly smooth with no signs of wear or deterioration perceptible even with heavy wholesale traffic of farm traction engines and threshing machinery. Extremes of temperature as we have it here do not seem to affect the blocks, nor has there been any tendency for the pavement to swell or heave, even where the full paved width is 50 feet. No estimate of the life of the pavements can be given at this time but it is my opinion that they will give a serviceable street for 20 years, with a minimum of repair.

The only objections to the pavement is its hardness and slipperiness. The blocks are as hard and smooth as concrete. When the pavement is wet, and especially when frosted, a horse cannot stand up unless very well shod. But in spite of the hardness the blocks are not as noisy as brick blocks, the sound being deader.

The special feature of the Blome or concrete pavement is the use of hard granite or trap rock screenings for the wearing surface, which is mixed one part of cement to one and one-half parts of screenings which range from ½-inch down to ⅛-inch mesh. The pavement is blocked off into rectangles 4½ inches by 9 inches to give proper foothold to traffic. This pavement gives eminent satisfaction on account of its pleasing appearance, ease of cleaning and sanitary condition at all times. It is not affected by the climatic conditions, nor is it noisy as would be supposed. Our experience with it is in a quiet residence district where there is no through traffic or fast driving with horses. My opinion is that it is an ideal pavement for such conditions. I would not recommend it for business streets or streets of considerable through traffic and subject to rather fast driving with horses. It is not slippery but its hardness must be objectionable for horses.

Nothing need be said with respect to the other pavement, as its wide distribution and similarity to asphalt, as far as appearance and general qualities are concerned, make it familiar to all. A tar or asphalt concrete, as a general term applicable to all such pavements, when correctly constructed, makes a pavement suitable for almost all kinds of traffic. Its resilience commends it to horse-drawn traffic. Climatic conditions seem to have no deleterious effect on asphalt, bitulithic or similar pavements where the local condition of extreme cold is taken into consideration in tempering the binder.

BRIDGE FLOORING

After some 25 years of experience with replanking its bridges and the never-ending expense and generally poor condition of the covering, the city a year ago paved the largest one with creosoted blocks. The joist and 3-inch plank covering, which were put in new, were boiled for about three minutes in coal tar, the crude product direct from the gas retorts being used. The blocks were tamarack 3½ inches deep, treated with 20 pounds of oil to the cubic foot.

The special feature of the pavement was the use of a sand and asphalt mortar for the joints. This mortar, a mixture of sand and an asphalt tempered in such a way as to retain its adhesiveness and ductility in the wide range of temperature we have here, was mixed on a hot plate and used hot. The blocks were put in place with a push joint of the mixture to insure not only a full joint of the mortar, but a cementing of the blocks to the planking below. The blocks were put on the planking without a cushion except a possible film of the mortar.

This construction has entirely overcome the frequent trouble with blocks coming loose on bridges. Subsequent attempts to remove blocks have proven the impossibility of their coming loose. The blocks will break rather than come loose from the mortar.

A slight crown was given the pavement by springing the plank covering over the joist. The results have been eminently satisfactory and a great saving is expected over continual replanking.

WOOD PAVING IN AMERICAN CITIES

One Hundred Cities Have Laid It—Pavements in Boston, Chicago and Philadelphia—Description of the Original Creo-Resinate Process—Chicago Specifications for Treating Blocks—Some Early Creosoted Wood Pavements

The general history and specifications of wood paving in New York City form the theme of the leading article in this issue. The other large cities of the country, however, have all used more or less modern wood block pavement. Boston, Mass., is generally cited as the first city in the East in which modern wood block pavement was laid (see, however, statements further on in this article), and more or less of this is laid every year. During 1910 something over 3,000 square yards were laid. The first pavement in Boston was laid in 1900 on Tremont street in front of the upper end of the Common. At the convention of the American Society of Municipal Improvements in 1901 Mr. B. T. Wheeler, superintendent of streets of Boston, stated that the amount laid that year was 1,360 square yards. He further described the blocks as being uniformly 4 inches wide, 4 inches deep and 8 inches long, of long leaf Georgia yellow pine. The blocks had been placed in an air-tight cylinder and subjected to a dry heat of 215 degrees F. for one hour, after which the heat was increased and pressure applied, both being raised gradually during two hours until 285 degrees and 90 pounds pressure were reached, to which the blocks were subjected for another hour. During the next hour the heat was reduced to 250 degrees and the pressure to about 40 pounds, following which a vacuum of 26 inches was created, and while under this vacuum a mixture of one-half creosote and one-half resin was run into the cylinders, after which pressure was applied which gradually reached 200 pounds per square inch, at which it was maintained until from 21 to 22 pounds of the mixture per cubic foot had been absorbed by the wood. The wood was then placed in another cylinder and subjected for one hour to milk of lime applied under a pressure of 200 pounds at 150 degrees temperature. These blocks were laid on a one-inch sand cushion and the joints filled with dry screened sand, the pavement then rolled with a five-ton steam roller and the joints finally filled with a creo-resinate pitch heated to 300 degrees and covered with $\frac{1}{4}$ inch of clean, sharp sand. In the following year at the convention of the same society Mr. McClintock, a consulting engineer of Boston, stated that he had never noticed any slipping of horses on this street; and a representative of this Journal was recently informed by the policeman on the beat that there was no trouble of this kind on this stretch of wood block.

Probably the largest amount of wood block paving found in any one city is approximately 800,000 yards in Minneapolis, Minn. The next largest is apparently New York City with nearly 700,000 square yards. Indianapolis is said to have about 500,000 square yards; Cincinnati, 300,000, and Chicago about the same. Besides these, Mobile, Ala.; Pensacola, Fla.; Toledo, O., and probably some other cities have each more than 100,000 square yards of modern wood block pavement.

CHICAGO

One of the most comprehensive plans for wood block paving is that of the city of Chicago, which proposes to lay this kind of pavement upon practically all of the streets of what is known as the "loop district"—the business district of the city. During 1910 five contracts for wood block paving were carried out, one for 5,700 square yards at \$3.16; another for 10,600 square yards, at \$3.35; a third for 5,200 square yards, at \$3.35; a fourth for 6,300 square yards, at \$3.42, and a fifth for 5,300 yards, at \$3.45. In constructing these pavements the subgrade was rolled with a ten-ton three-wheeled roller. Following this there was laid an 8-inch Portland cement concrete foundation, mixed 1:3:6; and this was covered with a sand cushion to receive the blocks. This sand cushion was intended to be one-inch thick; but, owing to the fact that in spite of all

precautions the surface of the concrete had not been brought parallel to the finished surface, the sand cushion varied in thickness from $\frac{1}{2}$ inch to several inches, it being necessary in some cases to chip off the concrete in order to secure the $\frac{1}{2}$ inch of sand. Where more than one inch was used it was found that the blocks did not hold their surface well. The blocks were of long leaf yellow pine, $3\frac{3}{4}$ inches wide, 4 inches deep and from 5 to 10 inches long. These were treated with creosote oil, the specifications for which were as follows:



MADISON STREET, CHICAGO. WOOD BLOCK PAVING.

The oil shall be a pure coal-tar product, free from any adulteration. It must not contain any petroleum oil or any product obtained from petroleum and shall contain not more than 5% of matter insoluble in benzole and chloroform. No oil obtained wholly or in part from water-gas tar or oil tar will be accepted.

The specific gravity of the oil shall be at least 1.10 at 25° C.

The oil shall be subject to a distilling test as follows:

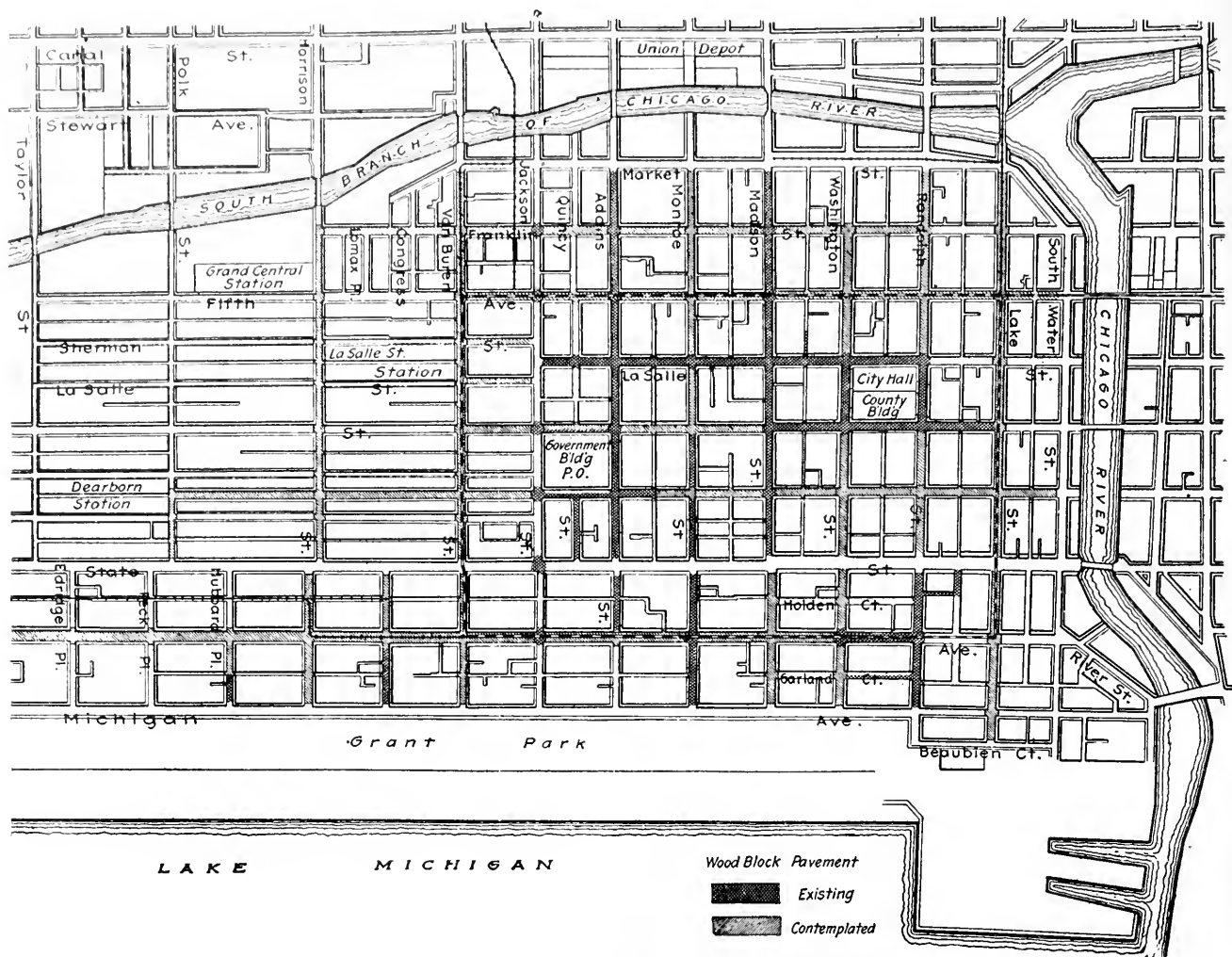
The apparatus for distilling the creosote must consist of a stoppered glass retort having a capacity, as nearly as can be obtained, of 8 oz. to the bend of the neck, when the bottom of the retort and the mouth of the off-take are in the same plane. The bulb of the thermometer shall be placed $\frac{1}{2}$ in. above the liquid in the retort at the beginning of the distillation, and this position must be maintained throughout the operation. The condensing tube shall be attached to the retort by a tight cork joint. The distance between the thermometer and the end of the condensing tube shall be 22 inches and during the process of the distillation the tube may be heated to prevent the congealing of the distillates. The bulb of the retort and at least 2 inches of the neck must be covered with a shield of heavy asbestos paper during the entire process of distillation, so as to prevent heat radiation, and between the bottom of the retort and the flame of the lamp or burner two sheets of wire gauze each 20 mesh fine and at least 6 inches square must be placed. The flame must be protected against air currents.

The distillation shall be continuous and uniform, the heat being applied gradually. It shall be at a rate approximating one drop per second, and shall take from 30 to 40 minutes after the first drop of distillate passes into the receiving vessel. The distillates shall be collected in weighed bottles and all percentages determined by weight in comparison with dry oil. When 100 grams of the oil are placed in the retort and subjected to the above test, the amount of distillate shall not exceed the following:

Up to 150° Centigrade.....	2%
Up to 210° Centigrade.....	10%
Up to 235° Centigrade.....	20%
Up to 315° Centigrade.....	40%

The contractor shall deliver to the Board of Local Improvements an affidavit setting forth that all oils used for treating the blocks for this contract are oils obtained wholly and entirely from coal tar and free from all adulteration, and that there is no material not a product of coal tar mixed with it.

Sixteen pounds of this was used per cubic foot. (West Taylor street had been laid in 1904 with blocks containing 12 pounds, and although a very heavy traffic was carried on a



THE "LOOP DISTRICT" OF CHICAGO, SHOWING WOOD BLOCK PAVEMENTS

38-foot roadway, in which is located a double-track street railway, the pavement has shown no signs of failure.)

A strip 18 inches wide along railroad tracks, about the same width next to the curb and for a short distance around all manholes was laid with tar filler; but for the rest of the surface fine sand was used in the joints and the surface was covered with $\frac{1}{4}$ inch of coarse sand after completion of the pavement. Expansion joints were placed along each curb and transverse joints at intervals of 25 feet, except in portions of Randolph street and Wabash avenue, where the transverse expansion joints were placed 50 feet apart. These joints were composed of one inch of paving pitch specified to be the direct result of the distillation of "straight run" coal tar.

The pavements built in 1910 were given a crown of not to exceed 8 inches on roadways 60 feet wide, or 7 inches on roadways 48 feet wide. The reason for the flat crown was to prevent slipping on the smooth pavement. As the street grades were very flat, numerous sewer inlets were provided to draw off the water as rapidly as possible. The blocks were laid at an angle of 45 degrees with the line of the street, this being the general practice in Chicago; except that between railway tracks they are laid at right angles to the street. The blocks were laid as close together as possible and frequently straightened out into line with a sledge. In addition, the blocks in each line were pried into close contact with an iron bar and held in this position by substituting a longer block for a short one in the row. In spite of this, it was noticed that after applying the sand the joints opened up sufficiently to take a considerable amount of this. The blocks were rolled with a drum roller weighing about five tons when loaded with coal and water, the wheels being 41 inches wide. A good many blocks were broken in this rolling, and it was believed by the engineer that better satisfaction would be obtained if two rollers be



TOP VIEW OF BLOCK SHOWN BELOW



LONG LEAF PINE PAVING BLOCK, AFTER 28 YEARS' USE
Laid on Market St., Galveston, in 1875. Removed in 1903. Creosoted.

used, one a light roller, such perhaps as is used for asphalt paving, and the second a heavy roller, weighing at least ten tons.

The total amount of wood block laid in 1910 in Chicago was 63,857 square yards. It is not known yet just how much wood block paving will be laid this year, but the chief engineer reports that probably it will reach about the same amount.

Although the Tremont street pavement in Boston, laid in 1900, is sometimes cited as the first modern wood block pavement, Mr. Linn White stated last year before the American Society of Municipal Improvements that in 1898 a piece of wood block pavement was laid on Michigan avenue, Chicago, which was stated by the manufacturer to have been impregnated with not more than 14 pounds of creosote to the cubic foot. This pavement was down for ten years, and when taken up in 1908 on account of widening the street was apparently as good as when laid.

An even earlier instance of creosoted wood block paving is reported, such a pavement having been laid on Market street, Galveston, in 1875, and removed in 1903. This was creosoted long leaf pine, but we understand that the blocks were not rectangular nor was the pavement in other respects equal to the modern pavement.

PHILADELPHIA

In 1909, after the completion of a subway in Market street, Philadelphia, the merchants on that street, after considerable canvassing of the question, requested the authorities to use wood block in repaving. The first section so paved included about 58,000 square yards, which was begun on September 13 of that year and finished on December 11. In this pavement were used wood blocks which the specifications required to be treated with 20 pounds of creosote oil per cubic foot; but it was also required that they should not absorb more than 3 per cent of water, and to meet this requirement it was found necessary to use an average of 24 pounds per cubic foot, according to Mr. A. W. Dow. The blocks were 4 inches wide, 4 inches deep and from 5 to 10 inches long. They were laid on a sand cushion on a 6-inch foundation. A one-inch expansion joint was provided at each gutter and $\frac{1}{2}$ inch transverse expansion joints at intervals of 100 feet, these joints being filled with bituminous cement. The pavement was rolled with a ten-ton roller. The contract price was \$3.49 per square yard. In 1910 about 0.7 of a mile of wood block was laid under a ten-year guarantee.

CITIES WHERE WOOD BLOCK HAS BEEN LAID

Including these instances of large amounts of wood block paving and also all cities where any amount whatever has been laid, we have prepared the following list which is believed to include practically all cities in this country which had laid any wood block paving up to the beginning of this year. It is possible that certain of those listed as having wood block paved streets have used this paving on bridges only, although an effort was made to list such cases separately under the head of wood block paved bridges.

CITIES HAVING WOOD BLOCK PAVED STREETS

ALABAMA—Mobile.
 ARKANSAS—Pine Bluff.
 CONNECTICUT—Bridgeport, Hartford, New Haven.
 FLORIDA—Pensacola.
 GEORGIA—Atlanta.
 ILLINOIS—Chicago, Decatur, East St. Louis.
 INDIANA—Indianapolis, Mishawaka.
 IOWA—Ames, Clinton, Des Moines, Ft. Dodge, Indianola, Mason City, Ottumwa, Perry, Shenandoah, Sioux City.
 KANSAS—Wichita.
 KENTUCKY—Lexington, Louisville, Winchester.
 LOUISIANA—New Orleans.
 MARYLAND—Baltimore.
 MASSACHUSETTS—Boston, Springfield.
 MICHIGAN—Calumet, Detroit, Grand Forks, Houghton.
 MINNESOTA—Albert Lea, Austin, Duluth, Little Falls, Minneapolis, Moorhead, Red Wing.
 MISSOURI—Cape Girardeau, Kansas City, St. Joseph, St. Louis.
 MONTANA—Billings, Great Falls.
 NEBRASKA—South Omaha.
 NEW JERSEY—Hoboken, Jersey City, Paterson.
 NEW YORK—Geneva, Jamestown, New York, Poughkeepsie, Rochester, Utica, Watertown.
 NORTH DAKOTA—Fargo, Grand Forks.
 OHIO—Cincinnati, Delaware, Springfield, Toledo.
 PENNSYLVANIA—Easton, Harrisburg, Philadelphia.
 SOUTH DAKOTA—Aberdeen.
 TENNESSEE—Bristol.
 TEXAS—Dallas, Houston.
 VIRGINIA—Norfolk.
 WASHINGTON—Seattle.
 WISCONSIN—Appleton, Beloit, La Crosse, Milwaukee, Superior, Watertown.

WOOD BLOCK PAVED BRIDGES

MONTANA—Missoula.
 NEW YORK—Baldwinsville, Ithaca, Mt. Vernon, Oswego, Seeley Creek.
 OHIO—Akron, Columbus, Mansfield, Montpelier, Newark, Philo, St. Marys, Stryker, West Milton.
 PENNSYLVANIA—Lykens, Tyrone.



LAYING WOOD BLOCKS ON MARKET STREET NEAR TENTH STREET, PHILADELPHIA

NEWS OF THE MUNICIPALITIES

Current Subjects of General Interest, Under Consideration by City Councils and Department Heads—Streets, Water Works, Lighting and Sanitary Matters—Fire and Police Items—Government and Finance

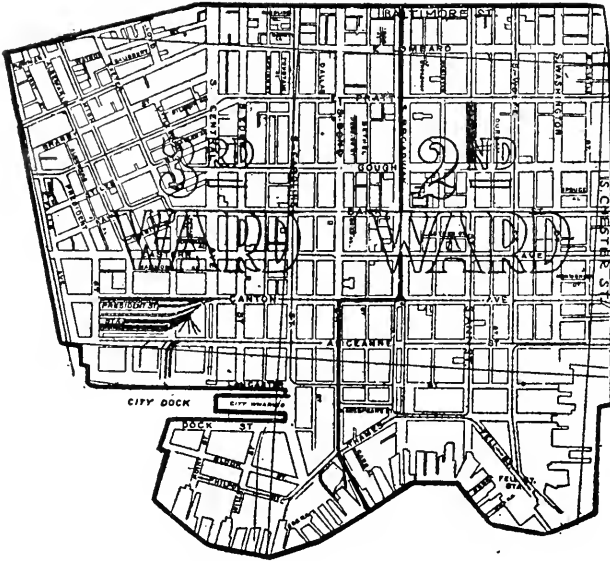
ROADS AND PAVEMENTS

Street Committee to Inspect Street Work

Atlanta, Ga.—The Street Committee of Council will devote a day to making a trip of inspection in automobiles throughout the city in order to see how the new street work is going forward and to decide where other work is needed. The Chief of Construction will accompany the Committee on this trip. The Committee will have a look at every piece of new street work that is being done in Atlanta, and will inspect every street for which improvements have been asked. The inspection will be one of the most thorough that any street committee has ever made. Bright and early the Committee will start on its trip and throughout the day will continue its inspection.

Inadequacy of Past Paving Plans Explained

Baltimore, Md.—The Baltimore News is publishing daily a series of maps of the city wards showing the futility and purposelessness of the present method of paving the city's streets from the inadequate general levy. The heavy black



MAP SHOWING YEAR'S PAVING

line shows the paving done and paid for by the city in the Second and Third Wards in 1909. The dotted black line indicates paving done in 1909 in the wards the expense of which was borne in whole or in part by abutting property owners.

Would Sprinkle Streets with Calcium Chloride

Duluth, Minn.—Alderman L. A. Barnes has received from the Board of Public Works a communication with recommendations for sprinkling the streets at West Duluth providing that the business district be kept free from dust at all times. This includes Central avenue from Main to Cody streets and Grand avenue from Central to Fifty-eighth avenue west. The communication also recommends that all streets not having a hard surface be sprinkled two or three times during the season with calcium chloride, which, it is believed, will assist greatly in laying the dust in the residence sections.

Extensive Street Improvements for New London

New London, Conn.—General street improvement is awaiting action of the Legislature, granting authority to issue bonds. If the authority is granted it is intended to lay granolithic walks five feet wide over a large section of the city and assess one-half the cost on the abutting property.

Good Road Nearing Completion

St. Augustine, Fla.—Within 30 days the county will be able to boast of a stretch of 66 miles of rock road, better than any road in the State of Florida. This will be when the contractors complete the county rock road through to Homestead. The last bond issue, carrying \$75,000 for new roads, \$15,000 for each of the five commissioners' districts, has all been expended or will have been when the work to Homestead is completed. There remain only about two miles more to be built to connect Homestead with the present rock road and a stretch of six miles to Silver Palm. The roads of the county will then be practically all new, with a few exceptions. There are a few stretches between Miami and Fort Lauderdale that need renewing, but about 85 per cent of the main highways are in good condition.

Details of Du Pont Offer to Build Road

Wilmington, Del.—T. Coleman Du Pont has offered to finance the building of a highway across the State. He proposes to organize a company which should have power to condemn a right of way one or two hundred feet wide. The proposition contains the proviso that a portion of this right of way shall be reserved for the construction of a trolley line, pole lines for electric light and power lines and conduits for water, oil, gas, steam or anything desirable. The paved roadway would vary from 12 to 18 feet, according to travel anticipated in each section of the road. Space would be allowed for planting trees. On the completion of the road this strip, 30 feet wide, would be deeded to the State.

Street Paving Held Up

Walla Walla, Wash.—By the decision of Judge Thomas H. Brents, making permanent a temporary injunction restraining the carrying out of a paving contract, the construction of new pavements will be held up for several months, at least. Assessment paving has been done in Walla Walla under a law by which a quarter of the cost of the work was charged against a certain city fund. This fund became exhausted and the work of paving was continued, the property owners paying the whole cost. Recently a case came up in which property owners disagreed as to the material to be used and in consequence the matter got into the courts. The court holds that work cannot proceed under the law unless the city at large pays its share of the cost.

Improving Ohio State Highway Laws

Youngstown, Ohio.—Placing the State Highway Commissioner's office on a plane commensurate with the dignity of the State, systematizing existing legislation, repealing conflicting statutes and providing a better outlook for the good roads movement is the intent of a bill introduced in the State Senate by Senator S. B. McGuire, of Tuscarawas County. The measure bears every indication of being one of the most far reaching and important efforts at legislation during the present session of the Legislature and is of peculiar interest in Youngstown, where considerable opposition has developed to the policy of the good roads commission and where further roads work is now tied up by court proceedings. The movement for better roads in Ohio is being backed by the Ohio Good Roads Federation, a non-partisan, non-political organization, the members of which, business men, farmers and others, have no ax to grind and no motive other than making Ohio better in a business way by improving old and opening up new highways so essential to the mercantile and agricultural welfare of the Buckeye State. Compulsory education of county commissioners, township trustees, county engineers and road supervisors will be provided by a meeting to be held at least once a year in each county seat which would be presided over by the State Highway Commissioner, one of his deputies or a department engineer.

New Specifications for Street Paving

Dallas, Tex.—City Engineer J. M. Preston has prepared a new set of specifications and bidding sheet in the place of those that have been in effect for three years. The kinds of pavement provided for include creosoted wood blocks, bitulithic, asphalt, asphaltic concrete, rock asphalt and brick.

Fort Worth Interested in El Paso's Paving Plan

El Paso, Tex.—Fort Worth is interested in El Paso's revolving paving fund system. City Attorney W. M. Coldwell has received a letter from the authorities of that city asking that a copy of the charter of El Paso be forwarded. It is explained that Fort Worth anticipates the creation of paving districts and desires to follow the example of El Paso. Will Rand, of the bitulithic company, said recently: "El Paso's revolving fund is the best ever. With the original \$200,000 over \$400,000 worth of paving has already been laid."

Digging up Streets Presents Problem

Los Angeles, Cal.—How to properly fill, or to have filled, excavations made in the streets by contractors is a problem which just now is worrying the members of the Board of Public Works. Streets which have been dug up by contractors for the purpose of laying gas mains, sewer pipes, etc., and for connecting them with residences often show signs of never having been properly resurfaced and are filled with ruts and depressions. W. M. Humphreys, inspector for the board, explained that there are two ways in which the matter can be handled. One way is to either have the city fill all excavations and put the surface of the street in proper repair or else have city inspectors watch every excavation to see that it is properly filled. The other way is to make every contractor responsible for the condition of the street after he leaves it. The first-named plan of having the city do the work itself, or have every excavation inspected, would necessitate establishing an entirely new department of the city government and would result in large expense. The other plan is the one which is being followed now as nearly as possible, contractors who excavate being required to take out permits and then putting up either a certain amount of money or a bond to insure the street staying in good condition for at least a year. Inspector Humphreys informed the board that many streets which came under his observation would stay in good condition for a year after being excavated, and then would begin to show the effects of having been dug up. He thought the time of responsibility for the contractors should be extended as long as the life of the pavement.

Provision Made for Double Inspection

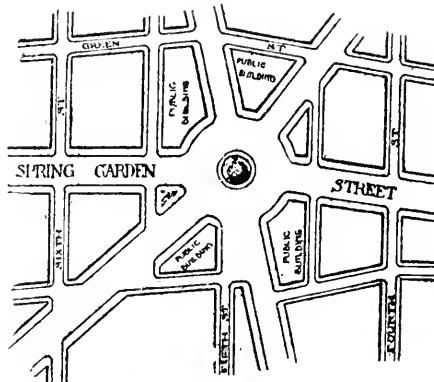
Cincinnati, O.—The final form of the new street paving specifications has been agreed upon at a conference between Public Service Director Sundmaker, City Engineer Shipley, Director Miles and Engineer Barlow, of the Bureau of Municipal Research. Most of the changes made were of a technical character. Provisions were inserted in the specifications for the appointment of an unofficial inspector by the service director, who shall have the same rights at the wood block manufacturing plants as the City Inspector except that of condemnation. It is agreed that samples may be shipped away for analysis, the only provision being that the City Inspector shall receive a sample from the same batch of oil shipped away, so that the city and the outside chemist will make their tests of the same quality of material. Director Miles declared after the conference that the specifications as amended were perfectly satisfactory to the bureau.

Able-Bodied Men Must Work on Roads

Cleveland, O.—The law made prominent by the recent decision of the Supreme Court to the effect that road superintendents and directors of public service can order able-bodied male residents of a community out on the roads for two days' work each year will not be met with an overflow of substitutes as was at first proposed, at least not in Cleveland. Mayor Baehr said that if it came to a show-down he himself would be ready to go out on the street for two days a year to work out his tax instead of turning over the \$3 for the pay of a substitute.

Improvements at Intersections of Diagonal Avenues

Philadelphia, Pa.—Upward of fifty neighborhood centers connected by diagonal avenues as proposed by the Comprehensive Plans' Committee, will form the basis of the general scheme for future development to be taken up shortly by the Board of Surveyors. The general project has been plotted, and hereafter ordinances for the opening of streets or striking others from the city plan proper will be considered in the light of the diagonal and neighborhood center



PROPOSED TREATMENT OF IMPORTANT INTERSECTION

recommendations of the Comprehensive Committee. There are already eight great diagonal avenues which run through 36 of the 47 wards, and new avenues will be laid out. The centers will be used for different purposes. In some will be located the headquarters of many branches of the city government. Some of the proposed centers are of such size as to furnish sites for schools and hospitals. In the congested districts playgrounds, drinking fountains, band stands and monuments may be located. The illustration shows one of the larger centers.

Camden Wins Paving Suit

Camden, Pa.—By the Court of Appeals affirming the assessment for the paving of Broadway, below Bulson street, Camden won a big victory in its controversy with the Manufacturers' Land and Improvement Company, after the matter had been in litigation for over three years. One of the points raised by counsel for the land company, outside of testing the constitutionality of the paving act, was that the street had been paved once by the land company and that the paving for which the assessment was made in 1908 was repaving, and that the city could not therefore make an assessment for it. City Council Bleakly insisted that there was a material benefit to the land from the new and improved asphalt pavement, and that the amount of this benefit was a lien upon the land and that if the Council had not made the assessment they would have neglected their duty. It is admitted that in the past Camden has not made assessments in these cases.

Planning to Call Roads Conference

Los Angeles, Cal.—A conference of supervisors of Southern California counties probably will be called in Los Angeles for the near future to take steps to secure for Southern California what is considered a just proportion of the \$18,000,000 road bonds voted by the people at the last general election. The question was raised at the supervisors' meeting by a communication from Ventura county supervisors suggesting that the Los Angeles board take the initiative in calling such a conference. The Ventura board suggested the coast road as one for general improvement. Members of the board unofficially endorsed the suggestion, and the matter was referred to R. W. Pridham, chairman of the board, to investigate.

Fifty Miles of Streets to Be Treated with Oil

Santa Monica, Cal.—The completion of three oil-paving contracts in the hill districts gives Santa Monica a total of about 50 miles of streets thus improved. The total mileage of open and traversable streets is 165, in a condition as a whole, says C. B. Pettis, Street Superintendent, that ranks the north beach city among the first for good roads in Southern California.

SEWERAGE AND SANITATION

No Lead Pipe to Be Used in Soda Fountain Connections

Denton, Tex.—State Pure Food and Dairy Commissioner J. S. Abbott, of this city, has issued a ruling that the use of lead pipe in making connections in sodawater fountains will be held a violation of the pure food and drug law of Texas.

Enforcing Sanitary Laws

Fort Scott, Kan.—State Pure Food Inspector Kleinhaus spent several days at Chetopa, making an investigation of the sanitary condition of some of the local places of business, and as a result a restaurant, a grocery store and a bakery were ordered closed until the proprietors complied with the sanitary laws.

Complete Sewer System for Long Beach

Long Beach, Cal.—Plans for the complete sewerage of the city have been submitted to the Board of Public Works by City Engineer Dewey. It is estimated that it will cost the taxpayers \$343,454.18 for this extensive addition to the present sewer facilities.

Bar Sewage to Protect Water

Toledo, O.—Action against property owners on the river road between the Children's Home and Delaware Creek has been taken by Service Director Cowell to enforce his orders that no more sewage from the included district shall be dumped into the Maumee. The purpose of the order is to protect the city water supply. The order includes the Children's Home, a county institution, and the Country Club. Twenty-three sewers empty into the river within the district included. Some of them lie below the intake of the filtration plant, but the infirmity director asserts that frequently the wind blows back beyond the intake crib the sewage coming from them. The law gives the Service Director power to prevent pollution of the stream from which the water supply is taken for a distance of 20 miles above the intake.

Towns Arrange for Exchange of Sewerage Facilities

Lynn, Mass.—A public hearing was recently held on a bill to authorize the city of Lynn and the town of Swampscott to make an agreement for the disposal of certain sewage. The act will affect about 30 citizens who live in the city and town where sewer entrance is possible only into a sewer under the control of the place in which the land is not assessed. The cost of the service is left to mutual agreement of the municipal authorities. The assessments will be levied in the municipality in which the property is located. There was no opposition to the passage of the bill.

WATER SUPPLY

Filter Ready at Jonestown

Lebanon, Pa.—Within a few days, it is expected, the great filter plant at Jonestown of the Lebanon Valley Consolidated Water Supply Company will be so far advanced toward completion as to permit the delivery of filtered water to the company's patrons in the suburbs of this city. The plant is said to be one of the finest water filtration systems in the country. On it and the pipe lines it will supply have already been expended over \$300,000, and the total to be expended on the system when complete will be in the neighborhood of half a million dollars. The system takes the Swatara water at a point not far north of the Jonestown railway station, and after passing through a settling or sedimentation basin that takes out of it the impurities in suspension the clear liquid is taken through the regular filters and completely purified. Later it goes to a closed well, concrete lined, from which it is pumped up the four-mile grade to the big concrete reservoir on Sand Hill. The Sand Hill Reservoir is a big closed basin. From the time the water enters the filters until it is delivered in the home of the consumer it is not exposed to the light of day. The Sand Hill Reservoir is so constructed that the water in it is kept constantly in motion in a concrete covered reservoir.

Fight Filtration Order

Lima, Ohio.—Mayor Dyer, Director Rowlands and City Solicitor McLaughlin visited Cincinnati, where they met with the State Board of Health and filed an appeal from the recent order of that Board commanding the city to build a filtration plant.

January Record of Cincinnati Filtration

Cincinnati, Ohio.—Superintendent Laidlaw has received the report on the chemical analysis of the Ohio River water for January. The report showed that the highest number of bacteria was found on Jan. 3, when the count was 360,000 to the cubic centimeter. The lowest was on Jan. 26, with a count of 6,700, and the average for the month was 63,000 to the cubic centimeter. The average for the filtered water was 11 to the cubic centimeter, showing a filter efficiency of 99.98 per cent. On four days no bacteria was found in the filtered water; on five days only one to the cubic centimeter was found; on one day two, on two days three and on seven days but four. On the day of the greatest impurity in the raw water the count for the filtered water went to 110, which is but 10 above the standard German average of 100.

Cranford Has Water Supply

Cranford, N. J.—Cranford apparently has located a sufficient water supply for the town, and within 10 days' time a complete report from Special Engineer Fuerties is expected by the Township Committee on the number of gallons the two driven wells will supply and the cost of building a complete water plant. The question of municipal ownership of a water plant will be submitted to the voters in April. Engineer Fuerties reported to the township officials that the first well driven to a depth of 216 feet flows within three feet of the top and that the new well was completed at a distance of 220 feet, with over a thousand gallons of water flowing over the top in a day's time. Engineer Fuerties reported that the second well had every prospect of yielding better than the first one. The first well produced 300,000 gallons a day on a six-day test.

Long Beach Citizens Voice New Water Rate Objections

Long Beach, Cal.—During a recent discussion of water rates by the City Council and citizens who crowded the Council chamber, there were openly expressed hints at having the people take the fixing of rates out of the Council's hands by means of the initiative and referendum. It was a very lively and interesting session and resulted in the Council postponing action for one week. The chief cause for complaint voiced by the citizens was the alleged reduction offered in water for domestic uses where meters are used. The present rate is 20 cents per thousand gallons. The new ordinance proposes the same rate for quantities less than 10,000 gallons; 15 cents between 10,000 and 90,000 gallons, and 8 cents per thousand for users of more than 90,000 gallons.

Filtration Plant a Success

Toledo, Ohio.—After almost a year's operation Service Director Cowell and water works officials have found the process of the Toledo filtration plant to be entirely satisfactory. After a number of minor structural changes have been made the Norwood Engineering Company, which built the plant, will be released from its \$240,000 guaranty bond at the expiration of the year's period, March 23. The matter has been discussed by the Service Director and W. A. Stevenson, representative of the company, and the changes to be made were ordered. None of them, Mr. Cowell said, is of great importance. Mr. Stevenson said that work on the erection of the 14 additional units of the filtration plant will be begun as soon as the plans are completed and approved by the State Board of Health.

Court Stops Reservoir Work

Tyrone, Pa.—Alleging that the big reservoir which a water company is building to supply Tyrone is a menace to the citizens because the breast is not of sufficient strength to hold the contents with safety, the Borough Council has applied to the Court for an injunction restraining further work on it. A preliminary injunction was granted.

STREET LIGHTING AND POWER**Explosion in Power Plant**

Niagara Falls, N. Y.—Without a moment's warning a terrific explosion wrecked a penstock at the power house of the Ontario Power Company, near Queen Victoria Park, on the Canadian side, killing three men instantly, fatally injuring two and seriously hurting five others. General Superintendent Hugh H. Wilson stated that the loss aside from the fatalities would be trivial, possibly not exceeding \$5,000. Discussing the probable cause of the disaster, Mr. Wilson said that so far as could be ascertained at this time the explosion was due to a leaking gas pipe. There is a small gas line within the penstock for heating purposes and it is thought that gas escaping from this pipe produced the fatal combustion.

Grounding of Secondary Wires Advised

Hingham, Mass.—Wm. L. Puffer, Consulting Engineer, Boston, has made a report to the Municipal Lighting Board recommending the grounding of secondary wires. In answer to a specific question, "grounding" is defined as the deliberate connection of one of the secondary wires to as good earth as can be found. The report states that it is desirable to ground these wires wherever there is a possibility of exposure to stray currents coming from dangerously high voltage wires. The wires carrying the railway currents, the series street light currents and the primary currents of the lighting system are classed by Prof. Puffer as dangerous. He advises the grounding of the secondary systems to the cast-iron water pipes as near the transformers as possible at all services where it can be done conveniently. In other sections of the city where the water pipes are not cast iron and subterranean water is known to exist, pipes should be driven into the ground and the secondary wires connected to them. These pipes should be tested to see that the ground connection is sufficiently good before the wires are connected.

Columbus May Abandon Arches and Adopt Clusters

Columbus, Ohio.—Columbus business men are positive in expression of opinions for and against the present system of High street electric arches, many being in favor of abolishing the present arches and adopting a more up-to-date plan. Several state that the old style arches have long ago passed their days of usefulness and it is time for something newer and better. South High street business men, where the first arches were erected, still favor the present arches, but it is generally felt that some other kind of lights would be preferable. Cluster lights such as have been installed on East Main street and which are generally used for up-to-date street lighting are suggested.

Mayor and Aldermen Take up Subscription to Pay Contempt Fine

Clay Center, Kan.—The costs of the contempt case of Mayor Hanna and the City Aldermen of Clay Center, which the United States Supreme Court recently ordered the men to pay, will be raised by popular subscription among citizens here. No one will be permitted to give more than a dime. The costs are \$27.60. The municipal officers last November cut down the poles of the Williamson Electric Light Company here before a decision of the Supreme Court of Kansas against the company had stood the necessary 30 days to become effective. Thus did they get into contempt. No penalty besides the payment of the costs was exacted.

Learn the Cost of Street Lights

Lansing, Mich.—When Secretary W. B. Kirby, of the Water and Electric Light Board, reported that the first cost of the Tungsten lighting system now in use in the business districts was but \$11,407.36, general satisfaction and surprise were expressed. In all, the system includes 263 poles, of which 77 have a cluster of five lights and the other 186 three lights. The cost of each pole was \$18; the cost of the cable from pole to pole was \$11.54. The painting, wiring, globes, etc., made the total cost for the three-light poles \$42.30, while that of the five-light poles is \$45.92.

FIRE AND POLICE**Mayor's Gift to Town**

Branchville, N. J.—Mayor John H. Nelden formally presented the hose cart he purchased some weeks ago to the borough at a meeting of the Council last week. Councilmen D. L. B. Smith, Truman Compton and Wilbur F. Dye, in turn voiced their thanks on behalf of the town.

Jersey City Has Auto Fire Truck

Jersey City, N. J.—Jersey City's newest fire station, at the Boulevard and Van Nostrand avenue, Greenville Heights, was opened for duty last week. It is equipped with automobile fire fighting apparatus of the latest design and the first to be used in this city. The automobile equipment consists of a combination truck, which carries a 40-gallon chemical tank, 2,000 feet of hose and two extension ladders of 25 feet each. When light this truck weighs 5,500 pounds and is driven by a 50-horsepower motor, with a guaranteed speed of 50 miles an hour. Battalion Chief Chambers will be in command.

Ordinance Regulates Sale of Firearms

Louisville, Ky.—Chief of Detectives Capt. John P. Carney has prepared an ordinance regulating dealers in firearms. The measure provides that stores dealing in firearms or ammunition must register every sale, giving the number of the arm sold, the make, the caliber, the amount of ammunition purchased and the name and address of the purchaser. Captain Carney says that there is no law of the kind now in force in Louisville. He feels certain that such a law would be a great benefit to the police and detective departments in reducing crime. Captain Carney points out that the dealers would benefit by the passage of the ordinance, inasmuch as they would know the number of their firearms and could furnish them to the police department in the event that they were stolen, thus helping the department to trace them. In cases of murder or suicide the name of the owner of the weapon would be a valuable assistance to the police. The police would also be in possession of the names of all the firearm owners in the city.

Policemen to Wear Uniforms at All Times

Rochester, N. Y.—As a result of a recent discussion of the affairs of the Rochester Police Department by Commissioner of Public Safety Charles S. Owen and Chief of Police Joseph M. Quigley, it will be suggested to the members of the department, and especially to those above the rank of patrolman, that uniforms be worn in public at all times, except when permission is given by the Chief to policemen to appear in citizens' clothes. All members of the Police Department, except the detectives and patrolmen assigned to plain clothes details, are now required to wear their uniforms when on duty. The patrolmen and officers of the department may wear civilian clothes on their days off duty and on furlough, upon being given permission by the Chief to do so.

Some of the patrolmen who are on duty in the day time have a habit of appearing in public in their civilian clothes in the night time. Some of the captains and the lieutenants also have acquired the habit of leaving off their uniforms when quitting the station houses for their meals. Some even occasionally appear on duty without their uniforms.

Million Dollar Fire in Minneapolis

Minneapolis, Minn.—Losses of more than a million dollars were suffered in a fire which swept the Syndicate Block, Nicollet avenue, Sunday morning, March 5. More than a score of lives were imperiled and thrilling rescues were made by the firemen. The Donaldson block caught fire, but was saved by the sprinkler system. The buildings across the avenue were saved with difficulty, as it was, the roof and upper story were burned. Three fire companies came to the aid from St. Paul. Chief Strapp made the trip from the business district in St. Paul in 15 minutes. Crowds of people visited the scene on Sunday afternoon and were surprised to see among other things that the ornamental Corinthian lighting standards stood intact, although the building on the opposite side of the street was severely scorched.

Installing Danger Signals

Portsmouth, Va.—Danger signals are being installed at High and Court streets, Effingham and London streets, and Washington and South streets by Superintendent Smith of the city's fire alarm telegraph system. The signals are intended to light simultaneously with the fire tap of the fire alarm gongs in the engine houses of the Chambers Fire Company, No. 2, in Court street, the Park View Engine Company, No. 3, and the Independent Fire Company, No. 1, and are to warn approaching street cars of the movements of fire apparatus. The signals consist of two red electric incandescent globes suspended over the center of the roadway and the traction tracks.

Hauling Steam Engine with Auto

Walla Walla, Wash.—Fire Chief William Metz and the firemen have been testing out the Metropolitan steam engines as to their state of efficiency so that in case of emergency the fire-fighting equipment of the city will all be in trim for immediate use. Instead of hauling the engines about with horses they were trailed behind the 80-horsepower fire auto and the big car shows the drawing capacity of a locomotive. One of the steamers was taken up East Alder street behind the auto at the rate of 15 miles an hour, and so far as could be judged, without any strain on its motive power.

Policemen Receive New Book of Rules

Providence, R. I.—The Board of Police Commissioners has distributed a new book of rules among the members of the force. Included in the advice to a young policeman are the following recommendations:

"Remember that you are the servant of the people."

"If you don't like your job, resign, but don't attempt to influence anyone to make your duties easier."

"Don't forget that when you were appointed there were many others who would gladly have taken the position given to you."

"Accept no favors from anyone, pay for what you get, and don't be chummy with loafers or lawbreakers."

"Vote as you please, and don't think you can merit or secure promotion by being a politician."

Girl Fire Chief of City

Port Tampa, Fla.—Miss Maggie Harris, daughter of the late Fire Chief A. J. Harris, of Tampa, has the distinction of being the first girl in the world to be called upon to organize a fire department. Miss Harris will organize a volunteer department for Port Tampa City. Several severe fires recently have awakened the citizens and officials to the need of protection. About 40 men have volunteered their services. The men selected will be thoroughly drilled by Miss Harris. The late Chief Harris resided in Savannah for a number of years, during which time he was connected with the old volunteer department. He moved to Tampa when the Tampa department was reorganized and became its chief. Miss Harris was secretary to her father during his career, and took a deep interest in fire-fighting.

New Apparatus Given Test

Janesville, Wis.—The new chemical apparatus recently purchased by the city and placed on the fire chief's auto, has been tested for its efficiency. The tank was charged and put in operation and a nozzle an eighth of an inch in diameter was used with the hose coming with the equipment. The charge lasted for about fourteen minutes, but lost a good deal of its strength after the apparatus had been used about ten minutes. A pressure of 155 pounds was secured at the outset of the trial. It has been decided a large stream will be of more service in fighting small blazes and hereafter a three-sixteenths inch nozzle will be used. This, it is expected, will throw a stream of sufficient force for about four minutes, by which time the fire wagons or the fire patrol will be at the scene of the fire, or if necessary the reducer attached to the equipment on the chief's auto and a stream of water used in extinguishing the blaze. The auto with the equipment was weighed this morning and tipped the scales at 3,350 pounds. The auto alone weighs 2,720 pounds, making the weight of the chemical apparatus 630 pounds.

New Auto Engine Makes Good Record

Paterson, N. J.—Engine No. 10, the new automobile fire engine, covered 52 miles while answering fire alarms during the month just passed, and in many cases, although a long distance from the fires, came in not far behind the regular apparatus. In some cases it would have been able to get to the scene first but racing is forbidden by the rules of the department so that if it were last in the stretch it was obliged to retain its position. During this time 16 alarms of fire were answered.

New Chemical Engine Used for First Time

Two Harbors, Minn.—The Fire Department was called out one day last week to put out a fire at the Carey residence on Sixth avenue. It was only a small fire, caused by sparks falling on the roof, and was easily extinguished. For the first time the chemical engine purchased by the city was used and proved very successful, 100 pounds pressure being generated in about four seconds.

GOVERNMENT AND FINANCE

Wants Smaller Council

Richmond, Va.—Holding that the two branches of the Council are too large and are unwieldy, Councilman Clyde H. Rotchiffe has proposed a resolution to reduce the number from 64 to 24. He proposes to divide the city into three wards, instead of eight, allowing each ward three members of the Board of Aldermen and five Councilmen.

Many of the politicians oppose the plan because they will lose their prestige, while the business men favor the change. The possibility of the city changing to the commission form of government may have something to do with the suggestion at this time. The charter of the city would have to be amended to secure the result desired by Mr. Rotchiffe.

Chief of Statistics Calls Municipal Financiering Reckless

Boston, Mass.—Charles F. Gettemy, Chief of the Massachusetts Bureau of Statistics, has reported to the Senate that in 15 cities and 156 towns examined by his Department in response to an order of the Senate there is a total of \$1,124,231.98 municipal indebtedness and no provision for meeting it. Wholesale and indiscriminate borrowing from individual, trust funds, cemetery funds, Chief Gettemy reports, has plunged the cities and towns of the commonwealth into hopeless confusion from which the Legislature will have to rescue them. Mr. Gettemy intimates that there is a shadow of illegality resting upon some of the loans made apparently in accordance with the law. Borrowings amounting to nearly half a million are made from trust funds left for town improvements, but appropriated by the towns for current expenses. Towns are paying 6 per cent upon these misappropriated funds. Several towns have asked for legislative permission to refund. In some cases, however, refunding must be gradual so as not to financially wreck the present taxpayers. The proposition for a State finance commission is urged to meet the situation. The ruling of ex-Attorney-General Malone that towns which have borrowed in this way must regard such borrowings as narrowing their debt limit makes it impossible for them to borrow further without legislation.

Favors Municipal Ownership of All Public Facilities

Columbus, Ohio.—Mayor Marshall has declared for municipal ownership of all public utilities in a speech on the gas rate matter. At present there is municipal ownership of the light, water, sewage and garbage disposal plants, but the Mayor hopes also to effect ownership of gas, telephones and street railways.

Elect Councilman by Toss of Coin

York, Pa.—After four ballots taken by the West York Borough Council for the election of a successor to Councilman C. L. Green found the body still deadlocked, John Shive was chosen for the vacancy by the unusual method of flipping a coin. His opponent for the office was John Horner. Each of the candidates had received three votes in the four different ballots and after Burgess Luther E. Newcomer had tossed up the penny which decided the contest the action was made legal by the taking of another ballot in which all votes were for Shive.

STREET CLEANING AND REFUSE DISPOSAL

Garbage Disposal Faulty

Erie, Pa.—While City Health Officer J. W. Wright believes the backbone of the typhoid epidemic has been broken, a secondary outbreak may be even worse unless action is taken immediately relative to garbage disposal. The present system, he says, is a menace to the city. Three months work and \$75,000 will be required to establish a new system. The Water Commission has voted \$10,000 to assist in waging war against the epidemic. Every trained nurse that can be secured in Northwestern Pennsylvania is being employed here, and many are being brought from Pittsburg, Philadelphia, Buffalo and Cleveland. Between Jan. 1 and March 1 the fever claimed 84 victims, one for every 750 persons in the city. There were 744 cases.

Plan to Make Garbage Haul Itself by Rail

Atlanta, Ga.—A plan whereby the city's garbage can be made to haul itself to the crematories which the city is going to build in the near future will be considered by the special committee having the matter in charge. The plan is to install at each of the two proposed crematories a plant consisting of boiler, steam engine and electric dynamo, and by the joint operation thereof to develop power sufficient to run electric garbage trains on tracks to be built by the city from receiving stations at opposite ends of town to the crematory plants. It is estimated that the burning of the garbage at each crematory would produce ample heat to drive an electric plant powerful enough to pull the garbage trains.

Garbage Will Be Removed by City

Portsmouth, Va.—The Street Committee of the Council has taken over the work of the removal of garbage, and C. E. Murden has been engaged to supervise its collection. Heretofore the work of removing garbage has been done by contract, but the Street Committee believes that it can save money to the city by taking the work over and the new plan will be tried for a year.

City May Build Reduction Plant

Cincinnati, Ohio.—Mayor Schwab and Service Director Sundmaker are securing data in an investigation of the advisability of constructing a municipal reduction plant, when the present contract with the Cincinnati Reduction Company expires in June, 1913. The Mayor is of the opinion that the collection and reduction of garbage by the city might be done at a reduced cost from what is paid in the contract. The Mayor's attention was called to the matter when the hospital commission made arrangements for garbage incinerators for the new Avondale Hospital. They have secured a furnace which reduces all classes of garbage to ashes at a slight cost and without any offensive odors. The cost of the contract with the present contractor has steadily advanced each year from \$76,000 in 1903 to \$93,000 last year.

Recommends Incineration of Rubbish for Columbus

Columbus, Ohio.—Superintendent I. S. Osborn has made a report to Mayor Marshall outlining a plan for the disposal of rubbish, ashes and manure. He figures that \$63,380 will pay for collection and \$5,836 for disposal as compared with \$150,000, the estimated cost of disposition by private contract. By operating the plant in connection with the workhouse \$4,000 more may be saved. The present cost of removing rubbish is estimated on a cost of \$3.77 per residence for 40,000 residences. The item cost of collection includes \$18,600 for collecting manure, which Director Holton says can be made self-sustaining. To accomplish the results stated by Osborne an incinerator and utilization plant will have to be built. The incinerator is figured to cost \$36,000, and the utilization plant, which will consist of a building, conveyors, etc., where the portions of the waste which have value, such as rubber, leather, bottles, etc., may be picked out. The cost of operating incinerator and utilization plant is \$16,120, revenue from steam generated and sale of valuable materials, \$10,284; net cost, \$5,836, as stated. Mayor Marshall states that 100 deaths a year from communicable diseases will be avoided if the street sweepings and rubbish are disposed of in a sanitary manner.

Wants Change in Garbage Contract

Huntington, Ind.—To change the time of the expiration of city garbage collection contract to June 30 is a plan considered by Councilman Harmon Hendricks and he will probably introduce a resolution in the Council to bring about such a change after the present year. According to the present custom, the garbage collector assumes the task January 1, a time at which the work is the most difficult of the year. Before a plan of disposing of the refuse is well worked out, residents in some parts of the city usually bring in complaints of neglect. It is to correct this and to give the new man an opportunity to commence work during the warmer weather that Hendricks proposes the change.

Bill Purposes Economy in Street Cleaning Work

St. Louis, Mo.—A bill reorganizing the street cleaning divisions of the Street Department by combining the cleaning of hard pavements and the block patrol was introduced in the House of Delegates last week by Delegate Hildenbrandt at the request of Street Commissioner Travilla. The bill reduces the number of employees from 71 to 60 and the salary roll from \$67,464 to \$56,640, a decrease of \$10,824. Street Commissioner Travilla states that with the addition of three automobile runabouts to the equipment of the departments its efficiency would be largely increased. The bill substitutes for two superintendents at \$150 a month each, one superintendent at \$200 a month and makes similar combinations in the lower positions. The two departments can very readily be combined, as the inspectors cover the same areas while inspecting different matters.

To Demonstrate Incinerator Plant

Mason City, Iowa.—W. H. McGuire, of Oklahoma, is expected in the city shortly to demonstrate his incinerator plant. The sewage of the city as it now is empties into Lime Creek, and when the water is low a protest goes up from residents far down the stream. There has been talk of injunction proceedings time and time again, but nothing has been done. The system has been put in at a very heavy expense, but there can be no question that some other plan to take care of the sewage must be made soon.

Garbage Reduction Resumed at Bridgeport

Bridgeport, Conn.—The garbage reduction plant to be operated by C. C. Fischer, York, Pa., has been got in condition promising the beginning of active work March 15. Beginning that date it is expected that everything will be in readiness to receive garbage for reduction. For the past ten months the city has been obliged to bury its garbage. The town farm has been used for this purpose.

The operation of Fischer's plant will be watched with interest by East Side residents. Fischer's contract has a clause making a limit for the odor zone and, judging from the opinions of East Side residents, this clause will be enforced. There is a difference of opinion as to whether John B. Livingston, former head of the Bridgeport By-Products Company, or the city, will press their heavy damage suits. Nothing has been done concerning them for a long time and interest has somewhat been overshadowed by speculation as to how Fischer will succeed.

Municipal Garbage Plant

Winnipeg, Manitoba.—Chief W. J. Bailey, Department of Sanitation, who has been in charge of a 100-ton Dixon crematory for a short time—with the aid of convict labor, by the way—says in his report, in part: "From the first of the month to the present date we have consumed on an estimated average of from 6 to 75 tons of mixed refuse daily, all loads being dumped into the machine, and all non-combustible refuse, etc., being hauled from the machine the following morning with the ashes. We are burning coal in this machine, for which we pay the sum of \$3.65 per ton in lots as we require it. We have two paid men at work, all other labor being furnished by the city prisoners, they being worked by this department. Our highest rate of operation per ton of garbage, etc., consumed thus far has been \$0.219. The percentage of ashes, tin cans, etc., is about 15 to the 100 loads.

RAPID TRANSIT

City of Trenton Gains Decisive Victory for Good Trolley Service

Trenton, N. J.—Under orders and recommendations issued by the Board of Public Utility Commissioners of New Jersey to the Trenton Street Railway Company, the city of Trenton gains a decisive victory in its efforts to have the trolley service of the city materially improved. The orders are of such a character that safe and adequate service is guaranteed throughout the city within two years and the recommendations provide suggestions to the company, which, if adopted, will prevent a return to the present conditions. All of the reconstruction work ordered must be started on or before April 5 and completed during the year 1911. All of the rest of the work ordered must be started on or before April 5 and completed before the close of 1912. The orders demand complete reconstruction of parts of the system of tracks of the company on Hamilton avenue and South Broad street, and the repair of all joints in tracks in seven sections of the city. It prescribes the manner in which the joints shall be repaired in order that depressions which now exist shall not recur.

Municipal Ownership Bill Dies in Committee

Columbus, O.—The Geleerd bill which would have given the people of the municipality the right to own and operate its own street railway lines was defeated in the House cities committee last week. The defeat of the bill was in a large measure due to the exposure of the rider incorporated in its provisions, giving municipally owned street car lines rights to public streets without the consent of abutting property owners. This rider was similar to the one discovered in the Krause bill, which will probably meet a similar fate when it comes up for a third reading in the Senate this week.

MISCELLANEOUS

Gift of 10,000 Catalpa Trees to Woonsocket

Woonsocket, R. I.—James M. McCarthy, head of the McCarthy Dry Goods Company, of this city, who has been greatly interested in the subject of the benefit resulting from the intelligent work in recent years of Tree Warden Edwin O. Ronian, announces that the McCarthy Company will present to the city through the school children of Woonsocket 10,000 hardy Alice Catalpa trees. They will be ready for distribution in time to be planted next Arbor Day, which comes on May 12. They will be one year old and 12 to 15 inches high. The hardy catalpa trees are especially valuable for their rapid growth and shade-giving branches. According to the offer made by Mr. McCarthy to Superintendent of Schools Frank E. McFee, and which will be announced at the next meeting of the school committee and to the parochial schools, there will be cards of instruction as to planting and care of the trees attached to each tree. The trees that will be distributed grow rapidly. Their growth keeps pace with that of the individual and by the time some of the children who plant them attain manhood or womanhood they will find their tree abundant with foliage and 40 feet high. The only stipulation that accompanies the gift is that each child receiving a tree must plant it and promise to care for it. This gift will lend an unusual significance to a notable anniversary and the fruit of it will be apparent in Woonsocket for generations yet to come. Alice Catalpa tree roots well and thrives in almost any kind of soil.

South Bend Plans New Zoological Garden

South Bend, Ind.—In preparation for the launching of plans for the new \$3,500 animal zoo for Leeper Park, members of the City Park Board spent a day last week in Chicago on a tour of inspection. The Park Commission spent the greater portion of the day at Lincoln Park, where many valuable hints were secured for the construction of a thoroughly modern zoo in Leeper Park. The Common Council has appropriated the amount for the improvement in its annual budget and work will begin on the new building in a short time. An architect is to make plans of the building immediately.

New Municipal Dock Opened

Tacoma, Wash.—Tacoma's temporary municipal dock has been formally opened, several thousand persons—men, women and children—participating in a big house warming to celebrate the occasion. The affair was notable in point of interest displayed and members of the Business Men's Dock Committee were more than delighted with the success of the event, according to E. R. Rogers, chairman of the committee. Following an inspection of the building—and no nook nor corner was overlooked—the visitors gathered in the big freight room, and, standing, listened for an hour and a half to a program of addresses by prominent men.

Woodlawn Opens City Hall

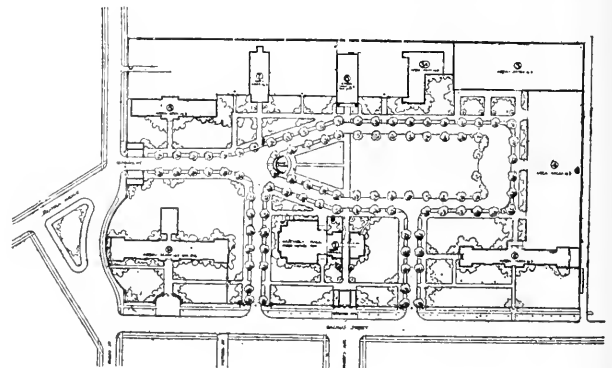
Woodlawn, Pa.—The new borough hall at Woodlawn was opened to the public last week and 1,800 persons, including 600 school children, marched through the building. Officials of the Jones & Laughlin Steel Company were present, and a band of employees of the company furnished music. The building is a three-story buff brick structure, erected at a cost of \$29,000.

Macon Plans for Child Welfare

Macon, Ga.—Macon will be among the first of Southern cities to establish a municipal playground for its youthful population. The field secretary of the National Playground Association has begun the work of inaugurating the playground on Tatnall Square. The city has already appropriated \$3,000 for improving Tatnall Square for this purpose.

Plan of Rochester's New Exposition Park

Rochester, N. Y.—The plan of the new Exposition Park, one of Mayor H. H. Edgerton's favorite schemes, was made by Architects Gordon & Madden. The landscape work is being done by Pitkin & Weinrighter. The improvements will cost about \$150,000. The new park will be about 15 acres in extent and the stone wall by which it is surrounded will be removed and an ornamental iron fence substituted. The Bloss street extension will be in the form of a convex curve, which will leave plenty of space in front of the old Girls' Dormitory. The driveway at the main entrance on Bloss street will be 30 feet in width and will divide at the bandstand and run northerly 20 feet wide on either side



EXPOSITION PARK

of an esplanade, which will front the three exposition buildings, numbered two, three and four. The esplanade will be 304 feet long and 148 feet wide. Trees and walks along the lawn will make it one of the prettiest spots in the city. There will be nearly a mile of cement walk and about one-half mile of driveway in the new park. Building No. 6 will be the aquarium and No. 7 will be the zoo building. Building No. 8 will be used as a vocational school. No. 3-a will probably be used for storage purposes. The Mayor admits he has a plan for the utilizing of Building No. 9, but declines to say anything about the matter, except that when finished it will be one of the most attractive buildings in the park. Building No. 1 will be the Assembly Hall, with a seating capacity of 1,200. Besides the main entrance on Bloss street there will be two entrances to the park from Phelps Street.

Foreign Labor Not Wanted in Centralia

Centralia, Wash.—Following the decision by the City Council of Chehalis that none but American citizens could work on city improvements, a large number of aliens have come to Centralia to endeavor to get employment in the public work that will shortly start here.

Centralia does not take undesirable foreign labor any more than Chehalis, and it is expected that this matter will come up before the Aldermen at the next meeting.

Fresno Yields to Street Speakers

Fresno, Cal.—The controversy over the right to speak on the streets of Fresno has been settled by Mayor Rowell and the City Council ratifying the action of the citizens' committee in granting to members of the Industrial Workers of the World permission to speak on K street and in Chinatown. The compromise provides that the 86 convicted Industrial Workers of the World now serving 40 days in jail for violating the street-speaking ordinance of the city shall be paroled, and the 30 unconvicted prisoners charged with the same offense shall be released immediately. The speaking will be governed by the permit system, the police to be instructed to grant permits to the Industrial Workers of the World to hold meetings on K street next to the Court House Park, and on Tulare street, in the Oriental quarter.

Petitions Urging Municipal Band Circulated

Pasadena, Cal.—Special effort is being made to secure 500 signatures on the petition asking the City Council to put up to the people at the next city election an ordinance establishing a municipal band at a cost of \$32,000 or less per year.

Smoke Ordinance Arouses Interest

Youngstown, O.—There has been perhaps no local legislation of recent years that has caused such general interest as the proposed smoke ordinance now in the hands of a committee of Council. This ordinance, which aims to make Youngstown a smokeless city, will demand a departure in established methods of installing fire grates and firing boilers, since all stacks in the city which emit a dense smoke, with the exception of dwelling chimneys, will come under the ban, and means must be provided for eliminating this nuisance. A violation of the ordinance is liable to a fine of not less than \$10 or more than \$50 for the first offense and a fine of not less than \$20 or more than \$100 for the second offense. Each day in which any provisions of the ordinance is violated shall constitute a separate and distinct offense.

Quiet Fourth of July for Monroe

Monroe, Mich.—Following the example of Toledo and Detroit, the Common Council has enacted an ordinance prohibiting the sale of giant fire crackers, dynamite canes, toy or blank pistols or anything else containing explosives, the ordinance to take effect in 20 days. For violating the ordinance a fine of not less than \$50 nor more than \$100 or imprisonment up to 90 days in the county jail is fixed.

Improvement Association Asks for Wooden Park Benches

Los Angeles, Cal.—Stone or cement seats for Central Park will be too cold, according to a petition filed by the Federated Improvement Association, which asks that the Council install wooden benches, with perhaps an iron framework, instead of the kind proposed by the Park Commission. The petition has been referred to the supply committee, which has the matter in charge.

Vote to Open Parks for the Public

Hackensack, N. J.—The Improvement Commission has voted to open three new parks, Anderson Park, the Park on the Green and Fairmount Park to the public. The question of cost could not be estimated. Accordingly the resolution was referred back to the committee to investigate and report at a later meeting. The resolution authorized a suitable tablet in Anderson Park to commemorate the donor. This question has been up for consideration before, but previously it has been impossible to obtain a favorable vote.

Hagerstown Plans for Cleaner City

Hagerstown, Md.—That the visit of Mrs. Caroline Bartlett Crane, of Milwaukee, to this city some time ago is about to bear fruit in the way of a vigorous campaign to improve the material and moral welfare of Hagerstown is evidenced by a call issued for a meeting of the Hagerstown Civic League. The invitation is extended to all citizens who are interested in promoting the sanitary, aesthetic and educational condition of the city. It is proposed to start at once the practical work of the league according to methods outlined by Mrs. Crane, who is an expert in "civic housecleaning." It is expected that hundreds of citizens will become members of the league.

Pittsburg to Have Free Bridges

Pittsburg, Pa.—Pittsburg is to have free bridges. Within ten days there is likelihood that one may travel to the Northside and back again without having to pay for the privilege. That is the construction placed by all concerned on the decision of Secretary of War Dickinson that the bridges need not be raised. Whether or not the bridges must be raised in the future—and the river interests have not given up the fight—is beside the question. The decision of the Secretary has made action possible and the Board of Commissioners has met and authorized Attorneys Hay and Vail to begin condemnation proceedings. The attorneys have all the papers prepared. They have asked the court for the appointment of viewers. And from that time on the County Commissioners are convinced things will proceed with neatness and dispatch. And the decision of Secretary Dickinson means the paving the way not for the freeing of three or four bridges, but for all five over the Allegheny in the city limits—five bridges capitalized at \$1,820,000, divided as follows: Sixth Street Bridge, \$625,000; Seventh Street Bridge, \$750,000; Ninth Street Bridge, \$150,000; Sixteenth Street Bridge, \$95,000; Thirtieth Street Bridge, \$200,000.

That they have been and are money makers is evidenced by the fact that the Sixth Street Bridge pays annual dividends of 15 per cent on par value of \$25 a share; the Seventh Street Bridge, 6 per cent on par value of \$50 a share; Ninth Street Bridge, between 11 and 14 per cent on \$50 par value; Sixteenth Street Bridge, 20 per cent on \$50 par value, and Thirtieth Street, 6 per cent on par value of \$50. The bridges are owned by 645 stockholders, a large percentage being estates. The Sixth Street Bridge has 327 stockholders, holding 24,411 shares of stock, more than 17,000 of these being held by women and children and trust estates. The Ninth Street Bridge has 93 stockholders, including 37 estates. There are 100 stockholders in the Seventh Street Bridge, 100 in the Sixteenth and 25 in the Thirtieth Street Bridge.

Municipal Shows Meeting with Success

Hartford, Conn.—The municipal exposition under the auspices of the joint committee of the Municipal Art Society and the Civic Club is meeting with popular favor. The different departments of the city government have been industriously engaged for several weeks in preparing their exhibits. The general public will find a lot of information at this exhibition about the city government that it did not possess before. The plans of Carrere & Hastings for the development and beautification of the city, which will be forwarded from New York this week, will be displayed.

Toledo, O.—Toledo's first municipal show is giving citizens the opportunity to inspect the work of all the various departments. The hall is open each afternoon with moving pictures and a musical program each evening as added attractions. There is no admission charge. For the purpose of giving many persons the unusual opportunity to see the legislative branch of the city government in actual operation, the session of council will be transferred one night to the stage of Memorial Hall.

To Popularize Central Park

New York, N. Y.—The question of the popularization of Central Park, which raised much opposition last year, was taken up by the Aldermen last week, and a resolution passed requesting Park Commissioner Stover to proceed at once with the construction of the playground, wading pool, etc., in the northern end of the park authorized in the budget for this year.

LEGAL NEWS

A Summary and Notes of Recent Decisions—Rulings of Interest to Municipalities

Illegal Removal of Fire Chief

Leonard vs. City of Terre Haute.—Under the express provisions of Burns' Annotated Statutes 1908, the chief of the fire department is an appointee of the board of public safety whom the board cannot remove for political reasons, nor in any other manner than as therein provided. When a de facto officer is in the possession of an office and discharging his duties under color of right, a person claiming to be de jure entitled to the same office cannot sue for the salary or fees of the office without first establishing his right to the office by quo warranto, as otherwise it would permit him to try the title to an office in a collateral proceeding to which the holder of the office under color of right was not a party. Where a statute makes provision for the chief of fire force and firemen, their appointment, mode of compensation and proceedings for removal, their duties are of a public nature, and so far official that one holding a position either as chief or fireman is entitled to his salary as an incident to the position, whether he performs the duties of such position or not. Acts done under coercion cannot be held to be an abandonment of office. Appellate Court of Indiana, 93 N. E. R., 872.

Legislative Control—Municipal Property

Board of Handley Trustees vs. Winchester Memorial Hospital et al.—Acts 1895-96, entitled "An act to enable the city of Winchester to accept the bequest of John Handley," etc., provided for a board of trustees to carry out the objects and the benefactions, instead of the Common Council, and provided that the trustees should superintend and direct the investment of the fund, etc., but that no plan for the ultimate application of the fund should be valid unless approved by the Common Council. Held, that the act deprived the Common Council of all power to charge the fund for services rendered by an attorney in litigation which arose concerning it. Supreme Court of Appeals of Virginia, 70 S. E. R., 133.

Paving Assessment—Review

City of Decatur vs. Brock.—Questions relating to certain clauses of a paving contract and the extension of time for the completion of the work are not questions of record or jurisdiction to be reviewed by a common-law certiorari to review an assessment therefor, especially in view of Laws 1907, giving a right of appeal. Supreme Court of Alabama, 54 S. R., 209.

Vacation of Streets—Evidence

Gatie vs. City of Cedar Rapids.—The court in determining whether there should be a vacation of streets in proceedings under Code, authorizing the vacation of plats and streets and alleys thereon, must consider reasonable future requirements, and the fact that the streets are considered necessary for use by the city for water and sewer pipes shows that they will also be needed for use by the general public, and they should not be vacated. Supreme Court of Iowa, 129 V. W. R., 737.

Paving Assessment—City Park

Newberry vs. City of Detroit.—Under Detroit City Charter, providing that for the purpose of an assessment for paving a street the lots and parcels of real estate situated on the street and fronting the portion improved constitute one local assessment district, and the assessment thereof shall be according to their frontage, a park owned by the city and fronting thereon is not exempt from assessment. Supreme Court of Michigan, 129 N. W. R., 699.

Defects in Streets—Lighting

Blain vs. Town of Montezuma.—Under Code, giving to cities and towns the power, but not expressly imposing on them the duty, to light their streets, no absolute obligation is imposed, either as to the extent or mode of lighting, and the inefficiency of a system of lighting installed does not constitute negligence. Supreme Court of Iowa, 129 V. W. R., 808.

Dangerous Trees—Question for Jury

Wright vs. City of Chelsea.—Where a shade tree in a city street has plainly, for over a year, been in a condition making it a menace to the public and the defect can only be remedied by removal of the tree, and not by trimming it, and the officer charged with care of the streets takes no steps to report the defect to the proper authorities, looking to its removal, as required by Revised Laws, section 10, nor to warn the public of the danger, the city is liable for injuries to a traveler by the fall of a limb. Whether a tree was dangerous because of decay and liability to fall, and whether a city has used due care to protect the public, as required by Revised Laws, providing for the removal of such trees, are jury questions, in an action against the city for injuries received by the falling of such tree. Supreme Judicial Court of Massachusetts, 93 N. E. R., 840.

Street Commissioner—Term of Office

Otto vs. City of Detroit et al.—Under Completed Laws 1897, providing that all appointive officers shall hold until the second Monday in April after their appointment and until their successors are qualified, unless a different term be prescribed, and that officers appointed to fill vacancies shall hold until the next annual election and until their successors are elected and qualified, one appointed village street commissioner would hold the office de jure until his successor qualified and entered upon his official duties, so that the invalidity of a subsequent reappointment of such appointee could not prevent him from recovering his salary for the time he held the office until such successor qualified and entered upon his duties. Supreme Court of Michigan, 129 N. W. R., 731.

Attorneys—Compensation

Moore et al. vs. City of Detroit et al.—Where the president of a village made a contract for the services of attorneys, the agreement covering also a retainer, which contract was beyond his power, and the village by resolution of the Council subsequently appointed the attorneys to the position of attorneys for the village, but provided for no specified compensation, the attorneys were entitled only to reasonable compensation for services actually rendered, and hence, in an action by the attorneys for compensation, the jury should have been charged that no retainer could be recovered. Where the value of an attorney's services, outside those covered by the retainer, which he was not entitled to recover, as testified to by the plaintiff, was something over \$2,000, and the difference between this sum and the amount of the judgment was practically the amount of the retainer during the period of employment, there can be no doubt that in making up their verdict the jury allowed the plaintiffs a sum equivalent to the retainer, so that failure to charge that plaintiff could not recover for the retainer was prejudicial. Supreme Court of Michigan, 129 N. W. R., 715.

Contracts—Use of Public Money

McManus et al. vs. City of Petoskey et al.—A provision of a lease by a city of its land that the city shall deposit with a third person a sum of money belonging to the city, to be paid over to the lessee when a new building to be erected by the lessee for manufacturing purposes is completed, and which fixes the interest of the city in the building, is invalid as an attempt to use public money for the furtherance of a private enterprise. Supreme Court of Michigan, 129 N. W. R., 681.

Suspension of Employee—Compensation

Hoyt vs. City of New Rochelle.—The voluntary reinstatement, after a suspension of 13 or 14 months, of a sewer inspector appointed under the civil service laws, without proceedings by him to secure reinstatement, do not establish a wrongful discharge in the first instance, and do not entitle him to compensation for the period during which he was suspended. The suspension by the Board of Public Works of a city of a sewer inspector, appointed under the civil service laws, because of lack of work and lack of funds, the inspector being put back in his position as soon as there was work for him to do and money with which to pay him, was not a wrongful act and showed no bad faith on the part of the board. New York Supreme Court, 127 N. Y. S., 223.

Use of Streets—Automobile Races—Accident Liability

Bogart vs. City of New York.—A City Council has no power to authorize the use of public streets by an automobile club for automobile races to be held within certain hours on a particular day, and such use of the street is illegal. Where a spectator was voluntarily present to witness automobile races on a public highway, illegally authorized by the City Council, his administrator could not recover against the city for his death, resulting from being struck by an automobile swerving in its course and leaving the highway, on the theory that the contest was illegal in the absence of proof of negligence. Court of Appeals of New York, 93 V. E. R., 937.

Incorporating of Cities—Statutes

Kuhn, Atty.-Gen. vs. Common Council of City of Detroit.—Under Constitution Annotation, 1908, providing that under general laws the electors of each city may frame, adopt, and amend its charter, and Public Acts No. 279, providing for the incorporation of cities and authorizing, in section 21, amendments proposed by the legislative body or by initiatory petition, a revision of an existing charter of a city as authorized by the act of 1909 must precede proceedings to amend the charter in the manner prescribed in the act. Supreme Court of Michigan, 129 V. W. R., 879.

Defective Sidewalk—Contributory Negligence

Stodd et al. vs. City of Philadelphia.—The parents of a boy 4½ years old of ordinary intelligence who lived in a large city, are not chargeable with negligence as matter of law for permitting the child to play on the sidewalk without an attendant, although having knowledge of a defect in the walk likely to cause a child passing over it to fall, but, in an action for an injury to the child from such defect causing his death, the question of contributory negligence of the parents is one for the jury. United States Circuit Court, 183 F. R., 659.

Street Widening—Removal of Buildings

Wheeler vs. City of Sault Ste. Marie.—A city contracting to buy land to widen a street could not undertake with the owner to move his building, make a fill on land retained by him, re-establish fences, etc., nor to indemnify him against risks in moving the building as to persons and property. A city has only such powers as are given it by the Legislature. In acquiring land to widen a street, a city is limited by the modes prescribed by statute and its charter. A city cannot indemnify risks for individuals or other corporations. Supreme Court of Michigan, 129 N. W. R., 685.

Contracts—Fraud—Interest of Officer

Mayor, etc., of City of Ensley vs. J. E. Hollingsworth & Co.—Where in an action on a contract for the construction of sanitary sewers for a city it appeared that the contractor was a firm, a partner of which was a member of the City Council at the time of the execution of the contract, evidence of other bids on the same work was relevant on the issue of fraud in procuring the contract. Where in an action on a contract for the construction of sanitary sewers for a city a plea averred that plaintiff's bid had been fraudulently changed from a bid of 40 cents per wye to \$1.40 per wye after the making of the contract, the testimony of a bidder that his bid of 80 cents per wye was the highest bid, was admissible to show that plaintiff's bid had been changed. A contract by a City Council with a firm, a partner of which is a member of the Council, for public work is not invalid, in the absence of a statute, where it is free from fraud, and where the partner did not vote on the proposition nor take any part in behalf of the city in making the contract. Code 1907, providing that no alderman or officer of a municipality shall be directly or indirectly interested in any work, the expense of which is paid from the treasury, does not apply to a contract made before the adoption of the statute. Supreme Court of Alabama, 54 S. R., 95.

Ordinance—Two Subjects—Review

Lonsinger et al. vs. Ponca City.—Where it is not apparent that the title of an ordinance contains two subjects and the same is not pointed out, the ruling of the trial court upholding the validity of the ordinance will not be disturbed in this court. Supreme Court of Oklahoma, 112 P. R., 1006.

Injuries to Servants of Independent Contractor

Huey et al. vs. City of Atlanta.—The operation of a system of water works is not such a governmental function as that a city is not liable for injuries resulting through negligence in the maintenance thereof. While this business is quasi public, it is not essentially governmental. If the proprietor of premises on which machinery is located employs an independent contractor to repair a particular machine, and the proprietor knows, or by the exercise of ordinary care should know, not only that the machine is out of repair, but that there is some extraordinary latent danger or perilous condition attaching upon the service, and the independent contractor sends a servant to make the repairs (the servant being actually or constructively ignorant of the extraordinary danger), it is the duty of the proprietor of the premises to warn the servant thereof; and for a breach of this duty, resulting in injury to the servant, the latter has a cause of action against the proprietor of the premises. Court of Appeals of Georgia, 70 S. E. R., 71.

Village Election—Insufficient Notice

In re Village of Lynbrook.—A notice of an election on the question of the incorporation of a village, which provides that the election shall be held on a designated date between the hours of 1 o'clock in the afternoon and sunset, is insufficient under Village Law, as amended by Laws 1910, requiring that the polls shall be open from 1 o'clock in the afternoon until 8 in the evening, where on the designated date the sun set 20 minutes after 7, and the election must be set aside, though the notice need not specify the hours during which the polls shall remain open, but, where it purports to do so, it must comply with the statute. The act of the town clerk of a town in leaving on the counters of tradesmen notices of election on the question of the incorporation of a village and in hanging up one notice in a shop is not a compliance with Village Law (Consol. Laws, c. 64), section 10, as amended by Laws 1910, providing that the notice shall be posted in conspicuous places. New York Supreme Court,

Licenses—Exemptions—Charitable Societies

City of Mobile vs. Kiernan.—An indorsement on the back of a petition to the Mobile City Council for exemption from payment of a license fee and for the return of the amount paid, "We will vote to grant this petition," signed by nine members of the Council, was of no legal effect; the legislative authority of the city being vested in the Council as an organized body, whose will could be expressed only as prescribed by law, the members acting severally being able to do nothing. Mobile City Charter empowers the City Council to collect a license tax from all persons or corporations trading or carrying on any business, trade or profession, by an agent or otherwise, within the corporate limits. A charitable society contracted with an amusement company to hold a street fair in the city, the society to furnish the license and to receive a percentage of the receipts. The amusement company was a purely business concern. Held, that the business was subject to a license as well as any other, even if charitable enterprises were exempt. Supreme Court of Alabama, 54 S. R., 103.

Control of Streets—Railroads

City of Memphis et al. vs. St. Louis & S. F. R. Co.—Under the provisions of the charter of the city of Memphis giving it entire control over all the city streets and power "to permit and regulate the laying off of railroad tracks and iron and the passage of railroad cars," vesting in the City Council charge and control of the granting of all franchises and special privileges, and providing that "no franchise shall be granted or sold to any commercial railroad . . . or other quasi-public corporation except by ordinance fully guarding and protecting the rights of the public," in the absence of direct legislative authority, a railroad company has no right or authority to build or maintain a track within the city and over its streets without the consent of the Council, and where the Council has granted such right by an ordinance, subject to certain conditions, one of which is that the company shall file a written acceptance of its provisions, such ordinance is an entirety, and its acceptance is a condition precedent to the grant. United States Circuit Court of Appeals, 183 F. R., 529.

TANKS AND STREET KETTLES

NEED OF STORAGE CAPACITY

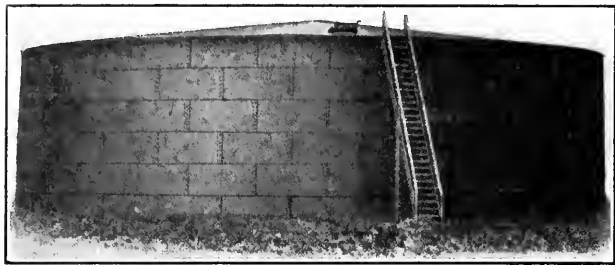
The remarkable increase in the amount of bituminous road construction brings to the front the question of ways and means of handling the bitumen. In the discussions of road making the value of asphalt and tars depending on their physical and chemical constitution is argued ad infinitum, but possible economies through the choice of the best means for handling the bituminous materials are generally overlooked. Ordinary construction tools and machinery play a subordinate part in the new method of road making and an unfamiliar class of appliances are of the greatest importance—namely, tanks. That the supply of this

tank cars and kept standing, under a demurrage charge to the owner of the tank. If the amount of work under control is large and likely to be duplicated in succeeding years, as in the case of a well established local contractor or a municipality doing its own work, the use of one or more storage tanks will be found to pay. In addition to security of supply, if the tank is properly placed there is considerable economy effected in handling from the car in which the material arrives to the tank wagon or whatever device is used to deliver it on the work.

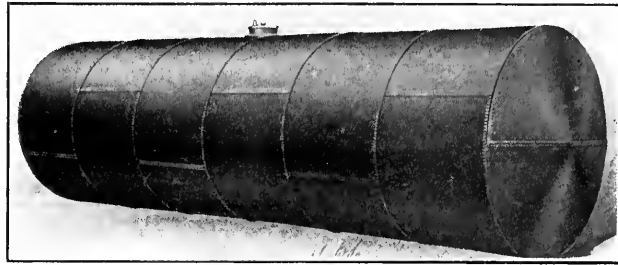
GENERAL CONSIDERATIONS

In choosing storage tanks the shape and number of tanks has to be consid-

though a light oil or tar is used, heating will facilitate the work in cold weather, permitting construction to go on under conditions otherwise impossible. A drip to draw off water should be provided. The amount of water that condenses in such a tank is surprisingly large, and if the material is to be heated up to 212° F. the trouble with foaming may be such as to stop the work. Of course if the bitumen is handled at a lower temperature than 212° F., the water will do no harm. But in a permanent installation both contingencies should be provided for. The choice of a valve for drawing off has to be considered. Gate valves are objectionable, as they may stick, and a workman in



LARGE STORAGE TANK MADE BY THE PETROLEUM IRON WORKS CO.



6,000 TO 12,000-GALLON STORAGE TANK, MADE BY WARREN CITY TANK AND BOILER CO.

sort of equipment has not kept pace with the demand is the evidence of contractors who have had work to do, particularly in places far from the great cities.

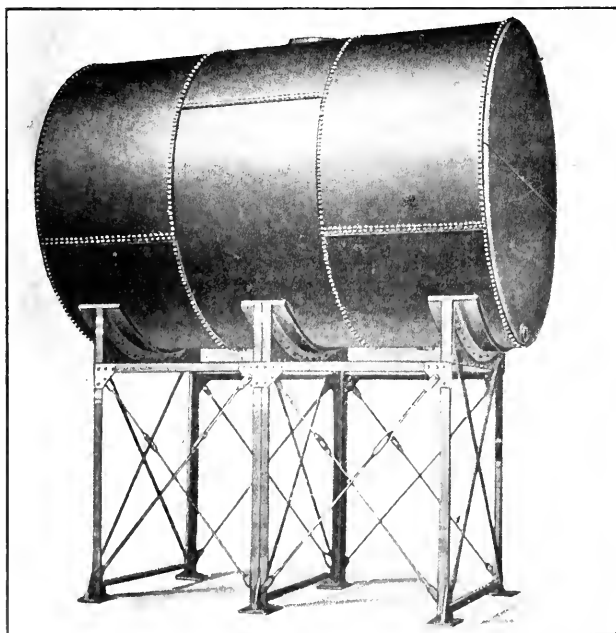
Of course if details are gone into fine enough no two jobs are alike or require the same equipment. There are few pieces of bituminous road work, however, that can be carried on without some provision for storage. Lack of storage means idle men and needless expense or the disintegration perhaps of a well organized force of men when the supply gives out. The need of storage may be supplied by keeping barrelled material on hand on vacant lots along the line of the work. Or the tar or asphalt may be purchased in

ered. The shape will depend on the location, the difference in level between receiving and shipping points, as well as considerations of cost of the different styles. Whether one tank is sufficient is another question to be decided. For an equal storage capacity, one tank is the cheapest. But if two or more tanks are set up, different kinds of material, as tar and asphalt, may be handled at the same time. As to the size of storage tank, considerably more than the capacity of one railroad tank car, about 7,000 gallons, should be provided. Ten thousand gallons is the least capacity worth considering, and where anything like continuous work is in sight twenty thousand gallons is not any too much, even for a town of moderate size.

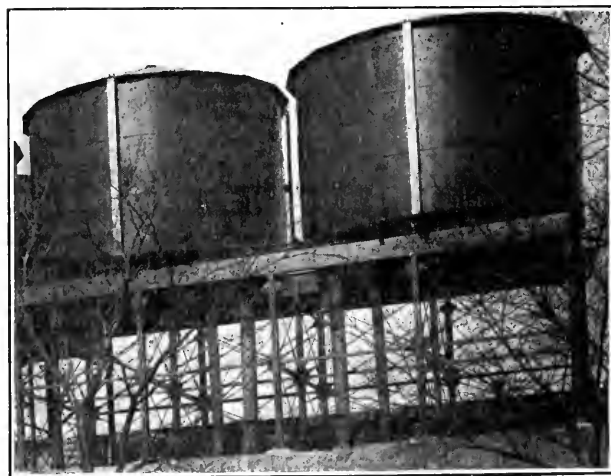
Among the important accessories of a storage tank are steam coils, for even

his hurry may twist off the stem. A common plug valve is cheaper and better.

Probably the first inclination of a contractor or city official who has decided to buy a storage tank for road oil is to direct inquiries to the nearest boiler maker. This, however, is not likely to be the best thing to do. Tank making is not ordinary boiler making. Tanks are made of quarter-inch steel, or about that thickness, furnished in large plates, five feet wide and from six to nine feet long. The large sheets, besides making a better tank, avoiding chance of leakage, are more desirable economically, as requiring less riveting. A tank maker may have the sort of tank that is required on hand, at any rate he is in a position to make it promptly. The prospective purchaser might think that the item of freight would prohibit any but the nearest tankmaker from being a successful bidder, but such is not necessarily the case. Manufacturers frequently supply tanks to points hun-



ELEVATED STORAGE TANK, 6,000 TO 12,000 GALLONS, MADE BY WARREN CITY TANK AND BOILER CO.



STORAGE TANKS ELEVATED ABOVE RAILROAD, MADE BY CANTON BOILER AND ENGINEERING COMPANY

hundreds of miles distant from their plants. The accompanying illustrations show a variety of storage tanks built by companies to whom the *Municipal Journal* has directed inquiries. Most of the manufacturers state that they build tanks to meet the requirements and under the specifications of the purchaser. The Warren City Tank & Boiler Company, however, state that they keep on hand at all times cylindrical tanks of from 6,000 to 12,000 gallons capacity. Some of these are already equipped with heating coils of proper design. Among the companies that state that they are ready to supply at short notice tanks of from five barrels to 65,000 barrels capacity are the Petroleum Iron Works Company, the Treadwell Construction Company, the Canton Boiler and Engineering Company and William Graver Tank Works.

A peculiar system of storing and handling road bitumens has been developed by S. F. Bowser & Co. A heavy steel tank is buried underground located so that it can be filled immediately by gravity from the tank car—a quick and cheap method. A Bowser rotary pump is recommended for drawing the liquid from the storage tank into wagons or kettles which are to carry it to the work. The pump need not be installed close to the tank. This system is in use in Milwaukee.

TANK WAGON

From the storage tank, in the ordinary routine of work, the bituminous material is transferred to smaller tanks which serve as heaters, as means of transportation and as distributors or for all these purposes to a varying extent. A tank made by the Barrett Manufacturing Company, of which a reproduction and diagram are shown, answers all these purposes very well when it is convenient to handle so much material at one time. Its capacity is 600 gallons. This outfit consists of an ordinary but very substantial running gear carrying on semi-elliptical springs, a framework, suitably braced, of which the principal parts are two 6-inch I-beams, 10 feet 7½ inches long reinforced with a wooden filler. As the whole equipment with load weighs nearly 9,000 pounds the heavy springs and frame are essential to durability. The tank is 9 feet long and 42 inches in diameter. It sets up above the I-beams, being supported by four brackets on each side, riveted to the tank. There is a firebox under the tank at the rear and a flue running the whole length and a stack at the front side of the driver's seat to give proper draft. As the tar is delivered into the tank hot only a small fire is necessary and the direct exposure of the tank to the heat does no harm. The firebox is of cast iron, 23 inches deep and 20 inches wide. The pipe for drawing off is placed as near the bottom of the tank as possible. On top of the tank is a manhole for use during cleaning, a plug and flange at the opening

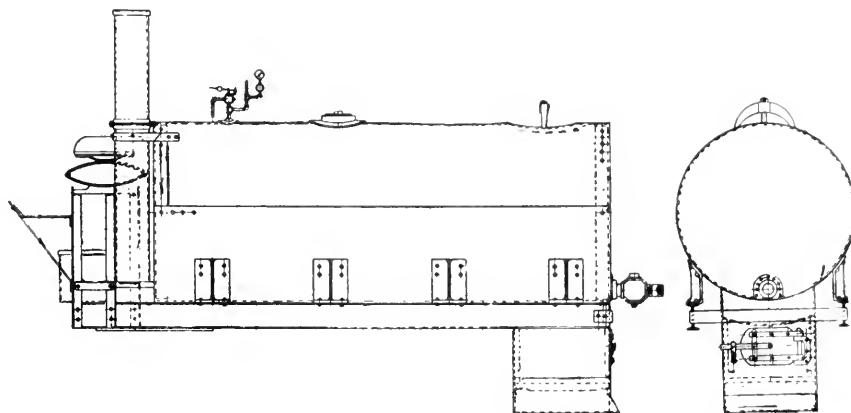


DIAGRAM BARRETT MFG. CO.'S TANK WAGON, WITH FURNACE

where the tank is filled, a pressure gauge, a blow-off valve and connections for compressed air or steam.

The reproduction shows a side view of the tank wagon which is being drawn by a road roller spreading heavy tar via with special spray nozzles, using air pressure. A galvanized iron hood, to protect the spray from wind, covers the nozzles. This arrangement spreads a strip about 7 feet wide. The quantity used per square yard is regulated largely by the speed of the roller.

The distinction between this Barrett tar wagon and an ordinary watering cart used for transporting and distributing oil is perhaps rather a line one. For if the tank of the watering cart is of steel and strong enough to stand a pressure of 20 pounds to the square inch the function performed may be the same. In fact, the Barrett wagon is frequently used in this way without any fire and the wagons are also built without the fire box. But as this article is confined to the consideration of storage tanks and kettles, tank wagons, having no means of heating attached, will not be further considered.

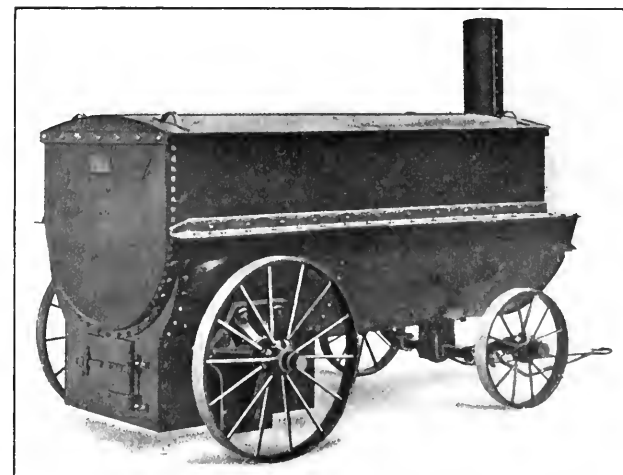
CAPACITY AND SHAPES OF STREET KETTLES

Before taking up the different types of street kettles, in the more restricted meaning of appliances for heating and aiding in the distribution of tar and asphalt, some general considerations should be borne in mind. First, there is the question of capacity—this means both quantity contained and amount that can be heated, depending on the efficiency of the firing arrangements—grate area and area of surface exposed to the heat. In making quick estimates of capacity certain units easily kept in mind are sufficiently accurate for rough estimates. The amount of bituminous material needed is best figured in fractions of a gallon per square yard

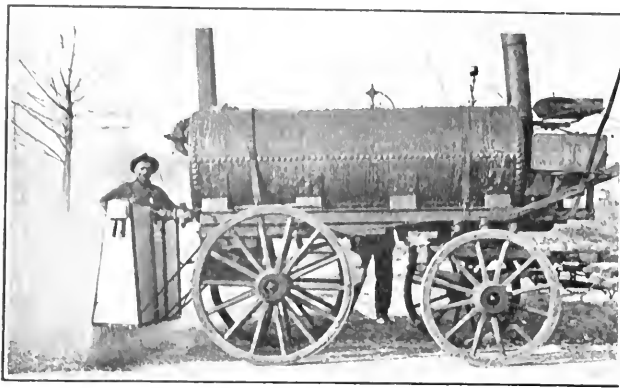
of work. In figuring the capacity of the tank a barrel, assumed to measure fifty gallons, is the ordinary unit. One-barrel tanks are the smallest used and ten-barrel tanks the largest. How many times a tank may be heated up in a day is hard to say, as skill in handling and the nature of the materials vary so much. Three hours allowed for the first tank in the morning and two hours for the succeeding tanks would be fair work. The first tank should be fired up by the watchman and ready for use when the men come to work. About five tanks a day should accordingly be heated. Referring to our units then, with a ten-barrel tank on work requiring half a gallon to the square yard, 1,000 square yards of roadway should be covered for each tank used. The matter of the durability of the tank is an important one. In this connection, it is interesting to note the great improvement made in street kettles in recent years. The weak points of all kettles are the running gear, including the handles or device by which it is drawn, including the joint to the axle, and the bottom of the kettle which is exposed to the heat. Old style kettles were rectangular, drawn on four wheels with frame and kettle proper riveted in one structure. The wheels were small and wore out at the axles. The handle and hooks were continually breaking and the bottom when it burned out was expensive to replace. After one or two years' time extensive repairs were necessary. In the kettles illustrated, these defects have been to a large extent overcome. In small kettles two large wheels are now used. This not only decreases the wear on the axles and hubs, but decreases the strain on the handle and hooks during transportation. In the case of



F. H. EVANS' RECTANGULAR STREET KETTLE



JOS. HONHORST'S 500-GALLON STREET KETTLE



BARRETT MFG. CO.'S TAR WAGON IN OPERATION

four-wheeled kettles larger wheels than formerly are used and a substantial fifth wheel added. To decrease the danger of burning out the bottom of the kettle, the pot, is made detachable so that it can be taken out, heated over a fire or burned out with the aid of kerosene. In one of the kettles described a cast iron bottom is used, and in all cases the material chosen for the melting pot is carefully selected.

CARE OF KETTLES

A few words regarding the care of kettles with a view to prevent burning out. The destructive influences at work on the bottom of the kettle are the same as those which tend to destroy a steam boiler, and the remedy is the same, namely, keep the metal clean. To keep it absolutely clean is hardly possible, to keep it practically clean only requires due attention and the use of proper tools. All tars and most asphalts contain dirt and carbon which settle to the bottom and form coke. Besides, street dust blows in and adds to the sediment. Coke even to a considerable depth may accumulate in the kettle, unsuspected by a superintendent not thoroughly familiar with the peculiarities of tar kettles. The scale cannot be detected by ordinary sounding with a bar. Even if the tank is emptied and observed it is not easy to distinguish between the coke and the steel bottom. Use of a cold chisel and a hammer will disclose the facts. For cleaning kettles a chisel-faced tool two or three inches wide with a handle about two and a half feet long is very useful. The kettle should be cleaned daily with such a tool, and once or twice a week, according to the nature of the materials used, it should be removed from the frame and completely burned out and

gone over with a chisel and hammer if necessary. The saving in fuel will pay the cost of cleaning, to say nothing of the life of the kettle, which could be prolonged indefinitely if kept absolutely clean.

LARGE STREET KETTLES

The largest portable kettles made are of 10-barrel or 500-gallon capacity. We illustrate two of these, both of which answer the same purpose, but vary in construction and design. The Jas. Honhorst Co.'s four-wheeled tar wagon is constructed of 1/4-inch steel plate throughout. The firebox is large in size, made to burn coal or wood and is provided with heavy cast iron grate bars and heavy inside lining of 3/8-inch steel plate. The front end of firebox extension has double doors hinged on so that the space between kettle bottom and inside can be thoroughly cleaned from end to end. The rear end has large size fire door hinged on with full length strap hinges and latch. The smoke stack is fitted over nozzle, riveted to top of firebox projection at front. The shell of firebox extends semi-circular up around the sides of kettle, thus making a quick and easy heater. The kettle is semicylindrical in shape with end heads flanged and riveted in and is stiffened on each side full length, with 2 1/2-inch angle iron, also around the top with 1 1/2-inch angle and cross-stayed with two 1/2-inch rods passing through pipe. The kettle is bolted to firebox at side angles and the front end has a 2-inch flange with nipple and draw-off cock. The rear axles are of heavy cast-iron bracket type, with larger taper machine steel spindles cast in by having the casting poured around same, in mold. These are securely bolted to sides of firebox through the outside shell and the inside 3/8-inch lining. The front axle is a 2 1/4-inch square steel forging with eye at center and a steel pin passing through fifth wheel, which is so constructed that the weight on same is distributed between the shell of firebox and the bottom of kettle. The wheels are 24-inch and 42-inch diameter, all-steel, with extra long hubs, bored to suit taper of axles, staggered wrought spokes and welded rims with extra steel tire shrunk over outside and riveted. This outfit is furnished complete with a cover made of



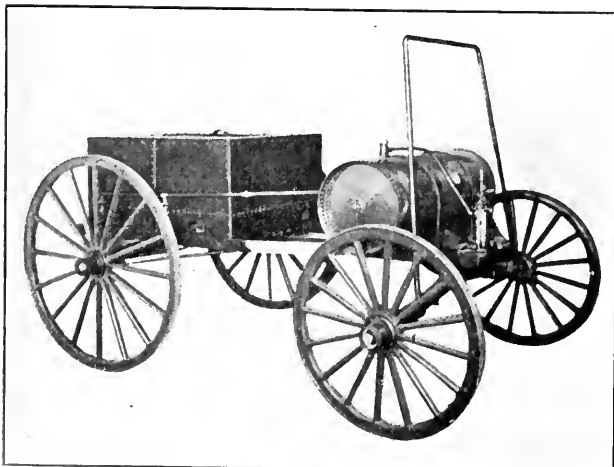
TIDEWATER IRON WORKS 500-GALLON STREET KETTLE

sheet steel, arched and reinforced underneath and edges projecting over sides and ends. Each part of cover has two handles. The front axle has a yoke or tongue attached to clips and with turned eye in middle for coupling to rear of supply or tool wagon.

The other kettle of the same class is made by the Tidewater Iron Works whose officers have been closely associated with the paving business for many years, with the result that their design embody many ideas of practical men. The kettle is so made that horses can be quickly attached to it. Racks for carrying wood, which have been built on top are a great convenience, providing means for overcoming the difficulty of keeping material hot on long hauls. The boiler can be replaced without sending whole kettle to shop for repairs. Both running gear and kettle are substantially constructed throughout.

The Tide Water Iron Works also make a combination tar kettle and gravel heater which might be useful in road work as well as for repairs to granite paving, for which it was built. One fire furnace both hot tar and gravel. Over the firebox in front of the kettle proper is a structure made of perforated iron plates, showing in cross-section like an inverted V. Baffle plates arranged outside of this form pockets for the gravel or broken stone. These baffle plates, however, are not brought close to the perforated plates, but an opening is left so that the gravel, thrown in cold at the top, is taken heated from the bottom. The whole apparatus is mounted on two large wheels and can be drawn about easily.

A peculiarly constructed kettle is made by Walter Macleod & Company. The tar is heated by means of oil burners placed



WALTER MACLEOD COMPANY'S OIL-HEATED STREET KETTLE



SMALL ELLIPTICAL KETTLE, TIDE WATER IRON WORKS



CANNERY & CO.'S SMALL ELLIPTICAL KETTLE

der a tank. The capacity of these machines varies from 50 to 200 gallons. An tank is carried in front of the wagon; pressure supplied by a hand pump feeds the fuel to the burners. The ordinary consumption of kerosene is stated to be two or three gallons per hour. The price is claimed to eliminate the smoke nuisance which often makes street kettles so offensive. However, the nuisance of a tar or asphalt kettle is caused almost wholly by the practice of burning the staves of the barrels in which the material comes. This is easily avoided by burning the staves. When fuel costs money and barrel staves are to be had for nothing, it is hardly in human nature to use them. With the oil-burning kettle they cannot be used.

SMALL KETTLES

In connection with road construction there are thousands of gallons, perhaps, used daily, it would seem at first sight that small kettles of one or two barrels capacity would be of no use. Wherever there is new work there are always roads to follow, and even in new construction there are small sections to do, as at intersections. For this reason there seems to be no doubt that small kettles find an extensive use. The cost of transportation and the deterioration of material when heated for a long time make large kettles undesirable for doing all pieces of work. The type of kettle that have been developed in connection with asphalt paving repair work will probably best answer the purpose, as they have been built to meet the conditions. The small kettles herewith de-



IROQUOIS IRON WORKS' SMALL ELLIPTICAL KETTLE

scribed will, therefore, interest those who have the construction and maintenance of bituminous roads under their charge.

The Iroquois Iron Works makes a rectangular heating kettle of one, two or three barrel capacity, equipped with two steel wheels 48 inches in diameter, with 4-inch rim and wrought-steel spokes. The wheels are mounted on a heavy steel axle fastened securely to the bottom of the kettle. The furnace is provided with sheet-steel bottom, No. 12 gauge. A tongue is riveted to the tanks at the proper height for hauling the kettle, and a wrought-iron rest with a foot is provided. The most frequently encountered difficulty in working with kettles, namely, clogging of the faucet by cold material, has been overcome by placing the faucet inside the kettle. This is shown in the cut. The three sizes of kettles weigh 650, 750 and 910 pounds, respectively.

Iroquois asphalt and tar kettles are also made elliptical in form, of 1/4-inch tank steel, riveted to heavy angles at the top and bottom and are made in 100-gallon capacity. General dimensions: Length, 44 inches; width, 33 inches; depth, 30 inches. Fire door of sheet steel is located at rear near bottom, and is equipped with heavy wrought-iron hinges, lugs, latch, etc., and has an opening of 13 1/2 by 8 1/2 inches. A cast-iron elbow is riveted to kettle on front end at top, to which is attached the smoke stack, which is of No. 16 steel, 36 inches in height, with properly designed supports. The kettle is equipped with cast-iron grates. The asphalt tank is made of same material as kettle and is supported by angles, tank dimensions being 27 1/2 inches wide by 38 inches long by 28 inches in depth; bottom is of cast iron having raised in center and properly ribbed to prevent warping, and is riveted in. The weight of the elliptical kettle, two-barrel capacity, is 1,420 pounds.

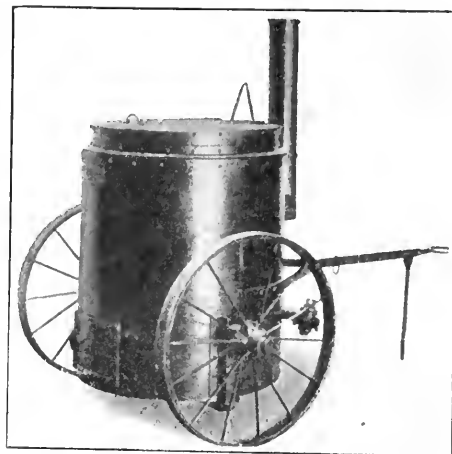
Cannery & Company make a 100-gallon wheel kettle which weighs 625 pounds. It is 42 inches high, made of No. 12 firebox steel and has a 2-inch solid crank axle. The sides are reinforced. The wheel track is 5 feet 2 inches wide. Wooden wheels are also furnished if preferred. This company also makes a 150-gallon rectangular kettle with four wheels.

F. H. Evans, who has been manufacturing kettles for roofers for 25 years, makes a portable tar heater shown in the illustration. The angle-iron frames are welded and the sides are double. They are claimed to be very rapid heaters. There is a 2-inch valve to draw off pitch, not shown in the illustration.

The Tide Water Iron Works make a rectangular kettle which they claim is the most substantially built one on the market. It is built of No. 12 steel throughout. The firebox measures 30 by 24 inches. The wheels are 11 inches in diameter and have 3-inch tires. This kettle is made in three sizes, 50, 100 and 150 gallons capacity.

Joseph Honhorst Company makes two styles of elliptical kettles, A and C. The best of these, style C, is shown in the illustration. It is made in 50, 60, 75, 90, 100 and 125-gallon sizes.

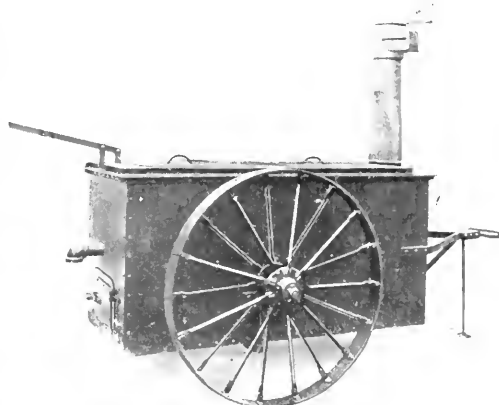
The outside shell or firebox is made of one continuous plate of special firebox steel thoroughly riveted and reinforced at bottom and top with angle-iron ring riveted in place. The bottom is covered with heavy sectional cast-iron grate bars, which rest on and are secured to bottom angle bearing bar. The front has a cast-iron smoke elbow connected to shell near top and fitted with full length 6-inch sheet-steel smoke stack. This ar-



JOS. HONHORST'S SMALL ELLIPTICAL KETTLE

angement causes all the heat to travel up and around the kettle before escaping. The back of firebox has a large size plate-iron fire door hinged on with wrought iron strap hinges and fitted with lever latch. The doors on small size kettles are equipped with drip guard over top to prevent contents of kettle splashing into fire. The kettle is made of blue annealed soft tank steel, and has a tapered shape with heavy boiler-plate bottom securely riveted in. All seams and joints are thoroughly riveted and caulked proof against leaks of melted tar. The top edge of kettle is reinforced with heavy angle-iron flange on outside which fits into top of firebox, thus suspending kettle so that heat has full play on all sides and bottom. A 2-inch draw-off flange with nipple and stop cock is fitted to shell of kettle close to bottom, which does away with the old method of dipping out over top of kettle. The kettle has a hinged cover of heavy sheet iron which is provided with bracket rest and handle. The outfit is mounted on a heavy square steel drag-axle which passes under firebox, so that there is no danger of kettle tipping back or upsetting.

The wheels are all-steel design, having welded wrought-steel felloes with 3-inch welded wrought-steel tires shrunk over outside and riveted. The spokes are oval wrought steel, staggered into hubs and swaged and riveted into felloes so that grease, heat and vibration have no destructive effect. Front of kettle has a wrought-iron tongue securely riveted to shell of firebox and provided with large eye at outer end for coupling to rear of tool or supply wagon. This tongue is fitted with improved safety locking tongue rest, which prevents the kettle from moving while in use. The tongue shaft also has a loose link for holding rest while kettle is in motion.



IROQUOIS IRON WORKS' SMALL RECTANGULAR KETTLE

NEWS OF THE SOCIETIES

Good Roads Association of Livingston County, N. Y.—The largest good roads meeting of the year in New York State was that held at Geneseo, March 3, in the Village Building. Frank McGuire, of the State Highway Department, speaking of culverts, said that it was a waste of money to construct concrete culverts where roads have not been improved and that only temporary culverts should be built. C. B. Perry, State Highway Department, spoke of dangerous places in highways. The proper placing of a guard rail where there were ditches concealed by vegetation would have prevented many accidents last year. Mr. Perry made the interesting statement that 90 per cent of the State aid money came from the cities.

Northwestern Cement Products Association.—The seventh annual convention was held at Minneapolis, Feb. 28-March 1. The meetings were well attended and much interest was shown. The address of welcome was made by Wallace G. Nye, secretary of the public affairs committee of the Commercial Club. President H. E. Murphy responded. The following addresses were made: Ernest McCulloch, Chicago, on the subject of stucco finishes. C. M. Powell, assistant engineer Portland Cement Company, on cement tile drain. A. A. Pollard, Minneapolis, on economies in concrete construction. Martin T. Roche, on marketing cement products. Capt. George W. Freeman, United States Engineer, gave an account of the proposed high dam on the Mississippi River between Minneapolis and St. Paul. The dam will have the lock on the Minneapolis side, and powerhouse on the St. Paul side, and will develop about 15,000 horsepower for 228 days a year. The estimated cost is \$800,000. Charles E. Sims, Worthington, Minn., spoke on the manufacture of cement drain tile. James G. Houghton, inspector of buildings, Minneapolis, spoke on reinforced concrete construction. W. E. Martin discussed the question of the proper paint for concrete surfaces.

Congress of Technology.—Among the papers to be presented at the fiftieth anniversary of the granting of the charter to the Massachusetts Institute of Technology will be the following: "Sewage Disposal with Respect to Offensive Odors," by George M. Fuller, M. I. T., '90, hydraulic and sanitary engineer, New York City; "The Massachusetts Institute of Technology's Part in Water Purification and the Present Status of the Science," by George C. Whipple, '89, consulting engineer.

American Institute of Architects.—A committee of the Washington, D. C., Chapter has made a report and recommendations to the Chamber of Commerce regarding the future development of Washington. Besides recommending that the spirit of the Park Commission's plan be carried out in the development of Washington, the committee specifically urges that the Lincoln memorial be placed on the bank of the Potomac River, on the axis of the Capitol and the Monument; that Rock Creek Valley be made a park, and that the banks of the Potomac River be acquired as part of the Appalachian forest reserve provided for in a bill passed by Congress. Steps will be at once taken to enlist the aid of the commercial bodies of the United States in influencing Congress to favor the plan.

Massachusetts Civic Conference.—The Conference held its annual meeting March 2 with sessions at the rooms of the Twentieth Century Club and an evening session in Channing Hall, Unitarian Building, Boston. The time was occupied with discussions of play, physical education and playgrounds. At the evening session Joseph Lee presided. Dr. Edward W. Stitt, district superintendent of public schools of New York City, spoke on the use of the public school buildings as recreation centers, saying: "Hitherto not enough use has been made of the public school buildings. In most cities they are used only about 1000 hours a year. This amount must be increased at least 200 per cent."

Dr. Stitt urged as the objects:

To keep children and young people from street dangers; to prevent formation of habits of idleness; to teach city children organized play; to encourage reading of good books, magazines and morals of young people in places where bad language and evil companions are forbidden; to make children play fairly, honorably and honestly; to bring real happiness to many children who are deprived of the pleasures which are the rightful heritage of children.

Dr. Stitt's suggestions were:

"Install bowling alleys in waste places in cellars of large school buildings; make larger use of auditoriums for public meetings; encourage mixed dancing classes in school halls; give moving picture shows at least once a week; maintain information bureaus in many schools from 7 to 9 p. m.

Dr. Howard Bradstreet, director of the bureau of recreation, park department, New York City, spoke on "A System of Public Recreation for a City." He said in part:

"The playground is more than a place for amusement. It can and should be a factor in constructive development of citizenship. While the city may easily provide pure water, milk, police or fire protection, it is not easy to make appeal to the free will of a very self-willed part of the community, and more than a commissioner is necessary. The governing board should contain a citizen representation."

At the morning session the speakers were Joseph Lee, president of the Playground Association of America, whose subject was "What Play Means," and Ernest Hermann, superintendent of playgrounds and director of physical education in Cambridge, who spoke on "Playgrounds for Children Under 10."

Association of County Highway Commissioners of Wisconsin.—An association with this title was formed at Madison, Wis., March 3. The following officers were elected: President, George F. Post, Spring Green; vice-president, F. M. Sargeant, Ladysmith; secretary and treasurer, Prof. W. O. Hotchkiss, Madison.

The association listened to Senators J. S. Donald, of Mount Horeb; Timothy E. Burke, of Green Bay, and E. E. Browne, of Waupaca, who explained the highway bills pending before the Legislature. Assemblyman L. E. Gettle, of Edgerton, also spoke on the subject. The association appointed a committee which drafted resolutions expressing the views of the association on the creation of an unpaid state highway commission and the subject of good roads.

Kensington, Pa., Board of Trade.—Clean streets and more lights were leading subjects of discussion by members of the Kensington Board of Trade at their annual meeting last week. The reports of William T. Weir, Jr., secretary, and Robert McNeil, treasurer, show the organization to be in excellent condition. Among the improvements pointed out in the secretary's report were the 19 new electric lights that have been secured for Front street and Kensington avenue, the opening of North Front street, the opening of Pennsylvania station at Front and North streets and a general increase in business. The following were elected officers: President, A. C. Keeley; first vice-president, Samuel Reinheime; second vice-president, Gustav Lischuetz; third vice-president, John Reynolds; treasurer, Robert McNeil; secretary, William T. Weir, Jr.; corresponding secretary, Harry Derbyshire.

Playground Association of America.—April 6, 7 and 8 have been chosen for the Playground Association of America as the dates for the playground institute to be held in Minneapolis, Minn. At this meeting representatives will be present from Wisconsin, Illinois, Iowa, Kansas, Missouri, Nebraska, North and South Dakota and Minnesota. Prominent speakers will lecture on the organization and administration of the association from different cities where they are now located and visiting members will discuss topics of general interest. Those prominently connected with the national association are President Theodore Roosevelt, Hon. Joseph Lee, Mrs. Lovell White, Jack Riis and many other noted social and educational workers.

Montclair Municipal Art Commission.—The Art Commission organized as a subsidiary to the Montclair Civic Association, has submitted its final report to the directors of the parent body. The report, which was prepared by Emerson P. Harris, told for what purpose the commission was organized—the beautifying of Montclair—and said that there was no further need for its existence. The Montclair Art Association, the report stated, had taken charge of the \$50,000 gift for an art museum made by Mrs. Lang. The further work, it was stated, could best be done by a special committee of the Civic Association named for this purpose. The report was accepted and the commission discharged, with thanks.

Massachusetts Highway Association.—Added interest in the coming conference on street cleaning, to be held in this city in May, is occasioned by a announcement that the quarterly meeting of the Massachusetts Highway Association will take place here on the same day and in connection with the conference. The committee of arrangements has decided on May 11 as the date of the conference and the headquarters of the Board of Trade as the place. There will be morning and afternoon sessions and possibly a special event in the evening. The members will meet in Worcester and travel by automobile over roads built last year by the Highway Commission, Springfield. There will be a paper read at the afternoon meeting on "City Ordinances, Police Control in Street Cleaning Work," prepared jointly by James H. Sullivan, Division Engineer, Boston Street Department, and Superintendent Arthur A. Adams, Springfield.

Calendar of Meetings

ch 21-22.
New York State Railroad Association.—Quarterly Meeting, Syracuse, N. Y.—Gordon Real, Secretary, Kingston, N. Y.
 11 6-8.
American Electrochemical Society.—Annual Meeting at New York City.—Secretary, Joseph W. Richards, Lehigh University, South Bethlehem, Pa.
 7.
City Commission Congress.—Meeting. Galveston, Tex.—Mayor Lewis Fisher, Chairman of Committee, Galveston, Tex.
 7 11.
Massachusetts Highway Association.—Quarterly Meeting in conjunction with the New England Conference on Street Cleaning, Springfield, Mass.
 7 18-19.
Ohio Society of Mechanical Steam and Electrical Engineers.—Annual Convention, Youngstown.—F. E. Sanborn, Secretary, Ohio State University, Columbus.
 7 29-June 3.
National Electric Light Association.—Annual Convention, Engineering Societies Building, New York, N. Y.
 e 6-10.
American Water Works Association.—Thirty-first Annual Convention, Powers Hotel, Rochester, N. Y.—John M. Diven, Secretary, 14 George street, Charleston, S. C.
 e 11-16.
International Association of Chiefs of Police.—Eighteenth Annual Convention, Rochester, N. Y.—Major Richard Sylvester, Superintendent of Police, Washington, D. C., President.
 e 13-18.
New York State Association of Chiefs of Police.—Annual Convention, Rochester, N. Y.
 e 13-16.
American Society of Civil Engineers.—Annual Convention, Chattanooga, Tennessee.—Charles Warren Hunt, Secretary, 20 West 57th St., New York.
 ober 4-6.
League of American Municipalities.—Annual Convention, Atlanta, Ga.—John MacVicar, Secretary, Des Moines, Ia.

PERSONALS

BUDD, W. E., has been appointed Treasurer of the Asphalt Block Paving Co. Toledo, Ohio.
 COLLINS, WALTER L., has been elected President of the Boston City Council.
 DONKIN, DENNIS P., Assistant Fire Chief of Saratoga Springs, is dead.
 CRAIG, WILLIAM J., has been re-elected Mayor of Victoria, Tex.
 DALLACH, A. C., has been chosen Mayor of Wenatchee, Wash., by the City Council succeeding C. B. Halbert, resigned.
 DILLMAN, S. M., a civil engineer of Toona, Pa., has been appointed by the Mayor to assist in making tests of paving brick to be used in the city.
 DOBBINS, JOHN W., has resigned as a member of the Board of Health of New York, N. J.
 DUNWOODY, C. E., a chemist of the Inselear Institute, of Troy, N. Y., has been appointed to take charge of the purification plant at Erie, Pa.
 ELVERSON, JAMES, JR., has been appointed a member of the Park Commission of Philadelphia, Pa., to succeed his father, the late James Elverson.
 ENGLAND, CHARLES, has been elected Chairman of the Sewerage Commission of Baltimore, to succeed the late Gen. Ter Leary, Jr.
 FERGUSON, CHARLES S., former City Engineer, has been appointed Superintendent of the City Water Works of Dayton, Ohio.
 FORD, FREDERICK L., City Engineer of Hartford, Conn., who has been in the service of the city for the past fifteen years, has resigned his position, to take effect April 1, and will go into business as a member of the engineering firm of Ford, Buck & Sheldon.

FORSYTHE, DR. A. A., has been re-elected Mayor of Monroe, La.

FROMELL, DR. BERTHA F., has the distinction of being the first woman ever elected to the Board of Health of Fairhaven, Mass.

FUERTES, J. H., of New York, an expert hydraulic engineer, has been engaged in making an examination of conditions in Cumberland, Md., in connection with a new water supply, and has made his recommendations to the Mayor.

GAILBREATH, W. M., has been elected Mayor of Gainsboro, Tenn.

GOLDEN, P. N., of New York City, has been appointed Superintendent of the Middletown, Conn., electric plant.

HAYES, ROWLAND B., has been appointed Playground Expert by the Playground Association of America. He will spend most of his time in New York, but will visit cities all over the country with a view to giving assistance and helpful suggestions. He will shortly visit Utica, to make an investigation.

KELLY, DAVID I., has been appointed an Assistant Fire Marshal of New York City.

KLOPFER, HENRY, has been appointed Chief of Police of Fremont, Ohio.

SMITH, THOMAS S. A., has been appointed Street Commissioner of Metuchen, N. J.

NAKUINA, MRS. EMMA M., an American woman now living at Kalihi, has made herself a power in Hawaii. She holds an unusual position in the Territorial Government. She is a water rights commissioner, acting as judge to decide cases where the rights are in litigation, and is considered an able and just official. She is the great-granddaughter of Captain Metcalf, of the *Eleanor*. Of distinguished ancestry on both sides, well educated and possessing literary ability, she is deeply interested in the welfare of the Hawaiian people.

PARKER, J. C., has been re-elected Mayor of Bemidji, Minn.

STECKLER, CHARLES, has been appointed by the Mayor as a member of the Court House Commission of New York City, an honorary body appointed to select the site for the proposed new county court house.

SMALLEY, JOHN D., of Hammond, Ind., for six years controller of Hammond, has been advanced to the office of Mayor, with the appointment of Lawrence Becker as judge of one of the new superior courts.

WALLACE, JOSEPH McD., has retired as Assistant Cashier of the Boyle Bank and Trust Company, after having held the position for forty-three years, to become Mayor of Danville, Ky. He has been chosen by the City Council to succeed Mayor Woolfolk, who resigned.

WARNER, C. A., has been appointed City Engineer of York, Pa.

WAY, GUY, Chief of the Fire Department of Muncie, Ind., has resigned.

MAYORALTY ELECTIONS

MAINE

Auburn—Irving L. Merrill.
 Bath—Frank A. Small.
 Eastport—Walter J. Garnett.
 Ellsworth—Chas. A. Leland.
 Gardner—Bert E. Lamb.
 Hallowell—Emory O. Veane.
 Lewiston—Frank A. Morey.
 Rockland—G. Herbert Blethen.
 Saco—Walter J. Gilpatrick.
 South Portland—John A. S. Dyer.
 Waterville—Wm. R. Pattangal.

VERMONT

Burlington—Robert Roberts.
 Montpelier—S. S. Balarid.
 Rutland—P. W. Clement.
 St. Albans—S. V. Green.

TRADE NOTES

Cast Iron Pipe.—Chicago: There is an increased demand for pipe from small municipalities. Gas companies are purchasing freely. Quotations: 4-inch, \$25.50; 6 to 12-inch, \$24.50; 16-inch and up, \$24. Birmingham: Announcement of a number of large lettings from Southern cities has been received and the demand for small lots continues good. It is expected that producers will insist on higher prices than have been quoted heretofore. It is understood that all plants will soon resume operations at normal capacity. Quotations: 4 to 6-inch, \$22; 8 to 12-inch, \$20; over 12-inch, average, \$19. New York: The general demand continues quiet. Prices appear to be no stronger. Quotations: 6-inch, car loads, \$21 to \$22.

Lead.—Market decidedly unsatisfactory. Quotations: New York, 4.40c.; St. Louis, 4.25c.

House Fly Campaign.—The Educational Exhibition Company, 70 Waterman street, Providence, R. I., have prepared material for use in sanitary campaigns against the house fly. The simplest of these are rubber stamps, for which various uses are suggested, such as prizes for essays by school children. A set of 35 lantern slides have been prepared for illustrating lectures.

Auto Patrols.—The Police Department has put in commission two auto-patrol wagons, made by the Studebaker Brothers Manufacturing Company, South Bend, Ind. Each machine can carry 12 people. Other details are: Speed, 45 miles per hour; horsepower, 48; wheel-base, 120-inch; wheels, 36-inch diameter; tires, 5-inch; length, 20 feet; height, 8 feet. The wagons are painted dark blue and have lettering and trimmings of gold.

Wagons.—The Ft. Worth Wagon Company was recently organized at Ft. Worth, Tex., with a capital stock of \$150,000. The incorporators are Warren Heaton, C. Hightower and John F. Shelton.

Steam Rollers.—Indicating that there is to be no cessation of road construction and improvement in the Philippines, the Iroquois Iron Works, Buffalo, N. Y., has just received an order for six 10-ton macadam steam rollers for immediate shipment to Manila. At the same time the United States Government ordered a 10-ton Iroquois macadam roller for delivery at Washington, D. C.

Street Car.—A new pay-as-you-enter type of street car, built by the Brooklyn Rapid Transit Company, was recently put in commission. The greatest advantage claimed for the car is the safety which it affords to passengers. The doors of the rear platforms fold inward upon the operation of a lever by the conductor. When the doors are closed by him from within, the platform step automatically folds up close to the platform, so that no one can board the car while it is in motion. The front door and steps are similarly operated by the motorman. Other features of the car include an anti-telescoping bumper.

Water Company.—George L. Smith, Louisville, Ky., has purchased a controlling interest in the Cadiz Water Company, Cadiz, Ky., terminating a stockholders' fight which has been on for several months. Mr. Smith has become president of the company, and is planning improvements in the plant.

Refuse Destructors.—The Destructor Company, 111 Broadway, New York, advises that the Heenan Destructor, which they are building for the City of Montgomery, Ala., is nearing completion, and that the following cities have placed contracts with them for Heenan high-temperature destructors:

San Francisco, Cal., two complete plants, one for Islais Creek district of 120 tons capacity per day, the other for North Beach district, of 360 tons capacity per day. These two plants are designed on the unit principle, the former containing two 60-ton destructors, and the latter designed to contain six 60-ton units, only two of which, however, are being constructed at this time.

New York City, one 90-ton plant for the Clifton district, containing two 45-ton units. It is interesting to note that this plant has been contracted for after three years' use of the 60-ton plant which was installed for this city in the West New Brighton district.

Havana, Cuba, has also placed a contract for one of the largest destructor plants ever built. This has a capacity of 500 tons per 24 hours, and consists of four Heenan destructor units of 125 tons each.

Seattle, Wash., is also duplicating the plant which they have used with success for the past five years. This plant is of the high-temperature type, following the Meldrum design.

Road Machinery.—Within a few weeks the J. I. Case Threshing Machine Company, Racine, Wis., will issue their first catalogue of road-building appliances. The catalogue will cover 64 pages, and will include the following lines: The 10-ton power steered road roller, municipal tractor engines, contractors' hauling engines, Troy bottom dump wagons, Troy reversible wagons, Troy dump boxes, Case rock crushers, Case rotary stone screens, Case perfection road graders, road drags, road plows, township plows, fuel and water engine tenders, stationary engines, etc.

Catalogues and Price Lists.—An American consulate in South Africa is in receipt of a request from a large local firm for catalogues and price lists descriptive of cable conveyors, the information being desired for a client and probable purchaser of such machinery. This and numerous other requests for catalogues and price lists of American products illustrate the value to American manufacturers of having on file at consular offices catalogues and other literature descriptive of their goods and also the names of their representatives, if any, to whom inquiries could be referred. This consulate now has a large number of catalogues of American manufacturers and is constantly adding to the list, but the more generally American concerns avail themselves of the opportunity to be thus represented at consular offices the greater will be the benefits accruing to American trade. Address No. 2629, Bureau of Manufacturers, Washington, D. C.

Engineering Firm.—Lewis & Kitchen, Engineers, 1200 Michigan Boulevard, Chicago, Ill., announce a change in their copartnership. S. R. Lewis, son of E. C. Lewis, has become a member of the firm. Lewis & Kitchen are engaged in the business of designing and constructing septic tanks, garbage crematories and sewage disposal works. The business will be conducted under the same name with offices in Chicago and Kansas City, Mo. The factory is in Kansas City, Mo.

Large Gas Engines.—The Wisconsin Engine Company, Corliss, Wis., has made a very considerable addition to its equipment and working capital in order to allow it to enter new lines of manufacture. The principal business of the company is the manufacture of Corliss engines, which may be operated at higher speeds than the ordinary design of Corliss engine. The new business, however, is principally the manufacture of Adams gas engines, which will be made in sizes from 200 to 3,000 horsepower in a single unit.

Somers System of Taxation.—The Somers system of real estate valuation for taxation purposes probably will be used in Milwaukee, Wis., this spring. The special committee on taxation of the Common Council has decided to recommend the adoption of the system. The Somers system, as proposed, will be used only to value real estate, the portion of the proposition relative to the valuation of buildings having been turned down by the committee. According to the agreement signed by the representatives of the Manufacturers' Appraisal Company, Cleveland, O., owner of the Somers patents, the company will grant to the city the use of the tables, rules and mechanical devices needed during 1911 and will provide experts who will instruct the city officials in the system, and supervise the work. The city will pay the company 11 cents for each parcel of land valued by the system, the total not to exceed \$9,000. The experts of the Appraisal Company will begin work on May 1, and the work must be finished by the last Monday in June.

Large Water Meter Factory.—The Gannon Company, Newark, N. J., manufacturers of the Watch Dog water meter, have moved from their old factory, 81 Mt. Prospect avenue, to a new plant, 282-296 South street, Newark, which is said to be the most modern and up to date in the world used exclusively for the manufacture of water meters. The plot occupied is 200 by 209 feet, and space is reserved for contemplated additions to the plant. The main building is 208 feet long by 30 feet wide, and the foundry extension is 25 by 50 feet. Columns have been entirely omitted, steel beams spanning from wall to wall, and the floors are of mill or slow burning construction, especially suited for factory buildings. Power will be electric current, furnished by the Public Service Corporation, driving a number of motors located in various parts of the building and the heating will be done by steam. The building was built rapidly, ground having been broken November 28, last. A. W. Jacobi was the engineer.

Drilling Wells.—F. A. Champlin, of East Longmeadow, Mass., one of the best-known drillers of artesian wells in New England, has had a large increase in his business during the last year over that of the year preceding. In 1909 he drilled 65 wells, while during 1910 the number went to 100. The eight wells drilled for Smith & Wesson, of Springfield, were put down 500 feet, and yield 100 gallons a minute. The eight wells for the Hotel Kimball, in Springfield, are 445 feet deep, and yield an equal amount. These are among the deepest wells drilled, although eight wells for the Farr Alpaca Company, of Holyoke, were drilled 500 feet deep. The deepest well drilled in the year by Mr. Champlin was for Francois Marcail, of Holyoke, and is 584 feet deep. Some of the wells, however, are only 50 feet deep and some even less.

Garbage Wagons.—The Barron & Company, Franklin street and W Broadway, New York, recently supplied six garbage wagons to the city of Passaic, N. J., of which the following description: They are of the bottom dump style, with a capacity of 4 cu yards. The inside is lined with 12-gauge steel and at the front and rear of top there is a semi-circle of wood with a pole running between. The wagon is fitted with attachment for a canvas cover over this pole so that dry garbage can be loaded if desired. All four wheels have tires 4 x 5/8, and the wheel base is 9 feet 10 inches. The wagons are also equipped with brakes, and the woodwork had two coats of paint and two coats of red lead. The body is made a slate color and the wheel dark red. The lettering on the wagon was D. P. W., City of Passaic, and they were numbered from 1 to 6.

Chief's Motor Car.—The Viele, made at Moline, Ill., has been undergoing tests by the Boston Fire Department as a chief's car. The automobile was placed in actual fire service for a week, carrying Battalion Chief Madigan about on his regular duties, responding to all alarms for inspection work throughout the Fire Department's route. It was driven by three different drivers to prove the ease in handling the machine. The Viele as a municipal service car has been used by Superintendent of Streets, Lowell, Mass., and by the sheriff at Providence, R. I., as a patrol.

Kyrock.—The Wadsworth Stone Paving Company, Pittsburgh, Pa., owners of the process of laying Wadsworth macadam, have registered the name Kyrock for use in connection with their business. The Wadsworth macadam new construction consists of a roller stone base, 6 inches deep, made of stone varying from 2 to 4 inches in diameter, an upper course 2 1/2 inches deep of stone exceeding 2 1/2 inches in diameter, a top dressing 3/4 inch deep, loose measure, of pulverized Kentucky sandstone rock asphalt. In resurfacing old macadam roads the base stone is omitted and the upper course made of such thickness as will make a suitable contour for the finished road.

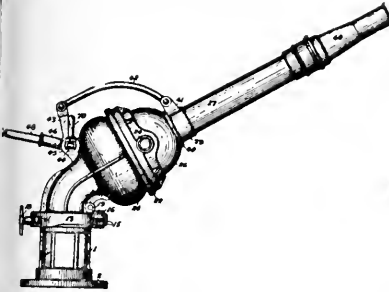
Pumps.—The Harris Pump & Company, Pittsburgh, Pa., has increased its capital stock from \$60,000 to \$100,000.

Smoke Consumers.—Manufacturers of smoke consumers will be able to market their devices to better advantage in the South, as many municipalities have taken up an active campaign to reduce smoke emission. The Board of Trade of Louisville is working on this project, while Nashville and Knoxville, in Tennessee, have strict ordinances under consideration. In connection with the formation of the National Smoke Preventer Company, Louisville, is of interest. It will sell a smoke preventer manufactured by H. Long, a local launderer. W. Davis, sales agent for a number of iron and steel companies, is interested in the project.

Fire Alarm.—The Gamewell Fire Alarm Telegraph Company have completed the installation of the new manual system for Grand Rapids, Mich. There will be no more muddled alarms that have worried the firemen and filled the citizens of Grand Rapids with apprehension lest the whole system should fail. The new system is the non-interfering system with manual transmitt

PATENT CLAIMS

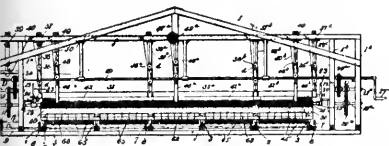
557. **HIGH-PRESSURE NOZZLE.** Henry H. Gorter, San Francisco, Cal. Serial No. 519,035.
 A high-pressure nozzle the combination of a tubular outer portion formed in its inner surface with a lower runway for a nozzle, a sleeve within said outer portion carrying the nozzle, a ring secured



in the lower end of said sleeve, a ring between said ring and runway, a sleeve having at its upper end a flange, and rollers carried by said flange, the ring against the side of said tubular portion adjacent to the nozzle, the axis of said rollers being parallel with the axis of the sleeve, substantially as described.

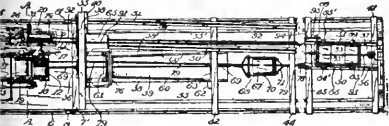
553. **FIRE-EXTINGUISHING COMPOSITION.** William S. Rheem, Oakland, Cal., Marvin L. Chappell, Berkeley, and John Black, Stege, Cal., assignors to Standard Oil Company, Richmond, Cal., a Corporation of California. Serial No. 532,105.
 A charge for fire extinguishers comprising glue, and separated solutions adapted to be brought together to produce a foam which is incombustible and a non-supporter of combustion, and to form a film with the glue, said glue being an ingredient of at least one of said solutions.

547. **MACHINE FOR MAKING REINFORCED CONCRETE PILES, COLUMNS AND THE LIKE.** Alexander Crawford Chenoweth, New York, N. Y., assignor of one-half to John McNamee, Brooklyn, N. Y. Serial No. 407,276.
 A machine for making reinforced concrete piles, columns and the like, the combination of a movable platform on which a sheet of material is rolled into



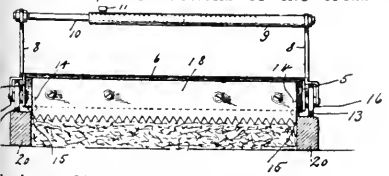
a compact body, means for rolling the sheet into a body, reels or bobbins for receiving wire adapted to be attached to the rear end of the reinforcing part of said sheet of material, whereby when the body has been rolled into form the continued rotation of the said body serves to wind said wires upon the exterior of the body.

546. **SCRAPING EXCAVATOR AND CONVEYOR.** Joseph L. Potter, Indianapolis, Ind. Filed Nov. 1, 1909. Serial No. 525,674.
 A scraping excavator and conveyor including an inclined scoop-guide, and a trestle having



rails thereon arranged in a plane intersecting the plane of the scoop-guide.

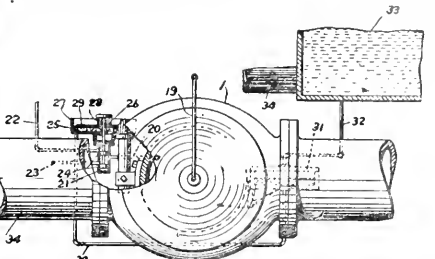
514. **PAVING TOOL.** Aaron W. Croyer, Durham, N. C. Filed Oct. 4, 1910. Serial No. 585,177.
 A paving tool comprising spaced side members, a sectional cross-bar connecting the members, the sections of the cross-



being adjusted relatively to each other in the direction of their length, means for adjusting the sections in adjusted position, and a scraper blade carried by the cross-

984,820. **VALVE MECHANISM.** John Ledoux, Swarthmore, Pa. Serial No. 464,940.

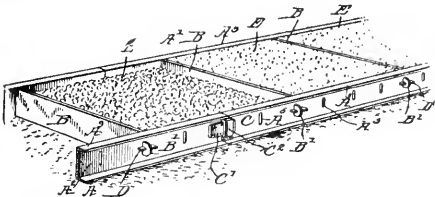
In a valve mechanism, in combination with a conduit and a reservoir with which said conduit is connected, a casing having a port in said conduit, a piston valve disposed in said casing so as to be operated by the pressure of liquid in said conduit to open said port, a pipe for conveying pres-



sure to said casing to cause said valve to close said port, a valve for controlling the flow through said pipe, a vessel, a float in said vessel, means for connecting said valve last named with said float, and means for connecting said vessel and reservoir whereby said float is operated by changes of head in said reservoir.

985,035. **FORM FOR THE CONSTRUCTION OF CONCRETE WALKS, FLOORS, CURBS, GUTTERS AND LIKE STRUCTURES.** Mark Stewart Hotchkiss, Binghamton, N. Y. Serial No. 596,075.

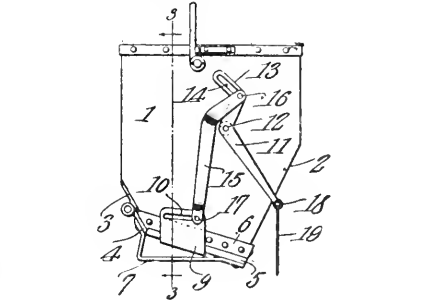
A sectional form comprising metal side bars provided with interlocking end-engaging means on a side face of the side bars, and slots intermediate the ends of said side bars, transverse division plates



having shoulders adapted to abut against the said side bars and tongues adapted to be inserted through the slots in said bars, and means engaging said tongues to secure the parts in position, said bars and division plates making a guide for striking-off, substantially as described.

985,578. **BOTTOM-DOOR DUMP BUCKET.** George Focht, Hoboken, N. J. Filed Dec. 24, 1909. Serial No. 534,775.

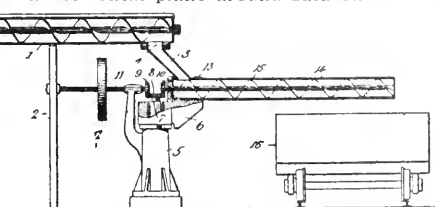
A bucket comprising a body, a door hinged to the body, a lever fulcrumed upon



the body, and a link slidably and pivotally connected with both the lever and the door.

985,436. **CAR AND VEHICLE LOADER.** William D. Mount, Saltville, Va. Filed Mar. 24, 1910. Serial No. 551,264.

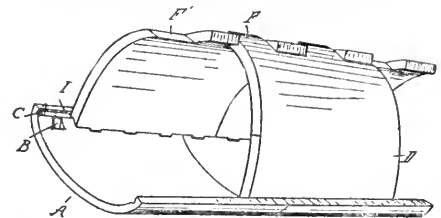
A car loader comprising an upright standard, a conveyor having a swiveled connection therewith, and adapted to rotate in a horizontal plane around said standard



as an axis, a fixed conveyor located above said standard, and an inclined chute having a swiveled connection at one end with said fixed conveyor and terminating at its opposite end in said movable conveyor with its rotating axis coinciding with the axis of the movable conveyor.

985,539. **CULVERT.** Frank Ottney, Charlotte, Mich. Filed May 7, 1910. Serial No. 560,028.

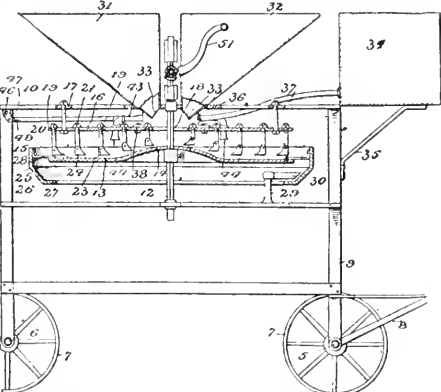
A sectional culvert, comprising a base section having a plurality of apertures along each of its longitudinal marginal edges, side sections provided with lugs at their lower ends for engaging said apertures and at their upper ends with interlocking projections, said base section and



each of said side sections being provided with a tongue and groove engagement for locking the side sections to the base in the assembled relation of the parts, one of the co-operating portions of the tongue and groove engagement being formed upon the base intermediate the longitudinal marginal edge of the latter and said apertures, and the other upon the side section above said lugs.

985,602. **CONCRETE MIXER.** Walter L. Jones, Thomson, Ill. Filed June 22, 1909. Serial No. 503,743.

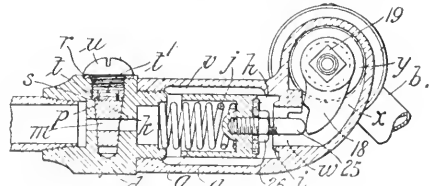
A mixing machine including a supporting frame, a stationary mixing member, a movable mixing member spaced from the stationary member, a receiving trough surrounding the lower mixing member and



movable therewith, agitation fingers depending from the stationary member and adjustable to either retard or accelerate the flow of material to the receiving trough, and a stationary scraper for removing the material from the receiving trough.

985,166. **SANITARY DRINKING FOUNTAIN.** John Hall, Jr., West Springfield, Mass. Filed Feb. 26, 1910. Serial No. 546,128.

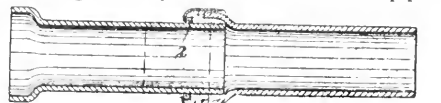
A drinking fountain having in combination with a barrel element, a valve mounted thereon, an arm-piece for conveying the



liquid, and an adjustable connection between the arm-piece and said valve, whereby any wear therebetween may be compensated for, as described.

985,182. **JOINT-PROTECTOR FOR SEWER-PIPES.** Frederick W. Lang, Minneapolis, Minn. Filed July 7, 1910. Serial No. 570,745.

The combination with pipe sections, the one having a large end telescoped over the smaller end of the other, of a pliable packing ring telescoped on to the smaller pipe



end, adjacent to the larger pipe ends, an annular metal shield telescoped over the said packing ring and the large pipe end, and cement contained within said shield and forming a tight joint between the pipe sections, substantially as described.

THE WEEK'S CONTRACT NEWS

Relating to Municipal and Public Work—Street Improvements—Paving, Road Making, Cleaning and Sprinkling—Sewerage
Water Supply and Public Lighting—Fire Equipment and Supplies—Bridges and Concrete Work—Sanitation,
Garbage and Waste Disposal—Police, Parks and Miscellaneous—Proposals and Awards

To be of value this matter must be printed in the number immediately following its receipt, which makes it impossible for us to verify it all. Our sources of information are believed to be reliable, but we cannot guarantee the correctness of all items. Particular charge of proposed work are requested to send us information concerning it as early as possible; also corrections of any errors discovered.

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREET IMPROVEMENTS				
Indiana	Paoli	Mar. 17, 2 p.m.	Constructing gravel road	A. B. Ham, County Auditor.
Ohio	Cincinnati	Mar. 17, noon	Improving portion of Third Avenue	Stanley Struble, Pres. Bd. Comrs.
Michigan	Muskegon	Mar. 17, noon	Furnishing 14,200 cu. yds. of road building material	John B. Barlow, County Clerk.
Pennsylvania	York	Mar. 17, noon	Paving various highways with bitulithic, vitrified brick, compressed concrete, asphalt, wood blocks, or any other known and approved paving material	S. W. Bahn, Chm. Hwy. Com.
Ontario, Can.	Oshawa	Mar. 18,	Constructing 4,300 lin. ft. asphalt block pave. on two streets	Frank Chappell, Town Engr.
Indiana	Anderson	Mar. 20, 10 a.m.	Constructing various County roads of gravel	Wm. T. Richards, County Auditor
Virginia	Portsmouth	Mar. 20, noon	Paving various streets	L. P. Slater, City Clerk
Indiana	Greenfield	Mar. 20, 10 a.m.	Grad. gravel road in Sugar Creek	C. H. Troy, County Auditor.
Kansas	Topeka	Mar. 20, 2:30 p.m.	Grading 11 blocks, cement curb and gutter	C. B. Burge, City Clerk
New York	Albany	Mar. 20, 22, 24	Building state roads, 60 pieces	State Highway Commission.
Virginia	Newport News	Mar. 20, noon	Constructing concrete curb and gutter	George E. Via, Chm., Com. on H. ways and Sewers.
Ontario, Can.	Petrolia	Mar. 20, 5 p.m.	Constructing about 6,000 sq. yds. brick pavement and 2,500 lin. ft. concrete curb and gutter	J. McHattie, Town Clerk.
Oklahoma	Muskogee	Mar. 20, 5 p.m.	Paving about 3,500 lin. ft. with asphalt macadam; 4,350 lin. ft. asphalt	Chas. Wheeler, Jr., City Clerk.
Kansas	Lawrence	Mar. 20, 5 p.m.	Paving various streets and alleys with brick	F. D. Brooks, City Clerk.
Illinois	Peoria	Mar. 20, 2 p.m.	Repaving Harrison Street with asphalt	Geo. F. Simmons, Pres. B. L. Imp.
Missouri	Webb City	Mar. 20	Paving with macadam, curbing and guttering, and constructing concrete sidewalks on 1/2 mile of Madison st.	L. A. Walker, City Clerk.
Ohio	E. Youngstown	Mar. 20	Constructing sidewalks and crosswalks during year 1911	M. J. Carney, Jr., Village Clerk.
Michigan	Adrian	Mar. 20, 9 p.m.	Furnishing 550,000 first quality repressed paving block	John Mawdsley, City Clerk.
California	Covina	Mar. 21	Improving Citrus Ave., requiring 74,000 sq. ft. asphalt concrete pavement, 140,500 oil macadam pavement, 29,250 sq. ft. concrete gutter, 2,700 lin. ft. concrete curb and 4 reinforced concrete culverts	A. M. Pence, City Clerk.
Rhode Island	Providence	Mar. 22, 2:15 p.m.	Furnishing 275,000 granite paving blocks	Henry Fletcher, Chm. B. C. & Capt. R. B. McBride, Con. Q. M. U.
Virginia	Fort Monroe	Mar. 21, 10 a.m.	Constructing macadam walks and roads	J. G. Sutton, City Secy.
Texas	Beaumont	Mar. 21, 10 a.m.	Repaving portion of Pearl Street	Francis G. Ward, Comr.
New York	Buffalo	Mar. 23, 11 a.m.	Repaving and paving various streets	P. J. Hurtgen, Chm. Bd. Pub. W.
Wisconsin	Burlington	Mar. 24, 2 p.m.	Paving with brick, cement, curbing and guttering certain streets	Stanley Struble, Pres. Co. Comrs.
Ohio	Cincinnati	Mar. 24, noon	Improving Broadwell road	Jas. C. Wonders, State Hwy. Co.
Ohio	Columbus	Mar. 24, noon	Grading and macadamizing 2.10 miles road	Ray L. Jordon, Village Clerk.
Ohio	Richwood	Mar. 25	Paving with vit. brick portions of various streets	F. S. Weber, Chm. Bd. Pub. Wks.
Wisconsin	Watertown	Mar. 25, 2 p.m.	Paving with vitrified block about 7,500 sq. ft.; 3,650 lin. ft. combined curb and gutter, 2,845 cu. yds. excavation	P. H. Connelly, Chm. Bd. P. Wks.
Wisconsin	Racine	Mar. 25, 10 a.m.	Paving and grading various streets	Simon A. Bartholome, Clk. D. P.
Indiana	Evansville	Mar. 25, 10 p.m.	Furnishing broken rock and screenings from May 1, 1911 to May 1, 1912	S. G. Brown, Engr.
Ohio	Belle Valley	Mar. 28, noon	Grading and paving with brick 0.9 mile of road, in Noble Twp.	H. H. Canfield, 309 Beckman Bl.
Ohio	Cleveland Hghts.	Mar. 28	Improving Berkshire Road	Cleveland, Village Clerk.
Ohio	Bowling Green	Mar. 28, 1 p.m.	Grading, draining and macadamizing three roads	F. W. Toan, County Auditor.
New York	Poughkeepsie	Mar. 30, 4 p.m.	Paving 13,000 sq. yds. of brick pavement	Robt. J. Harding, Supt. Pub. W.
North Carolina	Wilmington	Mar. 31, noon	Paving and curbing portion of Sixth street	Commissioner of Streets.
Iowa	Logansport	Apr. 1	Constructing 50,000 sq. yds. of sheet asphalt	William Pickett, City Clerk.
Indiana	Bronson	Apr. 3, noon	Road work in Floyd Township	H. H. Onstot, Clerk.
Indiana	Madison	Apr. 4, 1 p.m.	Construction of gravel road	Andrew M. Taff, County Auditor.
Alabama	Wetumpka	Apr. 4, 11 a.m.	Grading and surfacing about 30 miles of sand-clay road	County Commissioners.
North Dakota	Rugby	Apr. 5, 2 p.m.	Metal culverts and road machinery for year 1911	Henry Albertson, County Auditor.
Washington	Coupeville	Apr. 5	Improving Hinman Road No. 32	H. T. Wanamaker Au'l. Island Co.
Maryland	Cambridge	Apr. 6, 11 a.m.	Grading, paving and curbing various streets	Henry Lloyd, Chm. St. Imp. Co.
Maryland	Ft. Howard	Apr. 7, 11:30 a.m.	Constructing cement walks	Constructing Quartermaster.
New Jersey	Swedesboro	Apr. 15	Constructing Railroad Avenue	Wilmer Egee, Mayor.
SEWERAGE				
Pennsylvania	Williamsport	Mar. 17, noon	Building sewer in East End: Penn St. and Gradius run route	John B. Otto, City Engr.
Maryland	Ft. Washington	Mar. 20, 1:30 p.m.	Constructing sewer outlet and outfall	Capt. R. B. Kelton, C. Q. M. U. S.
Connecticut	Stamford	Mar. 20, 8 p.m.	Constructing various sewers	Jos. H. Provost, City Clerk.
Ohio	Grandview Hghts	Mar. 21	Constructing sewer and outlet	John Hinterschied, Village Clk.
West Virginia	Moundsville	Mar. 21, 10 a.m.	Constructing 26 miles of sewers	Oscar B. Bonar, City Clerk.
Ohio	Columbus	Mar. 21	Constructing sewer and outlet at Grand View	John Hinterschied, Clerk.
Ohio	Akron	Mar. 22, noon	Constructing sewers in various streets	John W. Gauthier, Dir. Pub. Se.
Wisconsin	Burlington	Mar. 24, 2 p.m.	Constructing about 2,000 lin. ft. vitrified pipe sewer; 290 lin. ft. sanitary sewer, 7 manholes 18-10-in. 1/4 bends	P. J. Hurtgen, Chm. Bd. Pub. W.
Connecticut	Putnam	Mar. 24, 4 p.m.	Constructing about 10,000 lin. ft. of sewers	Geo. W. Perry, Engr. Sewers.
North Dakota	Minot	Mar. 27	Constructing four miles of sewers	Board of City Commissioners.
Ohio	Cleveland Hghts.	Mar. 28, noon	Constructing sewers in various streets	H. H. Canfield, Village Clerk.
Iowa	Indianola	Mar. 29, 7 p.m.	Blg. sewer system in North Indianola	A. H. Gilliland, City Engineer.
Sask., Can.	Moose Jaw	Apr. 10, 8:30 p.m.	Furnishing and laying about 30,700 lin. ft. tile pipe sewer, building manholes, etc.; separate bids. Con. sewage disposal plant, etc.	W. F. Heal, City Clerk.
California	San Jose	July 3	Construct septic tank for County hospital	City Clerk.
WATER SUPPLY				
Illinois	Aurora	Mar. 17, 5 p.m.	Constructing 160 ft. brick chimney at pumping station; and furnishing two 230 H.P. Babcock & Wilcox type boilers	Board Public Works.
New Mexico	Fort Bayard	Mar. 18, 4 a.m.	Furnishing motor driven submerged type centrifugal or impeller type pump capacity 200 gals a minute	J. R. McAndrews, Con. Q. M., U. S.
Wisconsin	Watertown	Mar. 18, 7 p.m.	Laying c. i. pipe and spec. and construct. manholes for w. wks.	Win. F. Voss, Secy. Bd. W. Comr.
Pennsylvania	Bristol	Mar. 20	Constructing water works and filtration plant	Jos. R. Grundy, Chm. Com.
Ohio	Fernbank	Mar. 20, noon	Furnishing water pipe and special castings	W. Ellwood, Wynn, Clerk.
South Dakota	Gettysburg	Mar. 20	Constructing water works	F. M. Wright, City Auditor.
New York	Westbury	Mar. 20	Constructing water works	Thos. J. McCord, Chm. B. W. Com.
Manitoba, Can.	Souris	Mar. 20	Laying about 31,500 ft. standard c. i. water pipe and similar amount vit. sewer pipe; construct. building, furn. pumps, machinery etc.	V. H. Williams, Town Engr.
Iowa	Nevada	Mar. 20, 7:30 p.m.	Extending city water plant	R. A. Davis, City Clerk.
New York	New York	Mar. 21, 11 a.m.	Constructing drainage equipment for underwatering the shafts and tunnel of the Roundout siphon of the Catskill Aqueduct	Chas. Straus, Pres. Bd. Water S.

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
WATER SUPPLY (Continued)				
Texas.....	San Augustine...	Mar. 21.....	Furnishing mat. for construction of w. w. system.....	Mayor.
Texas.....	Ft. Sam Houston	Mar. 21, 11 a.m.....	Furnishing compound or triple expansion pumping engine capacity 1,000,000 gals in 24 hours.....	P. W. Guiney, Con. Q.M. U.S.A. John Hinterschied, Clerk.
Ohio.....	Columbus.....	Mar. 21.....	Laying water mains and water pipes at Grand View.....	W. A. Clement, City Engineer.
British Col, Can	Vancouver.....	Mar. 22.....	Furnishing water pipe, fire hydrants and pig lead.....	C. N. Humason, Mayor.
Texas.....	Lufkin.....	Mar. 24.....	Constructing water works, includ. boilers, pumps, motors etc.....	A. B. Lea, Dir. Pub. Serv.
Ohio.....	Cleveland.....	Mar. 24, noon.....	Furnishing valves for the Water Dept.....	J. W. Sanderson, Treas.
Indiana.....	Nat. Mil. Home...	Mar. 25.....	Install. mach. for imp. water sup. at Marion Beh., N.H.D.V.S.	T. J. Godfrey, Town Clerk.
Ont., Can.....	Chapleau.....	Mar. 27.....	Furnishing duplex steam pumping engine.....	H. J. Canfield, 309 Beckman Bldg., Cleveland, Village Clerk.
Ohio.....	Col'bus Heights	Mar. 28.....	Constructing water mains.....	M. Paterson, Secy. B.I. Control.
Man., Can.....	Winnipeg.....	Mar. 29, 11 a.m.....	Furnishing c. i. pipe for water works and sewer pipe required during present year.....	E. B. Harrington, Secy. B.F. & W.C. W. B. Neil, City Comr.
Missouri.....	Kansas City.....	Mar. 30.....	Constructing self-contained, vertical, triple-expansion crank & fly-wheel pump, engine of 20 million gals. capac. in 24 hrs.	W. D. Walpole, Secy. Water Co A. T. Dickey, City Engineer.
Sask., Can.....	Saskatoon.....	Mar. 31, noon.....	Installing mechanical filtration plant.....	A. B. Mace, Pres. B.I. Water Comr's W. F. Heal, City Clerk.
Pennsylvania.....	West Telford.....	April 1.....	Constr. water works; approx. cost \$30,000.....	Capt. Jos. F. Gohn, Con. Q.M.U.S.A.
Texas.....	Galveston.....	Apr. 3, noon.....	Installing 10,766 lin. ft. of water main.....	
New York.....	Kesville.....	Apr. 5.....	Constructing reservoir, laying water pipe, etc.....	
Sas., Can.....	Moose Jaw.....	Apr. 10, 8:30 p.m.....	Furn. and lay. about 29,700 lin. ft. c. i. water main; sep. b'f's.	
Maine.....	Ft. McKinley.....	Apr. 15.....	Constructing chemical water softening plant.....	
BRIDGES				
Nebraska.....	Benkelman.....	Mar. 20.....	Constructing wooden wagon bridge.....	Dund County Commissioners.
Indiana.....	Greenfield.....	Mar. 20, 10 a.m.....	Constructing four bridges.....	C. H. Troy, County Auditor.
Ohio.....	Cambridge.....	Mar. 21, noon.....	Building two stone piers and stone abutments for bridge.....	H. Z. Deseln, County Auditor.
Ohio.....	Coshocton.....	Mar. 21, 10 a.m.....	Constructing bridge; repairing and painting bridge.....	Frank Mowrey, County Au litor
Ohio.....	Cleveland.....	Mar. 22, 11 a.m.....	Bridge and road work.....	John F. Goldenbogen, Clk Comrs, Wm. Doran, Park Comr.
Ontario, Can.....	Niagara Falls.....	Mar. 23.....	Erecting six concrete bridges.....	Stanley Struble, Pres. Co. Comrs.
Ohio.....	Cincinnati.....	Mar. 24, noon.....	Constructing concrete bridge.....	
Virginia.....	Danville.....	Mar. 28, noon.....	Constructing reinforced conc. bridge about 1,000 ft. long with 20-ft. roadway.....	J. O. Magruder, City Engr. Frank H. Moir, Town Clerk. Ben S. Smith, Co. Clerk.
New York.....	Fredonia.....	Apr. 1, 2 p.m.....	Constructing concrete arch over Candaway Creek.....	Frank Shanley, County Auditor.
Kansas.....	Hill City.....	Apr. 4, noon.....	Constructing bridge.....	
North Dakota.....	Cando.....	Apr. 4, 1 p.m.....	Constructing 150 ft. more or less of concrete and steel bridges..	
LIGHTING AND POWER				
New York.....	Gloversville.....	Mar. 21.....	Furnishing and operating for period of 5; also 10 years, about 132 electric arc street lights and about 194 incandescent street lights.....	Morrell Vrooman, City Engineer. City Clerk.
Iowa.....	Webster City.....	Mar. 21.....	Constructing electric light and power plant.....	City Clerk.
Indiana.....	Columbia City.....	Mar. 25.....	Furnishing machinery for electric light plant.....	City Clerk.
Alberta, Can.....	Calgary.....	Mar. 22, noon.....	Furnishing one 1,500 KW. turbo-generator with condenser; three 1,000 KVA single transf. 12,000 to 2,300 volts with switch gear etc.....	W. D. Spense, City Clerk.
Kentucky.....	LaGrange.....	Apr. 1.....	Installing second-hand 65 H.P. gas engine and producer for soft coal; 45 kilowatt D. C. multipolar comp, 250 volt generator; also poles, overhead and underground wire, cross-arms etc.....	J. C. Emmick, Manager.
Sask., Can.....	Rouleau.....	Apr. 4.....	Pumping machinery, electrical machinery, pole line, etc., producer gas plant, c. i. or steel water mains, valves etc.....	W. H. Stewart, City Secy.-Teras. W. F. Heal City Clerk
Sask., Can.....	Moose Jaw.....	Apr. 10, 8:30 p.m.....	Furn. 2 electrically driven centrif. pumps and auto starters.....	
FIRE EQUIPMENT				
Wisconsin.....	Racine.....	Mar. 21, 8 p.m.....	Furnishing 1,000 ft. of 2½ in. double jacket cotton rubber lined hose guaranteed to withold 400 pounds pressure.....	Leslie M. Fowler, City Clerk.
Washington.....	Tacoma.....	Apr. 6, 3 p.m.....	One-third size steam Fire Engine.....	L. W. Roys, Comr. Public Safety.
New Jersey.....	Princeton.....	July 5.....	Furn. auto pumping engine.....	E. M. Urdike, Chm. F. & W. Com.
MISCELLANEOUS				
Massachusetts.....	Boston.....	Mar. 17, noon.....	Erecting, and completing additions, extensions and improvements to bath houses.....	Richard M. Walsh, Chm. Bath Trus.
New York.....	New York.....	Mar. 17, noon.....	Furnishing carts with horses for disposing of street sweepings from piers and water front property, Beras, Manhattan, Bronx Brooklyn and Queens.....	Calvin Tomkins, Comr. of Docks. John Gifford, City Purchasing Agt. Geo. W. Cousins.
Washington.....	Spokane.....	Mar. 17, 2 p.m.....	Furnishing 5-passenger automobile.....	F. L. Sian, Chm.
California.....	Eureka.....	Mar. 18.....	Improving the jail.....	P. L. Hurlgen, Chm. B. P. Wks.
South Carolina.....	Georgetown.....	Mar. 20.....	Erecting 2-story brick fire house.....	Allen P. Keith, Secy. Com. Sup.
Wisconsin.....	Burlington.....	Mar. 24, 2 p.m.....	Building reinforced concrete retaining wall around stand-pipe.....	Rensselaer County Jail Comr.
Massachusetts.....	New Bedford.....	Mar. 29, 3 p.m.....	Furnishing 57 sanitary drinking fountains in various schools.....	Wm. H. Sanlerland, City Clerk.
New York.....	Troy.....	Mar. 29.....	Erecting county jail.....	
Connecticut.....	Waterbury.....	Apr. 5, 4 p.m.....	Altering building to conform to requirements of mod. fire sta.....	

STREET IMPROVEMENTS

Demopolis, Ala.—City will lay about one-half mile of cement sidewalks along Maine st., Washington to Fulton st.—Jesse B. Hearin, Mayor.

Pomona, Cal.—Paving of Park ave., 2d st. to Garey ave., is being considered.

Sacramento, Cal.—Bids will be asked by Board of City Trustees for furnishing 12-ton roller of modern make.

Stockton, Cal.—San Joaquin County highway bonds to the amount of \$500,000 have been purchased by E. H. Rollins & Sons, San Francisco.

New London, Conn.—If Legislature grants authority to issue bonds city will lay granolithic walks 5 ft. wide over large section of city.—Geo. K. Crandall, City Surveyor.

Arcadia, Fla.—Council has ordered laying of concrete walks on ten principal streets.

Tampa, Fla.—Board of Public Works is considering purchase of three or four cars of oil for use on streets and three or four cars of brick.

Augusta, Ga.—Board of Public Works has ordered laying of additional mile of curbing in Third Ward.

Macon, Ga.—Bibb County will vote May 10 on \$100,000 bonds for road improvements and new roads.

Moscow, Ida.—City is considering election on paving number of streets.

Peoria, Ill.—City Engineer Van Deusen is preparing estimate for paving of East Court st. under direction of Board of Local Improvements.

Kendallville, Ind.—Council has passed resolution to pave North Main st.

Logansport, Ind.—Plans and specifications have been prepared by City Engineer Harry Thompson for paving North st.

Mt. Vernon, Ind.—County Council has appropriated \$20,000 for road and bridge construction in Posey County.

Princeton, Ind.—Council will order construction of several miles of concrete walks.

Vincennes, Ind.—Resolutions have been adopted for improving Short and Upper 11th sts.

Salina, Kan.—Council is considering paving of 9th st.

Lexington, Ky.—Board of Public Works has decided to advertise for bids separately as follows: Furnishing 12,000 tons of crushed stone and spreading same on the macadam streets of city; unloading, spreading and selling the stone delivered from city jail; sweeping and cleaning all the improved streets of the city; cleaning all macadam streets and public alleys twice a year; furnishing and spreading 170,000 gals. of Baltimore oil on the macadam streets.

Ratland, Md.—City will pave and repave

with improved pavements portions of eight streets.—B. T. Fendall, City Engineer.

Boston, Mass.—City is considering the construction of granolithic sidewalks on Washington st., West Roxbury, from Green to Walker Hill st., distance of one mile; also the paving of South st., Centre st. to Arbor Way, with brick, and granolithic sidewalks, distance of one-half mile.—Louis K. Rourke, Commissioner Public Works.

Dartmouth, Mass.—Town has voted \$3,500 to continue macadamizing of Chosen road, \$8,000 to resurface Panaman road and \$3,250 for improving other streets.

Dighton, Mass.—Town has voted to improve Center st. with macadam.

Dracut, Mass.—Town has voted to raise \$1,000 to construct macadamized road on Pleasant st.; also \$1,000 for building sidewalk on Lakeview ave.

Lakeville, Mass.—Town has appropriated \$2,500 to improve roads.

Marblehead, Mass.—Citizens have appropriated \$3,500 to build granolithic sidewalk at Causeway at Riverhead Beach, \$500 to construct sidewalks on Atlantic ave., also \$600 to cover Curtis st. drain.

New Bedford, Mass.—Board of Aldermen has voted to ask for bids on 15-ton steam road roller.

Oak Bluffs, Mass.—Town has voted \$2,000 for improvement of road along Lagoon road.

Crookston, Minn. Plans are being prepared for paving 21,372 sq. yds. with Westrumite asphalt macadam. J. E. Carroll, City Engineer.

Rolling Fork, Miss. Sharkey County has voted \$40,000 bonds for road improvements.

St. Louis, Mo.—Board of Public Improvements has rejected all bids received for paving Delmar blvd. from Skinner road to city limits.

Kalispel, Mont. Bids will at once be asked for proposed street paving; bitulithic pavement is favored.

Flemington, N. J.—Bill has been passed to allow Hunterdon County to increase amount it may spend for road construction; \$10,000 a year is now allowed, but work to cost more is planned.

Hackettstown, N. J. Council will at once ask new bids for crushing and delivering stone for road work.

Long Branch, N. J.—Council will ask for bids for furnishing gravel for repairing streets by cubic yards f. o. b. Long Branch on approximate quantity of 100 carloads.—E. E. Newcomb, City Clerk.

Newark, N. J.—Board of Public Works will let forty-four separate paving contracts during year; Engineer Howell, of Street Department, has estimated cost at \$830,000.

Newark, N. J.—Senate has passed unanimously, in concurrence with House, Assemblyman Levean's bill authorizing Newark to raise funds not exceeding \$1,000,000 for widening of Mechanic st.

Metuchen, N. J.—Street Committee will ask for bids for resurfacing Main st.

Perth Amboy, N. J.—Paving of Smith st. with asphalt block is being considered.

Sharpstown, N. J.—Citizens of Pilesgrove Township have petitioned Salem County Freeholders to build State road from the proposed Mannington and Woodstown State road to village of Sharpstown, distance one mile.

Trenton, N. J.—County Board of Freeholders is considering improvement of road extending from city to Lawrenceville and Princeton.

Westfield, N. J.—Town has \$9,000 available for repairs to roads.—J. A. Dennis, Mayor.

Binghamton, N. Y.—Plans for proposed strip of macadamized highway from Whitney Point to Glen Aubrey have been received by Clerk Asa L. Bonnell, of Board of Supervisors; plans provide for a road 5.30 miles in length; cost about \$60,000.

Canastota, N. Y.—Paving of Peterboro st. with either brick or bitulithic is being urged.

Herkimer, N. Y.—State Highway Commission has submitted figures showing cost of the German street pavement to be \$32,063.46.

Lenox, N. Y.—Town has voted \$4,490 for road improvements.

New York, N. Y.—City will pave 4th ave., 8th st. to 23d st., with granite curbs.

Pelham Manor, N. Y.—Citizens will vote on expenditure of \$13,000 for laying of 10,000 ft. of new sidewalk and also for repairing of several thousand ft. of old sidewalks.

Poughkeepsie, N. Y.—Plans and specifications will be prepared for paving with brick North Clinton st. and with macadam Mansion st.

Port Jervis, N. Y.—Bids will be asked in near future for paving estimated to cost \$30,000.—Theodore Ludlum, Superintendent Paving; Irving Righter, City Engineer.

Poughkeepsie, N. Y.—Council has ordered macadamizing of Hammersley ave., paving of Mill, Cannon and South Hamilton st. with vit. brick, and Washington st. with creosote wood block.

Syracuse, N. Y.—Plans for Skaneateles-Camillus county highway have been approved and appropriation for construction authorized by Board of Supervisors.—F. W. Starr, Division Engineer, State Highway Commission.

Utica, N. Y.—Board of Contract and Supply has rejected all bids received for pavements on seven streets.

Kings Mountain, N. C.—Kings Mountain Precinct, No. 4 Township, has been authorized to call election on \$25,000 bond issue for road construction. J. M. Patterson, Highway Commissioner, is interested.

Barberton, O.—Street Committee has recommended paving of 3d st.

Bucyrus, O.—The Road Commissioners of Road District No. 1 in Crawford County are planning improvement of several highways, at estimated cost of \$15,000.—G. F. Ackert, man, County Auditor.

Hamden, O.—The State Highway Department and Commissioners of Vinton County are considering construction of pike from McArthur to Hamden, distance 7 miles.—S. R. Walker, County Surveyor.

Hamilton, O.—Improvement of Fairgrove ave. is being considered; cost is estimated by Engineer F. E. Weaver at \$3,606.

Marletta, O.—City Engineer E. F. Oates has prepared plans and estimates for rais-

ing Front, Putnam and Greene sts. to a higher level; work includes 67,000 cu. yds. curth fill, \$13,000; 26,700 sq. yds. repaving, \$10,000; 9,950 lin. ft. curb reset, \$2,500; relaying water mains, including new 10-in. main on Front st., \$1,700; concrete retaining walls, \$5,100; storm water sewers and street inlets, \$1,000; raising sanitary sewer openings to grade, \$500; relaying sidewalks, \$9,000; engineering and contingencies, \$7,300; total cost, \$80,100.

Junction City, Ore.—Council is considering laying of concrete paving on main streets in spring.

Portland, Ore.—Street Committee has rejected bid of Montague-O'Reilly Co. for paving East Morrison st. with wood blocks; also bids of Oregon Hassam Paving Co. for paving three streets; bids will be re-advertised.

St. Johns, Ore.—City is considering paving Jersey st. for 13 blocks with Westrumite; cost about \$25,000.

Altoona, Pa.—Board of Public Works will ask bids for paving at cost of \$75,000.

Hickory, Pa.—Road Supervisors of Mount Pleasant Township will build additional brick roads this summer.

Philadelphia, Pa.—If parking plans of Comprehensive Plans Committee are realized city will ultimately have 133 miles of park drives, exclusive of those in Fairmount Park, connecting numerous parks of city.

Pittsburg, Pa.—City is considering widening of Smithfield st. bridge.

Wilkes Barre, Pa.—Permission for improvement of the road between this city and Harvey's Lake will be asked of next Grand Jury by County Commissioners.

Providence, R. I.—Council has passed resolution appropriating \$80,000 for widening Eddy st.

Latta, S. C.—Bids will be received for paving sidewalks; either per sq. yd., contractor furnish material, or per sq. yd., town to furnish sand, cement and rock.

Chattanooga, Tenn.—Board of Aldermen has voted \$45,000 bonds for paving purposes.

Greenfield, Tenn.—City will petition Legislature for authority to issue \$30,000 of bonds for street improvement.—J. N. Ray, Mayor.

Knoxville, Tenn.—City will have at least three improvement districts to pave this year.

Angleton, Tex.—Brazoria County will vote March 28 on \$150,000 bonds for road improvements in District No. 1.

Austin, Tex.—Council has decided to pave 4th st., Colorado to Trinity st.; bids will soon be asked.

El Paso, Tex.—City Engineer F. H. Todd has estimated cost of paving East San Antonio st. with bitulithic at \$22,511.62.

Luling, Tex.—Election on \$50,000 road bonds is being considered.

Price, Tex.—City will at once put into effect ordinance allowing levy of taxes for street and sidewalk improvements.

Salt Lake City, Utah.—Senate has passed bill providing for the issuance and disposal of bonds in sum of \$260,000 or \$10,000 for each county excepting Salt Lake, for building of roads and bridges in the State, and apportionment of the money to various counties in State.

St. Albans, Vt.—Citizens have voted \$15,000 for street improvements.

Bristol, Va.—Building of macadamized highways out of city into Washington County, will begin this spring.

Newport News, Va.—City Engineer Pearce has reported that it will cost \$6,459 to put crushed rock on all unpaved streets in city where curbing and guttering have been laid.

Hillyard, Wash.—Paving of Market st. for distance of 16 blocks is being considered.

Seattle, Wash.—Bids have been rejected for paving McClelland st.; Independent Asphalt Paving Co., low bidder, \$28,155.20.

Seattle, Wash.—Board of Public Works has received following estimates for improvements: Lucille st., plank roadway, \$3,370; Seattle blvd., wood walks, \$9,100; Brandon st., grading and curbing, \$51,200.

Spokane, Wash.—City will pave Wall st. with asphalt macadam pavement from Garland to city limits.

Beloit, Wis.—Council has ordered brick pavement in west side fountain square.

Milwaukee, Wis.—Asphalt mixing plant costing about \$10,000 and portable asphalt repair plant costing about \$3,500 are desired by Department of Public Works.

Medicine Hat, Alta, Can.—Council has passed by-laws to provide for the following street improvements: Concrete sidewalks, \$83,500; curbs and gutters, \$17,500; sidewalks, \$5,500; sewers, \$51,500.

New Westminster, B. C., Can.—Plans and specifications are being prepared for large amount of proposed paving.

St. Lambert, Que., Can.—Citizens have voted \$225,000 bonds for street improve-

CONTRACTS AWARDED

Birmingham, Ala.—To Southern Bitulithic Co., Nashville, Tenn., for paving Ave. F' from 18th to 27th st. with bitulithic \$15,000.

Santa Monica, Cal.—Grading, paving, constructing cement curbs, sidewalks and catch basins in Vicente Terrace Tract, by Fred H. Stout, 3246 S. Grand ave., Los Angeles, \$7,065.

Greensburg, Ind.—Paving Main st. with brick, to Daniels, Lyst & Douglas, Anderson, \$70,600.

Indianapolis, Ind.—Contract for not less than 600 tons nor more than 750 tons of asphalt for municipal asphalt repair plant to California Asphaltum Sales Agency, by Board of Public Works, at \$24 per ton; contract is for Maltha California asphalt.

Lapel, Ind.—Building cement walks along Pendleton ave., to A. W. Doan, \$5,812.

Louisville, Ky.—Laying 200,000 vit blocks, to Peebles Paving Block Co. Portsmouth, O., \$15 per M; laying unlimited number of vit. brick, to Kentucky Vitified Brick Co., city, \$12 per M.

Fort Andrews, Mass.—Constructing roads, walks, gutters, catch basins and drain, to Thomas Fitzgibbons, Beverly.

Haverhill, Mass.—Supplying cement for street department use during season, to Haverhill Cement Stone Co., \$1.49 per bbl.

New Bedford, Mass.—Block paving of Purchase st., to Simpson Corporation \$7½¢ per sq. yd.; city will provide granite block.

St. Louis, Mo.—Paving: To G. Eyermann & Bro., 1216 S. Grand ave., a portion of Fassen st. with brick, \$6,080; to Ruecking Construction Co., Marine ave. and Gasconde st., portions of Liberty and S. Dakota sts. with brick, \$2,545 and \$3,970, respectively; to Granite Bituminous Paving Co., Pierce Bldg., Destrehan st., from 19th st. to Florissant ave., with bitulithic, \$11,116, and 13th st., from Cass ave. to 11th st., with bitulithic, \$68,589; to Perkins Bros. Construction Co., 3237 Carter ave., Destrehan st., from 2d to 11th sts., with brick, \$6,520; to Skrainka Construction Co., Security Bldg., a portion of Clarence ave. with brick, \$9,394; to John F. McMahon, Wainwright Bldg., with brick, Leffingwell ave., Angelica st., Destrehan ave. from Hall to 2d st. and 19th st. from Branch to Salisbury st., at total of \$42,327; to G. A. Heman, with asphalt, portions of 16th and 17th sts., 23d st. from O'Fallon to Madison st., and 19th st. from Washington ave. to Carr st., at total cost of \$100,320; to Harry F. Heman, 721 Olive st., 19th st. from Carr to Madison st., with brick, \$17,566, and 23d st. from N. Market to Hebert st., with brick, \$23,384; to Parker-Washington Co., 4506 Duncan ave., with wood blocks on several portions of 18th st., total cost \$54,691.

Jersey City, N. J.—Improving 14th st., to Nolan & Horning, \$26,058.

Newark, N. J.—Re-paving asphalt streets in the city for years 1911, 1912 and 1913: To Standard Bitulithic Co., \$1.15 per sq. yd. for resurfacing and \$1.19 per sq. yd. for repairs; furnishing broken stone for road repairs for the years 1911, 1912 and 1913, to Frederick Van Keuren, Harrison, \$2.05 per cu. yd.

New York, N. Y.—Flagging, etc., Muscoota st., to Ames Transfer Co., Kingsbridge ave., Bronx, \$41,638; repairing asphalt block pavement, to Harlem Contracting Co., 2 Rector st., \$43,235.

Alva, Okla.—To Rackliffe-Gibson Construction Co., St. Joseph, Mo., for 23,000 sq. yds. Hassam pavement.

Muskogee, Okla.—To Hemans Construction Co. for street improvement work in District No. 104 which embraces certain blocks on Columbus ave., Galveston and East Side bldg., \$27,734.42; Trinidad Lake asphalt will be used.

Carbondale, Pa.—Grading Powderly road, to John Booth, 50¢ per cu. yd. for removal and filling in with dirt, \$2.50 for rock excavating.

Pittsburg, Pa.—Furnishing cement, to Universal Portland Cement Co., \$1.41 for the barrel, or \$1.01 by sack; the Standard Bitulithic Co. will resurface Hulton road with Warrenite, 37¢ per sq. yd.; Verona road will be resurfaced by the Pittsburg Amiste Co., 85¢ per sq. yd.; ballast, to the Clydesdale Stone Co., Morrison & Co., Booth & Flinn and the Pope Stone and Brick Co.; delivering ballast, to James Creese, Edward Vero, Seebolt & Skiles, H. F. Caley, Hodel & Brown, Wolf & Thompson and W. S. Bedall, at prices depending on length of haul.

Dallas, Tex.—Paving Main st., Ervay st. to Houston and Texas Railroad, to Texas Bitulithic Paving Co.

Lynchburg, Va.—Laying tar macadam on Wise st., to S. B. Bennington, city, \$16,517.30; other bidders: Long & Miller, New York, \$17,211.50; J. R. Ford & Co., city, \$17,952.80; J. L. Meem Engineering Co., city, \$21,861; paving three streets with bit-

ulthitic, to Atlantic Bitulithic Co., Richmond, \$30,000.
Norfolk, Va.—Paving Bank st., Freemason and Queen sts., with wood block, to United States Wood Preserving Co., New York, for which William A. Young is Norfolk agent, \$2.85 per sq. yd.
Roanoke, Va.—To T. Wright & Co., J. T. Muddleman, C. Markley and Vaughan Construction Co. for the construction of macadam streets and concrete curb and gutters throughout city at total cost of \$180,000.
Spokane, Wash.—Paving Hamilton st. with asphalt, to Barber Asphalt Paving Co., \$65,448.
Ghent, W. Va.—Laying about 8,500 sq. yds. of vit. brick on Olney road and Bote-court st., to Louis S. Lawson, \$3 per sq. yd.

BIDS RECEIVED

Boston, Mass.—Furnishing 400,000 gals. of emulsified oil and 400,000 gals. of emulsified road oil, Standard Oil Co., 26 Broadway, New York, 4c. per gal., 4.95c. per gal.; Texas Oil Co., 4.9c.; Gulf Refining Co., 3 3/4c., 4.75c.
Mt. Vernon, N. Y.—Regulating and grading Oakley ave: James Piro, new curb 70c., old curb 35c., brick pavement \$2.34, brick pavement relaid 10c., new flag walks 68c.; Louis Petrillo, new curb 80c., old curb, 45c., brick pavement \$2.35, brick pavement relaid 25c., new flag walks 60c., old flag walks 10c.; James Garofano, new curb 69c., old curb 35c., brick pavement \$2.53, brick pavement relaid 15c., new flag 67c., old flag 15c.; Charles Mattolla, new curb 80c., old curb 35c., brick pavement \$2.45, brick pavement relaid 25c., new flag walks 65c., old flag walks 12c.; Frank Nordone, new curb 65c., old curb 30c., brick pavement \$2.25, brick pavement relaid 10c., new flag 67c., old flag walks 9c.; Sabino Guarino, new curb 80c., old curb 30c., brick pavement \$2.35, brick pavement relaid 25c., new flag walks 70c., old flag walks 7c.; J. A. Sillery, new curb 70c., old curb 70c., brick pavement \$2.75, brick pavement relaid 30c., new flag walks 65c., old flag walks relaid 10c. Treating of trees along city's streets: Inter-State Tree Treating Co., 85c. per tree; N. L. Rich, Stamford, Conn., \$1.35 each; R. F. Planta, 72c. each. Regulating, grading and paving Villa st.: Charles Mattolla, new curb 90c., old curb 25c., old cross walks \$1.25, brick pavement \$2.30, brick pavement relaid 50c., macadam 97c., old sidewalks 15c., brick pavement on a 6-in. foundation \$2.30; James Ciadra, new curb 75c., old curb 25c., old cross walks 25c., brick pavt. 25c., macadam \$1.05, old sidewalk \$1.04, brick pavt. on a 6-in. foundation \$2.40; Louis Petrillo, new curb 80c., old curb 35c., old cross walks \$1, brick pavement \$2.30, brick pavements relaid \$1; macadam \$1.13, old sidewalks 10c., brick pavement on a 6-in. foundation \$2.35; Jas. Garofano, new curb 70c., old curb 20c., old cross walks 50c., brick pavements \$2.30, brick pavements relaid 15c., macadam 98c., old sidewalks 15c., brick pavements on a 6-in. foundation \$2.30; J. A. Sillery, new curb \$1, old curb \$1, old cross walks 25c., brick pavement \$2.25, brick pavement relaid 12c. macadam \$1.15, old sidewalks 10c., brick pavements on a 6-in. foundation \$2.50; Frank Nordone, new curb 60c., old curb, 66c., old cross walks 25c., brick pavements \$2.19, brick pavements relaid 1c., macadam \$1.15, old sidewalks 9c., brick pavements on a 6-in. foundation \$2.30; Sabino Guarino, new curb 80c., old curb 25c., old cross walks 10c., brick pavements \$2.20, brick pavements relaid 10c., macadam \$1.11, old sidewalks 10c., brick pavement on a 6-in. foundation \$2.36.
New York, N. Y.—Re-paving with improved granite block pavement on concrete foundation 4th ave. from 8th to 23d st., Republic Construction Co., 11 Broadway, lowest bidder, as follows: 20,290 sq. yds. improved granite block pavement, with paving cement joints, except the railroad area, \$3.55; 1,900 sq. yds. improved granite block pavement with paving cement joints, within the railroad area, no guarantee, \$3.55; 3,860 cu. yds. Portland cement concrete, 1c.; 4,720 sq. ft. new granite bridge-stone, furnished and laid, 70c.; 1,350 lin. ft. header stone, 30c.; 1,000 lin. ft. new bluestone curbing, 70c.; 200 lin. ft. old bluestone curbing, reset, 70c.; total, \$83,362; 26th st. from 7th ave. to 10th ave., Thos. Larpy, 409 E. 69th st., lowest bidder, as follows: 8,210 sq. yds. improved granite block pavement with paving cement joints, \$2.85; 1,620 cu. yds. Portland cement concrete, \$4; 380 sq. ft. new granite bridge-stone, 75c.; 90 lin. ft. header stone, 1c.; 4,630 lin. ft. new bluestone curbing, 60c.; 350 lin. ft. old bluestone curbing, reset, 21c.; total, \$33,444.
Utica, N. Y.—Street paving: Mary st.: Barber Asphalt Paving Co., asphalt pavement with sandstone curb \$6,862.40, with certified stone curb \$6,412.40; Warner-Quinlan Asphalt Co., Syracuse, asphalt with sandstone curb \$6,798.90, artificial

curb \$6,546.90; Hickory st., Barber Asphalt Paving Co., asphalt with sandstone curb \$10,474.90, artificial \$9,847.90; Warner-Quinlan Co., asphalt, sandstone curb \$10,372, artificial \$9,812; J. W. Johnston & Son, metropolitan block, sandstone curb \$11,571, artificial \$10,821; Mack on Corning brick, sandstone curb \$11,215, artificial \$10,465; Knox st., Barber Asphalt Paving Co., asphalt, sandstone curb \$1,942.60, artificial \$1822.10; Warner-Quinlan Co., asphalt, sandstone curb \$1,897, artificial \$1,823.50; Young pl., Barber Asphalt Paving Co., asphalt, sandstone curb \$2,756.90, artificial asphalt, sandstone curb \$2,756.90, artificial \$2,579.40; Warner-Quinlan Co., asphalt, sandstone curb \$2,701.50, artificial \$2,589; Humbert ave., Barber Asphalt Paving Co., asphalt, sandstone curb \$5,920.30; artificial \$5,542.80; Warner-Quinlan Co., asphalt, sandstone curb \$5,879, artificial \$5,646.50; Kirkland st., Barber Asphalt Paving Co., asphalt, sandstone curb \$12,297.70, artificial \$11,547.70; Warner-Quinlan Co., asphalt, sandstone curb \$11,897.50, artificial \$11,435.50; North Genesee st., Barber Asphalt Paving Co., asphalt \$20,807.40, Mack brick pavement \$26,967.40, Hammond sandstone pavement \$35,318.40; Warner-Quinlan Co., asphalt, \$19,082.40; J. W. Johnston & Son, Mack or Corning brick, Medina curb, \$21,897.20, Hammond curb \$21,669.20, metropolitan block, Medina curb \$22,597.20, Hammond curb \$22,369.20, Hammond stone pavement and curb \$29,033.60, Medina stone pavement and curb \$31,038.20; N. D. Peters, Mack brick pavement \$22,394.60, Hammond stone pavement \$29,558.60; J. R. Baxter, Jr., Shawmut brick pavement \$21,318.80, Hammond \$28,638.40; H. W. Roberts & Co., Mack, Clearfield or Corning brick pavement \$23,067, Medina stone \$31,062.20.
Utica, N. Y.—Constructing highways around Delta reservoir as follows, (a) Cunningham & Woodway Co., Hudson Falls, N. Y., (b) Jas. Anderson, Box 631, Caledonia, N. Y., (c) Theo. C. Hailes, Jr., 86 State st., Albany: Clearing, lump sum, (a) \$500, (b) \$220, (c) \$250; 57,900 cu. yds. all excav., (a) 54c., (b) 57c., (c) 41c.; 44,800 cu. yds. forming embankment, (a) 12c., (b) 18c., (c) 12c.; 380 cu. yds. 2d class concrete, (a) \$8, (b) \$7.50, (c) \$8; 7,400 lbs. metal reinforcement, (a) 6c., (b) 4c., (c) 4c.; 1,100 sq. yds. cobblestone paving, (a) \$1.50, (b) \$1, (c) 85c.; 300 cu. yds. 4th class rip-rap, (a) \$2.50, (b) \$2.60, (c) \$2; 10,300 lin. ft. wooden fence, (a) 30c., (b) 26c., (c) 23c.; underdrain, laid, including trenching and back filling, (a) 30c., (b) 30c., (c) 35c.; 12 M. ft. yellow pine saved lumber in bridge floor, (a) \$40, (b) \$60, (c) \$60; taking down, moving, re-erecting, cleaning and painting bridge, lump sum, (a) \$990, (b) \$1,200, (c) \$1,625; totals, (a) \$47,632, (b) \$51,037, (c) \$10,834.
Elizabeth City, N. C.—Street paving: F. J. McGuire, Norfolk, Va., sand foundation, Mack block \$1.71, Peebles block \$1.63 Baltimore block \$1.42 1/2; concrete foundation, Mack block \$2.31, Peebles block \$2.17, Baltimore block \$2, asphalt macadam \$1.35, tertia macadam \$1.20, asphalt block \$2.10; J. L. Robertson, Baltimore, Md., sheet asphalt \$1.50; Atlantic Bitulithic Co., Richmond, Va., bitulithic \$2.06, double bond \$1.55; United States Wood Preserving Co., New York, wood block \$2.23, wood block \$2.81; Lewis Lawson, Norfolk, Va., sand foundation, Baltimore block \$1.45, Carlisle block \$1.57, Mack block \$1.65, Peebles block \$1.57; concrete foundation, Baltimore block \$2.03, Carlisle block \$2.17, Mack block \$2.25, Peebles block \$2; concrete block, No. 1 \$2, No. 2 \$1.60, No. 3 \$1.35, asphalt macadam \$1.39, tertia macadam \$1.21, asphalt block \$2; Peters Bros. Paving Co., Chicago, Ill., sheet asphalt, Ohio \$1.62, sheet asphalt \$1.59, sheet asphalt \$1.51, 1 1/2 in. gravel \$1.40; Warner-Quinlan Asphalt Co., Syracuse, N. Y., sheet asphalt, California \$1.59, sheet asphalt Trinidad \$1.63, sheet asphalt Bermuda \$1.66, asphalt macadam, California \$1.21, asphalt macadam Trinidad \$1.24, asphalt macadam Bermudas \$1.29.
Lorain, O.—Sidewalk contract, H. A. Schallon, city, lowest bidder, \$11,557.65; detail bid was as follows: new stone, 2-in. stone laid with base, about 61,000 sq. ft., 93c. per sq. ft.; 3-in. stone, 100 sq. ft., 133c.; 1-in. stone, 100 sq. ft., 17c.; 5-in., 20 sq. ft., 22c.; 6-in., 6,100 sq. ft., 25c.; relaying, 2-in. stone, including base, 50,000 sq. ft., 34c.; 3-in., 2,000 sq. ft., 34c.; 4-in., 400 sq. ft., 4c.; 5-in., 20 sq. ft., 5c.; 6-in., 6,700 sq. ft., 6c.; new concrete walk, 4-in., laid in base, 1,000 sq. ft., 16c.; 5-in., 1,000 sq. ft., 17c.; vit. pine, 8-in. laid, 100 lin. ft., 16c.; 10-in., 100 lin. ft., 22c.; 12-in., 100 lin. ft., 30c.; 15-in., 50 lin. ft., 37c.; 18-in., 50 lin. ft., 50c.; 24-in., 20 lin. ft., 80c.; grading, 3,000 cu. yds., 40c.; extra planning, 45c.; extra labor, 224c.; totals of other bidders: A. Graepner, city, \$11,635.20; H. N. Oberlander, Bucyrus, \$11,912.22; M. J. Jackson, city, \$11,942.75; Aaron Best, city, \$12,032.80, and McHugh Bros., Springfield, \$19,524.41.

Dallas, Tex.—Paving with asphalted macadam Jefferson st., Tenth to Tyler, Oak Cliff, two bids were opened, as follows: Standard Engineering & Construction Company, \$1.26 per sq. yd. of surface, without maintenance, including subgrade excavation, with \$1.00 per cu. yd. for rock excavation above grade; John C. Underwood, \$1.35 per sq. yd.
Kenosha, Wis.—Paving Lake ave., (a) asphalt macadam, (b) brick, (c) sheet asphalt, (d) wood block; Chris Petersen, (a) \$20,000, (b) \$31,700, (c) \$30,860, (d) \$13,460; White Construction Co., Milwaukee, (a) \$29,288 (c) \$31,528; John Brigan, Green Bay, (a) \$33,148, (d) \$42,528; C. P. Flatley, Green Bay, (b) \$31,374; Western Improvement Co., Racine, (a) \$32,381, (b) \$32,524, (c) \$33,641, (d) \$10,641; McCugo Bullock Co., Waukegan, Ill., (b) \$31,685, (d) \$39,245; Kelley Co., Chicago, Ill., (a) \$30,589, (c) \$31,429.
Seattle, Wash.—North half of Grand Blvd. from 15th ave. W. to 20th ave. W., plank-ing, Donaldson & Johnson, 3926 Aurora ave., \$11,889.66; Rufus Buck, \$15,324.68; N. D. Johnson, \$15,806.80; 6th ave. S. et al., asphalt top, independent Asphalt Paving Co., \$22,019; Barber Asphalt Paving Co., 144 Henry Bldg., \$30,990.

SEWERAGE

Berkeley, Cal.—Citizens have voted \$250,000 bonds for installation of storm sewers.
Calexico, Cal.—Bids are being received for construction of sewer system requiring 1,335 ft. of 15-in., 2,281 ft. of 17-in., 1,256 ft. 10-in., 15,271 ft. 8-in. and 9,310 ft. of 6-in. sewer, two concrete settling tanks, man-holes, etc.—J. B. Hoffman, City Clerk.
Los Angeles, Cal.—Streets and Boulevard Committee of Council has decided to recommend immediate repairing of the Sacatella storm drain, Western ave. to Wilton pl.; cost about \$3,500.
San Bernardino, Cal.—Bids will soon be asked for constructing vit. pipe sewers in Second, B and other streets.
Denver, Col.—Board of Public Works will soon order construction of lateral sanitary sewers in portion of Subdistrict No. 3; cost about \$141,246.
Springfield, Ill.—Sewerage system will be installed in near future.—H. Lang Mack, Village President.
Mt. Vernon, Ind.—City Engineer G. W. Sarlls is preparing plans for sewers for eastern section of city; cost about \$5,000.
Newcastle, Ind.—Council has obtained services of John H. Petri, Marion, to draw plans and specifications for arched sewer to carry stream flowing through center of city and known as Bowery Brook; the work will cost not less than \$60,000.
Mansfield, Mass.—Town has voted to adopt enabling act of Legislature whereby it may build system of sewerage.
Marion, Mass.—Town has appropriated \$3,000 to build sewer pumping station.—Geo. F. Richards and H. C. Luce, Commissioners.
Duluth, Minn.—Construction of sanitary sewer in Lake ave., distance over two miles, is being considered.
Jersey City, N. J.—Citizens will vote on \$75,000 bonds to improve drainage and water system.
New Brunswick, N. J.—Advisory Sewage Disposal Commission appointed by former Mayor W. E. Florance has recommended erection of three sewage disposal plants at estimated cost of \$105,000, exclusive of cost of the land upon which plants are to be erected, for treating sewage of the city by the chlorine process, bonds to be issued for work.
Ocean City, N. J.—Citizens will vote April 25 on \$75,000 bonds, to be used principally in providing surface water drainage.
Paterson, N. J.—Board of Finance has decided on \$27,550 appropriation to enable Board of Public Works to construct proposed sewers.
Trenton, N. J.—Consulting Engineer Rudolph Hering, 170 Broadway, New York City, will prepare plans for construction of proposed sewage disposal plant to cost from \$350,000 to \$500,000.
Frankfort, N. Y.—Vrooman & Perry, Gloversville and Canajoharie, are preparing revised plans for sewer system and sewage disposal plant.
Scarsdale, N. Y.—Survey is being made for sewer system to benefit southern end of county seat and town.
Black Mountain, N. C.—Citizens will vote on \$15,000 bonds for construction of sewerage system and water works.
Bowling Green, O.—Council has decided to construct lateral sewer in South Enterprise st.
Ironton, O.—Council has decided to issue bonds for construction of sewers in about eight streets and alleys.
Kennedy Heights, O.—Council has passed ordinance providing for construction of sewers in District 1; also authorized Engineer Jas. A. Stewart, Traction Bldg., Cin-

cinnati, to complete plans for sewers in Districts 2 and 3; cost of each sewer about \$23,000.

Newport, Ore.—Louis C. Kelsey, Selling Bldg., Portland, Ore., has been engaged as Consulting Engineer in the designing and construction of sanitary sewerage system.—E. B. Davis, City Engineer.

Lebanon, Pa.—Council has sold \$110,000 sewer plant bond issue to Graham & Co., Philadelphia.

Providence, R. I.—Committee on Sewers has presented following resolutions ordering sewers to be constructed: Elk st., \$37,261.48; Union ave., Laurel Hill ave. to Pocasset ave., and What Cheer ave., Laurel Hill ave. to Pocasset ave., \$8,179.27; President and Cole ayes., \$3,353, assessments, \$1,952; Geneva and Powdermill sts., \$1,185.59; Tell st. and Atwell's ave., Harris ave. to new sewer, Kinsley ave. extension, \$1,254.10; Pocasset st., \$9,313.19; 10th st., \$2,767.10; Langham road, Ivy st. to Mope st., \$2,612.88.

Honea Path, S. C.—Council has adopted ordinance providing for issuance of \$25,000 of bonds for construction of sewer system.

Aberdeen, S. D.—Benecette Williams, Chicago, Ill., has been selected as Consulting Engineer to work with R. B. Easton, City Engineer, in construction of the \$200,000 worth of sewer extension and sewage disposal plant, and W. P. Mason, New York, N. Y., a bacteriologist, will also be employed to assist in work.

Maryville, Tenn.—City has petitioned Legislature for authority to issue \$100,000 of bonds for construction of sewerage system and water works.

Montross, Va.—Citizens have voted \$50,000 bonds to improve sewer and water system.

Milwaukee, Wis.—Department of Public Works is planning to build \$50,000 relief sewer in Thirteenth Ward.

CONTRACTS AWARDED

Colorado Springs, Col.—Construction of sewers in Storm Sewer District No. 1, to the Westcott-Doan Co., Denver, about \$31,000.—T. L. Waggener, City Engineer.

Washington, D. C.—Constructing sewers, to Warren F. Brenner Construction Co., Washington, as follows: Sewers in the vicinity of Potomac Heights, \$7,787; Georgia ave. trunk sewer, \$5,958.—Asa E. Phillips, Superintendent Sewer Department.

Belvidere, Ill.—Constructing sewers, to Schuyler Vandewalker, about \$3,000.

Bement, Ill.—Constructing system of storm sewers and also outflow drain, to Arthur Bert, Decatur, \$22,145; other bidders: Henry Rees, Quincy, \$25,200; Henning Vineyard Co., Evansville, Ind., \$22,729; R. E. Goodwin & Jno. W. Ryan, Springfield, \$22,318; Samuel F. Ferguson, Danville, \$22,236.

New Bedford, Mass.—Supplying sewer pipe for year, to Chas. Warner Co.

Niagara Falls, N. Y.—Building sewers in South ave., to John Rinaldo, 20 days, \$1,792.84; other bidders: Reach, Morello & Co., 15 working days, \$2,139; Cosano & Dower, 25 working days, \$1,883.50; William Rufran, 25 working days, \$2,126.10; Antonio Fiorilla, 25 days, \$2,074.80; Nick Nolfe, 25 days, \$2,014.90.

Hamilton, O.—Constructing sanitary sewers on 2d st. alley and 2d st. to Black for \$1,150.25 and on F st., Park ave. to Ross st., for \$985.40, to Frank J. Davis.

Clinton, Okla.—Construction of sewers, to J. W. Rooks, McAlester, at the following bid: 27,848 ft. 8-in. No. 1 vit. pipe, 28c.; trenching and refilling, 25,274 ft. 6 to 18 ft. deep, 18 to 49c.; 26,173 ft. pipe laying, including cement, etc., 6c.; 23 standard manholes, 7 ft. and under, 35c.; 4 extra for each drop to manhole, \$10; 68 extra for each additional foot of manhole, \$5; 39 combined flush tanks and manhole, \$100; 22 lamp-holes, 7 ft. and under, complete, \$1; 101 deep-cut house connections, \$4; 9,470 ft. galvanized 3-in. pipe, laid, 20c.; 29 taps off water main, \$4; total, \$22,781; other bidders: Hunter & Hunter, Pools Valley, \$30,535; E. M. Eby, Wichita, Kan., \$31,614; Stone Construction Co., Clinton, \$31,262; Connelly Construction Co., El Reno, \$34,206.

Stoughton, Wis.—Constructing complete sewer system, to E. R. Harding Co., Racine, \$69,999; work includes 13 1/4 miles of sewer, varying from 6-in. to 18-in. pipe, and a septic tank 9x25x10 ft.—L. C. Currier, City Clerk.

BIDS RECEIVED

Long Beach, Cal.—Sewer construction in 2d and other streets, Peter Grbovach, Los Angeles, \$7,900; S. Zarubica, Los Angeles, \$7,889; Frank H. Thomas, city, \$10,963; White & Gaskill, city, \$15,953.

Los Angeles, Cal.—Building sewer in Savannah st., Krist Radich, \$27,443; W. N. Hendricks, \$29,500; J. Zarubica, \$26,638; R. N. Nikoievich, \$32,915; John Baleh, \$31,000;

Geo. A. Rogers, \$26,873; Peter Grbovach, \$33,990; Geo. Wujacich & Co., \$33,207; M. S. Cummings, \$47,753; Joe Chlutuk, \$29,420.

Rock Island, Ill.—Installing west section of Seventh Ward sewer system, P. F. Trenkenschuh, city, \$60,429; Tri-City Construction Co., \$62,565; the E. R. Harding Co., \$69,000; the D. E. Keeler Co., Davenport, \$55,697.

Sigourney, Ia.—Detail bld of Bash & Gray, Joplin, Mo., successful bidders for constructing proposed sanitary sewers: 36,645 lin. ft. 8-in. pipe, 48c.; 5,351 lin. ft. 10-in., 52c.; 312 lin. ft. 12-in., 60c.; 100 lin. ft. 10-in., less than 4 ft. deep, 49c.; 407 lin. ft. 10-in., 4 to 6 ft. deep, 49c.; 247 lin. ft. 10-in., 6 to 8 ft. deep, 49c.; 153 lin. ft. 10-in., 8 to 10 ft. deep, 59c.; 216 lin. ft. 10-in., 10 to 12 ft. deep, 59c.; 146 lin. ft. 10-in., 12 to 14 ft. deep, 69c.; 50 lin. ft. 10-in., 14 to 16 ft. deep, 69c.; 44 lin. ft. 12-in., less than 4 ft. deep, 56c.; 100 lin. ft. 12-in., 4 to 6 ft. deep, 56c.; 883 lin. ft. 12-in., 6 to 8 ft. deep, 66c.; 474 lin. ft. 12-in., 8 to 10 ft. deep, 66c.; 229 lin. ft. 12-in., 10 to 12 ft. deep, 66c.; 120 lin. ft. 12-in., 12 to 14 ft. deep, 76c.; 367 lin. ft. 15-in., less than 4 ft. deep, 53c.; 853 lin. ft. 15-in., 4 to 6 ft. deep, 63c.; 905 lin. ft. 15-in., 6 to 8 ft. deep, 78c.; 648 lin. ft. 15-in., 8 to 10 ft. deep, 95c.; 544 lin. ft. 15-in., 10 to 12 ft. deep, 95c.; 483 lin. ft. 15-in., 12 to 14 ft. deep, 95c.; 130 lin. ft. 15-in., 14 to 16 ft. deep, \$1.25; 24 lin. ft. 10-in. c.-i. pipe, \$1.75; 42 brick piers, \$10; 41 flush tanks, \$60; 8 lampholes, \$4; 104 regular manholes, \$33; 7 drop manholes, \$35; 1 septic tank, West plant, \$2,400; 1 septic tank, East plant, \$2,500; 1 septic tank, South plant, \$300; 1 set of filters, West plant, \$1,200; 1 set filters, East plant, \$1,200; 1 filter, South plant, \$200; total, \$39,741.

Baltimore, Md.—Sanitary Contract No. 62, Pratt st. trunk sewer, and Sanitary Contract No. 63, lateral sewers in District 15; Sanitary District No. 62, McCay Engineering Co., 9 East Lexington st., \$2,752; John Muller, 120 Law Bldg., \$85,117; W. H. & C. F. Thompson, \$92,765; Ryan & Reilly, 405 Coleman Bldg., Philadelphia, Pa., \$95,036; B. F. Sweeten & Sons, 320 Sharp st., \$107,427; the Whiting-Middleton Construction Co., \$15,585; Sanitary Contract No. 63, William McCarthy & Co., \$75,187; M. J. Beach, \$79,890; B. F. Sweeten & Sons, 320 Sharp st., \$95,524; David M. Andrew Co., \$96,804; W. H. & C. F. Thompson, 627 Law Bldg., \$100,654; the Whiting-Middleton Construction Co., \$108,680.

Niagara Falls, N. Y.—Building sewers: Lafayette ave., Reach, Morello & Co., 30 working days, \$5,781; Cosano & Dower, 50 working days, \$5,389.75; W. A. Shepard & Co., 40 working days, \$5,755.25; William Rufran, 150 working days, \$5,117.50; Antonio Fiorilla, 25 working days, \$4,328.30; Nick Nolfe, 90 working days, \$5,280.20.

Watertown, N. Y.—Construction of a sanitary trunk sewer in the Second Ward from the Black River to Huntington st., Charlebois Bros., city, \$24,608; Lon E. Cleveland, city, \$23,001; W. S. Seisler, city, \$21,618; C. D. Hodge & Co., city, \$21,275; Philip Thomas, Syracuse, \$20,966; Samuel Brown, Syracuse, \$20,209; Burns Bros. & Haley, city, \$19,343.

Seattle, Wash.—Twenty-third ave. S. et al., sewers: Krogh & Jessen, \$29,790.30; D. McGarry, \$29,806.50; Young & Ulrich, \$29,455.80; T. I. Peterson, 324 24th ave., S., \$27,254.40; Nelson & Carlson, \$30,858.30; Becker & Walker, \$27,577.30; Virginia st. trunk sewer, (a) brick, (b) concrete, Walker & Placky, (a) \$20,245, (b) \$20,245; Hayden & Sons, (a) \$17,391.90, (b) \$17,391.90; Dan McGarry, (a) \$17,172.40, (b) \$16,268.40; Rounds Hurson Co., (a) \$16,121.60, (b) \$17,665.60; A. Peterson, 601 American Bank Bldg., (a) \$16,030, (b) \$16,030; B. H. Graff, Montera P. O., (a) \$17,473.88, (b) \$15,390.60.

WATER SUPPLY

St. Petersburg, Fla.—Plans are being prepared for construction of reservoir, capacity 225,000 gals.—C. B. McClung, Chairman Water Works Committee.

Salmon City, Ida.—Citizens have voted to purchase water works system; \$15,000 will be spent in improvements.

New Athens, Ill.—C. A. Redinger, Chemical Bldg., St. Louis, Mo., is preparing plans for proposed water works; cost about \$28,000.

Auburn, Ind.—City will gradually reequip present municipal water works and electric light plant.

Evansville, Ind.—Board of Public Works has decided to install water works pump at cost of more than \$10,000.

Indianapolis, Ind.—Council has appropriated \$1,045 for fire cistern.

Monticello, Ind.—Board of Public Works is considering asking for bids for improvement of water works.

Burlington, Ia.—Citizens Water Co. will enlarge filter plant and install additional engine.—E. P. Eastman, President.

Cumberland, Md.—J. H. Fierces, Expert Hydraulic Engineer, New York City, has made recommendations for bettering water supply; three sources of supply available; eight different plans for plants of 6,000,000 and 12,000,000 gals. capacity; cost from \$402,700 to \$1,082,850.

Cumberland, Md.—Council has adopted plan advanced by Engineer J. H. Fierces to take water supply from Ewitt's Creek; cost of the improvement will be in neighborhood of \$470,000.

Andover, Mass.—Town has voted \$20,000 appropriation for water extension.

Brockton, Mass.—Plan for twin reservoirs, each of 4,000,000 gals. capacity, have been prepared by City Engineer Charles R. Felton.

Tewksbury, Mass.—Citizens have defeated proposition to establish water plant; company will be formed to install system.

Lynn, Mass.—City Engineer George I. Leland is working on plans for extension of storage system for water supply.

Grand Rapids, Mich.—City has awarded \$75,000 water main extension bond issue to Harris Trust Co., Chicago; new bids will be asked for \$20,000 filtration bond issue.

Grand Rapids, Mich.—Bids will be received March 13, 4 p. m., for \$200,000 rapid sand filtration bonds.—Jas. Schurer, City Clerk.

Colé Camp, Mo.—Citizens will vote in April on \$10,000 water works bonds.

Columbia, Mo.—H. B. Shaw, Consulting Engineer, will purchase about 44,000 ft. 6-in. and 14,000 ft. 4-in. c.-i. pipe for water works extensions.

Diller, Neb.—Citizens have voted \$15,000 bonds for the construction of water works.—J. Smith, Village Clerk.

Dundee, Neb.—Citizens have defeated proposition to issue \$49,000 bonds to install independent water plant.

Kensaw, Neb.—Citizens have voted proposed water bonds.

Jersey City, N. J.—Citizens will vote on \$75,000 bonds to improve water and drainage systems.

Las Cruces, N. M.—Council will order election on bonds for construction of water works system.

Tucumcari, N. M.—Citizens will vote April 27 on purchase of water works plant.

Irondequoit, N. Y.—Governor Dix has signed bill legalizing a bond issue of \$20,000 for the construction of water works system at Summerville by this town.

Lyonville, N. Y.—Citizens will vote March 21 on \$25,000 bonds to install water works.

Portland, N. Y.—Engineer Wilder, Fredonia, has prepared preliminary estimates for water works.

St. Johnsville, N. Y.—Citizens will vote on \$5,000 appropriation to purchase and install system of water works.

Black Mountain, N. C.—Citizens will vote on \$15,000 bonds for construction of water works and sewerage system.

Charlotte, N. C.—Citizens will vote on \$350,000 bonds to bring water from Catawa River, 12 miles distant.

Baker City, Ore.—Estimates will be made on constructing of 3,000,000-gal. capacity reservoir near the present one.

Pendleton, Ore.—Water Commissioners will call election on bonds for installation of gravity water system; mountain water will be piped from the foothills of the Blue Mountains, the source of supply being the Thorne Hollow Springs, 14 miles distant; water will be brought to city in 18-in. pipe for a part of the distance and 20-in. pipe for the remaining distance.

Erle, Pa.—Dr. J. L. Leale, 158 Ellish st., Paterson, N. J., has estimated cost of installing proposed filtration and sterilization plant at \$250,000.

Franklin, Pa.—Consulting Engineer L. E. Chapin, Pittsburg, has recommended \$15,000 appropriation for improvements at water works.

New Kensington, Pa.—State Board of Health has ordered New Kensington Water Co. to submit plans for filtration plant not later than June 1.

Bancroft, S. D.—Election on bonds for installation of water works system is being considered.

Carter, S. D.—Council has decided to construct municipal water system; cost \$7,000.

Morristown, S. D.—Bonds have been voted for construction of water works.—J. Peter Healy, Town Clerk.

Clarksville, Tenn.—Water Committee has recommended improvements to cost over \$50,000, including erection of building for the pumping station to be built above high water and to cost approximately \$12,500; erection of another standpipe, 124 ft. in height; clear water concrete basin; installation of meter throughout city; extension of mains to sections of city not served, and such additional pumps as may be required to supply and protect city.

Maryville, Tenn.—City has petitioned Legislature for authority to issue \$100,000

bonds for construction of water works and sewerage system.

Snerman, Tex.—City has decided to improve water works plant.—Harne McDuffie, Superintendent.

Timpson, Tex.—Citizens will vote on \$20,000 of bonds for construction of water works.

West, Tex.—West Water, Power and Light Co. has decided to erect brick water station.

Salt Lake City, Utah.—City Engineer G. F. McGonagle is preparing plans for construction of additional water system.

Montross, Va.—Citizens have voted \$50,000 bonds to improve water and sewer system.

Seattle, Wash.—Board of Public Works is taking bids on a brick and concrete pumping station to be built at Interbay; plans prepared by City Engineering Department.

Tacoma, Wash.—City is preparing to call for bids for the construction of pipe line from McMillan to Tacoma and of \$100,000,000-gal. reservoir at McMillan.—Victor Lawson, Commissioner of Light and Water.

Frederic, Wis.—Citizens will vote April 4 on \$2,000 bonds to erect 50-ft. steel tower and 20,000-gal. steel tank.

La Crosse, Wis.—City Engineer Geo. P. Bradish has recommended improvements to water distribution system at cost of \$56,298.

CONTRACTS AWARDED

Ontario, Cal.—Constructing domestic water system from plans of F. E. Trask, Homer Laughlin Bldg., Los Angeles; laying pipe, to Joe Chutuk, Los Angeles, \$18,882; screw pipe and specials, Crane Co., Los Angeles, \$70,375; riveted pipe and specials, Western Pipe and Steel Co., Los Angeles, \$16,398.

San Francisco, Cal.—Furnishing, testing and delivering gate and check valves for auxiliary water system for fire protection, to Union Machine Co., \$11,593; furnishing and delivering bolts, tie rods, etc., for same, to Union Iron Works Co., \$106 per ton of 2,000 lbs.

New Haven, Conn.—Furnishing water pipe, to R. D. Wood & Co., \$22.08 per ton; other bidders: U. S. C. I. P. Co., \$22.45 per ton; Standard Pipe Co., \$22.68 per ton; Charles Miller & Son, \$22.70 per ton; M. J. Drummond, \$24.10 per ton; Lynchburg Foundry Co., \$24.50 per ton.

Augusta, Ga.—Furnishing 11,700 lin. ft. c.-i. pipe, to the General Pipe and Foundry Co., Atlanta, \$21.75 per ton; other bidders were Dimmick Pipe Co., Chattanooga, \$22.25; American Cast Iron Co., Birmingham, Ala., \$22.50; laying pipe, to Hallahan & Costello, Augusta, 12-in. 33c., 10-in. 25c., 8-in. 25c., 6-in. 18c.; only other bidder for this contract was T. G. Brittingham, Augusta, 12-in. 33c., 10-in. 32c., 8-in. 25c., 6-in. 20c.

Apple River, Ill.—Constructing water works, to T. H. Iglehart, Chicago, \$15,400.

Kingston, Ill.—Construction of water works system, to Belis & Gale, Oregon, Ill., \$3,855; work includes 1 10-h.p. gasoline engine, 1 4x6-in. compressor, 1 6-in. pump, 1 8x36-ft. pressure steel tank, 3,200 ft. of 4-in. water pipe with 9 hydrants containing two openings, 1 2½-in. and 1 2-in., to be placed at each street crossing.

Logansport, Ind.—Improvements to city water works, including engine, pump and other equipment: Hoovens-Rentschler Co., Hamilton, O., \$15,420; Snow Steam Pump Co., Chicago, Ill., \$17,745; Platt Iron Works Co., Dayton, O., two bids, \$15,500 and \$14,095; Allis-Chalmers Co., Milwaukee, Wis., 2 bids, \$13,995 and \$15,495; Prescott Steam Pump Co., Chicago, Ill., \$16,380.

Adair, Ia.—Water works and electric lighting improvements, to the Des Moines Bridge and Iron Co., Des Moines, \$28,460.—W. K. Palmer Co., Dwight Bldg., Kansas City, Mo., Engineers.

Atlantic, Ia.—Water works and electric lighting improvements, to the Joseph A. Bortenlanger Co., Omaha, Neb., \$43,000.—W. K. Palmer Co., 717 Dwight Bldg., Kansas City, Mo., Engineers.

Iola, Kan.—Installation of three new boilers, to United Iron Works, city, \$6,844.

Wymore, Neb.—Constructing municipal water and lighting plant, to Elkhorn Construction Co., Fremont, laying water mains, \$3,150; to Frank Wheeler, Havelock, Neb., constructing electric line, \$1,150; to St. Mary's Machine Co., Ohio, machines for general power, \$4,250.

Bayonne, N. J.—Laying 10-in. water main in Constable Hook yards of Standard Oil Co., to E. M. Mullen & Co., \$1,157.01.

Perth Amboy, N. J.—Furnishing engine and blower for water works at Runyon, to Engineering Co., \$775; to the same company for balanced draft system in connection with boilers for new pump, \$495.

Rochester, N. Y.—Furnishing stop valves for water works department, to Rensselaer Valve Co., \$540 for larger valves to \$8.20 for smaller sizes.

Canton, O.—To Chicago Bridge and Iron Co., Chicago, Ill., for constructing 1,000,000-gal. reservoir, \$23,200.

Euclid, O.—To Gould & Maybach, Cleveland, for improvement of Montclair road, by constructing a 6-in. water main, \$1,177.—F. A. Pease Engineering Co., 931 Williamson Bldg., Cleveland, Engineer.

Hamilton, O.—To Darling Pump Manufacturing Co., Williamsport, Pa., for 6-in. gate valves at \$11 each, and to Scioto Valley Supply Co., Columbus, for furnishing 4-in. wrought iron gas pipe at \$26.15 and 6-in. pipe at \$47.30 per 100 ft.

Toledo, O.—Furnishing year's supply of water pipe for water works department, to United States Cast Iron & Foundry Co., Chicago, \$22.80 a ton; department will use approximately 1,500 tons during season.

Nashville, Tenn.—Supplying city with 45,000 ft. of 6-in. and 3,000 ft. of 12-in. water pipe, to U. S. C. I. Pipe and Foundry Co., Chattanooga, \$20.95 f. o. b. per ton.

BIDS RECEIVED

Fort Terry, N. Y.—Construction of (a) reinforced concrete reservoir, (b) extension to water main: Sperry Engineering Co., New Haven, Conn., (a) and (b) \$11,110; A. Benvenuti, New London, Conn., (b) \$1,400; Connecticut Engineering and Contracting Co., Norwich, Conn., (a) \$6,750, (b) \$1,050; Francis J. Boas, Philadelphia, Pa., (a) and (b) \$14,300; John J. Fitzpatrick & Sons, Plattsburg, N. Y., \$13,578, (b) \$1,700; Alexander Johnstone Building Corporation, Waterbury, Conn., \$13,772; Amity Construction Co., New York City, \$9,636; F. H. Redden Construction Co., New London, Conn., (a) and (b) \$11,670; R. H. Whipple & Co., Worcester, Mass., (a) and (b) \$10,973; F. H. Schwiers, Jr., Co., New York, (a) and (b) \$12,000; alternate of F. H. Schwiers, Jr., Co., \$11,415; Neil Farnham, Inc., New York, (a) and (b) \$21,980; M. L. Bayard & Co., Philadelphia, Pa., (a) and (b) \$17,000; alternate of M. L. Bayard & Co., \$15,000; Pierson Engineering and Construction Co., Bristol, Conn., (a) and (b) \$12,500.

Coshocton, O.—Construction of either 3,000,000 or a 4,000,000-gal. steam pumping engine or a 3,000,000-gal. centrifugal electrical driven pump for water works department as follows: Platt Iron Works, Dayton, steam, 3,000,000-gal. pump, \$24,715; steam, 4,000,000-gal., \$25,430; each to be completed in six or seven months; 2-unit electric, 3,000,000, \$29,600; 4,000,000, \$10,060; four months on each: Holly Mfg. Co., Buffalo, N. Y., steam, 3,000,000, \$17,980; 4,000,000, \$19,130; each six months; electrical, 3,000,000, \$11,800; Allis-Chalmers Co., Milwaukee, Wis., steam, 3,000,000, \$22,485, 5½ months; 4,000,000, \$26,467, six months; electrical, 3,000,000, \$12,500; American Well Co., Chicago, Ill., electrical, 3,000,000, \$6,237; 4,000,000, \$8,175; each 95 days; Dravo-Doyle Co., electrical, 3,000,000, \$7,700; 4,000,000, \$8,000; each 110 days.

Dallas, Tex.—Erection of the White Rock standpipe, 70 ft. high and 20 ft. inside diameter; bids are for the placing of the foundations of concrete and for the necessary excavations for that work: Dallas Boiler Works, by J. F. Thrash, erection of the standpipe \$4,615, with 45c. per cu. yd. for earth excavations, \$2.50 for rock and \$7.60 for the concrete work; O. J. Gorman, erecting of the standpipe \$5,200, with \$1.680 for foundation work and \$2.60 per cu. yd. for rock excavation; Memphis Steel Construction Co., erecting of standpipe \$4,340, with earth excavation at 30c. per cu. yd., \$1.60 for rock excavation and \$6.60 to \$7 for concrete; F. B. Godley, standpipe erection \$5,559, with \$1 for earth work, \$2 for rock and \$6 for concrete, or a lump sum for the foundation work of \$1,360; Smith & Whitney, erection of the standpipe 5,375, with \$1 for earth work, \$2 for rock and \$6 for concrete, or a lump foundation sum of \$1,350; Chicago Bridge and Iron Works, standpipe erection \$6,795, with rock excavation at \$1 per cu. yd.; as an alternate bid the company offered to erect steel tank holding 165,000 gals., 12 ft. to the first expansion joint and 42 ft. to maximum water line, for \$5,900, with deduction if a valve is used of \$800.

LIGHTING AND POWER

Etna Mills, Cal.—Power house, which is owned by the Scott River Dredging Co., which furnishes town of Callahan with light, has been completely destroyed by fire.

Imperial, Cal.—C. S. Chestnut, Redlands, is interested in construction of electric light plant.

Los Angeles, Cal.—Citizens have declared in favor of municipal distribution of electrical power, which will be generated by the 250-mile Owens River aqueduct, as against proposal that it is leased to the existing power corporations.

Porterville, Cal.—The Home Gas Co. has decided to reconstruct plant; high-pressure

line is to be installed to cover entire city.—W. B. Phillips, President.

San Bernardino, Cal.—Lytle Creek Light and Power Co., holder of present lighting contract, has submitted offer to sell their system to the city for the establishment of municipal lighting plant desired by city officials.

Yreka, Cal.—The Siskiyou Electric Power and Light Co. is considering enlargement of plant.—J. W. Churchill, President.

Bridgeport, Ill.—R. D. Donnelly, W. E. Beyhau and V. H. Lytle have incorporated Bridgeport Light and Power Co., capital \$25,000, to furnish light, heat and power.

Waukegan, Ill.—North Shore Electric Co. is planning to erect addition to plant.

Fort Wayne, Ind.—Board of Public Works will within next few weeks receive bids on both tungsten and the magnoteite systems of illumination for ornamental posts to be installed on Calhoun st.

Terre Haute, Ind.—Citizens Mutual Heating Co. will erect power plant between 5th and 6th sts.; cost \$100,000.

Humeston, Ia.—Leon Electric Light Co. is considering extension to wires to light town.

Jeffersonton, Ky.—Commercial Club and Town Board are interested in formation of company to install \$15,000 lighting plant.

Louisville, Ky.—Kentucky Electric Co. has purchased additional site for erection of proposed \$1,000,000 power plant.

Kensington, Md.—Council will grant to Potomac Electric Power Co., Washington, 35-year franchise; company will extend its lines at once.

Clinton, Minn.—Citizens have decided to install electric light plant either by giving the franchise to private parties or by municipal ownership.

Byhalia, Miss.—Council is considering \$10,000 bond issue to purchase and install electric light and water plants.—C. M. Henry, Mayor.

Malta, Mont.—H. E. Wharton has asked Council for franchise to install electric light plant.

Franklin, Neb.—City proposes to construct electric light plant to cost \$7,000 to \$8,000.—H. Whitmore, City Clerk.

Gordon, Neb.—Citizens have voted bonds for installation of electric light, sewer and water works systems.

Cape May Court House, N. J.—The Wildwood, Angelsea and Holly Beach Gas Co. has been granted right to lay mains through streets of Cape May Court House and leading highways of Middle Township.

Columbus, N. J.—Township Committee is considering proposition to light village with gas.

New York, N. Y.—Public Service Commission, Second District, has received application from the Long Island Lighting Co., a new corporation, asking for its approval of the purchase of entire property and franchise of the Amityville Electric Light Co., the Sayville Electric Co., the Northport Electric Light Co. and the Islip Electric Light Co., and their merger into the Long Island Lighting Co.; new construction, additions and betterments to the amount of practically \$300,000 are proposed.

Richville, N. Y.—Village will vote March 21 on proposition of raising money to light streets.

Hankinson, N. D.—H. G. Squires, Galesburg, Ill., has applied for franchise to operate electric light plant.

Minot, N. D.—Burns & McDonnell, Kansas City, Mo., are investigating feasibility of installing municipal electric light plant.

Mott, N. D.—Council has granted 20-year franchise to J. Blaine Little for operation of an electric light plant.

Brookville, O.—Bids are now being received by village for electric power, commercial and street lighting.—H. E. Wheaton, Corporation Clerk.

Cleveland, O.—The Star Electric Co. has been organized, capital \$10,000, to furnish electric current for lighting and power purposes.—D. H. Tilden, A. A. McCorkin, Marjorie Ferrall, J. M. Brug and Elmer G. Perr, Incorporators.

Albany, Ore.—Electric Light Co. will expend \$100,000 in improving light and water systems.

Baker City, Ore.—City Commissioners have decided that under Commissioner Henry, City Engineer prepare estimates for pipe line from Elk Creek to Salmon Creek to replace flume now in; pipe line is to furnish power for electric lighting plant to be owned by city and the City Engineer was also instructed to estimate cost of such plant.

Salem, Ore.—Council is making arrangements for establishing cluster system if illuminating streets.

Hamburg, Pa.—Electric light plant has been destroyed by fire; loss \$10,000.—Morgan Ford, Engineer.

Lock Haven, Pa.—Council has instructed Light and Sanitary Committee to ask for bids for lighting streets by electricity; also

for bids for construction of electric plant to be owned and operated by city.

Dillon, S. C.—Electric Light Commission has decided to rebuild electric light plant.

Honea Path, S. C.—Council is considering \$11,000 bond issue for construction of electric light system.

Draper, S. D.—Council will grant 25-year franchise for installation of electric light plant.

Jackson, Tenn.—City will expend nearly \$20,000 for improving lighting system.

Lynnville, Tenn.—Board of Aldermen is considering application for franchise for construction of electric light and ice plant.

Memphis, Tenn.—Mayor Crump and Commissioner of General Utilities Thomas Dies are preparing to leave for Seattle, Wash., Portland, Detroit and Cleveland to investigate municipal lighting plants as a preliminary step toward establishing municipal lighting plant in this city.

Baird, Tex.—T. A. Ward, Comanche, has decided to construct electric light system.

New Braunfels, Tex.—The W. K. Palmer Co., Engineers, 717 Dwight Bldg., Kansas City, Mo., will prepare plans for installation of proposed municipal hydroelectric plant.

Ogden, Utah.—Engineer Strauss is preparing plans for proposed electric power plant to be constructed by Merchants Light and Power Co.

Olney, Va.—Peninsula Light and Power Co. has been incorporated by Thomas R. James, B. W. James, W. C. Fox, W. J. Milliner and R. S. Milliner to construct electric light plant.

Seattle, Wash.—Bids on Subdivision No. 1 of the Third ave. cluster light contract have been rejected by the Board of Public Works upon the recommendation of Assistant City Engineer Dimock; bids were on clearing, excavation, hand holes, concrete walks, iron pipe, fibre pipe and secondary cable; low bidder was Meacham & Babcock at \$20,157.80; new bids will be called for.

Albany, Wis.—Electric light plant has been destroyed by fire.

Beloit, Wis.—Council has taken steps to order all downtown telephone and electric light wires underground.

Racine, Wis.—Plant of Racine Electric Light and Railway Co. has been destroyed by fire with loss of \$125,000.

Superior, Wis.—Great Northern Power Company has issued call for bids for supplying apparatus that will be needed in construction of new electric transmission line from power plant at Thompson to Superior.

Sun Prairie, Wis.—Citizens have voted \$9,000 bonds for installation of electric light system.

CONTRACTS AWARDED

Willows, Cal.—Erecting 20,000-ft. gas holder for Northern California Power Co. to Davis & Farnum Manufacturing Co., Waltham, Mass.

Dalton, Ga.—By Council, for extension of electric light system, to John W. Ash, Austell, for reinforced concrete power house, electric light and pumping station, etc., \$16,500.—H. S. Jaudon Engineering Co., Box 582, Savannah, Engineer in Charge; W. M. Carroll, City Clerk.

East St. Louis, Ill.—To East St. Louis Light and Power Co. for furnishing 100 additional electric arc lights, \$50 per light.

Stanton, Ill.—To Wesco Supply Co., St. Louis, Mo., for installation of electrical apparatus in municipal electric light plant, \$6,725.

Adair, Ia.—Electric lighting and water works improvements, to Des Moines Bridge and Iron Co., Des Moines, \$28,460.—W. K. Palmer Co., 717 Dwight Bldg., Kansas City, Mo., Engineers.

Atlantic, Ia.—Electric lighting and water works improvements, to the Jos. A. Bortelanger Co., Omaha, Neb., \$43,000.—W. K. Palmer Co., 717 Dwight Bldg., Kansas City, Mo., Engineers.

Baltimore, Md.—Furnishing gas for municipal lighting for one year, to Consolidated Gas, Electric Light and Power Co., 70c. per 1,000 cu. ft. for street lighting and 80c. for lighting municipal buildings.

Newton, N. J.—By Newton Gas and Electric Co. for constructing new plant, to O'Donnell & McNaniman, Newton; cost about \$15,000.

Yonkers, N. Y.—Lighting streets for five years, to Westchester Lighting Co., \$28 per lamp.

Swansea, R. I.—Town has voted appropriation of \$1,000 a year for five years for erection and maintenance of a public street light system and voted to empower Board of Selectmen to execute contract with the Fall River Electric Light Co. to furnish electrical current and equipment.

FIRE EQUIPMENT

Texarkana, Ark.—Council has rejected all bids for furnishing auto fire apparatus.

Berkeley, Cal.—Citizens have voted \$85,000 bonds for fire department; three fire houses will be erected, fire house on Durant rebuilt and modern equipment purchased.

Willows, Cal.—Trustees have sold \$40,000 bonds for purchase of fire apparatus and site for city hall to E. H. Rollins & Co.

Fort Tampa, Fla.—Volunteer fire department will be organized.

St. Petersburg, Fla.—City will erect proposed fire house at 3d st. and 2d ave. East.

East Freeport, Ill.—Need of auto hose cart is being urged.

Goshen, Ind.—Council has decided to erect proposed central fire station at 3d and Jefferson sts.

Indianapolis, Ind.—Board of Public Works is considering plans prepared by Architects H. L. Bass & Co. for erection of three engine houses.

Newcastle, Ind.—Council will erect \$8,000 engine house at South 18th st. and Grand ave.

Hammond, La.—Purchase of motor chemical engine is being considered.

Searsport, Me.—Town has voted \$250 for hose and authorized Selectmen to purchase rubber coats for firemen.

Hyattsville, Md.—Town is about to erect fire department and municipal building.—J. Frank Rushe, Fire Chief.

Gloucester, Mass.—Council is considering purchase of auto chemical combination wagon. Address Chief Engineer Crowe.

Marblehead, Mass.—Town has appropriated \$9,000 to install larger fire alarm switchboard.

Monson, Mass.—Town will consider purchase of auto truck.

Newburyport, Mass.—Town will remodel engine at cost of \$1,300 and purchase 3,000 ft. of hose.

Rockport, Mass.—Town has voted to appropriate \$800 for purchase of fire hose.

Saugus, Mass.—City proposes to build fire station to cost \$20,000, also to spend \$2,500 for truck, \$1,200 for four horses, \$5,500 for auto combination wagon and \$1,000 for fire alarm extension.

Southbridge, Mass.—Fire department is urging need of 1,000 ft. of hose.

Grand Rapids, Mich.—Board of Fire Commissioners has recommended that motor-driven apparatus be installed at No. 1 engine house.

Duluth, Minn.—Oneota Improvement Club is urging erection of fire house and establishment of combination hose and chemical wagon.

Stephen, Minn.—Chief Jacob Peters is securing data on chemical engines.

Benson, Neb.—Citizens have voted \$5,000 bonds to purchase of fire apparatus.

Hempstead, N. H.—Town has organized fire department with H. W. Tabor as captain; purchase of chemical fire engine is being considered.

Manchester, N. H.—Board of Mayor and Aldermen of Council has asked for appropriation of \$6,000 for auto chemical to be stationed at the Fire King.

Morristown, N. J.—Fire Chief Trowbridge has recommended purchase of auto truck.

Ocean City, N. J.—Council has ordered purchase of 1,500 ft. of hose for fire department.

Paterson, N. J.—Board of Fire and Police Commissioners will ask bids for the converting of engines and hose wagons of steamer companies Nos. 1 and 5 to motor-propelled engines, and also for purchase of a motor hook and ladder truck.

Phillipsburg, N. J.—Council is considering purchase of chemical fire engine.

Clayville, N. Y.—Village will vote March 21 on \$1,500 bonds to erect engine house.

Hamburg, N. Y.—Fire Chief John Salisbury has recommended erection of fire station and purchase of 1,000 ft. of hose.

Little Falls, N. Y.—Fire and Police Board has asked permission to purchase hose wagon.

Mamaroneck, N. Y.—Citizens will vote March 21 on \$12,500 bonds to erect fire station.

Marathon, N. Y.—Village will vote March 21 on purchase of chemical fire engine; option has been obtained on suitable engine at price of \$665.

Niagara Falls, N. Y.—Taxpayers will vote in April on proposition to expend \$12,500 for two new fire halls, three pieces of automobile apparatus, and for protecting fire alarm system from injury by fire.

Pelham Manor, N. Y.—Citizens will vote on \$10,000 appropriation for purchase of motor fire engine.—J. Lewis Cunningham, Fire Chief.

Port Leyden, N. Y.—Citizens will vote on \$350 appropriation for chemical engine.

St. Johnsville, N. Y.—Citizens will vote on \$500 appropriation for fire alarm system.

Utica, N. Y.—Plans have been prepared by Architect Hobbes for erection of \$15,000 fire station at Elizabeth st. and Post ave.

Cincinnati, O.—Safety Director Small, Mayor Schwab and Fire Chief Archibald have decided on extensive improvements and additions to fire department, including installation of three auto fire engines and several auto combination hose and chemical engines.

Marietta, O.—Plans have been prepared for erection of house for Hose Co. No. 1.

Warren, O.—Council has passed bond ordinance for \$4,500 with which auto fire truck will be purchased for central department.

Chester, Pa.—Good-Will Fire Co. is planning to erect addition to engine house.

Erie, Pa.—Fire Commissioners have asked Council for \$20,000 appropriation for purchase of apparatus.

Hazleton, Pa.—Fire Chief Thos. Burkhardt has recommended purchase of triple auto, engine, chemical and hose fire apparatus to be stationed at central station, also two auto combination chemical engine and hose wagons.

Meadville, Pa.—Need of auto truck for Davis Hose Co. is being urged.

Pittstown, Pa.—Town has appropriated \$5,000 to erect fire station.

Providence, R. I.—Fire Commissioners have recommended gradual substitution of motor-driven apparatus for horse-drawn.

Sumter, S. C.—Committee, Alderman J. F. Glenn, Chairman, is considering need of auto apparatus.

Puyallup, Wash.—George Barry, Chief Fire Department, is in favor of city purchasing combination automobile chemical hose and hook and ladder wagon and of having up-to-date fire alarm system installed.

Tacoma, Wash.—City will purchase site at E. 26th and C sts. for erection of fire station.

Tacoma, Wash.—Municipal Committee has voted to purchase fire engine for station at N. 25th and Proctor sts., type, size and cost not yet determined.—L. W. Roys, Commissioner.

Beloit, Wis.—Council has ordered overhauling of fire alarm system and installation of 11 new boxes at cost of \$1,500.

CONTRACTS AWARDED

Pueblo, Col.—Furnishing auto fire truck, to American-La France Fire Engine Co., Elmira, N. Y., \$5,750.

Millville, N. J.—Eureka Fire Hose Manufacturing Co., 13 Barclay st., New York, has been awarded contract for 500 ft. of two-ply fire hose, \$1.00; company informs us that item in issue of March 8 stating that Paragon hose was furnished was in error.

Hazleton, Pa.—Furnishing auto chemical engine for Diamond Fire Co., to Robinson Fire Apparatus Co., St. Louis, Mo.

Columbia, S. C.—Furnishing auto hose wagon and chemical engine and automobile fire engine, to Webb Company and American La France Company combined, price being \$13,000.

BRIDGES

Macon, Ga.—Bibb County will vote May 10 on \$200,000 bonds for bridge improvements and new bridges.

East Peoria, Ill.—Village Board has voted to advertise for bids preparatory to erection of concrete bridge over Coles Creek at Washington st.; cost about \$4,000.

Moline, Ill.—Plans have been completed by Landscape Architect Henry C. Klehm, Arlington Heights, for erection of \$1,500 concrete bridge over West Lake.

Mt. Vernon, Ind.—County Council has appropriated \$20,000 for bridge and road construction in Posey County.

Washington, Ind.—Council is considering plans and specifications by Hugh O'Neill for construction of proposed bridge at North East 1st st.

Holyoke, Mass.—Board of Public Works has instructed City Engineer to submit estimates for bridge over second level canal at Cabot st.

Benton Harbor, Mich.—City is considering construction of a viaduct to connect East and West High sts.; preliminary plans have been prepared, providing for structure 825 ft. long and 28 ft. wide, with 4-ft. sidewalks and 20-ft. roadway.

Taylor's Falls, Minn.—L. P. Wolff, St. Paul, is preparing plans for bridge to be constructed over St. Croix River.

Omaha, Neb.—Plans have been prepared for erection of proposed 11th st. viaduct; cost \$100,000.—Geo. Craig, City Engineer.

Passaic, N. J.—Freeholders of Passaic and Bergen counties are considering erection of \$75,000 bridge across Passaic River at Rutherford ave.

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CONCRETE MARKET HOUSE, FORT WAYNE, INDIANA. CITY HALL IN THE DISTANCE

FORT WAYNE MARKET HOUSE

Constructed Entirely of Concrete, Except Roof—Method of Constructing Columns and Pavilions—Concrete Surfaces of White Cement and Roofing Gravel—Constructing Market Tables of Concrete

By EDWARD P. BAILEY

The city of Fort Wayne, Ind., has recently completed a market house which is constructed entirely of concrete, and in which successful effort has been made to produce excellent architectural results. The farmers' market has been a feature of the city for a number of years. Until the completion of this market-house three days a week were designated as market days, but no satisfactory accommodation had been furnished for the market men.

The new market-house extends for a block and a half along Barr street; from the rear of the city hall one-half block to Wayne street, and an entire block from Wayne to Washington street. There is an entrance into each of these sections from Wayne street and into the longer section from Washington street, a pavilion being provided at each entrance. The two pavilions facing each other on the opposite sides of Wayne

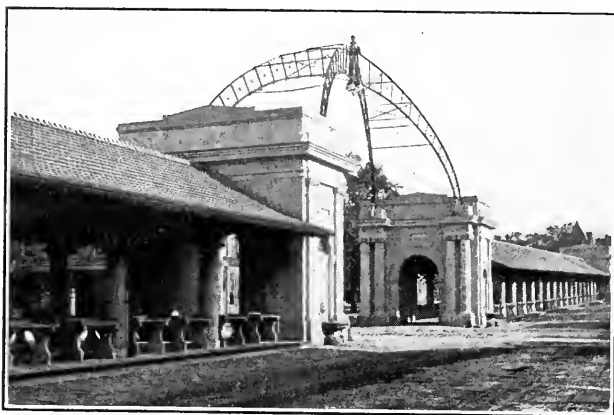
street are connected by steel arches, from which electric lights are suspended. The entire length of the market is 450 feet and the width from curb to curb is 26 ft. 8 in. The teams back up to these curbs, outside the structure, while the purchasers use the passage through it.

The pavilions are of the Ionic order of architecture. The capitals of the columns were cast in glue molds, as were also the lions' heads over the drinking fountains, while the other architectural features, such as rosettes, keystones, etc., were cast in plaster molds and set in place as the structure went up. The drinking fountains were cast in place, all pipes, etc., being placed in position beforehand. The walls of the pavilions were built upon a core of brick work, presenting an unbroken surface of concrete made of white sand and Medusa white cement, with an aggregate of birdseye or roofing gravel. When the forms were removed the surface was scrubbed with wire

brushes exposing the aggregate, and the general effect is very pleasing. The columns were cast in place in the same manner as the columns of the main part of the structure. These pavilions contain the market master's office as well as the public toilet rooms.

In the main part of the structure there are 54 round columns, and two square columns at the end next to the City Hall. The round columns have shafts 8 ft. 9 in. high, each resting on an octagonal base which varies in height with the elevation of the ground surface. The shafts are each 24 inches in diameter at the base and 21 inches at the top, and each is surmounted with a plain molded capital and square cap. These columns support the roof, and within the space enclosed by them are the tables used by the market men, and the passageway for purchasers.

In constructing the columns, a rough core was cast of concrete mixed one to five, which was 6 inches less in diameter than the finished column. When this core had hardened the forms were removed and the mold for the finished column was put in place around the core. This mold was built of wood, in four sections, with very carefully finished surfaces. Between this mold and the core was poured the concrete, of white sand, Medusa white cement and birdseye gravel, such as was used for the pavilions, the proportion being one cement, two sand



WAYNE STREET PAVILIONS, WITH CONNECTING ARCH

and three gravel. Medusa waterproofing compound was used in all of the concrete to the extent of about $1\frac{1}{2}$ or 2 per cent. of the amount of cement used. Twenty-four hours later the forms were removed and the surface brushed. In casting the columns long bolts were imbedded in the top of them in the line of their axes, and protruding for some distance, for the purpose of anchoring the roof to the columns. The caps of the columns were cast with circular openings in the center, through which the bolts would pass, and after the caps had been accurately adjusted to place this opening was filled with concrete, this serving the double purpose of holding the caps in place and giving additional anchorage to the bolts. The roof consists of a framework of wood covered with red roofing tile. A concrete floor is provided for the entire structure.

In line with the columns are placed 112 tables, two tables being placed in each opening between columns. These tables are entirely of concrete and are five feet long, two and one-half feet wide, and stand two feet ten inches above the floor. The tops rest upon two end supports of concrete cast solid, but of slightly ornamental design, 4 inches thick and about 2 ft. 8 in. high. They are reinforced with expanded metal and each was cast in a plaster mold made in four parts on a wooden frame, the mold consisting of these four sides clamped together and laid on a concrete floor, which had previously been covered with oil paper. The concrete was poured into this mold, and the top trowelled off smooth. In making these end supports two bolts were imbedded as dowels in the top of each, and holes were provided in the table tops for receiving these bolts. The bolt holes were countersunk in the top with a small trowel for receiving the nuts. The table tops are $1\frac{3}{4}$

inches thick, each reinforced with a sheet of Page woven wire and having a flange about 3 inches high extending around three sides. The tops were also cast on a concrete floor in a steel mold made for the purpose. All the concrete used in the tables was made of a one to two mixture of ordinary Portland cement and washed sand.

The architects for the market building were Mahurin & Mahurin, and the contractors were Borkenstein & Son, all of Fort Wayne, Ind.

GERMAN SYSTEM OF SEWAGE PURIFICATION

A system of treating sewage which has been introduced in Germany and is known as the Braun system, and which has been used in hospitals and military barracks, was described in a recent issue of the *Gesundheits Ingenieur*. It consists of two septic tanks, each of a capacity of 24 hours average flow of sewage, and a filter, with provision for aeration. The effluent from septic tank No. 1 is removed by a pipe and drops a short distance through the air into tank No. 2, during which drop the sewage is supposed to absorb oxygen from the air, and probably at least gets rid of a certain amount of the contained gases. From tank No. 2 the effluent passes to a filter bed which is usually from five to eight ft. deep, and consists of loosely packed large hard clinkers, furnace slag or coke with-out any small particles or sand.

The most novel feature of the plant is the method of distributing the sewage onto the filter. For this purpose a pipe from septic tank No. 2 discharges the sewage into a main distributing gutter which is carried over the filter for its entire length. Immediately below this gutter and at right angles to it are so-called "drip pipes," which are placed above the entire surface and 20 inches apart. The pipes are of a special construction in cross-section, in that the top at the center is depressed lower than the sides or edges. The edges are provided with slots at intervals of about six inches. Long wicks of an absorbent material are fastened in these slots, one end hanging for a short distance outside of the pipe. These wicks suck up the septic effluent, which drops from the outer end of the wick onto the filter.

The filter material is supported by a grating composed of small reinforced concrete beams between which are slots running the entire length of the bed. Beneath this grating is an open chamber from which air passes up into the filter. The bottom of this chamber is inclined about 2 per cent., and gutters in it collect the filter effluent and lead it into a collecting tank, from which it is finally discharged. The entire plant is enclosed.

It is stated that these plants give a purified, odorless effluent. Experience in England and this country would lead one to anticipate serious difficulties in connection with the system for distributing the effluent to the filter, the most probable being the choking up of the slots and coating of the wicks by mycelial or other growths. Several classes of trouble might also be expected, due to the continual dropping of the sewage at fixed points about a foot apart, among these being local clogging and low efficiency of filter action.

OIL ON ASPHALT STREETS

In a discussion on pavement maintenance before the American Society of Engineering Contractors, the subject of the effect on asphalt and bituminous macadam streets of oil from automobiles was discussed. Concerning this Mr. Geo. C. Warren said: "If the distribution of the oil is very excessive it would be very injurious. If, for instance, an automobile were standing for five or six hours a day dropping oil on a given area of pavement, the oil would in time soak in; but, on the other hand, a slight amount of oil dropped by moving automobiles on our excessively traveled boulevards is a protection to the pavement. The best asphalt pavement I have ever seen is in front of the Auditorium Hotel in Chicago. The only reason that I can conceive for that being better than the other

avements of its class is because of the large number of automobiles that have kept the surface of the asphalt at all times coated with a thin film of oil, which, I believe, has kept the immediate surface in a durable condition. Such a slight quantity of oil as drops from the engine, followed by the spreading of the oil by the automobile wheels, is, I believe, a great protection to a bituminous pavement surface."

SOUTH NORWALK MUNICIPAL ELECTRIC PLANT

The municipal electric plant of South Norwalk, Conn., was described by us in February, 1907, as one of the most successful in the country. In the spring of 1910 the growth of its business had been so great that it was necessary to increase the capacity of the plant, and \$29,881.66 was spent for this purpose. The new installation, which increases the former rated capacity of the plant about 22 per cent, consists of a brick extension with slate roof and concrete floor; a 225-h.p. American Diesel fuel oil engine; a 160-kilowatt 250-volt direct-current Fort Wayne generator, direct connected to the engine; a Norwalk air compressor driven by a 25-h.p. motor; a cooling water system consisting of two cooling towers, two motor-driven pumps, a receiving tank and an elaborate system of piping and valves; two switchboard panels, complete with all instruments, generator and motor connections; an extra engine and generator foundation, and a new trunk feeder.

This was all paid for from the profits of the plant for a little over a year, and the city now owns a plant valued at \$185,000, the debt on which has been reduced to \$50,000 by the profits from its operation. It is believed that the gross profits of more than \$25,000 a year will be increased with the added business this enlargement makes possible.

ELIZABETH TUNNEL, LOS ANGELES AQUEDUCT

By BURT A. HEINLY

THE "opening up" on February 27 of the Elizabeth Tunnel, which forms the most important strategic point in the construction of the new municipal water works of Los Angeles marks a chapter in the construction of that enterprise.

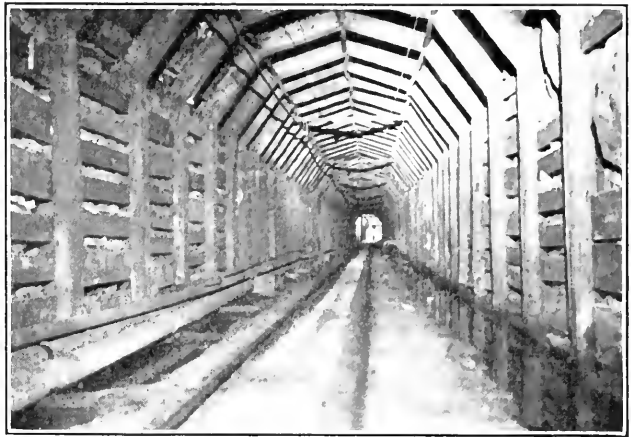
This tunnel pierces the crest of the Coast Range (Sierra Madre) with a total length of 26,872 feet, and is the second longest water tunnel in the United States. For the past eighteen months it has attracted the attention of the engineering world for the rapidity with which it has been constructed and the remarkably low cost of boring. All American tunnel driving records have been repeatedly broken, that of the Gunnison with 449 feet made in 1906 having been increased to 604 feet by the record of the Elizabeth south portal crews in May, 1910. The tunnel has been "opened up" more than a year ahead of the estimated time and the final cost will be approximately \$400,000 less than the sum set aside for the purpose. The total cost is now estimated at \$1,612,200.

The Owens River Project, or Los Angeles Aqueduct, of which this forms a part, is, as has already been described in MUNICIPAL JOURNAL AND ENGINEER, a plan of supplementary water supply being carried out by the municipality to conduct the snow waters of the eastern face of the Sierra Nevada Mountains through a concrete aqueduct 230 miles across the Mojave Dessert, beneath the Coast Range and into the San Fernando Valley at the mouth of which Los Angeles is built. The enterprise will provide a domestic supply for 1,000,000 people, irrigate 125,000 acres of land, and make possible the development of 100,000 horse-power of electrical energy by the fall in the aqueduct grade.

The Sierra Madre Range, which rises to a height of from 4,200 to 6,100 feet at the back of Los Angeles, was the great natural barrier to the construction of the aqueduct. This made necessary the boring of the Elizabeth Tunnel, located 67 miles north of Los Angeles, which will carry the water from the Fairmont Reservoir in the Antelope Valley on the north side of the range and deliver it on the south side of the mountain into the San Francisquito Canyon, thence into the San Fernando Valley.

The Gunnison, built by the United States Reclamation Service, is the longest water tunnel in the United States, with a length of 30,000 feet; after it comes the Elizabeth, then the famous Sutro, four miles long, and built in the late seventies to drain the Comstock mines.

The Elizabeth, after being faced with 8 inches of concrete, will have a height of 10 feet 10 inches and a width of 9 feet 6 inches. The grade is 5.28 feet to the mile and the capacity is 650,000,000 gallons per 24 hours.



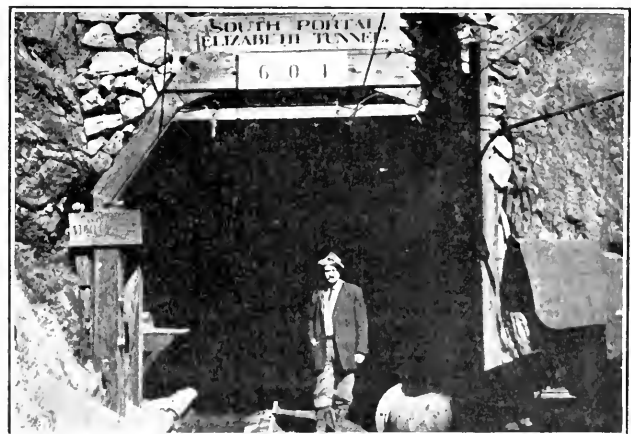
INTERIOR OF ELIZABETH TUNNEL
Showing timbering in place

Work was inaugurated October 5, 1907, at the south portal and November 2 at the north portal, and has been carried on by three shifts unremittingly from both ends excepting on several occasions when the men were driven from the north portal by floods of water.

Twelve hundred and forty days were required for the boring of the tunnel, and the cost was \$50 per foot. The concreting can be completed for \$10 per foot at outside cost, according to the Chief Engineer, making the completed tunnel cost \$60 per foot. The time required, as estimated by the board of consulting engineers, was 1,680 working days with a daily progress of 8 feet on each face, and the completed cost was figured at \$75.33 per foot.

Construction, as a rule, has been in hard granite, although the north portal heading has been driven through swelling earth, saturated sands and stiff clays with water pockets encountered on half a dozen different occasions. Despite these drawbacks the joining of the two headings was a distance of only 75 feet beyond the middle point of the tunnel.

All the work has been done by day labor under the supervision of the city's water superintendent, William Mulholland. The men were paid under the bonus system, by which they were rewarded for efficiency beyond the average and to this cause is given much of the credit for the remarkable speed attained.



SOUTH PORTAL OF ELIZABETH TUNNEL

DENVER STREET SIGNS

Denver, Col., has six classes of street signs, some of which are believed to be unique in their design. The old wooden signs nailed to telephone and telegraph poles are rapidly being discarded for combination iron poles and signs, and for ornamental bronze signs on certain streets. There are 1,050 of the iron signs, which were designed by Capt. Philips, of the Highway Department. These signs, with posts, cost approximately



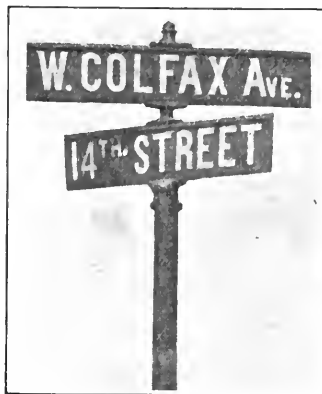
BRONZE SIGNS ON LIGHT STANDARD

\$9 each, including the labor of putting them into position. The pole is of wrought iron pipe and is set in a concrete foundation. The posts are 8 ft. high and the signs are of a superior quality of galvanized iron containing letters of brass enameled in white 3 inches high. The two sign plates, or three where there are three intersecting streets, are riveted to the poles in such a way that it is almost impossible to remove them.

On certain of the streets are ornamental signs which are attached to the combination light and trolley poles, completely encircling the pole. These signs are cast in two pieces, the name of the two intersecting streets occurring in each piece separated by a single ornamental projection containing the screw holes for fastening the casting to the pole. These are made of bronze, the letters being of polished bronze on a dark unpolished background. The double signs cost \$3.50 each, in-



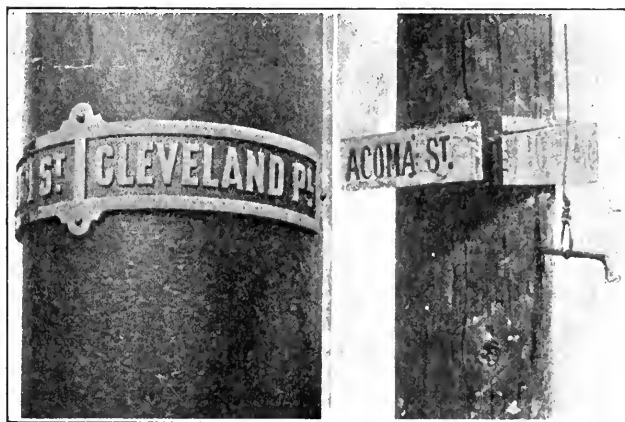
ILLUMINATED STREET SIGN—FLASHLIGHT TAKEN DURING SNOW STORM



IRON SIGNS GENERALLY USED IN RESIDENCE SECTIONS

cluding fastening in place. Another sign somewhat similar to this, for use on the lighting standards, is in the form of a flat bronze name plate, which fits into the base of the standard.

Of the sixth style of sign but one has yet been placed in Denver. The pole supporting the sign is connected with and receives current from electric wires above, and the sign, which



CIRCULAR BRONZE SIGN ON TROLLEY POLE

OLD WOODEN SIGNS

is in the form of a long narrow box, is lighted inside by means of an eight-candle power incandescent lamp. The light is reflected to the signs from the interior, the letters being on a background of mica. The illuminated letters can be seen for quite a distance and are arranged so that they can be removed without injury to the standard in case it should be desired to change the name. The lamp is said to be so arranged that it can not well be disturbed by mischiefmakers, but can be removed for cleaning or repair.

MUNICIPAL OWNERSHIP IN CALGARY

The city of Calgary, Canada, owns and operates the street railway, water works and electric light plants, which are operated by a commission of three. During the five years that the electric plant has been under municipal control the rates have been reduced 45 per cent. The street railway has been operating about eighteen months, and contracts have been let for 22 miles of new track this year. The water works plant was purchased from a private company several years ago in a very dilapidated condition, since when it has been largely reconstructed; 19½ miles of mains having been laid in 1910. This plant has cost about \$1,400,000. The electric plant has cost about \$500,000, and the street railway about \$530,000. During 1910 the net surplus was \$3,335 for the water works, \$22,407 for the lighting and power plant, and \$33,315 for the street railway. In figuring these allowance was made for interest, sinking fund and depreciation, except that apparently no depreciation is charged off for the water works. The interest rates are from 3 to 4½ per cent, and the sinking fund about 1.6 per cent for the water works and 1.8 per cent for the other two. For this information we are indebted to A. G. Gravel, Commissioner of Water and Electric Light.

METER INSTALLATION AND MAINTENANCE

In a paper read before the convention of the League of Nebraska Municipalities, Mr. H. D. Mead, Water Commissioner of Chadron, Neb., after discussing the value of meters, presented the following ideas and figures concerning the installation and maintenance of them:

Various plans are adopted by cities for the installation of meters.

1st. By ordinance, compelling the consumers to install meters at their own expense.

2nd. Meter installed by the city, requiring a deposit from the consumer while the meter is in service.

3rd. Meter installed by the city, exacting a small fee each month as rent until meter is paid for.

4th. Meter installed and kept in repair by the city free of cost to the consumer.

The last plan is considered the best, the commissioner becomes familiar with the construction and working of the particular make adopted, uniform parts are carried for repairs, ease in interchanging, records can be kept more complete. While requiring quite an outlay at the start, the results are quite satisfactory. Compelling consumers by ordinance to install at their own expense is a very unsatisfactory way to put the water system on a meter basis, the cost of installing a meter makes it a hardship on some, the consumer who is willing to put in a meter is taking the worst of it from his backward neighbor.

Quoting from a decision rendered by the Railroad Commission of Wisconsin, (on the complaint of a consumer against the Hudson, Wisconsin Water Works.) "The logic is overwhelming to the effect that meters constitute a part of the facilities incident to the services for which the management, whether public or private, is responsible. A meter is a part of the equipment of the plant. The city and that alone is responsible for the type of meter used and for their accuracy."

Durability

Tests have been made in several cities to determine the life of a meter and the cost of maintenance and repairs. Actual figures are available now to enable us to state that life on a high-grade meter is at least twenty-five years, with a good reason to believe that this figure will be largely increased in the future. This means a low depreciation figure. The cost of repairs of the high-grade meter of today is very low. Reports from several cities show that the maintenance account ranges from 5 to 20 cents per meter per year, varying with the quality of the water and other local conditions.

My own experience has shown, with about 480 meters in service, a maintenance account of 11 cents per year.

DISCUSSION OF WATER WORKS TOPICS

It is proposed that, at the convention of the American Water Works Association, which will be held in Rochester, N. Y., June 6 to 10, there be a general discussion on a number of topics, since it is realized that such general discussions are not infrequently of more interest and value than elaborate papers. A circular issued by the secretary gives a list of twenty-one questions concerning which discussion is requested, with the idea that members may prepare themselves beforehand with data and material for taking part in such discussions. The first of these deals with the treating of water to adapt it for boiler use, the question being whether it would be advisable to treat an entire supply which was suitable for all other purposes, or to furnish a separate supply for boilers! Other questions deal with the washing of mechanical filters, the use of oil for fuel, depth of mains necessary to prevent freezing, "red water" troubles, connection with independent factory fire services, superintendents' salaries, proper caulking of lead joints, metering free public supplies, preventing electrolysis, use of hypochlorite, use of leadite, unlawful use of water through fire

services, construction of valves, use of steam turbines direct connected to pumps, under-registration of water meters, and locating leaks in mains.

Those who cannot be present at the convention are requested by the secretary to send written discussions on these questions. If there are any who have not received his circular we know that he will be glad to send them a copy on request.

WATER RATES IN DULUTH

EDITOR MUNICIPAL JOURNAL AND ENGINEER, New York City.

Dear Sir: I have been considerably interested in the article appearing in your magazine in reference to Water Rates.

In the first place it is as impossible to have a uniform table of rates as it is to have uniform conditions.

A complaint in Duluth that our rates were discriminating in favor of the large consumer as against the small, has led to our making a very exhaustive study of this matter as it affects Duluth.

Our table of rates are as follows:

The first	8,000 cu. ft. each month,	17½c	per 100
" next	8,000 " " " "	10	" "
" "	60,000 " " " "	7½	" "
" "	100,000 " " " "	5	" "
All over	176,000 " " " "	2½	" "

Minimum monthly rate 50c.

Our income is as follows:

Water rates.....	\$231,000
Hydrant rentals.....	40,000

Our expenditures were:

Pumping water.....	28,855
Water services, which include all administration expenses, replacements, repairs, insurance, etc.....	51,124
Interest on outstanding bonds.....	105,627

Total\$185,606

The excess earnings are used in extending the plant. The hydrant rentals can be divided, in my opinion, as follows:

To apply on the interest.....	\$ 30,000
" " " " pumping.....	5,000
" " " " services.....	5,000

Leaving to collect of the consumer:

For pumping.....	\$ 23,855
" water services.....	46,124
" interest.....	75,627

As regards the cost of pumping, every gallon should be charged for at the same rate.

As regards the administration expenses, every service, whether affording a consumption of 300 feet or 300,000 feet, costs the same.

As regards the interest, were the works constructed simply to supply the present consumption and no more, it might be proper to charge that to each gallon at a fixed rate, but new works are so constructed. If the proper wisdom is shown, the plant, pumping works and mains, will have a capacity of four times the present consumption, simply to provide for the future.

As regards the surplus earnings which are to be devoted to new extensions, it certainly seems ridiculous to entertain the idea that the present consumers should pay for new extensions to the system for new consumers on the basis of their uses of water.

From this it appears that a sliding scale is just, and should be arranged to cover these various points; that is, if you can find a human mind capable of compassing it.

We estimate that we have about 10,000 family consumers; 3,346 paying not to exceed 53c per month; 6,288 paying not to exceed \$1.00 per month; 8,810 paying not to exceed \$2.00 per month; so out of the balance of the family consumers and from those who are using water for business and mechanical purposes comes the bulk of our receipts. This causes the charge of discrimination to collapse.

The board has concluded that our present rates are as fair and equitable as it is possible to make them, and particularly when so large an interest burden rests upon the department forcing a rather high rate that to apply as a flat rate of so much a gallon to all consumption would be prohibitory to our large business interests and the establishment of new ones, and would be like killing the goose that laid the golden egg.

Yours truly,

L. N. CASE,
Manager Water and Light Commission,
Duluth, Minn.

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Incorporated

239 West Thirty-ninth Street, New York
Telephone, 2046 Bryant, New York
Western Office, 929 Monadnock Block, Chicago

A. PRESCOTT FOLWELL, Editor
F. E. PUFFER, Assistant Editor

Business Department
S. W. HUME, President

T. MORRIS, Manager. A. PRESCOTT FOLWELL, Secretary

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CHANGE OF ADDRESS

Subscribers are requested to notify us of changes of address, giving both old and new addresses.

Contributions suitable for this paper, either in the form of special articles or of letters discussing municipal matters, are invited and paid for.

Subscribers desiring information concerning municipal matters are requested to call upon MUNICIPAL JOURNAL AND ENGINEER, which has unusual facilities for furnishing the same, and will do so gladly and without cost.

MARCH 22, 1911.

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Commission Government in the Far West

Municipal voting with some unusual features took place in two Western cities last week. In Los Angeles amendments to the city charter were adopted which gave it the power to operate quarries, or plants for making or transporting any materials required in constructing or repairing public buildings or improvements; to supply the citizens with any means of heat, illumination, power or refrigeration, selling any surplus light, power, etc., to other municipalities or non-citizens. It may also own and operate any means of conveying passengers or freight by land or water (air is not mentioned) either within or without the city; also elevators, warehouses, tunnels and viaducts. A Board of Public Utilities is created with power to investigate public service corporations and establish rates subject to approval of Council. An unusual provision for a charter is one limiting to 150 feet the height of all structures except public buildings, monuments, and the chimneys, etc., of houses of public worship. In the election of public officers every candidate is to be put up by petition, all names being voted on at a primary election. The names of the two receiving the highest number of votes for each office will

be placed upon the regular ballot; but if any candidate receives a majority of the votes he will be considered elected without further balloting. At the final election there will therefore be but two names to vote on for each position. The fact that certain offices may be filled at the primary election is expected to give this sufficient importance to induce the great bulk of the voters to take part in it.

On March 14 five commissioners, elected on March 7, succeeded a Mayor and ten Councilmen as the governing body of Spokane, Wash. At this election women voted for the first time in that city. The new charter, which provides for commission government, contains a few unusual features, that most so being the provisions for electing the commissioners. The manner of doing this is as follows:

Twenty-five electors may nominate a candidate by taking an oath that he is a qualified and a desirable man and that they desire to vote for him. The ballot contains the names of all the candidates in alphabetical order, followed by spaces marked for first, second and third choice. The voters mark 15 crosses on the ballot, voting for five men as first choice, five others as second choice and five as third choice. However, they may vote for third choice the entire list after eliminating first and second choice.

The majority of all votes cast elects on the first choice. Then the votes for the candidates who are unsuccessful in the first choice column and are in the second choice column, are counted to select the rest. If five candidates having a majority of first and second choice votes are not elected, the votes of the third choice are counted with the stragglers of the other two and the third choice selections fill out the five. The third choice men are elected by a simple majority.

The Spokane plan varies from all others by making the contest a free-for-all and not designating the office sought. It provides that candidates must not spend more than \$250 during the campaign, also making it compulsory to submit an itemized statement of expenditures, and no paid workers, carriages or other conveyances are permitted on election day.

Party lines are absolutely obliterated and personalities are eliminated. The candidate must take an oath that he represents no political party in the election nor any special interests.

There were 97 candidates at the beginning of the recent campaign. Three declined to make the race and two withdrew just before the election.

New York Health Bulletin

The Health Department of the city of New York has begun publishing a monthly bulletin along the general lines of those issued by most of the states. The first of these has been issued within the past week or two and contains several very interesting articles, one of these giving statistics concerning the health and death rates of the city for the past 43 years; others describing the child welfare exhibit and the operations of the Sanitary Bureau during the past two years; and the report concludes with a directory of the department, giving the locations of the offices in the several boroughs, of the laboratories, tuberculosis clinics and those for eye diseases, the hospitals, etc.

The editor state that "the *Bulletin* will contain, in addition to statistical summaries, articles dealing with special phases of the city's health, a record of the more important of the department's activities, and such other items of timely interest as may furnish to each citizen information of value regarding the health and welfare of the community."

The department has issued a notice under date of March 15 stating that so many requests have been received for this first issue of the *Bulletin* that it will be impossible to comply with all of them, but that a regular mailing list is being established and that it is possible that another edition of the January number will be printed in order to meet all requests for it. Those who desire to have their names placed upon this mailing list can probably do so by addressing the Editor, *Bulletin* of the Department of Health, Fifty-fifth Street and Sixth Avenue, New York City.

NEWS OF THE MUNICIPALITIES

Current Subjects of General Interest, Under Consideration by City Councils and Department Heads—Street
Water Works, Lighting and Sanitary Matters—Fire and Police Items—Government and Finance

ROADS AND PAVEMENTS

City Has Right to Order Use of Patent Pavement

Indianapolis, Ind.—The Supreme Court has held that a City Council has a right to order a street paved with a patent pavement where the owner of the patent signs a written waiver of his rights under the patent upon the payment of a specified royalty on each square yard of pavement which may be laid under any contract awarded for the pavement, and where the owners of the property fronting the street have petitioned for the improvement of the street with the patented pavement.

The case arose from the order of the city of Indianapolis to pave Senate Avenue with bitulithic pavement, the contractor to pay the holder of the patent a royalty of 25 cents on every square yard of pavement laid, there being a petition by the majority of the resident property holders to use that kind of pavement. It was contended that the pavement used was only a common macadam and coal tar pavement and that the granting of the royalty tended to promote a monopoly. The Court holds that as long as the offer of the holder of the patent is so definite that he cannot use dictation, but merely receives a royalty for each square yard, and the resident property owners desire to accept the paving on those terms, there is in no sense a monopoly, the contract is valid and there was nothing showing the letters patent on the pavement were not legal letters patent from the United States and such that the city could consider them valid.

Paving Companies to Hustle for Signatures

Portland, Ore.—Any paving company which shall secure the largest number of signatures of property owners to its petition will be given the contract for paving all the streets in Sellwood. This is the decision of the Sellwood Commercial Club. W. C. Adams, of the paving committee, recommended the laying of bitulithic pavement, declaring he believed it the best to be had for the money. Those who favored hassam and asphalt paving disagreed with him and a heated discussion followed. The final decision was that each paving company shall circulate petitions among the property owners and the one securing the largest number of signatures shall be given the work. For the next two weeks there will be a scramble among paving companies for signers. The entire Sellwood district is to be paved.

Recommends Municipal Paving

Milwaukee, Wis.—The advantages of having the city do its own street improvement work as contemplated by the administration are pointed out by C. A. Mullen, Superintendent of Street Construction and Repair, in a special communication to the Council for consideration by the Committee on Streets and Alleys. In addition to effecting a saving of about \$250,000 annually, Supt. Mullen states that better streets will be the result. From the communication it is learned that practically no other but bituminous pavements will be laid in the future. This includes asphalt and the Milwaukee type which is similar to bitulithic. Block pavements, such as sandstone, granite, creosoted wood and vitrified brick materials, probably will be rarely used on the streets.

Will Test Oil and Calcium Chloride Sprinkling

Waukesha, Wis.—The Board of Public Works offered a resolution at a meeting of the Common Council which was adopted giving it the power to purchase 1,500 gallons of oil and three tons of calcium chloride. It is the intention of the board to use the substance for street sprinkling purposes as an experiment and the one that proves to be more beneficial than the other will be used hereafter, providing it proves itself to be superior and less expensive than water. It was stated by the city engineer that oil or calcium chloride will be used but once every two weeks.

Boulevard to Connect Leavenworth and Kansas City

Leavenworth, Kan.—A bill providing for the construction of a magnificent driveway from Leavenworth to Kansas City was put through the House by Representative Thomas, of Wyandotte County, and the bill has now received the Governor's signature.

Senator Stillings is entitled to the credit for this accomplishment. It means a beautiful macadam driveway 36 feet wide connecting the two cities. The inclines will be paved with brick and the curbing will all be of the big brick blocks such as are used on Fourth Street. The right of way is almost all arranged for. The work will commence at Lansing and the road will be pushed south a short distance and thence east directly to the bluffs where it will continue along the cliffs to Kansas City, Kan., connecting there with the new boulevard being laid out in that city. The people of Leavenworth will not at first realize the importance of this boulevard, but when it is once accomplished they will be astonished to see what they have gained.

Fine Driveways Will Soon Be Under Way

Leavenworth, Kan.—The long heralded improvement of Metropolitan Avenue, which has been proposed by the Department of Justice for the past two years, now appears to be near realization, as Warden McClaughry has received authority to begin work just as soon as it is possible to get everything in shape and start it. This authority and the plans for the work have been received from Washington. According to the plans the work when completed will furnish Leavenworth with the best styles of driveways to be found in the West and will prove of great benefit to owners of automobiles, affording them a drive which cannot be surpassed in beauty of scenery and road bed anywhere in the country. It is not decided what the driveways and new roads shall be made of, but it is believed that oiled macadam will be used, similar to that on Grant Avenue at the foot of Stone curbing will be used along both sides of Metropolitan Avenue. It is planned to do the work with the prisoners of both civil and military prisons. It will take at least two years to complete the work as outlined by the Department. The cost is expected to be \$50,000 at the least.

Cost of Street Work Decreases

Louisville, Ky.—The Board of Public Works has issued a comparative statement showing the steady decline during the years 1908, 1909, 1910 and 1911 in the cost of constructing granitoid sidewalks, vitrified block alleys, vitrified block streets and asphalt streets. The following are the 1911 prices per square yard and the decrease in price since 1908: Granitoid sidewalks \$0.92, decrease \$0.04; vitrified block alleys \$1.56, decrease \$0.0625; vitrified block streets, reconstruction, \$1.575, decrease \$0.04; asphalt reconstruction including foundation, \$1.7566, decrease \$0.0934; asphalt resurfaced \$0.93, decrease \$0.24.

Seek Aid for a Boulevard

St. Paul, Minn.—Aid from the State is being asked for building a lake shore boulevard 85 miles long from Port Arthur, Canada, to Duluth. Chris Murphy, county auditor of Lake County, was at the capitol last week in conference with G. W. Cooley, State Engineer. Plans have been made to co-operate with the Canadian authorities to make the boulevard one of the attractions of the State. There now is a State road laid out along the shore of which considerable work has been done. This road is cut from the rock along the shore in many places and the cost of construction is rather high. Mr. Murphy says the counties along the lake are ready to contribute a good deal of money toward the construction of the road and wants \$2,400 from the State, the limit to any one county under the present law of the highway commission. There are many demands for money, however, and it is doubtful if the full amount can be given Lake County. The matter will come up before the highway commission at its next meeting.

SEWERAGE AND SANITATION

Analyses of Water and Milk Disclose Good Conditions

Binghamton, N. Y.—During the month of February, according to the report filed with Commissioner of Health John E. Bloomer, by Assistant Food Inspector John L. Costello, 72 samples of milk were examined by the City bacteriologist. These samples were taken indiscriminately, and with the exception of six they were under the maximum bacterial count allowed by the department. Of these six the highest was 402,000. The large majority of samples showed traces of sediment in the milk, some revealing sediment in large particles. Health Officer D. S. Burr has received a report from the City Bacteriologist showing that an examination of the raw and filtered water used by the city from samples taken March 6 showed an excellent quality of water. Sewage bacteria could not be found in either the raw or filtered water and the efficiency of the filter is rated at 97 per cent. Usually at this season of the year traces of sewage bacteria are plainly discernible in the raw water.

City Faces Damage Suits

Spokane, Wash.—Union Park citizens are up in arms against the city because of flood waters which have inundated property in the district. Claiming that the city maliciously and with the sole purpose of safeguarding the city against damage suits," constructed culverts across the streets, citizens of the flooded section say that damage suits aggregating \$150,000 will be instituted against the city. It is claimed that the action of the city has resulted in great destruction of property. The city has expended \$10,000 in constructing these culverts across many of the streets. They are excavated four feet deep and 10 feet wide, walled in with stone and covered with heavy timbers at the level of the street grade, but they do not give any protection, it is claimed by the citizens of Union Park, and are inadequate to take the place of the natural drainage canal which has been filled up by the city.

Health Board Desires Laboratory for Tests of Food

Perth Amboy, N. J.—In connection with the efficient work of the present Board of Health several things have been suggested and thought of by the different members to add still more to the effectiveness of that body. One of the matters which has caused some informal discussion is the question of the desirability of a laboratory in connection with the work of the local board. This matter has been spoken of particularly in reference to the work of the milk and food committee. At present all this committee can do is to insure the sanitation of the surroundings under which the milk is produced. It has no means for testing the purity of the milk. There is also no means to test the purity of the food, the presence of disease germs, etc., and the multitude of similar phases which come up in the work of a Board of Health. It is possible that in a short time the local Board of Health will have a chemist installed in a suitable laboratory in the department's headquarters on the third floor of the City Hall.

Inspection of Eating Houses Leads to Improvement

Jacksonville, Fla.—The system of restaurant inspection inaugurated by the Board of Health is meeting with the co-operation of hotel and restaurant proprietors who evince their willingness to make needed improvements and take pride in raising their scores, which are published periodically in the local papers. In all 163 places have been scored during the past month. The total increase in the average score since the inspections were begun last September is 2.1 per cent, a marked improvement.

New Decatur's Sewer System

Decatur, Ala.—McPoland & O'Gara have just finished fourteen miles of sewer for New Decatur. This practically completes New Decatur's new sewerage system, and the total cost will be up in the hundred of thousands of dollars. A few minor contracts for sewerage are yet to be let, but the job is practically finished. This, it is said, gives New Decatur one of the best sewerage systems of any town of its size in the country.

Texas Sanitary Code Passed

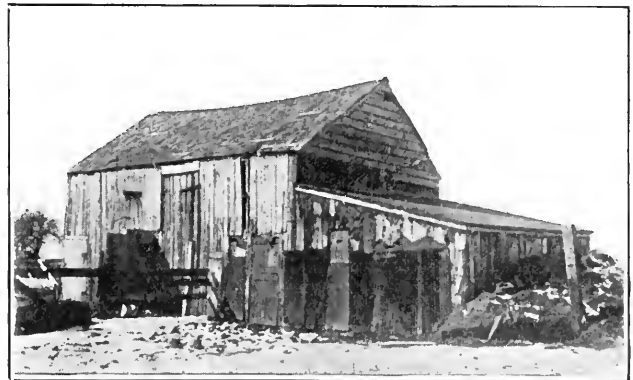
Austin, Tex.—The bill to enact into law the sanitary code bill for Texas has been passed by the Legislature. The measure will no doubt receive the signature of the Governor and become a law. It was prepared by the Attorney-General's Department under the direction of the State Board of Health.

When this new measure has received the Governor's signature affairs will take a different turn. The sanitary code which now becomes law provides for the protection and the promotion of the public health and for the general amelioration of sanitary and hygienic conditions within this State, for the suppression and prevention of infectious and contagious diseases and for the proper enforcement of quarantine, isolation and control of such diseases. It embodies all regulations relative to procuring and tabulating vital statistics.

The State Health Department will at once make earnest efforts to procure practically complete returns showing births and deaths. It is highly probable that Texas will soon attain the enviable distinction of being the only Southern State whose vital and mortuary statistics are accepted by the Federal Bureau at Washington.

Unofficial Dairies Within City Limits

Newark, N. J.—The Newark News has been investigating the subject of dairies within the city limits, and has found that unsanitary dairies exist which are not recorded as dairies on the books of the Board of Health. They are there designated simply as permits to keep cows. Where



Courtesy of Newark News.

UNLICENSED DAIRY, SHOWING UNSANITARY CONDITIONS

a man keeps from 10 to 30 cows it is inferred, however, that then the milk is produced for sale. Rather curiously, the investigator was in nearly all instances shown about the premises by the proprietor, who evidently took pride in his possessions. The unsanitary conditions apparently were purely the result of ignorance.

Food to Be Under Cover

Boston, Mass.—All dealers exposing meat, fish, vegetables and other articles of food will in the future be required to obey the law and keep their stock under cover, according to the information which comes from the Board of Health. This regulation was made more than a year ago, but has not up to the present time been thoroughly enforced. It will do away with the array of meat that may be seen hanging in the open air outside of hundreds of market stalls in the market district and elsewhere. In order for dealers to hang meat outside their stores in the future they will have to place the exhibit in glass cases. The Health Board maintains that the exposing of meat, berries, vegetables, etc., in the open air for hours at a time leaves the stock open to infection by all kinds of germs.

Chlorination System for Seaside Disposal Plant

Ocean City, N. J.—Along the line of improved sanitary conditions for Ocean City is the sewer-disposal plant to be installed by the Ocean City Sewer Company, the plans for which will be filed with the State Board of Health for approval. The plans are being supervised by Prof. Phelps, a consulting sanitary engineer of Boston and New York, whose system of chlorination, said to be the best known, is to be adopted here.

WATER SUPPLY

Eugene Water Filter Put Into Commission

Eugene, Ore.—The new water filter has been placed in operation and the machinery worked very satisfactorily to the city officials. W. H. Howell, superintendent of the plant at Oregon City, was here to start the machinery. It will not be necessary to boil the drinking water here, say the authorities.

City Cannot Regulate Water Company

Bluefield, W. Va.—The city is without authority to enforce rules or ordinances for the regulation affecting the property rights or the conduct of the business of the Bluefield Water Works & Improvement Company, according to a decision handed down by the Supreme Court in a case in which the water company is plaintiff and the city defendant. The opinion was written by Judge Poffenbarger and the action of the Circuit Court of Mercer County in dissolving the temporary injunction awarded against the city officials was reversed, and decrees entered for plaintiff. In short the higher tribunal holds that the city is without authority to regulate the water company because such powers are not delegated to it by the special act of the Legislature granting the city a charter.

Best Monthly Report of Cincinnati Water Works

Cincinnati, O.—Cincinnati's filtered water averaged 99.94 per cent pure for the month of February, according to the report of the filtration plant. This is the best showing the plant has made. The average number of bacteria in the raw river water was 15,500 to the cubic centimeter, which was reduced to the average of 10 in the filtered water. The highest number of bacteria in the raw water found was 34,000 to the cubic centimeter and on the lowest day the number was 3,800 to the cubic centimeter. The highest number of bacteria found in the filtered water was 36 and the lowest number one.

Water Softening Plant Near Completion

Daytona, Fla.—Work on the Daytona concrete water softening plant is progressing satisfactorily, and it is expected to be in operation within the next 30 days.

Gain in Earnings of Water Department

Lestershire, N. Y.—Reviewing and accepting reports of the Village Treasurer and the Water Department was the business at a recent meeting of the Board of Trustees. In point of money expended and balance on hand the Village Treasurer's report was one of the most satisfactory in many years. It showed that there had been a great saving of public funds during the past year, notwithstanding the many improvements that were made during the administration. The report of Superintendent W. D. Smith of the Water Department showed a marked gain in the earnings of this department, which reflects credit on the conservative manner in which affairs of the department have been handled during the past year.

Lockport Water Works Show Profit

Lockport, N. Y.—The annual report of Charles G. Peterson, Superintendent of the water works, has been given out and shows a net profit to the city on the year of \$10,660. The gross receipts were \$54,164. This is a gradual increase from an average total of about \$20,000 up to the time Mr. Peterson took office, seven years ago. The report contains an interesting discussion on the cost of pumping water and delivering it to the consumer, the estimate being \$.03457 per 1,000 gallons at the present rate of pumpage, namely, 5,000,000 gallons per day. The report shows that only 37 leaks occurred in the new pipeline last year. In 1909 there were over 700 leaks. Superintendent Peterson recommends the cleaning of all the old mains in the city and the construction of six-inch mains on important streets where four-inch mains are now in use.

City Refuses to Make Low Rate and Loses Customer

New Castle, Ind.—Because the City Council refused to grant it a lower rate for city water than it gave the other large consumers, the railroad company will sever its connection with the city as a water patron and install a private plant for supplying its engines with water.

Rights of Water Company Superior to Those of Oil Well Drillers

Butler, Pa.—That the rights of a water company to obtain its supply for centers of population by constructing storage dams along streams are paramount to the rights of owners of property on the watershed supplying the streams to drill and operate oil wells if the salt water discharged from the wells pollutes the water was the decision of Judge George S. Criswell, of Venango County, filed here last week, in the case of T. H. Henratty et al. vs. the Butler Water Company. Henratty and other oil producers in the Oakland and Center township oil fields, representing oil property worth \$100,000, sought an injunction against the Butler Water Company, restraining the corporation from building a large reservoir in the Connoquenessing Valley at Oneida, five miles north of here, on the ground that, according to the decisions of the courts, they would be compelled to abandon their properties, entailing a total loss, because salt water, which these hundred-foot wells discharge in large quantities in daily operation, has been declared a source of pollution. The oil men set forth that they could not operate the wells and prevent the salt water from flowing into the streams, and hence their rights to develop their properties and carrying the operations on such properties were interfered with. The oil producers give notice they will carry the case to the higher courts.

Increase of Typhoid Follows Disuse of Chemicals

Niagara Falls, N. Y.—Because of the increase in the number of typhoid cases in all cities along the great lakes, Health Officer Robert Talbot has issued a warning to citizens to boil all water used for drinking, washing vegetables, cooking and even cleaning teeth. "I deem it absolutely necessary to boil the water before using it, as neither the city nor the private water company is using chemicals of any kind to purify it," declared Dr. Talbot. J. H. Macbeth, superintendent of the Western New York Water Company, said no tests had recently been made of the water being supplied by the company. Hypochlorite of lime had not been used for some time, as the city had ordered the use of the chemical discontinued, he said.

Improvement in Ogden's Water Supply System Under Way

Ogden, Utah.—Work on the new city conduit to connect the reservoirs with the waters of Cold Water canyon has been commenced by the J. P. O'Neill Construction Company, a large force of men being in readiness to push the work to completion. The conduit will include about two miles of 24-inch steel pipe and about three-quarters of a mile of 36-inch wooden stave pipe. The rock work will consist of three tunnels, each of which will be about four feet wide and six feet in height, to permit the easy handling of the pipe and to furnish space necessary for the inspection of the conduit. The conduit will cost \$67,463.17, according to the contract signed by the city and the construction company which secured the job.

Municipal Water Plant Pays Well

San Antonio, Tex.—By figures in the annual report of the water company it is shown that the company made a total net profit during 1910 of \$119,763.82, of which \$67,761.60 was put back into the business in the shape of new extensions and materials, leaving a real net profit of \$52,002.22. The report shows that the average charge for water during the year has been 14 cents per 1,000 gallons.

Pure Water a Valuable Asset

Saginaw, Mich.—That a pure water supply for the city would be one of the greatest assets that Saginaw could secure for its health, welfare and upbuilding, is the declaration of Mrs. Caroline Bartlett Crane. Mrs. Crane, whose investigation of the water question has been extensive and covers many cities, is a great believer in pure water. She is also a thorough believer in filtration as a means for purifying the water supplies of cities. Mrs. Crane said she had made an investigation of this city recently and had pointed out perilous conditions caused by poor sanitation, but that they had not been remedied. Epidemics, she added, give cities a black eye and result in great damage aside from the loss of life.

Annual Report of Water Company Gives Satisfaction

Louisville, Ky.—Inasmuch as the annual report of the Louisville Water Company, just issued, for the year 1910, is the first annual report issued from the new home of the water company, especial attention is called by President Charles Grainger to the fact the splendidly arranged and superbly equipped office building enabled the company to serve the public with unusual speed and accuracy, and the many expressions of delight on the part of the public were a source of satisfaction to the company. Also, for the first time in its history, the announcement is made that the company owes no floating debt. On Feb. 6, 1911, the last obligation of that character was paid, and there remained on hand approximately the sum of \$86,000. No floating debt has since accrued. The report shows a reduction in operating expenses of \$280,24, and an increase in the net earnings of \$40,106.36 over the year 1909. The average amount of filtered water furnished the citizens of Louisville each day was 22,130,917 gallons. The operation of the filtration plant is announced as a perfect success and of incalculable benefit to the public.

Reduction in Water Rates

Naugatuck, Conn.—The Naugatuck Water Company has made a voluntary cut in its service rates. A score of years ago, when the company was organized, a rule was made that no service should be installed for a rental less than \$6. For several years the company has charged \$5 in many cases when a property owner had services in double or tenement houses. This was a sort of minimum rate, providing for a service of only one sink or its equivalent, as extra charges were made for bath rooms, bowls and toilets. Secretary E. C. Barnum for some time has been of the opinion that it was an injustice for one family to pay \$6 for a service for which another family paid but \$5, and he recently persuaded the directors to cut the rates to the uniform charge of \$5 for each sink, or its equivalent. The voluntary action of the company will mean a loss of between \$500 and \$600 a year to it, and a corresponding amount of money in the pockets of the property owners.

Separation of Water Works Accounts from Other Departments

Salt Lake City, Utah.—For the purpose of settling the conflict that has heretofore existed between the city water works and treasury departments over accounts, the City Council in special session last week unanimously passed an ordinance recommended by the water works committee, providing a new system in the keeping of accounts for the assessment and collection of water rates of the city. Under the provisions of the new ordinance a deputy assessor of water rates is to be appointed by the Mayor, subject to the approval of the Council, at an annual salary of \$1,500. He will be required to give a bond of \$5,000 in pledge of the faithful performance of his duties. The ordinance also provides for the appointment of an inspector of water and meter assessments, at a yearly salary of \$1,080. An appropriation not to exceed \$1,000 was authorized for the installation of the new system. The new system centers the responsibility in one department.

Schenectady Water Works Plans

Schenectady, N. Y.—In spite of frequent conferences the question of water works improvements is still undecided. Emil Knichling, Consulting Engineer, who made plans for a reservoir that would give increased pressure, recently explained at a public hearing further details of his plans. At another conference Charles A. Hague, Consulting Engineer, appeared for those who opposed the new reservoir. He termed the reservoir plan a luxury, and said that a standpipe of 2,600,000 gallons capacity would meet the needs of the city for the next forty years. Mr. Hague said the electrically operated centrifugal pumping system now installed is an engineering freak. In the meantime the Schenectady Illuminating Company have complained to the Mayor and Council because they have not been paid for installing the plant or even for the current used. They claim that the fault of the system is in the standpipe and certain pressure-reducing valves. The standpipe is not high enough to supply certain sections of the city. To correct this trouble check valves operating at 85 pounds have been placed at the standpipe and the pressure in the mains kept at 95 pounds.

STREET LIGHTING AND POWER

Underground Wire System Is Favored

Hoboken, N. J.—That the city seems in earnest in its desire to have the overhead wires removed seems evident from the text of a resolution passed at the Council meeting last week. This resolution calls upon the Corporation Attorney for an opinion as to what method of procedure will be necessary to compel the placing of all wires in the city underground. The resolution was introduced by Councilmen Belloff, Delaney and Volk, and was passed unanimously.

Municipal Control of Power Is Favored

Los Angeles, Cal.—Los Angeles will distribute its own electric power generated by the Owens River aqueduct. This was emphatically decided at the recent charter amendment election, when a straw vote on the question of whether the city should distribute the power or sell it to private parties or corporations, to be redistributed, was taken, resulted in an overwhelming declaration for the first proposal.

Olyphant Light Plant Again Shows Profit

Olyphant, Pa.—Continued good service for Olyphant from its electric light plant is shown by the annual report of the board of agents for the fiscal year which closed Nov. 30. This report has just been made public, and shows that with the exception of 16 hours and 10 minutes the commercial lines of the plant saw continuous service. Blowouts and short circuits caused the only delays. Arc lamps were out of service but one hour and 45 minutes. This was caused Feb. 5, 1910, by a broken circuit in the Third Ward school. The total free lighting list amounts to \$3,863.76. During the year \$5,275.33 was spent for new equipment, such as meters, lamps, extensions, etc. The net profit for the year was \$7,364.94, which is a slight increase over the profits realized the previous year.

Municipal Light Plant Earns Ten Per Cent

Pasadena, Cal.—Manager C. W. Komer, of the municipal electric light plant, in submitting a report covering period July 1, 1910, to Jan. 1, 1911, says in part: "Further analysis reveals the fact that the net receipts for the period amount to the rate of 10 per cent per annum on the total investment in the plant. The above period will give approximately average results for the entire year and proves beyond any doubt that with the continued and increased patronage of the owners of the plant, the citizens of Pasadena, there is no question or doubt concerning the perpetuation of the low base rate of 5 cents per kilowatt hour. The average number of consumers for the period was 3,273, as against 1,420 for last year. We have installed 4,142 services—that is to say, we would have had 4,142 customers if we had had no cut backs from original services. There are now 487 service connections not in use; however, we have used the meters at other places, allowing the services to remain. With the total number of consumers brought up to 4,000 or 4,200 it will be possible to improve the net results. The continued success of this department is assured with the continued patronage of its owners.

Municipal Electric Plant Completed

Eugene, Ore.—The formal beginning of operations at the Eugene municipal electric plant at Walterville, on the McKenzie River, took place last week, and the members of the City Council and a large number of citizens inspected the plant. The plant has been built at a cost of \$300,000 and has been in course of erection for two years or more. It will supply power for the operation of the pumps at the municipal water plant and will furnish light for the streets. Later the Council plans to do a commercial business.

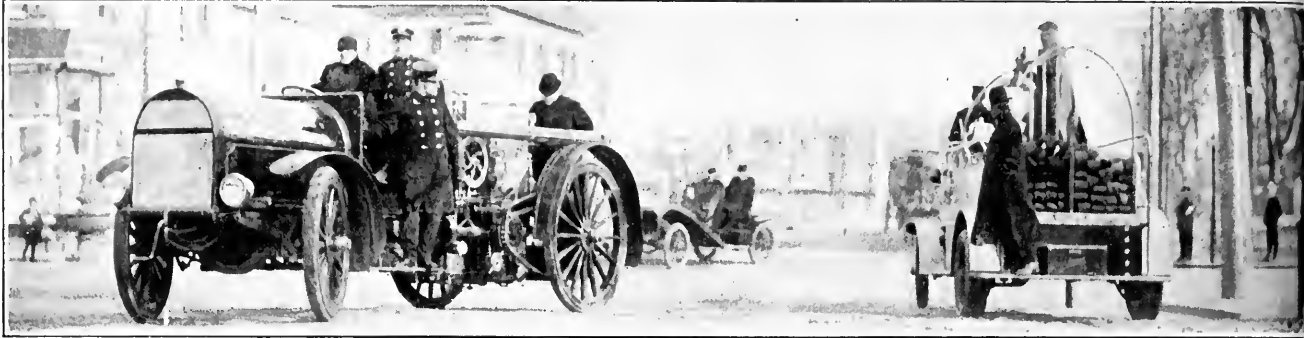
Report of Ilion Lighting Commission

Ilion, N. Y.—The report of the Ilion Municipal Lighting Commission for the year ending Feb. 25 has been issued. It shows that there are 613 meters in service, the number worn out and obsolete during the last five years being 69. The total cost of the meters was \$8,602.40. A credit of \$142 was obtained from the sale of junk meters. There were 102 meters installed during the year, the cost being \$1,081.20. The meter readings for the year were \$15,923.64, and there was paid in cash \$14,738.56, the discount amounting to \$986.42.

FIRE AND POLICE

Auto Steam Fire Engine Tested

New York, N. Y.—An official test of the new auto steam fire engine for speed and capacity took place in New York, March 16, in the presence of Commissioner Waldo, Chief Croker and other city officials and invited guests including the chiefs of fire departments of large cities who came from long distances and many chiefs of smaller cities nearby. Besides the engine there were assembled in front of the Fire Department repair shops, where the tests were



NEW MOTOR STEAM FIRE ENGINE AND MOTOR HOSE WAGON—NEW YORK FIRE DEPARTMENT

held, the Couple Gear auto water-tower and three Webb auto hose wagons designed for high pressure service. The Nott engine developed a capacity of 751 gallons a minute for ten minutes and was driven over twenty miles in one hour over city streets under ordinary service conditions. The accompanying illustration was taken at Jamaica, L. I., where the apparatus was driven during the test.

Police Purchase Automobile with Private Funds

Superior, Wis.—The Police Department has arranged for the purchase of a big touring car and the order for the machine has been sent into the factory at Luverne, Minn., by Lieut. Darwin D. Scoon, who is agent for the Luverne machine for Superior and Duluth. The new auto is a \$2,500 car, but it is understood that the police are purchasing it at a bargain price. The money has been raised in various ways, and does not come out of municipal appropriations. Most of the price was obtained last winter when the department was given a percentage of a stock company show at the Grand.

Police Begin Crusade Against Beggars

Lexington, Ky.—A crusade against beggars on the streets of the city is to be inaugurated by the Police Department, which will see that in the future all vagrants will be given a chance to support themselves by work or otherwise be sent to the county infirmary. This action was announced last week by the police and came as the result of a number of beggars being brought into Police Court recently on charges of vagrancy.

Auto Engine Proves Worth

Paterson, N. J.—Just what an automobile fire engine can do and how valuable one is to the city and its property owners was shown last week when No. 10, the city's new purchase, by making a run of over a mile and a quarter in five minutes, put out the fire in John Hartley's poultry houses and saved a row of dwelling houses from destruction. In addition to making a quick run the machine forced water through 700 feet of hose and delivered it in such a volume that the work of fire fighting was made easy.

New High-Pressure Area in New York

New York, N. Y.—An extension of the high-pressure fire service on the lower East Side is now in operation by an order issued by the Fire Commissioner. The area thus added to the high-pressure field is bounded by Chambers and Houston streets, the Bowery and the East River. It is the most dangerous fire zone in the world because it is filled with tall un-fireproofed tenements in which live many hundred thousands. High-pressure hose carts will be put in the district, and it is planned to supplement all horse apparatus there with automobile vehicles.

To Have Juvenile Police

Cincinnati, O.—At the instance of Councilman Mullen the Board will experiment with juvenile police at Lytle Park. Mr. Mullen said that boys damaged trees and shrubs in the park, and he thought boy police could do more to prevent this destruction than anyone else. He offered to pay the salary of a boy for the first year as an experiment. The Board decided to give the idea a trial, and instructed Secretary Longenecker to appoint a boy named Norris, whom Mr. Mullen recommended. The experiment will be watched with great interest and it is probable that the plan will be adopted in other cities.

Signal System Wanted

Salt Lake City, Utah.—Chief of Police S. M. Barlow has recommended to the City Council that a signal system be installed at police headquarters. There are fully a score of systems in use in various parts of the United States and thus far only two systems have been put into operation at a police headquarters. These include the signaphone, which includes a light and semaphore for the calling of a policeman, which is regarded as the most up-to-date, and the old system of the Dean Electric Company. The systems of the rival companies are now under demonstration at police headquarters and members of the City Council have made various inspections. Though the signaphone system seems favorable because of its up-to-date methods it is probable that the police and prison committee will desire to take a trip to Denver and inspect its system before making any recommendations. Chief of Police Barlow is in favor of installing the most up-to-date system or none at all.

Searchlights Added to Fire Equipment

Grand Rapids, Mich.—With the addition of powerful acetylene searchlights on the heavy fire trucks the Grand Rapids Fire Department is now equipped on a footing of equality with Chicago and the great centers of population throughout the country. Darkness will not baffle the firemen, who, with the aid of the powerful 10-inch reflectors will be able to flash lights down alleys, in dark corners and on danger points where firemen may be obliged to go, or to aid in locating any point within their radius. The big lamps are the workmanship of Master Mechanic Frank F. Hill, with the exception of the reflector portion. The acetylene manufacturing tank and all piping running to the lights are the work of Mr. Hill, and represent a great saving to the city. With the new equipment of lights, fire department officials expect to increase the efficiency of the department. In the past lights used on the trucks have been so dim that drivers have been unable to make speed, for fear of running down pedestrians or rigs in the darkness.

Automobile Fire Apparatus for Macon

Macon, Ga.—Work on the new fire house on the triangular lot in the rear of Wesleyan College has been resumed, and the construction of the edifice, which will quarter an all-auto apparatus company, is being rapidly pushed by the contractors. The automobile fire-fighting apparatus purchased from the Webb and the LaFrance companies at an expenditure of \$18,500 will arrive in the city in a few weeks. It may be necessary to store the engines and trucks somewhere, as the fire house will hardly be ready for occupancy at that time.

GOVERNMENT AND FINANCE

Plan Savings to Meet New Tax Law

Indianapolis, Ind.—On account of the depleted condition of the city treasury and a wish to save money in anticipation of a reduced tax levy next year under the new law providing a maximum tax levy for general purposes shall not exceed 5 cents on each \$100, the Board of Public Works is considering the question of meeting the cost of paving street and alley intersections this year by a special assessment on real estate. Beginning next year the cost of street sprinkling will likely be met by assessment on abutting property. The law provides this may be done. At present both the cost of street sprinkling and the cost of paving street intersections are met from the general fund.

City Refuses to Release Surety Company

Racine, Wis.—The concrete pier contractors will have to go ahead and complete their work of building the lake shore protection off of Seventh street. This was the decision of the committee on harbor and bridges who met last week to take up the proposition of releasing the surety company back of the contractors. Attorney Walter C. Palmer said the surety company was willing to pay the city \$2,000 to be released from further liability. The city has paid to the contractors an estimate of \$1,200. By the city accepting the proposition of the surety company it would be making \$800, but the officials do not like to do business that way. Merrill, Casson & McMynn, who took over the contract from the Interlocking Concrete Construction Company, furnished the city with a bond of \$26,500 as a guarantee of good work. The new firm started out to put in the work, but met with all kinds of reverses. High seas time and time again tore out all the work the company had put in. Finally the contractors gave up entirely and were forced into bankruptcy. The city was well protected, having a bond standing behind the contractors. The officials do not propose to settle for \$2,000, but prefer to have the bonding company go ahead with the work and put it in according to contract.

Commission Form of Government for Spokane by Court Decision

Spokane, Wash.—Spokane's long fight for the commission form of government is ended. The judges of the Washington State Supreme Court upheld the validity of the Spokane charter, adopted Dec. 27 by popular vote. The decision, rendered by Chief Justice Dunbar, is concurred in by every one of the other seven judges of the court, one seat now being vacant. It effectually knocks out every point raised by former Senator George Turner, late special counsel of the United States Government in the Canadian fisheries dispute, who was employed by opponents of the new form of government to defeat it in the courts.

The decision knocks out the last prop of the foes of the commission form of government in the State of Washington. It establishes the validity of the Tacoma charter as well as that of Spokane, and makes the commission form of government possible in every city in the State. There can be no appeal from the decision, the highest judicial body to which the matter can be submitted having passed final word.

Legislature Grants New Charter to San Antonio

Austin, Tex.—The bill granting a new charter to San Antonio last week enjoyed final passage in the House. The bill came up during the consideration of a host of local bills and was disposed of in one-half a minute's time.

Election Is Ordered on Bond Issues for Civic Improvements

Berkeley, Cal.—Public interest and the demands of the city for civic improvements were acted on by the City Council at its meeting last week, by the passage of eight resolutions, calling for bond election as to the acquisition and construction of city improvements, aggregating in the total an expenditure of \$940,000. A park in the west end to cost \$30,000 was added to the proposed list, and the matter of a bond election, calling for municipal kindergartens, was left to straw vote of the people in the coming city elections in April. The Council passed resolutions calling for an election early in May to learn the wishes of citizens on the proposed improvements.

To Recall Huron Mayor

Huron, S. D.—Petitions have been filed for the recall of Mayor Koepp and three commissioners of this city. They contain 15 per cent of the voters required by law, but the names of the heavier taxpayers and more prominent business men do not appear on the petitions. The complaint is that taxes have been largely increased, unnecessarily; the commissioners claiming in a published statement that the increase was necessary for the creation of a sinking fund to meet maturing obligations for which no provision had heretofore been made.

Dry City Has No Money for Lights

Everett, Wash.—This city cut its running expenses \$50,677 and as a result must go without street lights and other modern accessories of a prosperous municipality for a year. The reason is the loss of revenue from saloon licenses. The city went "dry" last fall.

Municipal Shows Continue to Interest the Public

Hoboken, N. J.—The Hoboken Budget Exhibit will be held during the last two weeks in April, and it has been definitely decided that the show will be on the third floor of the new Steneck Building on River street.

STREET CLEANING AND REFUSE DISPOSAL

Object to Reduction Plant

Cincinnati, O.—Mayor Schwab has received a letter from the Lower River Road Improvement Association asking him to do all that he legitimately could to prevent the rebuilding and operation of the reduction works at Anderson's Ferry, the property of the Cincinnati Reduction Company, which recently was destroyed by fire. The letter declares the operation of the plant is unfavorable to the development of the lower river villages as resident sections. The letter also says that with Delhi annexed and Saylor Park coming in it is only a question of time when Fernbank, Addyston, North Bend and Cleves will be added to the city. Mayor Schwab referred the letter to the City Solicitor for advice as to the legal status of the matter.

Spring Cleaning Decided on at Everett

Everett, Wash.—The Chamber of Commerce has taken up with the Health Department the question of a spring cleaning campaign in this city. The plague in China and the reported discovery of a case of bubonic plague in Spokane is regarded as sufficient reason for the people to get their premises, as well as the streets and alleys, in the best possible condition before summer opens.

Salt Water for Sprinkling Streets

Salem, Mass.—Salt water will probably be used for sprinkling streets in Salem and Beverly next summer. The water of Wenham Lake is so low that there will probably be none to spare for street sprinkling in the summer time. Mr. Kelley, Superintendent of Streets of Salem, is planning to set up pumps on the shores of the harbor for filling the street sprinkling car. In Beverly similar plans are being made. It is also probable that some of the streets of Salem and Beverly will be oiled next summer. Wenham Lake is about 10 feet lower than it was a year ago. There are scant prospects that the spring rains will fill it to its normal spring level. The water board is still urging people to be as economical as possible in the use of water.

Clean-up Week for Wilkes-Barre

Wilkes-Barre, Pa.—Plans for another clean-up week have been launched at a joint meeting of the Civic Club, Board of Trade and City Council members. This was in the form of a conference at the home of Mrs. C. P. Hunt, on North River street, and was well attended. It was decided that another clean-up week campaign be conducted. Encouraged by the success that attended efforts in that direction last year the movement this year is to be conducted on a much larger scale.

The work will be systematized, the city divided into districts and a definite time set aside for the clean-up of each district. The children will be interested in various ways, and prizes will be distributed to those doing the best work.

RAPID TRANSIT

Proposed Bill Gives Cities Power to Run Street Cars and Light Plants

Harrisburg, Pa.—Two bills were introduced in the Senate last week that give all municipalities the right to purchase or condemn or construct and operate water plants and street railways, electric light plants, gas works and all other public utilities. While the measures are drawn in the interest of Mayor Magee, who wants Pittsburg to gain control of a street railway and a suburban water plant, they give all municipalities a similar right. The bill providing for the acquiring or construction of a water plant contains no other sections, but as in the other bill, which refers to the other public utilities, the municipality is given the right to lease to a corporation or individuals such public utilities and upon such terms as may be agreed upon.

Prospect of Municipal Street Railroads in Dallas

Dallas, Tex.—The bill amending the Dallas charter which has passed the Senate contains the following provisions looking towards the municipal ownership of street railways.

The Board of Commissioners may do the following named things upon its own motion or upon petition or upon an advisory vote of the people:

1. To require any person, firm or corporation holding a franchise from the city to operate its cars over street railway lines which the city may build or acquire, the Board to fix the rental's, after hearing a statement from the franchise holders. It is made the duty of the Board upon petition of 250 voters to submit a proposition to issue certain bonds to construct a street railway extension but the Board is authorized to make such extension out of revenues.

2. To build, purchase, own and operate street railway lines, full power being given to do the various necessary things in this regard.

Improved Type of Fenders on Cars

South Bend, Ind.—The Chicago, South Bend & Northern Indiana Railway Company is equipping cars on the city lines with fenders in compliance with an ordinance of the Common Council. The ordinance provides that fenders adequate to the needs of traffic in South Bend be fitted to all cars before April 1. A number of cars have been provided with fenders and officials of the company say all cars will be equipped before April 1. The fenders are of a type identical with those used on the surface cars in Chicago. The new safety contrivance includes a standard wheel guard and fender, the operation of which the company believes will make it practically impossible for a body to be mangled under the car wheels. Under the platform of the car and hanging almost flush with the extreme front end is a standard, which when struck automatically and instantly releases a fender placed slightly in the rear. The fender is of a basket type, and when released touches the rails and acts as a scoop, preventing a body from rolling under the car. In addition wheel guards are being placed on all trucks, the protection of which is such, officials of the company declare, it will be scarcely possible for a man's hand to be cut off. The cars are being equipped at the car shops of the railway company as fast as possible. The fenders and other equipment are being manufactured in the local shops. The standard, consisting of an iron framework with wooden strips crossing it, releases the fender.

Boston Elevated Road Planning to Carry Freight

Boston, Mass.—The executive committee of the Boston City Council, Councilor John J. Attridge, presiding, gave a public hearing in the aldermanic chamber last week on the petition of the Boston elevated for the right to become a common carrier of freight on their surface lines.

Trolley Freight in England

Bradford, England.—The Bradford City Tramways have developed a large parcel business and are now collecting and delivering about 14,000 parcels weekly. The capital expenditure at present standing against the business is £2,500, and the annual profits are about £1,700. The parcel service is in charge of a parcel superintendent.

MISCELLANEOUS

Serious Fire Destroys Plant of Light, Heat & Traction Co.

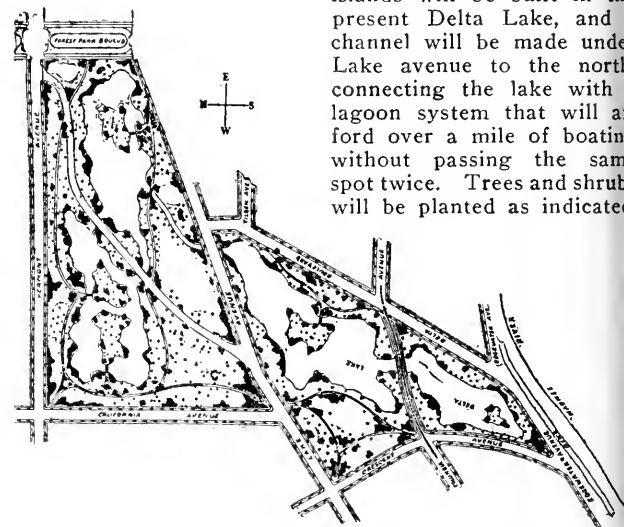
Racine, Wis.—Fire which completely destroyed the power house of the Milwaukee Light, Heat and Traction Company here last week, entailing a loss of over \$140,000, plunged the entire city into total darkness, brought street car and interurban traffic to a complete standstill and will result in the closing down of a number of factories in the city which depend on electricity for motive power. It may be weeks before the street car system will be running.

First Playground in Downtown District

Cincinnati, O.—The first playground to be established in the downtown district from the funds of the recent \$1,000,000 bond issue was arranged for last week by the Park Commission. The playground will be located at McMicken avenue and Walnut street and Link alley, and will comprise about 2,000 square yards. The property is a low-lying piece of land adjoining the small lake in Burnet woods.

Lakeside Park for Fort Wayne

Fort Wayne, Ind.—Superintendent Doswell, of Lindenwood Cemetery, has completed plans for the proposed Lakeside Park, which includes Delta Lake and a recently acquired tract of land north of it. As shown by the outline



islands will be built in the present Delta Lake, and a channel will be made under Lake avenue to the north connecting the lake with a lagoon system that will afford over a mile of boating without passing the same spot twice. Trees and shrubs will be planted as indicated.

A macadamized driveway through the park, with concrete arches over the lagoons, will be another feature of the new park. Graveled walks will thread the little resort with concrete arches connecting them with islands formed by the lagoons.

Artificial Bubbling Spring Constructed in Park

Los Angeles, Cal.—Work has been begun under the direction of the Park Commission on a unique scheme, which will form one of the attractions at Sycamore grove on Pasadena avenue. It is an artificial boiling spring and will be located in the northwest corner of the park. A pumping plant is being installed to pump the water to the northwest corner of the park, where sand, kept in place by a circular stone wall, will be placed and the water forced through to imitate the natural bubbling or boiling springs found in different parts of the country. The water then will be allowed to escape in a stream, which will be left as nearly like a natural waterway as possible and diverted across the park to the lily pond. Watercress and other natural aquatic plants will be grown along the banks of the stream.

Wish to Preserve Old Bridge

Trenton, N. J.—Moses Taylor Pyne, of Princeton, another prominent man, are making a fight against the proposed improvement of the bridge over Stony Brook. The bridge was built before the Revolutionary War, and was used by the American army on the way to Princeton. It is as solid as it was 150 years ago, and Mr. Pyne declares it should be left in its original shape as a Colonial landmark.

First Municipal Dredge Starts Operations

Philadelphia, Pa.—The new municipal dredging plant, which was authorized by Councils nearly a year ago, has been completed and has been placed in operation. The powerful outfit of machinery is the only city-controlled plant of the kind in the country, and consists of one hydraulic dredge, representing a cost of \$99,989; a combination scoop and clam-shell dredge, costing \$64,160; tugboats 65 and 80 feet long, built respectively for \$11,425 and \$20,855; two 500-yard scows, three 250-yard scows and a deck scow, aggregating \$37,250. Fifteen pontoons, costing in all \$2,393, complete the equipment, making the total cost \$236,072. The new plant is entirely the idea of Mayor Reyburn, and is probably the most important asset of the Dock Department. Since the institution of the latter the city's dredging bills have gone on apace and the administration now hopes to take care of all the needs of the port, and to present navigation and docking facilities in keeping with the position the city has taken in the shipping world, particularly in the last year.

Plan Campaign to Acquire Property for Civic Center

Toledo, O.—A bond issue of a million dollars for the acquisition of a civic center site extending from Jackson to Cherry streets, and from Erie street to Spielbusch avenue, and for the improvement of the boulevard, is the object toward which a committee of 50, provided for at the meeting of the Business Men's Club, last week, is to direct its attention. The committee is to consist of 10 members from the club, 10 to be appointed by the City Board of Control, 10 from the Central Labor Union, 10 from the Chamber of Commerce, and 10 to be selected by these members. Chairman O. S. Brumback was authorized to appoint from the city at large such members as any of these bodies fail to name within two weeks. Advisability of a civic day for a referendum vote on the bond issue is to be investigated by this committee.

Locomotives Make Half of City's Smoke

Cincinnati, O.—Forty per cent of the total smoke and over one-half the dirt traceable to smoke in Cincinnati is made by the locomotives on the railroads entering the city, declares Smoke Inspector Nelson in a report issued last week. But 15 per cent of the coal shipped into Cincinnati is consumed by the locomotives, so that the percentage of smoke from locomotives is far greater than that from stationary plants burning soft coal. On the basis of 300 working days in the year the locomotives use 1,300 tons of coal daily, the report says, or about 400,000 tons in a year. Approximately 10 per cent of all the soft coal fired in the locomotive firebox is discharged from the stack in the form of cinders, so that within the city limits probably over 100 tons of cinders are dropped from the locomotive stacks every day. Inspector Nelson says that the study made indicates clearly that electrification offers the only final and satisfactory solution of the locomotive smoke problem in the city.

Will Beautify Attleboro

Attleboro, Mass.—The people of Attleboro are rejoicing because of an offer made to the town the past week by Thomas E. McCaffrey, a prominent business man. The gift is 1,000 trees which will be set out on or about Arbor Day by the school children. Mr. McCaffrey made the offer through the school committee and that board accepted with a vote of thanks. In announcing his gift Mr. McCaffrey says he believes it will be an effective way of interesting the coming generation in the care and growth of trees in Attleboro.

Extensive Park Planned for Covington

Covington, Ky.—The Covington Park Board has engaged the services of a local civil engineer and as soon as a plat can be made of the recently acquired immense area of land presented to the city by the Devou brothers the work of transforming the valleys and dales into a beautiful park will be prosecuted vigorously. The members of the Board, which consists of such representative men as Father Brosert, Frank Woodall, Ulie Howard and E. L. Pieck, are enthusiastic over the prospects for a magnificent park, and these citizens are devoting much of their time in devising ways and means of securing the best results with the somewhat limited funds at their disposal.

Dog Pound May Be Established by City

Cincinnati, O.—The establishment of a municipal dog pound is being planned by Mayor Schwab and Safety Director Scott Small. Following a conference with an official of the Ohio Humane Society it was decided to inquire of other cities where the plan already has been put in operation as to its success. The contract for catching the stray dogs of the city is about to be let and the municipal pound will not be put into operation for another year.

Extensive Plans for Beautifying Salt Lake City

Salt Lake City, Utah.—With the passage of house bill No. 231, providing a strongly financed and properly empowered park commission for Salt Lake, which went through without objection in the Lower House, the Utah Legislature will place in the hands of Salt Lake a tool by which a garb of unblemished civic beauty can be created and maintained. So holds the Salt Lake Commercial Club, through whose influence the measure, once killed, was revived and favorably considered, and which, now that it has become a certainty, is planning to back an undertaking to park and boulevard every principal street of the city before the Panama Exposition opens in 1915 at San Francisco. The bill makes this possible. It gives Salt Lake a board of five park commissioners, invested with unhindered power to improve where and when they see fit. They may create parking districts in any part of the city and a two-thirds vote of the property owners will be necessary to gainsay them. By means of a tax of not less than half a mill, or more than two mills, separate from the general city taxes, they will have an annual fund of approximately \$100,000 with which to work; this to be used outside of the special tax property owners will be required to pay to defray the cost of parking in front of their homes or holdings. With such a fund boulevards can be created in every part of the city, public parks can be made veritable paradises of landscape gardening, and the whole general appearance of the city can be changed to delight the eye.

Concrete Bridge Will Be Erected in Preference to Steel

Fort Scott, Kan.—The concrete bridge bill which was passed by the House several days ago has been passed by the Senate. This bill requires that all public officials having charge of letting contracts for culverts and bridges in counties, townships and cities shall prescribe concrete or corrugated iron in preference to steel in all cases where the cost of construction of such concrete or corrugated iron bridge or culvert is not more than 130 per cent of the cost of building such bridge or culvert of steel. The bill prescribes the maximum strength for such concrete bridges and culverts. Brady, of Douglas, secured the passage of another bridge bill. His bill makes counties and townships liable for defects in bridges and highways and enables injured parties to recover damages for neglect to keep roads and bridges in proper repair.

Contractor Claims Lack of Information About Soil Conditions

Detroit, Mich.—Contractor James Hanley, who wants to be relieved of his contract to build that part of the Fairview sewer between Jefferson avenue and the river, set up a contention at a meeting of the Council Committee on Sewers last week that he is not only entitled to be relieved, but that he is entitled to damages from the city, on the ground that he was not properly informed as to the nature of the soil. He said he had lost \$11,000 in building about 1,000 of the 1,700 feet, and that City Engineer McCormick, knowing the soil conditions from having made borings, is responsible for his entering into a losing contract. The committee will hear the case in detail, with attorneys present for both sides, and the testimony will be taken by stenographers.

Puts Ban on Fireworks

South Bend, Ind.—Wholesale dealers handling fireworks will be notified by the police that ordinance No. 1249 regulating the sale of explosives will be enforced in South Bend. The Board of Public Safety authorized the police to see that the ordinance is enforced. Wholesale dealers will be warned at once not to purchase dangerous explosives, and the retail dealers will be given police attention later.

LEGAL NEWS

A Summary and Notes of Recent Decisions—Rulings of Interest to Municipalities

Defects in Streets—Liability of Abutting Owner

City of Omaha v. Philadelphia Mortgage & Trust Co.—If the owner of city lots constructs a building thereon adjacent to a street of the city, and in such construction excavates a large space under the street to be used as a room in connection with said building, and so maintains the same for several years, it will be presumed that such excavation was made with the consent of the authorities of the city, and upon the implied condition that such excavation shall be maintained in proper and safe condition for travel along the street and the walks thereon; and the owner of the property will be liable for damages caused by his neglect to so maintain said excavation.—Supreme Court of Nebraska, 129 N. W. R., 996.

Defective Streets—Contributory Negligence

Reynolds v. City of Centerville.—In an action against a city for damages for injuries caused by a defective road in answer to an inquiry as to whether or not "you consider it dangerous if you were not careful" in crossing with his team the street at the place he did, plaintiff testified "that it was dangerous if a man did not use his best judgment over such a place." Held to show that he appreciated the danger.—Supreme Court of Iowa, 129 N. W. R., 949.

Regulation of Public Places

Sioux City v. Simons Hardware Co.—A city granted to an individual the right to use a part of a street in the construction and support of a proposed building, on condition that he should erect and maintain a conduit of a specified capacity for the waters of a stream. The conduit constructed was of insufficient capacity, and by reason of I-beams therein the flow of the water was obstructed. The conduit, at an expense of from \$4,000 to \$5,000, could be changed so as to take care of the waters of the stream and protect the public against floods. Held, that equity, at the suit of the city, would not order the destruction of the building and the conduit, but would require changes in the conduit, so as to protect the public from floods.—Supreme Court of Iowa, 129 N. W. R., 978.

Streets—Prescription—Payment of Taxes

Lockey v. City of Bozeman.—That a city received taxes levied on land did not estop it to claim the land as part of a street by prescriptive right where the city had nothing to do with assessing the land. A county assessor's act in listing land for taxation cannot operate as an admission against a city claiming the land as part of a street by prescriptive right.—Supreme Court of Montana, 113 P. R., 286.

Excavation in Street—Injury—Negligence

City of Minot et al. v. Walton.—In an action against a city to recover for an injury to plaintiff from falling into an excavation in a street at night, where the controlling issues were whether the excavation was properly guarded and that of contributory negligence, and there was substantial evidence on both in support of the verdict, the case was one for the jury.—S. S. Circuit Court of Appeals, 183 F. R., 768.

Telephone Franchise—Illegal Grant

Tri-State Telephone & Telegraph Co. v. City of Thief River Falls et al.—Where a city without authority granted a telephone franchise for the maintenance and operation of a telephone system along its streets, without advertising for proposals, or competition, as required by its charter, and the grantee of the franchise immediately carried the same into operation by expending money in equipping a plant, the city was not by that fact estopped from later questioning the validity of the franchise.—U. S. Circuit Court, 183 F. R., 854.

Street Railway Track—Nuisance

Zimmerman v. Metropolitan St. Ry. Co.—A city cannot authorize a street railroad to so use a street with its tracks and cars as to materially obstruct the right of ingress and

egress of an abutting owner, thus constituting a private nuisance.—Kansas City Court of Appeals, Missouri, 134 S. W. R., 40.

Right of Appeal from Assessments—Statutes

City of Portland v. Nottingham & Co. et al.—Portland city charter, approved January 23, 1903, provided for appeals to the Circuit Court from city assessments, and that the verdict of the jury there should be final. At that time there was no appeal from orders granting new trials, but Laws 1907 gave the right. Constitution adopted in 1906 provides that corporations may be formed only under general laws, that the Legislature may not amend or repeal any charter, and that the voters of every municipality shall have the power to enact or repeal their charters. Constitution gives the initiative and referendum to the voters of every municipality as to all local, special and municipal legislation. Held, that as the Legislature under the above constitutional provisions could neither amend nor repeal municipal charters, Laws 1907 giving an appeal from an order granting a new trial did not affect the Portland city charter, so that no appeal would lie from an order setting aside the verdict of the jury on an appeal from an assessment under section 401.—Supreme Court of Oregon, 113 P. R., 28.

Regulation of Streets—Irrigation Ditches

Baker City Mut. Irr. Co. v. Baker City et al.—Baker City Charter, as amended, defining the powers of the municipal authorities over streets of the city, does not, either expressly or by necessary implication, authorize the municipal authorities to permit the construction of drainage ditches in any of the streets, and an ordinance granting such a concession is a nullity, and no right is secured thereby.—Supreme Court of Oregon, 113 P. R., 10.

Sidewalks—Injuries—Evidence

City of Louisville v. Uebelhor.—In an action against a city for injuries from stepping into a hole in a sidewalk in August, 1907, evidence as to the measurement of the hole at the time of trial, in October, 1900, and that the hole had not been repaired up to that time, was admissible in evidence in connection with an offer to show that the hole was in the same condition as when the accident occurred.—Court of Appeals of Kentucky, 134 S. W. R., 152.

Park Department—Governmental Functions

Brightwell v. Kansas City.—Revised Statutes, 1899, provides that whenever any city desires to establish a park, etc., the common council, etc., is authorized to purchase or condemn land in such city for that purpose. A section gives the board of park commissioners power to establish, etc., within such park district all boulevards as they may deem proper, and for such purposes gives them jurisdiction over such of the streets as they deem necessary to give convenient access to the parks. The Kansas City Charter and Ordinances 1898 requires the board of park commissioners to adopt a system of public parks, and to designate lands to be appropriated for that purpose, and to select routes for boulevards, and further provides that special assessments for parks and boulevards shall be subject to the same rebate on payment, the same penalties for nonpayment, and shall be enforced in the same manner as general taxes levied by the city. Held, that while a municipal act will be classed as ministerial if it is substantially of a local or corporate nature, though it relates in a general way to a function of government, in levying an assessment for park purposes, the city acted in a governmental capacity, so that it was not liable in damages for the failure of its treasurer to issue a certificate to a purchaser at a sale of property under an assessment levied to maintain parks and boulevards.—Kansas City Court of Appeals, Missouri, 134 S. W. R.

Dangerous Conditions in Parks—Liability

Pennell v. Mayor and Council of Wilmington.—The plaintiff brought an action against the defendant to recover damages for injuries resulting from defective or dangerous conditions in one of the public parks of the City of Wilmington. To the plaintiff's declaration the defendant demurred on the ground that the city is not liable in damages for injuries resulting from defective or dangerous conditions in its public parks. Demurrer overruled.—Superior Court of Delaware, 78 A. R., 915.

MUNICIPAL APPLIANCES

Locator for Underground Pipes

THE Modern Iron Works, Quincy, Ill., manufacture a device used for the purpose of locating underground iron pipes in streets. It is no uncommon experience in water works management for a gang of men to spend a day in

to be adhered to, however, the Clough mixer would have to be classed as a batch mixer because it receives its whole charge at once from a side of the mixer and the concrete is disloader. The loader is attached to a shaft, by which it is raised on one side

power and the whole apparatus is mounted on a truck with large wheels, the front 20 and the rear 44 inches high. The large-size mixer, capacity 80 to 150 cubic yards per day, weighs 4,500 pounds, is operated by a six-horsepower engine, is 10 feet long and four feet six inches wide. One-quarter of a cubic yard is mixed at a batch.

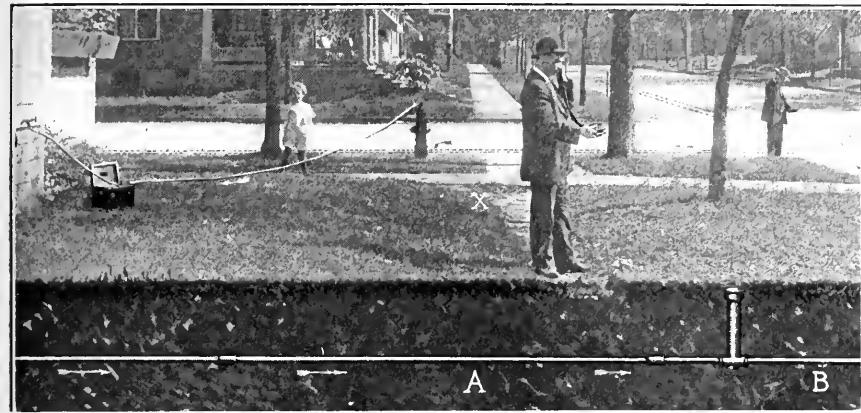
Drinking Fountains

The J. L. Mott Iron Works, Fifth avenue and Seventeenth street, New York City, manufacture drinking fountains in great variety, many of them of considerable artistic merit, considering the limitations of the material. Some of the designs are surmounted with single lamps, clusters or ornamental figures. The fountains are made to provide drinking water for men, horses and dogs. Every conceivable location in streets or parks seems to be provided for.

Combination Waste Receptacle for Garbage, Ashes and Combustible Rubbish

THE Universal Sanitary Appliance Company, 115 Dearborn street, Chicago, Ill., manufacture a combination waste receptacle, shown in the illustration attached to a fence, ready for use. The outfit consists of three compartments, made of cement and steel. The two lower compartments are for garbage and ashes. The upper one is for combustible rubbish and it can be burned in the receptacle. A grate at the bottom allows the charred material to drop down into the ash receptacle. Each compartment has a drain in the bottom so that it can be flushed out with water. As shown in the alley view, the construction is such that the iron doors are protected by setting back into the concrete, leaving no projections in the alley that might be damaged by wagons. All of the sections are universal and can be used separately.

The same company manufactures a portable concrete receptacle for burning rubbish. It is intended for domestic use, as well as for schools, clubs, hotels, golf courses, baseball parks, etc. The device is simply a concrete cylinder three feet high and two feet in diameter, provided with a grate about six inches from the ground, with an opening for withdrawing ashes from below.



LOCATING UNDERGROUND PIPE BY WIRELESS APPARATUS

tearing up pavements and digging for iron pipes which it is necessary to locate exactly. The labor spent in locating one pipe may easily amount to the price of the D. B. M. Pipe Locator, as it is called. The apparatus consists of a battery and a sender or vibrator for producing an electric current through the pipe which is to be located, and a special head telephone receiver and detector coil, constructed to pick up the electric wave produced by the instrument so that it can be distinctly heard in the receiver. In the case shown in the illustration the battery is connected by wires to a convenient hydrant and to a hose connection on the side of a house. The detector coil held in the right hand of the operator in the foreground, is also in the circuit by wires. The electric waves are transmitted without wires from the pipe to receiver.

When the operator is directly over the pipe no sound is heard, the windings of the detector coil having neutralized it. When this point is found, by passing the coil back and forth a few inches, the exact location of the pipe can be easily determined. The proper position for holding the coil to get the above results is flat, with the brass binding post on top. If turned up edgewise when over the pipe the sound is loudest.

The apparatus is mounted in a nicely finished case, equipped with a lock and handle for carrying; the entire equipment is first class in every respect.

Clough Concrete Mixer

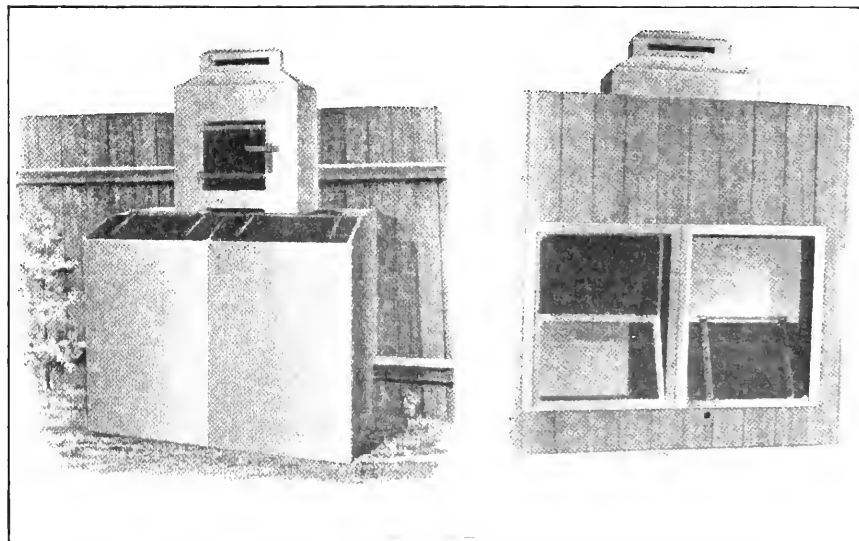
A concrete mixer having some unusual features is made by John G. Clough, Quincy, Ill., who calls it a continuous batch mixer. In general design the machine has the appearance of a continuous mixer and is claimed to have the advantage of portability and adaptability to work in difficult situations which such mixers have. With the improvements in feeding batch mixers and the hoods now generally placed over the end of the trough of a continuous mixer, the distinction between the two types is less distinct than it used to be. If the distinction is

of the mixer and the concrete is discharged from the trough or drum, it is hard to say which to call it, from the other. The mixing is done by revol-



PECULIAR TYPE OF CONCRETE MIXER

ving spring plows, which clean the trough at each discharge. The water is measured automatically for each batch. A gasoline engine supplies the



COMBINATION RECEPTACLE FOR ALL CLASSES OF WASTE

Tiffin Flushing Machine

The Tiffin flushing machines which have recently been placed on the market are claimed to have some merits not possessed by the original types of flushers. They have a water capacity of 600 gallons and an air capacity of one-third that amount. It is claimed that with an initial pressure of 60 pounds, a pressure of 25 pounds can be held until the tank is empty. The tanks, however, will stand a pressure of 125 pounds. It is stated that with one Tiffin flusher 40,000 square yards of pavement can be cleaned properly in ten hours. The use of two machines in co-operation increases this and 90,000 square yards can be cleaned by two. The discharge devices are claimed to be superior to those on any other flusher. A combination nozzle is made, by which the machine, when desired, may be operated as a street sprinkler.

The substantial character of the construction is shown by the following extracts from the specifications:

Tank—To be of the best grade of annealed steel, No. 10 gauge, uniform in thickness and free from flaws or defects. The internal diameter to be 46 inches, the internal length to be 114 inches. The heads to be of the best open-hearth flange steel $\frac{3}{8}$ of an inch thick and flanged to a true radius so as to make a perfect fit in the shell. All heads and plates shall be bevel sheared, as the tank must be caulked inside and out and all rivets must be $\frac{3}{8}$ of an inch in diameter, of proper length and driven hot. Tank to stand a test of 100 pounds to the square inch. Capacity of entire tank, 800 gallons, divided into two chambers, the small or air chamber to have 200-gallon capacity and to be a cylinder-tank extending from end to end. The large water chamber to have capacity of 600 gallons. Tank to have manhole 10 x 15 inches with handhole plate in water chamber. Air and water chambers to be connected by the necessary arrangement of valves and fittings to enable the tank to be automatically charged with the initial air pressure direct from the fire hydrant. Tank must have 6-inch pipe flange on bottom, bulk heads and double row of rivets.

Nozzles—To be brass of the Zig Zag Jackson pattern or a nozzle equally as good, positioned to deliver a zig zag sheet of water under pressure at or near the center of the machine, angles

of delivery to be so adjusted as to clean the streets most effectively of all refuse. Outlet or supply pipes to be equipped with 2½-inch brass lever throttle valves or valves equally as good. Said valves connected by two levers leading to the driver's seat, one on each side. Levers to be so adjusted that the valve will remain wholly or partially open without the assistance of springs or ratchets. In the bottom of the rear end of the tank is to be located a 2½-inch automatic brass check valve with necessary connections for attaching the 10-foot length of 2½-inch 3-ply rubber hose. Tank to have one pressure gauge located on top of rear end of tank for information to operator when filling.

Framework—Side sills to be 2¾ x 3¾-inch clear white oak with four oak cross sills properly mortised to side sills. Cross sills to be ironed with 3 x ¾ tee irons bolted to side sills. Cross sills to have rubber cushions for tank. Tank to be bolted to framework with three steel bands: Front band to be 1½ x ¾, other two bands to be 1½ x ¼. Ends of bands to be rounded to form a ⅝-inch bolt. The timber used in the framework to be of absolutely dry white oak of best grade, properly bolted to running gear.

Truck and Springs—To be truss-made, ironed top and bottom in the most improved way. To be a four-wheeled truck spring gear. Back spring to be 3 inches wide, 44 inches long and to contain 14 leaves. Front spring to be 2¾ inches wide, 40 inches long and to contain 11 leaves. Front and rear gear must track with a 4-ft. 6-inch tread. Axles to be steel, 2¼ front, 2½ rear and to be of Timken roller bearing pattern, guaranteed for one year. Truck to be arranged to be drawn by two horses. Brakes to be of thorough strength iron faced with all necessary spring, dogs and levers.

Wheels—To be 34-inch front and 52-inch rear. Hubs to be of the best grade of Pennsylvania black birch (or oak if required) 14 inches long and 10 inches in diameter. Spokes to be 3 inches and A grade white oak. Felloes, white oak, 3 inches wide, 2½ inches deep; tire 3 x ¾-inch round edge.

Weight—About 4700 pounds.

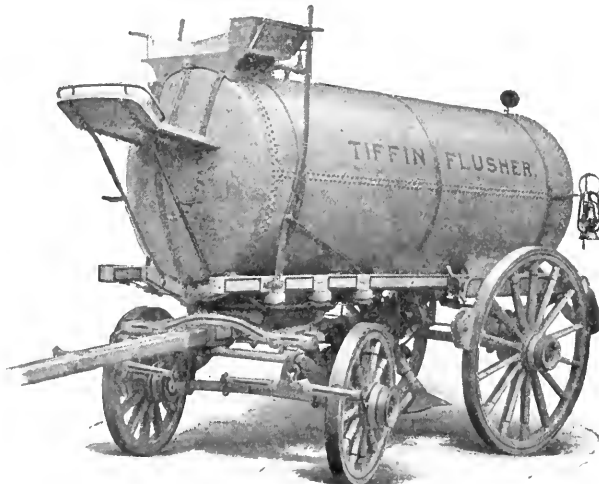
Sprinkler Attachment—To those wishing to use the same machine for flushing and sprinkling, a combination nozzle that can be attached for sprinkling purposes is furnished.

Cement Tile Machine with Mechanical Tamper

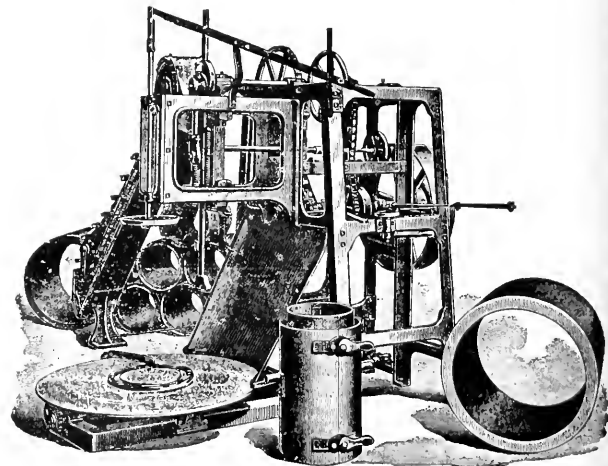
The National cement tile machine, for which the Marsh Company, 975 Old Colony Building, Chicago, Ill., are the general agents, is an improvement on the ordinary cement tile machine in that the concrete is tamped in place by an efficient mechanical tamper. The possibility of defects in hand tamped tile due to the negligence of workmen is too well known to need mention. The National machine is claimed to eliminate all such risk. The machine consists of a steel frame carrying the elevator and machinery, and at one side an iron pallet on which the mould rests.

The operation of the machine is as follows: The empty mould is placed on the table by a cart made for the purpose, the center is dropped down, the tamper is also lowered and the machine started in motion. The elevator starts and the man shoveling into same keeps the boot full all the time so that a continuous stream is pouring into the now revolving mould. The tamper playing up and down just like a trip hammer, rams the concrete in the mold until it is so hard that the tamper is forced up through the friction a little at a time, but the tamper does not raise until the concrete is packed so hard that it's forced up. It keeps going up until the tile is rammed full. The tamper is then stopped, trowel is brought into play, finishing up the top with a smooth surface. The tamper runs about 300 times per minute and strikes a 50 or 60-pound blow so that every particle in the mould is rammed dense and hard. After the tile is completed a cart comes up and takes the tile off the machine and same is wheeled back where the tile are to dry and the packets are removed immediately. The finished tile is just as hard at the top as at the bottom. Tiles made on this machine do not fall down as is common with hand-made tiles when packets are immediately removed. It is stated that five men can turn out 400 feet of 18-inch tile in 10 hours.

The general construction is strong and substantial. The chains are No. 6 and No. 67. The revolving table is made of heavy steel. Moulds are ½ inch steel outside and No. 10 inside. Each mould is in 10 pieces, held together by special locking devices that does not allow the least give. Top and bottoms of moulds are turned up in a lathe.



NEW STREET FLUSHING MACHINE



CEMENT TILE MACHINE—MECHANICAL TAMPER

NEWS OF THE SOCIETIES

City-Wide Congress, Baltimore, Md.

A three days' session was held at Albaugh's Theater, Baltimore, Md., March 8-10, for the purpose of organizing a movement to transform Baltimore and make a new and better city of it by 1920. More than 600 delegates, representing 130 civic, improvement and grades associations, were present. J. Iernsley Johnson, president, called the congress to order. Mayor Mahool, the second speaker, promised to follow closely the suggestions of the Congress and try to do all in his power to carry out the reforms proposed. Public hygiene was the first topic discussed in the formal program, and addresses were by Dr. Herman L. Biggs, New York, and Dr. William H. Welch, Johns Hopkins University. Dr. Biggs built up his address upon seven fundamental facts in the problem of public health. He set them forth as follows: There are certain fundamental facts in the problem of public health which must always be solved. Among these are: First, provision for a pure and abundant water supply; second, proper plumbing of the dwellings and an efficient drainage and sewerage system; third, proper disposal of the city waste; fourth, proper paving and care of the streets; fifth, adequate parks and playgrounds; sixth, proper housing of the people; seventh, proper planning of the city's growth. All of these mentioned have to do with the comprehensive and intelligent development of the great public works of the city. The great obstacles in the development of municipal public health work were stated to be: First, the lack of trained men, with permanent tenure of office, to administer sanitary affairs; second, the reluctance of the financial authorities to make adequate appropriations; and third, the lack of hearty co-operation of the people of the community in enforcing ordinances.

On the subject of Municipal Government addresses were delivered by Horace G. Deming, New York, and W. Cabell Bruce, former City Solicitor, Baltimore. On the subject of City Planning addresses were made by Frank Miles Day, Philadelphia, and V. W. Emmart, Baltimore. On Manufactures Taxation and Finance, Lawson Purdy and Prof. Jacob H. Hollander, Johns Hopkins. On social problems the speakers were Alexander Johnson, Chicago, and Mrs. Caroline B. Crane, Kalamazoo, Mich.

The objects of the convention were stated in the platform adopted, as follows:

Merit system in city administration.
The adoption of the city charter that was rejected by the last Legislature.

Marsh lands to be diked and channels deepened.

The drawing up of a plan by experts for straightening and widening streets and for the elimination of all unsightly nooks, corners, elbows, humps and other eyesores, and for a comprehensive system of parks and public squares.

The creation, through municipal co-operation or supervision, of private playgrounds for all city blocks where there is sufficient back yard area.

Increasing the boundary of the city, including the annexation of Brooklyn, in Anne Arundel County, and other adjacent settlements.

The adoption of a comprehensive system of paving.

The protection of the supply of the city's water from pollution in the country.

The employment by the city of men who have received expert training in sanitation, involving the possible idea of the establishment of a course in municipal sanitation at the Johns Hopkins University.

The condemnation of all property between Union Station and Mount Royal avenue, and the parking of the whole area.

A union freight station.
The laying out of the city in zones for trade, manufacture and residence.

The construction of beehive plants.
The purchase by the city of tracts of land to be developed to its best advantage for manufacturing purposes, to avoid mistakes in development that result in loss to investors and impede normal progress.

The extension of city street lines into outlying areas likely to become a part of the city in the future.

To prevent speculative builders from erecting inferior building that nullify the good of expensive municipal improvements.

The building of the Chesapeake and Delaware ship canal by the Federal Government.

The bridging of the Chesapeake.
The conservation of the beautiful section of the Patapsco River between Elliott City and Re'ay.

The paving of Light street in the best style from the wharf to the Long Bridge.

Firemen's Association of the State of New York.

At the last annual convention of the association, held at Watertown last August, Rochester was selected as the place of holding the next annual meeting, which will convene there on August 15, 16, 17 and 18. The following Central Committee has been appointed to make all arrangements: J. P. Kislisbury, president; Alfred Batho, vice-president; George King, treasurer; A. H. Otto, secretary; J. C. Kalbfleisch, Charles T. Chapin, William V. Clark, Charles E. Sunderlin. It is twenty-nine years since the Firemen's Association convened in Rochester. The parade was the finest firemen's parade ever seen in the city. At that time the association was in its infancy and has gradually grown to such dimensions that the committee expects at least 1,600 delegates present in this city. In order to raise sufficient funds to meet all expenses, the committee has associated with it Bert M. Tallinger, who is now soliciting advertisements for what will be the finest souvenir book ever issued in the city. Mr. Tallinger also has a letter of endorsement from the Chamber of Commerce. The committee is holding weekly meetings and will endeavor to make this the most successful convention in the history of the association. Applications have already been received for positions in the parade, which undoubtedly will be the largest Volunteer Firemen's parade ever witnessed in this State.

Engineers' Clubs of Philadelphia and Brooklyn.

The initial visit of a series which will be exchanged between the members of the Engineers' Club of Brooklyn and the Engineers' Club of Philadelphia was made March 11, when the Brooklyn men were entertained at dinner at the home of the Philadelphia club, No. 1317 Spruce street. All the officers and fifty additional members of the Brooklyn organization came to Philadelphia in a private car late in the afternoon. After the dinner the visitors enjoyed a vaudeville performance in the grill room of the club.

Toasts were responded to at the dinner by J. C. Meem, W. H. Roberts, president, and Joseph Strachan, secretary, all of the Brooklyn club; C. A. Angell, chairman of the Visiting Committee; James Christie, president, and W. P. Taylor, secretary, of the Philadelphia club. The local committee of arrangements was composed of Captain St. George H. Cooke, W. P. Taylor, Lewis R. Ferguson and F. K. Worley, chairman.

Idaho Society of Engineers.—The second annual convention was held at Iowa Falls, February 16-18, with about seventy members in attendance. Various questions pertaining to irrigation were the principal topics of discussion. The following papers were presented: "The Duty of Water as Applied to Different Soils and Crops," "Installation and Capacity of Reinforced Concrete Siphons," by Z. V. Vaughn, "Pumping Water for Irrigation," by E. V. Berg; "Conservation of the Waters of the State," by D. G. Martin; "Laying Out a Canal for a Given Acreage," by R. S. Cookinham; "Earth Dams," by A. M. McPherson; "Losses in Canals and Methods of Prevention," by F. W. Hanna. Excursions were made to a number of irrigation projects where construction was going on. At the invitation of City Engineer Mull and Superintendent Dan White, of the Warren Construction Company, a bitulithic pavement was inspected and a sample cut from it. The following officers were elected: Darwin A. Utter, Surveyor General, State of Idaho, president; State Engineer D. G. Martin, vice-president; Edmund M. Blake, Boise, secretary; Charles H. Mull, City Engineer, Twin Falls, treasurer.

League of Second and Third Class Cities of New York.

The following tentative program was formed at a conference between M. P. Capen, secretary to Mayor Duryee, Schenectady, and City Engineer Harding, of Poughkeepsie, where the meeting is to be held, May 25-26. It is proposed to hold the conference in Vassar Institute, where there will be two sessions each day. Among those invited to attend will be President Taft, Governor Dix, Mayor Gaynor, Tax Collector Lawson Purdy, of New York; Comptroller Prendergast, Herman A. Metz and Woodrow Wilson, Governor of New Jersey. Each evening the local committee will furnish entertainment. The topics to be discussed will be as follows:

Thursday morning—"Department of Public Works, in Relation to the Cleaning and Care of Streets."

Thursday afternoon—"Uniform Municipal Accounting."

Friday morning—"Taxation and Assessment."

Friday afternoon—"General Form of Work in Municipal Government," including a discussion on the proper form of government and the new form of commission government.

All these questions will be thoroughly discussed at the meetings. On Friday evening the local committee will tender a banquet to the visitors. This local committee will be appointed by Mayor Sague later on.

American Society of Civil Engineers.

Secretary J. P. Winn, of the Chamber of Commerce, Chattanooga, Tenn., has received a telegram from Charles Warren Hunt, secretary of the society, stating that the next annual convention of this body will be held at Chattanooga, June 13-16. This will be one of the largest and most important gatherings that has ever been held by the organization. Over 500 delegates from all parts of the United States and some foreign countries, including some of the most prominent civil engineers in the world, are expected to be in attendance. Hunter McDowell, of Nashville, chief engineer of the Nashville, Chattanooga & St. Louis Railway, is vice-president of the organization.

American Chemical Society.—At the regular meeting of the Cincinnati section, Clarence Bahlman read a paper on "The Determination of the Hardness of Water," and Dr. Folsom presented a paper on "The Filtration Plant of the City of Washington."

National Electric Light Association.—A branch section was organized at Pittsburg, Pa., February 28, at a banquet given by the officers of the Allegheny County Light Co. to the company's employees. About 150 were present, practically all of whom joined the new section.

Waterworks Manufacturers Association.—The American Waterworks Association will hold its thirty-first annual meeting in Rochester, N. Y., June 5 to 10. It is desired to make the exhibit of the various waterworks appliances one of the chief features of the convention. This will be under the auspices of the Waterworks Manufacturers' Association. All applications for space either in the exhibition hall or on the canal bank in the rear of the City Hall should be made to Mr. Fred S. Bates, chairman of the Exhibit Committee, 180 Broadway, New York City. Uniform signs only will be used and these will be small and provided by the association.

Chemists' Club of New York.—The Chemists' Building, 50-54 East Forty-first street, New York City, was opened March 17, with ceremonies and meetings which were continued for three days. The building is intended not only to supply the social needs of the Chemists' Club but also to serve as a meeting place for the New York section of the American Chemical Society, the Institute of Chemical Engineers, the Society of Chemical Industry and the American Electrochemical Society. The building occupies a lot 56 by 100 feet and cost upward of \$500,000. Addresses were made by the presidents of the societies interested and a number of technical papers were read. Among them was one by Prof. Wm. P. Mason, Rensselaer Polytechnic Institute, on the "Contribution of Chemistry to Sanitation."

National Good Roads Association.—The fourth National Good Roads Congress, which meets in Birmingham, Ala., May 23 to 26, promises to draw a very large crowd from all parts of the United States. The official call has been printed in many dailies and weeklies. Already inquiries in regard to special railroad rates have come in to the headquarters in Birmingham. J. A. Rountree, the secretary, has asked the Southeastern Passenger Association, the Western Passenger Association and similar organizations in the North for special rates for delegates and visitors to the congress. It is supposed that the Business Men's League and other local organizations will take advantage of this occasion and advertise to secure large crowds from the State and contiguous points. Several days ago an invitation to the fifty-two governors of all the States and territories in the Union were mailed by Secretary J. A. Rountree, joined by the Alabama Good Roads Association, Jefferson County Good Roads Association, Board of Revenue, Chamber of Commerce, Business Men's League and Board of Trade, requesting the presence of these governors and also asking that each of them appoint 100 delegates from their respective States to attend this congress. Already tentative acceptance has been received from several governors.

Calendar of Meetings

- March 21-22.
New York State Railroad Association.—Quarterly Meeting, Syracuse, N. Y.—C. Gordon Real, Secretary, Kingston, N. Y.
- April 6-8.
American Electrochemical Society.—Annual Meeting at New York City.—Secretary, Joseph W. Richards, Lehigh University, South Bethlehem, Pa.
- May.
City Commission Congress.—Meeting, Galveston, Tex.—Mayor Lewis Fisher, Chairman of Committee, Galveston, Tex.
- May 11.
Massachusetts Highway Association.—Quarterly Meeting in conjunction with the New Eng and Conference on Street Cleaning, Springfield, Mass.
- May 18-19.
Ohio Society of Mechanical Steam and Electrical Engineers.—Annual Convention, Youngstown.—F. E. Sanborn, Secretary, Ohio State University, Columbus.
- May 23-25.
National Fire Protection Association.—Annual Meeting, New York City.—F. H. Wentworth, Secretary, 87 Milk St., Boston.
- May 23-26.
National Good Roads Association.—Fourth National Good Roads Congress, Birmingham, Ala.—J. A. Rountree, Secretary, Birmingham, Ala.
- May 29-June 2.
National Electric Light Association.—New York City.—T. C. Martin, Secretary, 31 West 39th St.
- June 6-10.
American Water Works Association.—Thirty-first Annual Convention, Powers Hotel, Rochester, N. Y.—John M. Diven, Secretary, 14 George street, Charleston, S. C.
- June 11-16.
International Association of Chiefs of Police.—Eighteenth Annual Convention, Rochester, N. Y.—Major Richard Sylvester, Superintendent of Police, Washington, D. C., President.
- June 13-18.
New York State Association of Chiefs of Police.—Annual Convention, Rochester, N. Y.
- June 13-16.
American Society of Civil Engineers.—Annual Convention, Chattanooga, Tennessee.—Charles Warren Hunt, Secretary, 220 West 57th St., New York.
- October 4-6.
League of American Municipalities.—Annual Convention, Atlanta, Ga.—John MacVicar, Secretary, Des Moines, Ia.

PERSONALS

- ANDERSON, CHARLES L. B., retires from the firm of Hazlehurst & Anderson to become associated as chief engineer with the Clarendon Construction Company, of Washington, D. C.
- BENNETT, CHARLES J., Deputy Superintendent of Streets of Hartford, Conn., has been appointed Superintendent, to succeed Frederick L. Ford, resigned.
- BOARDMAN, WM. H., of Philadelphia, has been retained by the city of Frederick, Md., to investigate the water supply situation and to make recommendations for an increase in the supply.
- BOWMAN, JOHN G., secretary of the Carnegie Foundation, has been elected resident of Iowa State University. Mr. Bowman is but thirty-three years old and is said to be the youngest college president of the country. He graduated from Iowa State University in 1899 and received his M. A. degree there in 1904.
- CAMPBELL, FRANK, has been appointed Town Engineer of Hackensack, N. J.
- CASEY, WM. C., has been elected mayor of Batavia, N. Y.
- CLARKE, W. G., has been re-employed by the city of Toledo as consulting engineer at the filtration plant during the construction of the 14 supplementary filter units.
- CROWLIN, THOMAS, Mayor of Belle Center, Wis., has resigned because of the press of business. Dr. J. C. Banning has succeeded to the office.

DONAHOE, S. E., a former patrolman on the Alexandria police force and recently foreman of a railway construction crew at Hammond, will be the new Chief of Police of Alexandria, Ind., succeeding the late John L. Ellis.

DOWNES, HARRY C., will be chief smoke inspector of Cleveland, Ohio, on and after March 31. The resignation of William P. Walsh, present smoke inspector, will be in force on that date. It was announced by Director Hogan that Walsh had tendered his resignation in order to become city sales manager for the Great Western Oil Company.

GRAY, WM. B., has resigned as general superintendent for H. S. Kerbaugh, Inc., and has been appointed general manager and chief engineer for Geo. W. Jackson, Inc., of New York and Chicago, who are executing Catskill Aqueduct contract 54 for the New York Board of Water Supply. Mr. Gray while general superintendent for H. S. Kerbaugh, Inc., organized Contract 11 of the Catskill work and designed the steel crushing and mixing plant and the steel centering used on that contract. He was associated with H. S. Kerbaugh, Inc., for the past ten years, during which time he had charge of construction of the Marysville, Enola and Pitcairn yards and the low-grade freight lines of the Pennsylvania Railroad, all very heavy work, employing large forces of men and large plants. Mr. Gray is an associate member of the American Society of Civil Engineers.

HALDEMAN, B. A., presented a paper on "A Review of the Progress of City Planning" before the Engineers' Club of Philadelphia on March 18. At a business meeting of the club on March 4 Mr. N. W. Aki-moff read a paper on "The Design of Impellers of Modern Centrifugal Pumps," and Mr. Carl Hering one on "Engineering Features of Electric Furnaces."

HARRISON, CHRISTOPHER, has been appointed City Engineer of Everett, Mass., for the fourteenth consecutive term.

HAZLEHURST, JAMES N., consulting engineer, retiring from the firm of Hazlehurst & Anderson, will continue the practice of his profession at Atlanta, Ga.

MULLEN, C. W., has been elected mayor of Bangor, Me.

PEARSE, LANGDON, assistant engineer for the Sanitary District of Chicago, gave an illustrated lecture on March 11 at the Detroit Museum of Art on "Modern Ideas as to the Desirability of Pure Water, in Connection with Water Supply and Sewage Disposal." Mr. Pearse made particular reference to conditions in various typical lake cities.

STEPHENS, WM. D., of Los Angeles, Cal., whose term as member of Congress has begun, resigned his position of President of the Municipal Board of Water Commissioners, and Major Henry T. Lee was elected by the board as his successor. Mr. Stephens will continue for the time being to serve as a member of the Water Commission. Only the position of president of the board has a salary attached, \$3,000 a year. The other service is honorary and will not conflict temporarily with Congressman Stephens' other duties.

TIGHE, JAMES L., who has served the city of Holyoke, Mass., as engineer of the municipal water works and City Engineer for nineteen years, has opened an office as consulting engineer in the Caldonia Building, Holyoke.

VAN TASSEL, ROBERT, has been re-elected president of the Water Board of Lowell, Mass., and Robert J. Thomas has been re-elected superintendent.

WARD, MICHAEL P., has been chosen chairman of the new Board of Health named by Mayor Conroy of Lynn, Mass.

TRADE NOTES

Cast Iron Pipe.—Chicago—Business is active and numerous small sales have been made. Prices continue firm. Quotations: 4-inch, \$25.50; 6 to 12-inch, \$24.50; 16-inch and up, \$24. Birmingham—The tonnage placed recently consists principally of comparatively small lots, but the prices received indicate the maintenance of the recent advance. The market is considered as stronger than for some weeks. Quotations: 4 to 6-inch, \$22; 8 to 12-inch, \$20; over 12 inch, average, \$19. San Francisco—Prices show increasing firmness, and in expectation of a further advance a large volume of business has been booked. Most of the buying has been for small municipal projects. Quotations: 6-inch, \$33; 4-inch, \$35. New York—The general market shows a renewal of activity, with quite a number of inquiries from private consumers, and some sales. Competition for business is still keen. Quotations: 6-inch, carloads, \$21 to \$22.

Lead.—Some fairly good sales of lead have been made by outside sellers at lower prices than prevailed a week ago. The leading interest continues to keep its quotation at 4.50c., New York, which is now fully 12½ points above the price set by independent sellers. As a matter of fact, the American Smelting & Refining Company is practically out of the market, except that it is making a few sales of selected brands. The St. Louis market is ragged, and there are reports that the price of 4.22½c. has been slightly shaded there. Plenty of lead can be had in New York at 4.37½c.

Valves.—The stockholders of the Chapman Valve Manufacturing Company, Indian Orchard, Mass., have voted to accept the recommendation of the Board of Directors for a financial reorganization, by which the corporation will be capitalized for \$1,000,000; equally divided between common and preferred stock, an increase of preferred stock of \$200,000, but a decrease in common stock from \$1,000,000 to \$500,000. The stockholders were practically unanimous in their action, which will put the finances of the business on a most substantial basis.

100,000-Barrel Cement Order.—The Tennessee Coal, Iron & Railroad Company, of Birmingham, has closed a contract with the Standard Portland Cement Company, of Birmingham, for 100,000 barrels of Portland cement, to be used principally in the construction of the Edgewater dam. The Standard plant is located at Leeds, Ala., and the quality of cement manufactured is offered as fulfilling the most rigid tests and specifications.

Quarry Plant for Sale.—A stone-quarrying and crushing plant in Wake county, North Carolina, is offered for sale. Its daily capacity of crushed stone is 300 tons. For details address the American Stone Company, Box 538, Richmond, Va.

Hydraulic Pipe Flanging.—A new pipe flanger employing the cold hydraulic process is being developed by the Patterson-Allen Engineering Company, 2 Rector street, New York City. The machine is automatic in its operation and will flange bent and straight pipe equally well. It does its work rapidly, having a capacity of between 250 and 300 8-inch flanges per day.

Gravel Plant.—The Tioga Gravel Company, which was recently organized with a capital stock of \$200,000, will

install a plant for washing and screening gravel at Tioga, Ia. Among those interested in the enterprise are C. L. Dwyer, George K. Force, K. C. Barkley and A. D. Anderson, of Houston, Tex., and E. S. Brasher, of Tioga, Ia.

Municipal Auditing.—A settlement has been reached between the Audit Company of New York and the City of Louisville by which the Audit Company accepts \$39,500 in full settlement of its bill of \$46,000. The settlement was made by the advice of City Attorney Clayton B. Blakeley, who advised that if the bill were disputed there would be interest to pay, and a master's salary of \$2,000; besides the bill as presented might be allowed in full. The Audit Company was hired by Mayor Robert W. Bingham to audit the books of the Louisville Water Company. The books were found to be correct.

Cement Prices Advance.—The leading manufacturers of Portland cement advanced their quotations 5c. per bbl. on March 1. The new quotation for cement, delivered in New York City, is \$1.48, with an allowance of 40c. for the bags returned. Compared with the basis of last year, the quotation would be \$1.38. It represents a price of 80c. per bbl. in bulk at the mill. Manufacturers are making this quotation on contracts to be shipped within the next thirty days, and state that a further advance will probably be made April 1. There is little or no cutting of prices, except by some concerns which are habitually under the market.

Water Purification Apparatus.—The Walworth Manufacturing Company, of Boston, Mass., has taken over the sale of the apparatus for water purification made by the American Water Purification Company, of the same city.

Steam Rollers.—The Iroquois Iron Works, of Buffalo, has received an order for six 10-ton macadam steam rollers for the Philippine government work, and for a similar roller for government use in the District of Columbia.

Lap Welded Pipe.—American Spiral Works, Chicago, Ill., have issued a circular which calls attention to the line of lap-welded steel pipe made in sizes ranging from 12 to 72 in. in diameter, which are illustrated. This pipe is made from low carbon open hearth steel and is especially suited for gas, compressed air, vacuum and high-pressure hydraulic lines. The illustrations show some 30-in. lap-welded pipe and fittings and an 11-ft. lap-welded steel drum.

Crushing Plant.—The St. Paul Stone Quarries Company, St. Paul, Ind., is endeavoring to interest additional stockholders for the purpose of enlarging the present stone crushing plant.

Castings for Municipal Work.—The Murray Iron Works Company, Burlington, Ia., has issued a pamphlet devoted to a line of castings for sewer, water and street lighting work. All of these castings are illustrated and two of them, a catch basin and a sewer outlet, both of which are patented, are described at length.

Crushing Plant.—R. B. Tyler & Co., Louisville, who have bought the Tucker quarries at Tucker, Ky., will purchase a complete crushing outfit, including boilers, compressors and drills, and will extend the operations at Tucker.

Care of Solid Rubber Tires.—The Firestone Tire and Rubber Company has issued a colored poster containing a proposed Chauffeur's Moral Code, which refers to the elastic and other properties of rubber. The rules refer to the use of vehicles having solid, not pneumatic tires. The poster reads:

This Certifies, That the Commercial Motor Vehicle chauffeur to whom this document has been awarded has the interests of his vehicle ever in mind and, regardless of the yearnings of the repairman and the junk dealer, has adopted the following Chauffeur's Moral Code:

1. I will avoid overloading my vehicle, because of the heavy stress it places on the mechanism and tires.

2. I will not overspeed my vehicle, as I realize that its tires and mechanism have their limitations and if persistently overtaxed they cannot give their full length of service.

3. I will keep my brakes working with equal pressure on each wheel, and the axles and wheels trued up. I can thereby save rack and wear on the running gear and prevent unusual stress on any one of the tires.

4. I will not allow oil or grease to accumulate on my rubber tires, because this will cause them to decay.

5. I will always start my vehicle before turning the steering wheels, remembering that the act of turning the front wheels when vehicle is standing still, places a heavy and unnecessary stress upon the tires.

6. I will start and stop my vehicle gradually, and avoid jerky motions under all circumstances.

7. I will not persist in running my vehicle along street car rails, as that grinds off the edges of the tires.

8. I will always, when possible, choose the smoother pathway, avoiding obstacles and road irregularities, and will cross car tracks preferably at an angle.

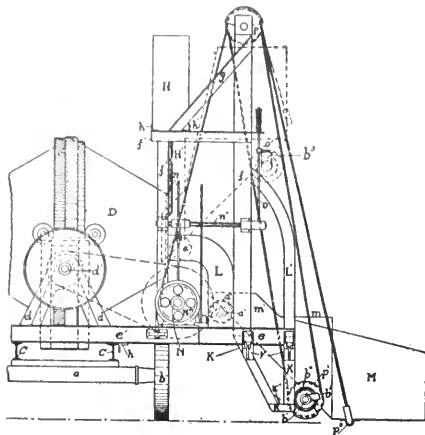
9. As merely resetting or repairing a side-wire tire will in many cases double its life, I will have my tires attended to promptly in order to secure this extra service.

Electrical Conduits.—The Steel Conduit Company has been incorporated with a capital stock of \$150,000 at Penn Yan, N. Y., to manufacture electrical conduits and insulating devices. The incorporators are W. T. Morris, H. M. Short and E. R. Ramsay, Penn Yan.

Lock Joint Pipe.—City Engineer Hoover, Everett, Wash., has expressed satisfaction over the contract of the Pacific Lock Joint Pipe Company that has completed the manufacture of cement pipe for the Capitol Hill sewer and laterals. The 4-foot sections, 3½ inches in thickness, 30 inches in diameter and each weighing 1,500 pounds, lie along Broadway, waiting for the sewer contractors, Snyder & Stalwell, to put them in place. The lock joint pipe is something new in Everett. From Seventeenth street to Twenty-first street, on Broadway, the pipe lying along the distance is of the 30 and 24-inch variety. The laterals will use a 24-inch pipe, the smallest made by the company. This was made on the ground, molded in collapsible steel forms 4 feet long, prepared of sand, gravel and cement in a one, two and four mixture. Superintendent W. S. Shaw, of the Pacific Lock Joint Pipe Company, has taken his men and equipment to Salem, Ore., where the company has a contract.

PATENT CLAIMS

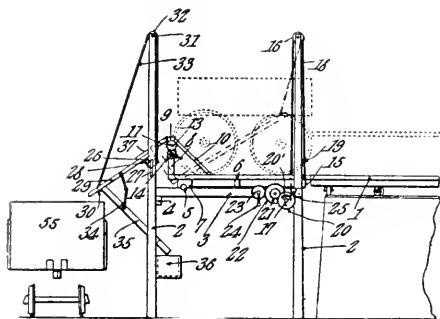
985,751. CHARGING DEVICE FOR CONCRETE MIXERS. Thomas L. Smith and Edward W. Meyer, Milwaukee, Wis., assignors to The T. L. Smith Co., Milwaukee, Wis., a corporation of Wisconsin. Filed Feb. 1, 1909. Serial No. 475,499.
A charging device for a concrete mixer consisting of a loading car having an open discharge spout adapted to enter the feed



opening of the mixer drum, guide tracks engaging said car and hoisting means for operating said car, said guide tracks so constructed as to introduce the discharge spout of the car to the feed opening of the mixer and to tilt the car for discharge by the upward movement given by the hoist.

985,923. LOADING APPARATUS. Frank J. Neefe, Cottage Grove, Wis. Serial No. 541,328.

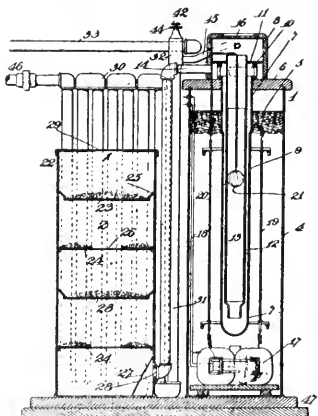
A loading apparatus comprising a frame,



a tiltable bed mounted upon the frame, a traction means mounted upon the bed, and a chute mounted upon the frame.

986,194. WATER-STERILIZING APPARATUS. Clifford D. Meeker, East Orange, N. J., and Charles Fred Wallace, New York, N. Y., assignors to Gerard Ozone Process Company, New York, N. Y., a corporation of New Jersey. Serial No. 575,492.

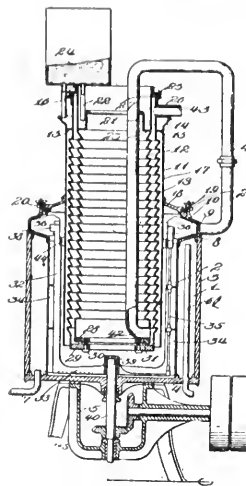
A water sterilizer having a tank containing oil, an ozonizer element submerged



In said oil, a transformer also submerged in said oil, and electrical connections from said transformer to the ozonizer element having joints therein located within the body of oil.

986,257. REGENERATIVE PASTEURIZER. Joseph Willmann, Derby, Conn. Serial No. 488,925.

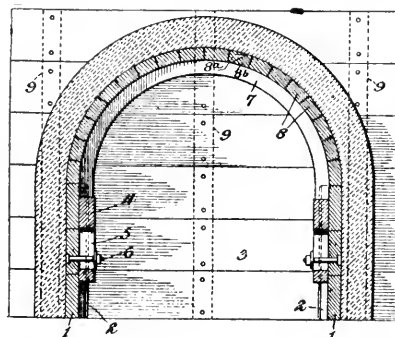
A regenerative pasteurizer comprising a heating section and a regenerative section,



the regenerative section being removably mounted within the heating section.

985,916. MOLD FOR CULVERTS. Nicholas Marx and John Ketzner, Mount Hope, Kan. Serial No. 514,561.

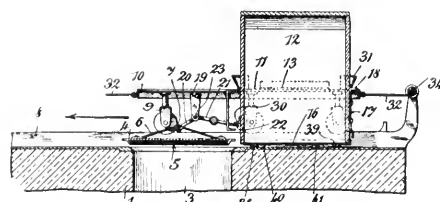
A culvert mold comprising a plurality of boards arranged on edge and rigidly connected by vertical cleats forming vertical side frames, vertically disposed blocks arranged at intervals on the inner faces of the side frames and provided with vertical slots, means for operating in the slots for adjustably securing the blocks to the side frames, said blocks terminating short of the



upper edges of the side frames, rigid arched supporting members spaced apart and removably seated at their lower ends upon the upper ends of the blocks and extending below the upper edges of the side frames and held against lateral movement by the same, and a collapsible arched cover resting upon the upper outer faces of the arched members and also upon the upper edges of the side frames, said cover being composed of longitudinal bars placed edge to edge, two of the said bars being beveled and overlapped to form an automatically collapsible joint, whereby the cover is collapsed by lowering the blocks at each side.

985,830. APPARATUS FOR DISCHARGING DUST-CARTS INTO THE FURNACES OF REFUSE-DESTRUCTORS. Jacob Ochsner, Zurich, Switzerland. Serial No. 487,990.

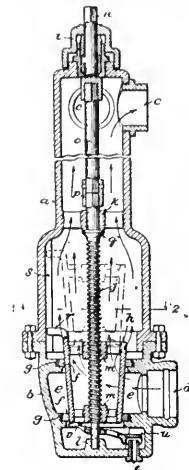
Apparatus for discharging dust into covered receptacles, comprising a movable frame, a lifting member thereon, means



operated by the movement of the frame to move the lifting member into position to engage the cover of the receptacle, and a dust box adapted to be placed in the frame and to actuate the lifting member to raise the cover.

985,469. HYDRANT. Ole O. Storle, Tacoma, Wash., assignor to O. O. Storle Valve Company, Green Bay, Wis., a corporation of Wisconsin. Filed July 11, 1910. Serial No. 571,443.

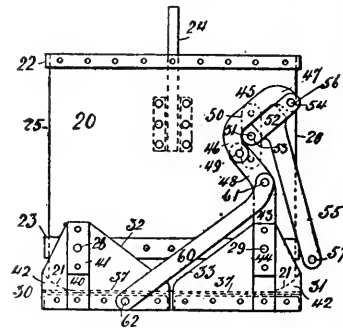
In a hydrant the combination with a tubular body having a discharge connection at the upper end, an inlet chamber and a lateral inlet connection opening into said chamber at the lower end and aligned open-



ings and valve seats on opposite sides of said inlet connection, a tapering tubular valve fitted to said seats, and an operating stem extending upwardly through said tubular body and adapted to move said valve axially.

986,100. BOTTOM-DUMPING BUCKET. Gustavus L. Stuebner, Flushing, N. Y. Serial No. 448,322.

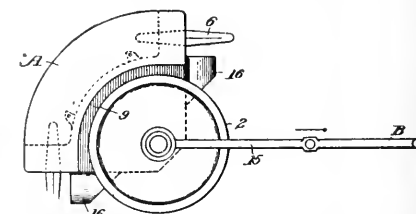
In a bucket the combination of a body having curved lower edges, a pair of doors pivoted thereto, side plates for the doors, bottom plates for the doors, filling blocks on the bottom plates curved to gauge with curved lower edges of the body of the



bucket, locking links pivoted to opposite sides of the bucket, arms extending from the side plates of one of the doors, links connecting the arms and the locking links, the latter link locking itself with the locking link when the doors close the bucket, connecting links connecting the said arms and the side plates of the other door, arms extending from the locking links, and a handle bar connecting the arms.

986,113. ROAD SCARIFIER. Edward Wright, Brooklyn, N. Y. Serial No. 565,941.

A road scarifier, comprising a metal body, wheel-supported means for pivotally supporting the body upon a horizontal axis at one side of a vertical line passing through its center of mass, so that said body is



normally unbalanced upon the shaft, a set of picks carried by said body and adapted to engage the ground when its center of mass is at one side of said horizontal axis, and another set of picks carried by said body and adapted to engage the ground when its center of mass is at the opposite side of said horizontal axis.

THE WEEK'S CONTRACT NEWS

Relating to Municipal and Public Work—Street Improvements—Paving, Road Making, Cleaning and Sprinkling—Sewerage, Water Supply and Public Lighting—Fire Equipment and Supplies—Bridges and Concrete Work—Sanitation, Garbage and Waste Disposal—Police, Parks and Miscellaneous—Proposals and Awards

To be of value this matter must be printed in the number immediately following its receipt, which makes it impossible for us to verify it all. Our sources of information are believed to be reliable, but we cannot guarantee the correctness of all items. Parties in charge of proposed work are requested to send us information concerning it as early as possible; also corrections of any errors discovered.

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREET IMPROVEMENTS				
Wisconsin	Burlington	Mar. 24, 2 p.m.	Paving with brick, cement, curbing and guttering certain streets	P. J. Hurtgen, Chm. Bd. Pub. Wks.
Ohio	Cincinnati	Mar. 24, noon	Improving Broadwell road	Stanley Struble, Pres. Co. Comrs.
Ohio	Columbus	Mar. 24, noon	Grading and macadamizing 2.10 miles road	Jas. C. Wonders, State Hwy. Comr.
Iowa	Des Moines	Mar. 24, 9 a.m.	Paving various streets and alleys, about 3,000 sq. yds.	Horace Susong, City Clk.
Ohio	Richwood	Mar. 25	Paving with vit. brick portions of various streets	Ray L. Jordon, Village Clerk.
Wisconsin	Watertown	Mar. 25, 2 p.m.	Paving with vitrified block about 7,500 sq. ft.; 3,650 lin. ft. combined curb and gutter, 2,845 cu. yds. excavation	F. S. Weber, Chm. Bd. Pub. Wks.
Wisconsin	Racine	Mar. 25, 10 a.m.	Paving and grading various streets	P. H. Connolly, Chm. Bd. P. Wks.
Indiana	Evansville	Mar. 25, 10 p.m.	Furnishing broken rock and screenings from May 1, 1911 to May 1, 1912	Simon A. Bartholome, Clk. D. P. W.
Iowa	Sioux City	Mar. 25, 9 a.m.	Paving portion of First Street with brick block	E. O. Wesley, Supt. Streets.
Florida	Manatee	Mar. 25	Constructing county roads	County Commissioners.
Ohio	Havana	Mar. 25	Constructing 9.6 miles macadam roadway	Trustees Norwich Township.
Wisconsin	Burlington	Mar. 25	Paving with cement 12,645 sq. yds.; brick paving, 2,220 sq. yds.; 5,875 lin. ft. combination curb and gutter; 5,970 lin. ft. cement curb; and 5,460 cu. yds. excavation	P. J. Hurtgen, City Engr.
New York	Long Island City	Mar. 27	Furnishing 58,000 vit. brick; 20,000 iron slag paving blocks; 25,000 wood paving blocks; 15,000 asphalt blocks	Lawrence Gresser, Pres. Boro. Queens.
New Jersey	Asbury Park	Mar. 27	Furnishing about 10,500 sq. yds. creosoted wood blocks, vit. brick or bitulithic	Wm. C. Burroughs, City Clk.
New Jersey	Jersey City	Mar. 27, 2 p.m.	Repairing asphaltic pavements to Nov. 30, 1911	Geo. T. Bouton, Clk. B. S. & W. Com.
Kentucky	Louisville	Mar. 27	Paving with vitrified block various streets and alleys	Caldwell Norton, Pres. Bd. Pub. Wk.
New Jersey	Jersey City	Mar. 27, 2 p.m.	Furnishing about 2,500 lin. ft. of Medina stone crosswalks	Geo. T. Bouton, Clk. Bd. S. & W. Cm.
Texas	Galveston	Mar. 27, 11 a.m.	Grading, regrading and paving road from La Marque to Texas C.	John M. Murch, County Auditor
Ohio	Belle Valley	Mar. 28, noon	Grading and paving with brick 0.9 mile of road, in Noble Twp.	S. G. Brown, Engr.
Ohio	Cleveland Hghts.	Mar. 28	Improving Berkshire Road	H. H. Canfield, 309 Beckman Bldg., Cleveland, Village Clerk.
Ohio	Bowling Green	Mar. 28, 1 p.m.	Grading, draining and macadamizing three roads	F. W. Toan, County Auditor.
Michigan	Grand Rapids	Mar. 28, 2 p.m.	Constructing certain gravel roads	Ralph A. Mosher, Clk. Bd. Co. R. C.
Indiana	Noblesville	Mar. 28, 2 p.m.	Constr. about 11 miles gravel road; and 3,789 ft. macadam road	Geo. Griffin, County Aud.
Dis. Columbia	Washington	Mar. 28, 10 a.m.	Furn. Portland Cement to the Naval Academy at Annapolis	T. J. Cowie, Paymaster General.
Ohio	Caldwell	Mar. 28, noon	Grad. and pav. with brick 4,580 lin. ft. road in Noble Township.	S. S. Barnhouse, Township Clerk.
California	Hermosa Beach	Mar. 28	Furn. 1,700 lin. ft. cement curb, 1,200 lin. ft. cement gutter, 163 lin. ft. reinforced concrete culvert, 616 lin. ft. roadway—roadway to be oiled and tamped.	E. McCoskey, City Clk.
Ohio	Cleveland	Mar. 29	Furn. 60,000 ft. wood blk., 60,000 ft. planking & 4,600 ft. whl.gd.	A. B. Lea, Dir. Bd. Pub. Ser.
Kansas	McPherson	Mar. 29	Paving with asphalt, asphaltic concrete, bitulithic, brick and concrete about 19,000 yds.; and 6,100 ft. of curb and gutter.	H. A. Howland, City Engr.
Ohio	Portage	Mar. 29, noon	Pav. with brick 5.53 miles of road in Ravenna & Franklin Twps.	James C. Wonders, State Hwy. Com.
Virginia	Washington	Mar. 29	Constructing about 7 1/2 miles of macadam road	P. St. J. Wilson, State Hwy. Com.
Washington	Spokane	Mar. 29	Paving with asphalt macadam about 15 miles of Apple Way	County Commissioners.
Ohio	Montpelier	Mar. 29	Constr. about 25,500 sq. yds. pave. on Main & Empire sts.	Riggs & Sherman, Toledo, O., Engrs.
New York	Poughkeepsie	Mar. 30, 4 p.m.	Paving 13,000 sq. yds. of brick pavement	Robt. J. Harding, Supt. Pub. Wks.
Ontario, Can.	Guleph	Mar. 30, noon	Con. about 26,000 sq. yds. pavement; 5,000 lin. ft. street railway track and 13,000 lin. ft. combined curb and gutter	T. J. Moore, City Clk.
North Carolina	Wilmington	Mar. 31, noon	Paving and curbing portion of Sixth street	Commissioner of Streets.
Ohio	Toledo	Mar. 31, 10 a.m.	Furnishing macadam material for repair of Stone Road No. 33	Chas. J. Sanzenbacher, Co. Aud.
Iowa	Des Moines	Mar. 31, 9 a.m.	Constructing brick and cement sidewalks for one year	Horace Susong, City Clk.
Indiana	Logansport	Apr. 1	Constructing 50,000 sq. yds. of sheet asphalt.	William Pickett, City Clerk.
Wisconsin	Racine	Apr. 1, 10 a.m.	Pav. with brick about 5,616 sq. yds.; 2,746 lin. ft. cement conc. curb; 1,836 cu. yds. excavation; 2,680 cu. yds. filling	P. H. Connolly, Chm. Bd. Pub. Wks.
Alabama	Birmingham	Apr. 1	Paving with various materials 70,000 sq. yds.	Maury Nicholson, City Engr.
Iowa	Merrill	Apr. 1	Grading several roads	Edward Stinton, Township Clk.
Rhode Island	Newport	Apr. 1, 11 a.m.	Constr. macadam road, gutter, catch basins, granolithic walk and concrete curb at U. S. Naval Station	Bureau of Yards and Docks, Navy Dept. Washington.
Iowa	Bronson	Apr. 3, noon	Road work in Floyd Township	H. H. Onstot, Clerk.
North Dakota	Grafton	Apr. 3, 6 p.m.	Constructing sidewalks and cross walks for the year	J. H. Johnson, City Auditor.
North Dakota	Park River	Apr. 3	Constructing sidewalks and crosswalks for one year	F. J. Prochaska, City Audr.
Ohio	Canton	Apr. 4	Improving various streets and avenues	O. H. Webber, City Engr.
Indiana	Madison	Apr. 4, 1 p.m.	Construction of gravel road	Andrew M. Taff, County Auditor.
Alabama	Wetumpka	Apr. 4, 11 a.m.	Grading and surfacing about 30 miles of sand-clay road	County Commissioners.
North Dakota	Rugby	Apr. 5, 2 p.m.	Metal culverts and road machinery for year 1911	Henry Albertson, County Auditor.
Washington	Coupeville	Apr. 5	Improving Hinman Road No. 32	H. T. Wanamaker Aud. Island Co.
Florida	Jacksonville	Apr. 5	Keeping in repair for one year Atlantic Blvd. and its bridges	P. D. Cassidy, Clerk.
Indiana	Bloomington	Apr. 5, 10 a.m.	Constructing a stone road in Clear Creek Township	Horace Blakely, Co. Audr.
Maryland	Cambridge	Apr. 6, 11 a.m.	Grading, paving and curbing various streets	Henry Lloyd, Chm. St. Imp. Comn.
Missouri	Fulton	Apr. 6	Lay. 5,000 sq. yds. of macad. with binder; also 3,500 ft. con.curb	P. D. Thurmond, City Engr.
Massachusetts	Holyoke	Apr. 7	Furnishing curbing, pitch, cement, coal and trap rock	City Clerk.
Maryland	Ft. Howard	Apr. 7, 11:30 a.m.	Constructing cement walks	Constructing Quartermaster.
Ohio	Cincinnati	Apr. 7, noon	Repairing Lick Run road	Stanley Struble, Pres. Bd. Co. Comrs.
Oklahoma	Lawton	Apr. 10	Paving approximately five miles, rock asphalt base, wearing surface, concrete curb and gutter	Z. M. Scifres, City Engr.
Iowa	Cresco	Apr. 10, 8 p.m.	Constructing 5,500 ft. cement concrete curbing and 11,500 sq. yds. cement concrete paving	John E. Peck, City Clerk.
New Jersey	Swedesboro	Apr. 15	Constructing Railroad Avenue	Wilmer Eege, Mavor.
Georgia	Dublin	Apr. 18, noon	Paving with vitrified brick about 600 sq. yds.	A. P. Hilton, City Clk.
SEWERAGE				
Wisconsin	Burlington	Mar. 24, 2 p.m.	Constructing about 2,000 lin. ft. vitrified pipe sewer; 290 lin. ft. sanitary sewer, 7 manholes 18 10-in. 1/4 bends	P. J. Hurtgen, Chm. Bd. Pub. Wks.
Connecticut	Putnam	Mar. 24, 4 p.m.	Constructing about 10,000 ft. of sewers	Geo. W. Perry, Engr. Sewers.
North Dakota	Minot	Mar. 27	Constructing four miles of sewers	Board of City Commissioners.
South Dakota	Huron	Mar. 27, 8 p.m.	Extending trunk sewers	S. S. Oviatt, City Auditor.
Ohio	Cincinnati	Mar. 27, noon	Con. main & lateral sewers & drains with appurt. in various sts.	John J. Wenner, Clk. Bd. Pub. Ser.
Indiana	Elkhart	Mar. 27, 10 a.m.	Bldg. about 2 1/2 miles of 30, 24 and 12-in. sewers	A. M. Smith, City Engr.
Iowa	Sibley	Mar. 28	Constructing sewer system in District 11	V. A. Burley, Co. Audr.
Ohio	Elyria	Mar. 28, noon	Constructing sewers in various streets	Rose Moriarity, Clerk.
Ohio	Cleveland Hghts.	Mar. 28, noon	Constructing sewers in various streets	H. H. Canfield, Village Clerk.
Iowa	Indianola	Mar. 29, 7 p.m.	Bldg. sewer system in North Indianola	A. H. Gilliland, City Engineer.
Pennsylvania	Wilkes Barre	Mar. 31, 8 p.m.	Constructing terra cotta pipe sewers on various streets & aves.	E. Z. Smith, Chmn. Sewer Comm.
Kansas	Leavenworth	Mar. 31, noon	Constructing about 8,500 ft. of sewers	Capt. J. E. Normoyle, C.Q.M., U.S.A.
Pennsylvania	Altoona	Apr. 1	Constructing sewers	F. Engstrom, City Engr.
Sask., Can.	Moose Jaw	Apr. 10, 8:30 p.m.	Furnishing and laying about 30,700 lin. ft. tile pipe sewer, building manholes, etc.; separate bids. Con. sewage disposal plant, etc.	W. F. Heal, City Clerk.
New Jersey	South Orange	Apr. 11, 8 p.m.	Bldg. sanitary sewers in the Hilton district	Edward Arcularious, Twp. Clk.
California	San Jose	July 3	Construct septic tank for County hospital	City Clerk.

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
WATER SUPPLY				
Texas	Lufkin	Mar. 24	Constructing water works, includ. boilers, pumps, motors etc.	C. N. Hamason, Mayor.
Ohio	Cleveland	Mar. 24, noon	Furnishing valves for the Water Dept.	A. B. Lea, Dir. Pub. Serv.
Illinois	Toulon	Mar. 24, 7:30 p.m.	Constr. system of cast iron wtr. supply pipes, hydrants, etc.	W. W. Shields Co., Engrs., 12 Hartford Bldg., Chicago.
Illinois	Chicago	Mar. 24	Laying cast iron water supply pipe and necessary water service pipes in Long Common and Downing rls.	F. S. McClary, Secy. Bd. L. Imp.
Indiana	Nat. Mil. Home	Mar. 25	Install. mach. for imp. water sup. at Marion Beh., N.H.D.V.S.	J. W. Sanderson, Treas.
Ontario, Can.	Chapleau	Mar. 27	Furnishing duplex steam pumping engine.	T. J. Godfrey, Town Clerk.
Massachusetts	Pittsfield	Mar. 27, 2 p.m.	Furn. about 3,800 tons cast iron wtr. pipe & special castings.	A. B. Farnham, Engr. Bd. Pub. W.
Ohio	Colbus Heights	Mar. 28	Constructing water mains.	H. H. Canfield, 309 Beckman Bld. Cleveland, Village Clerk.
Man., Can.	Winnipeg	Mar. 29, 11 a.m.	Furnishing c. i. pipe for water works and sewer pipe required during present year.	M. Paterson, Secy. Bd. Control.
Indiana	Evansville	Mar. 29, 10 a.m.	Furnishing 2 hori. shaft steam turbine-driven centrifugal pumping engines for supplying water to filtration plant.	Henry L. Heilman, Secy. B. W. C.
Iowa	Webster City	Mar. 29	Improving water system, including boilers, engines, etc.	P. M. Banks, City Clk.
Missouri	Kansas City	Mar. 30	Constructing self-contained, vertical, triple-expansion crank & fly-wheel pump, engine of 20 million gals. capac. in 24 hrs.	E. B. Harrington, Secy. B.F.&W.
Sask., Can.	Saskatoon	Mar. 31, noon	Installing mechanical filtration plant.	W. B. Neil, City Comr.
Oregon	Astoria	Mar. 31	Con. gate, well and high serv. dis. system for hill section of city.	City Clerk.
Minnesota	Minneapolis	Mar. 31, 7:30 p.m.	Constructing water tower.	Henry N. Knott, City Clk.
New York	Troy	Mar. 31, 11 a.m.	Furn. valves, sluice gates and appurtenances required in construction of reservoir; and for cast iron pipe and specials.	Edwin L. Grimes, City Engr.
Wisconsin	Wauwatosa	Apr. 1, 2 p.m.	Furn. one duplex compound steam driven, air compressor, 90 lbs. steam pressure; cap. 500,000 gals. per min.; also one air receiver or tank suitable size for use with compressor.	Edward Coulthard, City Clk.
Pennsylvania	West Telford	April 1	Constr. water works; approx. cost \$30,000.	H. Z. Walpoie, Secy. Water Co.
Washington	Tacoma	Apr. 1, noon	Constructing concrete lined reservoir; pipe line from Green River Crossing to reservoir, retaining wall, stand pipes and a telephone line from Headworks to reservoir.	Nicholas Lawson, Comr. Lt. & Board of Public Works.
California	Vallejo	Apr. 3	Laying 14-in. pipe and 8-in. pipe in various streets.	A. T. Dickey, City Engineer.
Texas	Galveston	Apr. 3, noon	Installing 10,766 lin. ft. of water main.	
Ontario, Can.	Welland	Apr. 3, noon	Constr. of one unit water-power driven water-works pump, 3,000,000 Imp. gals. daily cap., incl. turb., pipes, valves, etc.	R. Cooper, Chm. Water Comrns.
California	Ft. Baker	Apr. 4	Reconstructing pump house, installing machinery, laying 6-in. water main and erecting steel water tank.	Maj. Geo. McK. Williamson, Q. U. S. A.
New York	Keesville	Apr. 5	Constructing reservoir, laying water pipe, etc.	J. B. Mace, Pres. Bd. Water Comr.
Sask., Can.	Moose Jaw	Apr. 10, 8:30 p.m.	Furn. and lay. about 29,700 lin. ft. c. i. water main; sep. bids.	W. P. Heal, City Clerk.
Maine	Ft. McKinley	Apr. 15	Constructing chemical water softening plant.	Capt. Jos. F. Gohn, Con. Q.M.U.S.
BRIDGES				
Pennsylvania	Brookville	Mar. 24, noon	Constructing rein. concrete bridge over Runaway Run.	W. A. Kelly, Clk. Bd. of Comrns.
Ohio	Cincinnati	Mar. 24, noon	Constructing concrete bridge.	Stanley Struble, Pres. Co. Comrns.
Illinois	Patoka	Mar. 24, 1 p.m.	Constructing reinforced concrete bridge.	J. F. Davidson, Town Clk.
Virginia	Danville	Mar. 28, noon	Constructing reinforced conc. bridge about 1,000 ft. long with 20-ft. roadway.	J. O. Magruder, City Engr.
Indiana	Evansville	Mar. 30, 10 a.m.	Reinforced concrete wall on State Road; new concrete piers and abutments for Bayou Bridge; remodelling Marx Bridge; Butsch Bridge and Schaeffer Bridge.	Chas. P. Beard, County Auditor.
New York	Fredonia	Apr. 1, 2 p.m.	Constructing concrete arch over Candaway Creek.	Frank H. Moir, Town Clerk.
Kansas	St. John	Apr. 3, noon	Con. 2 cement and steel bridges & repairing 1 cement bridge.	R. C. Ardrey, Co. Clk.
Pennsylvania	Allentown	Apr. 3, 10 a.m.	Repairing 5 wooden bridges.	J. S. Troxell, Clk. Bd. of Comrns.
Kansas	Hill City	Apr. 4, noon	Constructing bridge.	Ben. S. Smith, Co. Clerk.
North Dakota	Cando	Apr. 4, 1 p.m.	Constructing 150 ft. more or less of concrete and steel bridges.	Frank Shanley, County Auditor.
Ohio	Columbus	Apr. 5, noon	Grad. roadway, con. abutments & approaches of various bridges.	F. M. Sayre, Co. Audr.
Indiana	Vincennes	Apr. 8, 10 a.m.	Constructing 3 bridges in Knox County.	John T. Scott, Aud. Knox Co.
New Jersey	Camden	Apr. 10, 11 a.m.	Constr. conc. culvert over Bates' Mill Stream; alternate bid for wooden bridge at same place.	Fred'k W. Gercke, Chm. Bridge Co.
LIGHTING AND POWER				
Pennsylvania	Wilkes Barre	Mar. 24, noon	Lighting with electricity and caring for 36 or more 5-light cast iron ornamental lighting standards in the pub. sq. for 1, 3 and 5 years.	R. Nelson Bennett, Ch.Light. Co.
Massachusetts	Springfield	Mar. 24, noon	Electric wiring of the Springfield Municipal power plant.	Edward H. Lathrop, Mayor.
Indiana	Columbia City	Mar. 25	Furnishing machinery for electric light plant.	City Clerk.
California	Los Angeles	Mar. 27, 2 p.m.	Furn. 2 engine gener. sets in Hall of Records; franchise granting right to construct electric poles and wire system through Central ave. and Linden st.	H. J. Lelande, Co. Clk.
Ohio	Madisonville	Mar. 28, noon	Furnishing 1 direct connected engine and generator, 100 K.W. 125 K.V.A., 2,300 volts, 3-phase, 60 cycles, 150, 250 or 277 R.P.M.	Wm. H. Blaney, Clk. Bd. Puv. A.
Iowa	Webster City	Mar. 29	Improving electric light system.	P. M. Banks, City Clk.
Kentucky	LaGrange	Apr. 1	Installing second-hand 65 H.P. gas engine and producer for soft coal; 45 kilowatt D. C. multipolar comp. 250 volt generator; also poles, overhead and underground wire, cross-arms etc.	J. C. Emmrich, Manager.
Sask., Can.	Rouleau	Apr. 4	Pumping machinery, electrical machinery, pole line, etc., producer gas plant, c. i. or steel water mains, valves etc.	W. H. Stewart, City Secy.-Treas.
Minnesota	Eveleth	Apr. 4	Furn. 6 blocks of ornamental street light. sys., about 46 posts.	D. P. McIntyre, City Clk.
Sask., Can.	Moose Jaw	Apr. 10, 8:30 p.m.	Furn. 2 electrically driven centrif. pumps and auto starters.	W. P. Heal City Clerk.
FIRE EQUIPMENT				
Ohio	Ashtabula	Mar. 27	Furnishing one combination hose and chemical automobile; one combination hose chem. and eng. automobile, both capable of carrying not less than 1,000 ft. 2 1/2-in. hose and both to be equipped with tanks of 30 gals. capacity.	I. M. Hadcock, Dir. Pub. Safety.
Pennsylvania	Lebanon	Mar. 27	Furnishing a chemical fire engine.	Chas. T. Hickernell, Pres. Vol. Fire.
Washington	Vancouver Bar.	Mar. 30, 11 a.m.	Constructing fire station.	Constructing Quartermaster, U. S.
Washington	Tacoma	Apr. 6, 3 p.m.	One-third size steam Fire Engine.	L. W. Roys, Comr. Public Safety.
New Jersey	Jersey City	Apr. 7	Furn. 1 first-size steam fire engine & 85-ft. aerial bk. & lad. truck.	Michael J. Fagers, City Clk.
New Jersey	Paterson	Apr. 21	Furn. automobile hook and ladder outfit and converting 2 first-class fire engines into gasoline-propelled vehicles.	T. S. Standeven, City Clk.
New Jersey	Princeton	July 5	Furn. auto pumping engine.	E. M. Updike, Chm. F. & W. Comr.
MISCELLANEOUS				
Wisconsin	Burlington	Mar. 24, 2 p.m.	Building reinforced concrete retaining wall around stand-pipe.	P. J. Hurtgen, Chm. B. P. Wks.
Pennsylvania	Carnegie	Mar. 24, 7:30 p.m.	Collecting and disposing of garbage for one year.	George W. Boden, Chm. B. P. Co.
Dis. Columbia	Washington	Mar. 24, 2 p.m.	Constructing an engine house on Georgia ave.	Cuno H. Rudolph, Chm. Bd. Co.
Illinois	Galva	Mar. 25	Constructing a sewage disposal plant.	E. O. Engstrand, City Clk.
New York	Buffalo	Mar. 25, 11 a.m.	Constructing a 40-ton grate refuse destructor.	Francis G. Ward, Comr.
Pennsylvania	Scranton	Mar. 27, 11 a.m.	Constructing two fire houses.	W. G. O'Malley, Dir. D. P. Safety.
Kansas	Salina	Mar. 27, 8 p.m.	Constructing city hall and jail annex buildings.	Chas. E. Banker, City Clerk.
Wisconsin	Green Bay	Mar. 29	Constructing jail and sheriff's residence.	Foeller & Schober, Architects.
Massachusetts	New Bedford	Mar. 29, 3 p.m.	Furnishing 57 sanitary drinking fountains in various schools.	Allen P. Keith, Secy. Com. Sup.
New York	Troy	Mar. 29	Erecting county jail.	Rensselaer County Jail Comn.
South Carolina	Charleston	Apr. 4, 7 p.m.	Furnishing for one year iron castings; brick, lime and portland cement; lumber; curbing; terra cotta pipe; concrete sidewalks; laying terra cotta pipe; hauling stone curbing; furnishing crushed stone; purchase and removal of manure.	J. H. Dingle, City Engineer.
Connecticut	Waterbury	Apr. 5, 4 p.m.	Altering building to conform to requirements of mod. fire sta.	Wm. H. Sanderland, City Clerk.
Texas	Rotan	Apr. 6	Constructing two story brick city hall building.	R. O. Owen, City Secy.
Kansas	Hutchinson	Apr. 7, 3 p.m.	Sprinkling various streets.	Ed. Metz, City Clerk.
Wisconsin	Fond du Lac	Apr. 7, 3 p.m.	Sprinkling various streets.	J. S. McCullough, Chm. Bd. Pub. W.

STREET IMPROVEMENTS

Phoenix, Ariz.—Council has decided to ask for bids for paving 12 blocks.—Frank Thomas, City Recorder.

Los Angeles, Cal.—City Engineer Homer Hamlin has recommended that First st. be paved at once.

Long Beach, Cal.—City will at once pave Third st. and Pine ave.; Daisy ave. will be paved for distance of one mile.

Santa Monica, Cal.—Plans for grading and oiling coast road from Topanga canyon entrance north to Malibu ranch gate are under favorable consideration with County Supervisors.

Collbran, Col.—Plateau Valley Good Roads Association has been organized to build pike road from Collbran to Palisade, 35 miles; will ask county to call a bond issue election; cost \$75,000.—J. E. Harris, Mesa, President.

Denver, Col.—City proposes to form two new improvement districts: East Denver Improvement District No. 4, work to include grading and concrete curb and gutter, estimated cost \$52,863, and East Side Improvement District No. 6, including grading, concrete curb and gutters and surfacing roadways with smaller slag and crushed live granite, estimated total cost \$68,612.

Putnam, Conn.—Town has voted to purchase a stone crusher and steam road roller for use on town roads.

Westport, Conn.—Riverside ave. will be macadamized; Deputy Road Commissioner Innis will have matter in charge.

Macclenny, Fla.—Baker County Commissioners have decided to construct road from west to east across county.

Athens, Ga.—Council has decided to issue bonds for construction of concrete sidewalks; bids will be invited at once.

Brunswick, Ga.—Council has decided to pave portion of F st.

Canton, Ill.—Board of Local Improvement has instructed the City Engineer to prepare estimate for paving West Chestnut st.

Moline, Ill.—City will pave East 4th ave. 34th st. to eastern limits of city.

Moline, Ill.—Improvement of Fifth ave. by widening from Fifteenth to Eighteenth sts. will cost \$34,765.

Silvis, Ill.—H. G. Paddock, Moline, is preparing plans for paving 1st st. with vit. brick at cost of \$61,685.—Geo. Sluth, Secretary Board Local Improvements.

Alexandria, Ind.—County Commissioners will consider improvement of Wayne ave. and East Second st.

Hartford City, Ind.—William P. Modlin and others have filed petition asking for improvement of public highway.

Hartford City, Ind.—County Commissioners are considering improvement of Wabash ave.

Sullivan, Ind.—Sullivan County Commissioners have ordered plans and specifications on which bids will soon be asked for construction of four crushed stone and one brick road.

Hampton, Ia.—Hall & Adams, Center-ville, have prepared plans for 5,060 sq. yds. brick paving, 1,860 lin. ft. cement curb, etc.

Shenandoah, Ia.—Council has decided to lay about 14 blocks of brick paving.

Covington, Ky.—Ordinances calling for resurfacing of 13th st. between Greenup and Garrard sts., and 20th st., Eastern to Glenway ave., with brick paving, have been adopted by Council.

Louisville, Ky.—Fiscal Court has decided to purchase three road rollers.

Shelbyville, Ky.—Council will call bond issue in fall on \$50,000 bonds to construct street, build city hall and make other improvements.

Alexandria, La.—Bond issue for road and bridge building is being considered.

Everett, Mass.—City is contemplating 16,000 sq. yds. granite block paving.—Chris. Harrison, City Engineer.

Methuen, Mass.—Town has appropriated \$1,700 for purchase of stone crusher.

Duluth, Minn.—Board of Public Works has decided to improve E. 4th st.

St. Paul, Minn.—Board of Public Works has rejected bids for curbing, filling and improving Langford ave.

Great Falls, Mont.—Construction of concrete sidewalks on 2d, 3d, 4th, 5th, 6th, 7th sts., 1st and Central avds. has been recommended.

Fulton, Mo.—Citizens will vote on proposition to improve 5th st. with macadam with binder; about 8,000 sq. yd. of macadam and 3,800 ft. of concrete curb; also proposition to pave four streets with brick; about 12,000 sq. yd. of brick and 4,000 ft. of curb; bids will probably be asked in April.—P. D. Thurmond, City Engineer.

Salem, N. H.—Town has voted to raise \$1,000 to repair macadam roads.

Newark, N. J.—Board of Works has decided to ask for proposals for paving South 19th st. with brick, Ave. B, Kirk alley, Hay alley, Exchange alley and Alyea st. with

granite, and Ardsley court and Coeyman st. with brick.

Orange, N. J.—Plans for making extensive repairs to the streets of Orange are being considered by Street Committee.

Woodbury, N. J.—Gloucester County Stone Road Committee has apportioned \$10,000 for repairs to roads in county.

Corning, N. Y.—Steuben County Board of Supervisors has approved all five of the propositions for building county roads in this county during the coming summer; there will be 17.72 miles of new county road built at an approximate cost of \$230,000.

Lyons, N. Y.—Board of Supervisors will at once approve plans and specifications of three county highways to be built with State aid next summer.

Newfane, N. Y.—Town Board has appropriated \$5,350 for improving roads.—Thos. Brennan, Superintendent of Highways.

New York, N. Y.—Resolutions have been passed for widening Twenty-third st., between Second and Seventh aves.; Thirty-fourth st., between Sixth and Madison aves.; Second ave., between Houston and Twenty-third sts.

Whitesboro, N. Y.—Village will soon vote on paving four streets.

Pittsboro, N. C.—Citizens have voted \$5,000 bonds for street improvements.

Tarboro, N. C.—Citizens will vote May 1 on \$25,000 bonds for proposed street paving.—Paul Jones, Mayor.

Barberton, O.—Council has decided to pave 3d st.; considerable paving is to be done this summer.

Cincinnati, O.—Council has approved approximate estimates for improvements of Sycamore st., 4th to North Court st.; first for asphalt, with wood block between the car tracks, \$40,891.50, and second for wood block entire, \$47,790.50.

Jackson, O.—City is considering street paving to cost \$8,000.—M. H. Monohan, City Engineer.

Perrysburg, O.—Council has voted to pave 2d st. from Hickory to Pine, seven blocks; brick will probably be used; estimated cost \$48,000.

Oklahoma City, Okla.—Mayor Dan V. Lackey has signed resolution adopted by Council authorizing the advertisement for bids for about 27 miles of paving in various outlying districts of city.—Bob Parman, City Clerk.

Portland, Ore.—City will pave Mississippi ave. this spring from Goldsmith to Prescott st.; distance of one mile.

Woodburn, Ore.—Council has passed Resolution No. 71, providing for improvement of a portion of Hayes st. with hard surface pavement at an estimated cost of \$13,271; also Resolution No. 72, providing for improvement of a portion of Garfield st. at cost of \$11,055.

Bellevue, Pa.—Citizens have voted \$25,000 bonds for street improvements.

Dallas, Pa.—County Commissioners are considering asking next Grand Jury for permission to improve Kingston and Dallas turnpike from Luzerne Borough through Courtdale Borough and Kingston Township to Trucksville.

Hazleton, Pa.—Council has decided to pave Diamond ave.—S. J. Hughes, City Clerk.

Pittsburg, Pa.—Council is considering resolution providing \$8,000 for grading, curbing and macadamizing of road from end of Beacon st. to connect with park drive in Schenley Park.

Steeltown, Pa.—Highway Committee will engage engineer to lay out grade for paving of Second st.

Thornton, R. I.—Johnstown Town Council has asked for \$7,000 appropriation for highway improvements.

Greenville, S. C.—County is considering paving of Buncombe road.—J. P. Goodwin, Supervisor.

Southern Pines, S. C.—Road Commissioners of McNeill Township have decided to construct road to Hoke county line to meet road connecting Southern Pine and Raeford.

Chattanooga, Tenn.—Improvement and widening of main road from this city to St. Elmo is being considered.

Lookout Mountain, Tenn.—Town will petition Legislature for authority to issue \$25,000 of bonds for road and street improvements.—J. B. Ragon, Chairman Committee.

Nashville, Tenn.—Board of Public Works has decided to ask for bids for building concrete sidewalks on sections of twenty-one streets.

Sweetwater, Tenn.—Monroe County is considering \$250,000 bond issue to build pike roads.

Dallas, Tex.—City Commissioners have decided to ask bids for paving 2d, 3d and 10th aves.

Galveston, Tex.—Commissioner Austin will advertise for estimates on work of paving with shell Avenue I, between Seventh and Eighth sts.

Sherman, Tex.—Citizens have voted \$5,000 bonds for street improvements.

Seattle, Wash.—Board of Public Works has approved plans and specifications for grading Fifth ave., N. E., and paving Eighth ave. S., and Duwamish st.; also received following estimates: Grading Belvidere ave., \$63,500, south half of East Union st., \$3,500.

Spokane, Wash.—Bids on street improvement work estimated to cost over \$60,000 have been rejected by Board of Public Works, leaving contracts to be readvertised and let by new commissioners.

Spokane, Wash.—Council has ordered the Board of Public Works to prepare plans and specifications for grading, curbing, parking and sidewalk of Helena st., 10th ave. to Southeast Blvd.

Spokane, Wash.—East Sprague ave. residents are urging paving of that thoroughfare.

Huntington, W. Va.—County Court will soon let contracts for repairs to pikes leading from this city.

Berlin, Ont., Can.—Council will soon call for tenders for paving King st.

Medicine Hat, Alta., Can.—Council has passed by-laws to provide for following street improvements: Concrete sidewalks, \$83,500; curbs and gutters, \$17,500; sidewalks, \$5,500; sewers, \$51,500.

Niagara Falls, Ont., Can.—Alderman Cole, Chairman of the Board of Works, will ask Finance Committee for appropriation of \$19,500 to be used in up-keep of the city streets.

CONTRACTS AWARDED

Selma, Ala.—To R. B. Cook & Co., by Dallas County Board of Revenue, to build 6 1/2 miles of good road on south side, \$12,000.

Jacksonville, Fla.—Grading and laying pavement and curbing at Dignan Park, to F. J. Trout; tile walk \$1.27 per sq. yd.; A. J. Cesery Co. bid \$1.30 per sq. yd., and Logan Concrete and Engineering Co., \$1.32 per sq. yd.; bids for laying curbing were 9c. per running ft., same for each bidder.

Manatee, Fla.—Building hard roads throughout county, to J. S. Tarror, Manatee Livery Co.—J. O. Gates, Supervisor.

Highland, Ill.—To Highland Marble Works for construction of 7,600 ft. of macadam road on upper Sebastopol road, \$10,644.

Jeffersonville, Ind.—Construction of gravel road in Owen, Bethlehem and Washington Townships, to W. Walter Taggart, \$5,568.

La Fayette, Ind.—Constructing the Higley gravel road, to Snyder & Barner, Frankfort, at \$6,995.

Rockville, Ind.—Constructing road in Liberty Township, to J. B. Thomas & Co., Kingman, \$4,375; other bidders: W. G. Carty, Montezuma, \$4,400; J. P. Vaufoosse, Rockville, \$5,100; Chas. Ireland, Montezuma, \$4,875; Ewbank & Ewbank Kingman, \$4,725.

Wabash, Ind.—Construction of gravel roads, to Conover & Toper, \$19,480; to Kilty & Hick, \$10,675; to C. J. McGreevey & Son, \$5,950; Frank Murphy, \$8,180.

Williamsport, Ind.—Constructing gravel road in Warren Township, to Haynes & Waymire, \$11,439; other bidders: D. H. Fatont, \$12,495; Frank Simms, \$12,557; W. W. Cram, \$12,980; Fred Cunningham, \$11,909; E. H. O'Leary, \$13,229.

Topeka, Kan.—Paving 20 blocks with brick to the Kaw Paving Co., \$55,000.

Detroit, Mich.—Grading and paving various streets: Berlin st., 26 ft. wide, with cedar blocks, to T. E. Currie, 20 McGraw Bldg., \$15,644; Dearborn ave., with cedar blocks, 30 ft. wide, less single track, and 40 ft. wide, less double track, to F. Porath & Son, Penobscot Bldg., \$10,859; Dix ave., 46 ft. wide, less double track, with cedar blocks, to F. Porath & Son, \$11,804; Missouri ave., 26 ft. wide, with cedar blocks, to Julius Porath, at \$8,102; Willis ave., 26 ft. wide, with cedar blocks, to F. Porath & Son, at \$20,821; Third ave., with cedar blocks, 28 ft. wide, to Julius Porath, \$52,869; Canton ave., 26 ft. wide, with sheet asphalt, to Otis Cement Construction Co., 1010 Hammond Bldg., at \$29,141; paving to be on concrete foundation with Amherst curbing.

Bernardsville, N. J.—Stone roads, asphaltic binder, total length of both roads 1,790 ft., to A. C. Denaban, Yardley, Pa., \$5,070.

Jersey City, N. J.—Repaving Jackson ave. on 6-in. concrete base, to Van Keuren & Sons at 79 per cent of the estimated cost.—George Bouton, City Clerk.

Brooklyn, N. Y.—Paving 85th st. with asphalt pavement on a concrete foundation and paving and repaving with granite blocks on a concrete foundation, from a point east of 11th ave. to 12th ave., to Brooklyn Alcatraz Asphalt Co., 407 Hamilton ave., at following bid: \$8,299 sq. yds. asphalt pavement, 5 years' maintenance, 90c.; 1,294 sq. yds. granite pavement, 1 year maintenance, \$2.75, and 1,470 cu. yds.

concrete for pavement foundation, \$5; total, \$19,130, totals of other bidders: Barber Asphalt Paving Co., 30 Church st., New York City, \$21,674; Cranford Co., 32 9th st., Brooklyn, \$19,529; Uvalde Asphalt Co., 1 Broadway, New York City, \$19,269.

New York, N. Y.—Repairing street pavements under jurisdiction of Park Department to Barber Asphalt Co.; about \$12,000.
Elizabeth, N. C.—Paving streets to E. J. McGuire, Norfolk, Va., with Baltimore brick, \$1.42 sq. yd.; Water st. is to be paved with granite block.

Akron, O.—Paving 3½ miles of Akron-Hudson road, to Pickett & Faust, Martin's Ferry, \$75,000.

Lorain, O.—Constructing sidewalks and crosswalks throughout city, to H. A. Schallon, \$11,598; other bidders: A. Graupner, \$11,635; H. N. Oberlander, \$11,912; M. L. Jackson, \$11,943; Aaron Besh, \$12,032; McHugh Bros., \$12,524.

Wooster, O.—Paving 3,700 ft. of road, to Herring & Son, Mansfield, \$8,150; other bidders: D. R. Houser, Wooster, \$8,198; D. A. Phillips, Ashland, \$8,800; and L. Winder-son, Orrville, \$8,900.

Wilson, Pa.—Paving and sewerage Mendelssohn ave., to Maynard & Flynn, Pittsburg, \$12,173.

Beaumont, Tex.—To Elliott Andrews, to grade road leading from El Vista to West Port Arthur, distance 3¼ miles, average bid, 18c. per cu. yd.

Dallas, Tex.—Furnishing 10-ton road roller, to J. I. Case Threshing Machine Co., \$1,650.

Dallas, Tex.—Paving Jefferson st., Oak Cliff, 10th to Tyler st., to the Standard Engineering and Construction Co., \$74,824.90.

Seattle, Wash.—Planking alley in block 56, to Hansen & Co., 4102 Twenty-fifth ave., S. W., \$463; wood and concrete walks on Seneca st., to same, \$764.34, and curbing and wood walks on Waters ave., \$26,976.

Superior, Wis.—Macadamizing county road, city limits to Cutler, to Russell Construction Co., city, grading \$1,400, stone \$2.60 per yd.; all culvert work during year to Richard Russell, city; macadamizing South Range road, distance 3 miles, to Ed. Johnson, grading \$990; stone \$2.67 per yd.; road north of Solon Springs to Jos. Andre, Bennett.

BIDS RECEIVED

Bridgeport, Conn.—Supplying crushed stone, (a) ½-in., (b) 1-in., (c) ¾-in., (d) screenings; Biltz Co., (a) \$2c., (b) 87c., (c) 90c., (d) 68c.; Rockland Trap Rock Co., (a) 85c., (b) 92c., (c) 90c., (d) 80c.; G. E. Sykes Co., (a) 90c., (b) 90c., (c) 90c., (d) 90c.; Connecticut Trap Rock Co., (a) \$1, (b) \$1, (c) \$1.20, (d) \$1; bids were based upon 3,000 tons of ½-in. stone, 2,000 tons of 1-in., 1,000 tons of ¾-in. and 3,000 tons of screenings; all bidders offered to deliver by boat excepting Connecticut Trap Rock Co., which uses cars.

Jersey City, N. J.—Reconstructing three sections of Boulevard: Bergen section, Van Keuren & Son, 71 per cent.; Thomas Harrington Sons Co., 92 per cent.; Joseph Murphy & Son, 69 1-3 per cent.; Edward P. O'Neill, J. F. Shanley Co., 99 per cent., and William Baker, 59 per cent. Greenville and Bayonne section: M. J. Curley, 85 per cent.; William Baker, 59 per cent. and Jos. Murphy & Son, 69 1-3 per cent. in Greenville, and 73 1-4 per cent. in Bayonne. William Baker's bid on entire job, \$80,180.89, while estimate furnished by Engineer Dunham gives total of \$135,901.50, two estimates on the three sections work out as follows: Bergen section, Baker, 47,421.25; Dunham, \$30,375; Greenville, Baker, \$18,400.62; Dunham, \$31,187.50; Bayonne, Baker, \$14,259.01; Dunham, \$24,339.

Newark, N. J.—Lowest bidders for paving various streets: Astor st. with brick, McMahon Construction Co., \$14,282; West End ave. with asphalt block, Hastings Pavement Co., \$13,420; for paving Seymour ave. with brick, Newark Paving Co., \$4,257.

Amsterdam, N. Y.—Paving Clearfield block, Baird Bros., lowest bidder: 8,400 sq. yds. brick pavement, \$2.35; 200 lin. ft. header, 25c.; total, \$19,790; for 1,000 lin. ft. curb additional, 73c.; making total with curb of \$20,520.

Brooklyn, N. Y.—Furnishing and delivering 1,500 tons of 2,000 lbs. each of refined asphalt at municipal asphalt plant, 7th st. basin: Union Oil Co., of California, \$35,440; Barber Asphalt Paving Co., New York City, \$43,200.

New York, N. Y.—Furnishing all the labor and materials required for regulating, grading and paving the South st. ferry approach and for constructing subway ducts at the St. George Ferry, Uvalde Asphalt Paving Co., 1 Broadway, city, lowest bidder, \$9,054; other bidders: Atlanta Contracting Co., \$11,690; Joseph Johnson Sons, \$9,470; M. Di Menna, \$9,287; Frank J. Gallagher, \$11,500; J. A. Donovan, \$9,995; Thomas Tarpey, \$11,375.

Portland, Ore.—Paving entire Beaumont district, which will cost approximately \$150,000 with bitulithic pavement, Elwood Willes was only bidder. Warren Construction Co. submitted proposal to pave Stanton st. district improvement with bitulithic, \$157,750; Barber Asphalt Paving Co., lowest bidder for paving E. Everett st. district of Laurelhurst, \$149,195; completion of Vista ave. improvement, \$23,685; Oregon Hassam Paving Co., only bidder; Oregon Independent Paving Co., underbid Barber Asphalt Paving Co. for paving E. Washington St. with asphalt pavement, \$7,569.

Spokane, Wash.—Grading in West Grove addition: James C. Kennedy, \$124,980; Mas- sie Bros. & Long, \$125,000; Naylor & Norlin Co., \$126,489; Mitchell Bros., \$129,000.

Fond du Lac, Wis.—Paving South Main st., 10th st. to the Ditch: John Rasmussen & Sons Co., Bar block \$1.94½ per sq. yd., Purington block \$2.02 per sq. yd., Metropolitan block \$2.10 per sq. yd.; curb and gutter 47c.; totals, Bar block \$20,260.35, Purington block \$20,951.10, Metropolitan block \$21,687.90; G. H. Stanchfield, Bar block \$2.07 per sq. yd., Purington block \$2.15 per sq. yd., Metropolitan block \$2.23 per sq. yd.; curb and gutter 46c.; totals, Bar block \$21,339.90, Purington block \$22,076.70, Metropolitan block \$22,813.50; Christ Johnson: Metropolitan block \$2.16 per sq. yd., Purington block \$2.10 per sq. yd., curb and gutter 44c.; totals, Metropolitan block \$22,191.40, Purington block \$21,638.80; John Brogan: Danville block \$2.02 per sq. yd., Indiana paving block \$2.02 per sq. yd., curb and gutter 50c.; totals, Danville block \$21,069.20, Indiana paving block \$21,069.20; on cement street, Rasmussen and Sons Co., paving \$1.45 per sq. yd., curb and gutter 47c., track work \$1,650; total \$15,701.40; G. H. Stanchfield, paving \$1.43, curb and gutter 44c., track work \$1,800; total \$15,487.20; Christ Johnson, paving \$1.64, curb and gutter 44c., track work \$2,000; total \$17,372.20; John Brogan, paving \$1.39, curb and gutter 50c., track work \$1,216; total \$15,266.90; on creosoted block, Rasmussen & Sons Co., paving \$2.49 per sq. yd., curb and gutter 47c., track work \$1,650; total \$25,279.80; G. H. Stanchfield, paving \$2.53, curb and gutter 47c., track work \$1,800; total \$25,612.20; Christ Johnson, paving \$2.54, curb and gutter 44c., track work \$2,000; total \$25,661.20; John Brogan, paving \$2.44, curb and gutter 50c., track work \$1,216; total \$24,937.40.

SEWERAGE

Texarkana, Ark.—Engineer A. B. Matson has begun preliminary survey of territory to be affected by Improvement District No. 10: cost \$40,000 to \$50,000.

Corning, Cal.—Plans are being prepared for construction of complete sewer and water system; estimated cost, \$70,000.

Los Angeles, Cal.—Board of Public Works is considering need of storm drains.

San Francisco, Cal.—Board of Public Works has recommended construction of sewers on Lincoln ave. at cost of \$125,000.

Denver, Col.—Installation of sewer district to be known as Part A of Sub. Dist. 1 of West and South Side Sanitary Sewer District is being considered; cost \$20,283.

Winsted, Conn.—Borough is considering installation of \$150,000 sewer system.—Chas. A. Patterson, Engineer.

Pensacola, Fla.—Board of Bond Trustees, together with Engineer George Rommell, Jr., have completed plans for sewer work which is to be done at total cost of about \$80,000.

Camilla, Ga.—Plans have been prepared for construction of sewers at estimated cost of \$150,000.—T. B. Perry, Mayor.

Macon, Ga.—Consulting Engineer Wilcox has been instructed by Council to prepare surveys and profiles for an auxiliary sewer system in South Macon.

Savannah, Ga.—Council is considering construction of system of house and storm drainage: City Engineer Howard has made preliminary plans; estimated cost of gravity system to drain southeast section, \$265,970, including the covering Bilbo Canal, \$150,000; same system for western section, \$67,770.

Kokomo, Ind.—Professor Sackett, of Purdue University, Lafayette, Ind., is preparing plans for proposed sewer system: cost about \$50,000.—Ben Havens, City Clerk; Jackson Morrow, City Engineer.

South Bend, Ind.—City Engineer Wm. S. Moore is preparing plans for proposed Bowman Creek sewer: pipes to be 10 ft. in diameter at intake and 12 ft. at outlet.

South Bend, Ind.—Preliminary resolution for a pipe sewer on Angelina, Blaine, McCarty and Portage aves. has been adopted by Board of Public Works.

Clinton, Ia.—City Engineer R. C. Hart has been ordered to make plans, specifications and an estimate for paving Fifth ave. from Second st. to Fifth st. with creosoted wood block paving; 12,000 sq. yds. required.

Shenandoah, Ia.—Council has decided extend sewer on West Groat ave.

Tipton, Ia.—Iowa Engineering Co., Clinton, has been selected to prepare plans sewer system.

Louisville, Ky.—Residents of Eastgate are considering improvements to sewer system. J. Russell Gaines, County Engineer, is interested.

Easton, Md.—Sewerage Commission organized, with Mayor Higgins, President will at once commence laying plans building proposed sewers.

Birmingham, Mich.—Village has voted \$25,000 bonds for sewer construction.—E. Dames, President.

Detroit, Mich.—Council has ordered advertisement for bids for constructing number of vit brick lateral sewers.—L. Haarer, Commissioner Public Works.

Ely, Minn.—Council is considering \$30,000 bond issue for constructing sanitary storm sewers.

Glasgow, Mont.—Plans have been prepared for extension of sewers in District 4; cost \$25,000.

Carthage, Mo.—Plans have been prepared by City Engineer Frank B. New for proposed sewer district; estimate shows cost will not exceed \$6.20 per sq. ft. of property.

Havelock, Neb.—Grant & Letton, Lincoln, are preparing plans for 10,000 ft. lateral sewers.

Bogota, N. J.—Plans by Engineer F. Campbell for sewage disposal plant, this borough have been approved by Board of Health; plans submitted for tank at either northern or southern end of sewer system, and the cost will exceed \$7,000.

Binghamton, N. Y.—Plans for intercepting sewers for conducting sewage of entire city to a sewage disposal plant located below the city limits have been approved by State Commissioner of Health if city authorities conform to demand State Department construction must be in spring of 1913; estimated cost of interceptor and sewage disposal plant, \$320,000.—Geo. L. Robinson, 37-39 E. 28th st., New York City, Consulting Engineer designs disposal works; City Engineer J. A. designed intercepting sewers, made surveys and collected necessary data.

Frankfort, N. Y.—Plans are being prepared by Vrooman-Perry, Gloversville, construction of sewer system and disposal plant.

Scarsdale, N. Y.—Assistant Engineer John Lowery, White Plains, is making preliminary survey for outlet sewer which is to cost \$11,000 and is to make connections with Bronx Valley sewer.

Bellefontaine, O.—Plans have been prepared by the Riggs & Sherman Co., Nasby, Toledo, for construction of sewer disposal plant; bids will be received a June 1.

Bucyrus, O.—Ohio State Board of Health has just approved plans prepared by Riggs & Sherman, The Nasby, Toledo, for age disposal plant.

Bryan, O.—Riggs & Sherman, Nasby, Toledo, have prepared plans construction of a sewer system and sewer disposal plant.

Delaware, O.—Riggs & Sherman, Consulting Engineers, The Nasby, Toledo, prepared plans for the installation of age disposal plant.

Marysville, O.—E. A. Kimmler, Columbus will furnish plans for sanitary sewer system, \$2,160.

New Bremen, O.—A. Elliott Kimble, 827 Columbus Savings and Trust Bldg. Columbus, has been retained by Village to prepare plans for sewerage disposal.

Pleasant Ridge, O.—Plans have been prepared by Riggs & Sherman, The Nasby, Toledo, for construction of sewer system and sewerage disposal plant.

Reading, O.—Plans and specifications have been completed for sanitary sewer system to cost about \$52,750.

Eugene, Ore.—Citizens will vote April on \$28,000 bonds to build trunk sewers.

South Bethlehem, Pa.—Borough Engineer R. E. Neumeyer has submitted to City Commissioner of Health Dixon plans sewerage disposal plant and system.

Clinton, S. C.—City is considering action on construction of sewerage system.

Yoakum, Tex.—Council has ordered plans for installation of \$30,000 sewer system; plans by D. W. McVea, Secretary Commercial Club.

Blacksburg, Va.—City is considering construction of sewer system.—F. W. Ehler, Mayor.

Colonial Beach, Va.—City has selected Harry Stevens, Union Trust Bldg., Washington, D. C., to prepare plans and specifications for sewer system and disposal works.—H. W. R. Williams, Mayor.

Puyallup, Wash.—Sewer Committee soon ask for bids for sewerage Har- St.; City Engineer W. T. Bowman

Estimated cost of 12-in. wood pipe extension at \$2,020 and 14-in. extension at \$2,280. Seattle, Wash.—Board of Public Works has received plans and specifications for orth trunk sewer in Interbay district.

Spokane, Wash.—Board of Public Works will prepare plans for sewer on upper roadway of Rockwood Blvd., Arthur st. to connection in Garfield; also on Garfield and upper roadway of Highland Blvd.

Scottstown, Que., Can.—City is considering installation of sewerage and water system; cost, about \$40,000; plans by Engineer Dufresne, Sherbrooke.

CONTRACTS AWARDED

Long Beach, Cal.—To S. Zarubica, Los Angeles, for construction of sewer in District No. 7, \$7,889.

Los Angeles, Cal.—To George A. Rogers for construction of a sewer complete in avannah and other streets, \$26,873.

Pocatello, Ida.—Construction of trunk sewers to R. M. Hardson & Co., Butte, Ont., as follows: 1,800 ft. 12-in. vit. pipe, 1-ft. to 14-ft. cut, \$1.667 per lin. ft.; 334 15-in., same cut, \$1.973; 220 ft. 20-in., 1-ft. to 16-ft. cut, \$2.968; 600 ft. same, 1-ft. to 18-ft., \$3.468; 90 ft. 24-in., 5-ft. to ft. fill, \$7.385; 180 ft. same, 0-ft. to 5-ft. cut, \$4.695; 990 ft. 24-in., 0-ft. to 5-ft. cut, \$6.1; 60 ft. same, 5-ft. to 8-ft. cut, \$3.02; 0 ft., 8-ft. to 10-ft., \$3.35; 420 ft. 10-ft. to 0-ft., \$3.495; 2,250 ft. 12-ft. to 15-ft., \$4.99; 0 ft., 15-ft. to 18-ft., \$5.68; 270 ft., 18-ft. to 20-ft., \$10.73; 360 ft., 20-ft. to 22-ft., 1.61; 450 ft., 22 to 25 in., \$12.29; 720 ft. -in. pipe, 0 to 5 fill, \$5.85; 40 24-in. x 6-in. specials, \$3.25; 40 6-in. 1/2-bends, 75¢ each; 9 6-in. vit. pipe risers, 25¢ per vert. ft.; 9 6-in. vit. pipe house connections, 0-ft. to 10-ft. cut, \$1 per lin. ft.; 1 flushing manhole and connection, \$275; 370 manholes and pert., \$6 per ft. of depth; 60.5 tons c-i. e., exclusive discharge pipe, \$90; 1 grit chamber and appurtenances, \$225; 3,200 cu. yds. rock excavation, \$2.75 per cu. yd.; 474 yds. excav. in soil, clay and loose gravel, \$3.634 cu. yds. extra earth filling, \$1; broken stone or gravel filling, \$2; 200 cu. yds. of concrete with forms furnished by contractors, \$12; 26,000 ft. of lumber for setting, \$27 per M.; 9,000 ft. of lumber, \$1 in place, \$35 per M.; resurfacing 1,725 yds. gravel streets, 35¢; c-i. pipe discharge apparatus and appurtenances at Artnear River, \$3,500; furn. 4-in. tile drain, 2¢ total, \$69,833.05; engineer's estimate, 2,493.53; other bidders, Moran Contracting Co., Ogden Utah, \$75,089.18; Gillis Construction Co., Salt Lake City, Utah, \$77,399; F. W. Whittier, Twin Falls, \$80,599.; Bannock Engineering Co., City, \$81,442; Lindstrom & Orem, Billings and Little, Mont., \$87,999.65; Montague & Reilly, Portland, Ore., \$90,347.10; W. W. Cook & Son, Junction City, Kan., \$94,204.65; Orange & Maguire, Salt Lake City, Utah, \$4,275.25; Geo. Irving, Salt Lake City, Kan., \$4,345.05; E. M. Eby, Wichita, Kan., \$4,444.40 and Jas. Kennedy Const. Co., Salt Lake City, Utah., \$97,433.75.—W. A. Samms, ty Engineer.

Rock Island, Ill.—Construction of west tion of Seventh Ward sewer system, to E. Keeler & Co., Davenport, \$55,697.

Abilene, Kan.—To Snyder & Peterson, uly Hall, for construction of storm sewer.

Billings, Mont.—Constructing a sanitary ework in Special Improvement District No. 1, requiring about 1,010 ft. 10-in. and 3,400 8-in. sewer, with necessary "Y" ranches, 7 manholes and 2 flush tanks, to Lindstrom for \$6,966.

Jamaica, L. I., N. Y.—To Litchfield Construction Co. for building sewer in Liberty d Stoothoff aves., \$51,395.

Erle, Pa.—To Clarence Wolfran for constructing 9-in. sewer in 24th st., \$1.15 for in. pipe and laying, 40¢ for 6-in. pipe, 40¢ for Y and T branches, and \$39 for anholes.

Toronto, Ont., Can.—To O. W. Rice, city, r construction of storm overflows for sewage tanks. 30¢. } er lin. ft.

BIDS RECEIVED

Jacksonville, Fla.—Laying of sewer and ain pipes in certain streets of city: 250 of 12-in. c-i. pipe on Missouri, 5th to eveland sts.; Bryan & Co., \$4 per ft.; ogan Engineering & Concrete Co., \$3.50; W. Long & Co., \$2.88. 940 ft. 10-in. -i. pipe, Cleveland, Missouri to 3rd sts.; ryan & Co., \$3.50; Logan Co., \$3.25; Long o., \$2.54. 500 ft. 30-in. circular brick ain, in alley west of Palm st.; Bryan & o., \$4.50 per ft.; Logan Co., \$4.75; Long o., \$4.54. 300 ft. circular brick drain, uth of Highway ave.; Bryan & Co., \$4.65; ogan Co., \$4.75; Long Co., \$3.95. 600 ft. -in. rein. concrete pipe, Holloman, north Highway; Bryan & Co., \$1.75; Logan Co., .98; Long Co., \$1.88. 1,100 ft. 15-in. rein. concrete pipe, Highway ave., Holloman to stelle st.: Bryan Co., \$2.30; Logan

Co., \$1.98; Long Co., \$1.88. 960 ft. rein. concrete pipe, Highway, Lime to Devine st.: Bryan & Co., \$2.75; Logan Co., \$1.98; Long Co., \$1.88. 465 ft. 12-in. rein. concrete pipe, Highway, Lime to Devine st.: Bryan & Co., \$2.10; Logan Co., \$1.73; Long Co., \$1.48. 300 ft. 12-in. double-strength terra cotta pipe, Highway, Holloman to Smith st.: Bryan & Co., \$1.65; Logan Co., \$1.73; Long Co., \$1.48. 600 ft. 10-in. terra cotta pipe, Osceola, Irene to Highway; Bryan & Co., \$2.25; Logan Co., \$1.50; Long Co., \$1.57. Building manholes on sewers: Bryan & Co., \$40 each Logan Co., \$45 each; Long & Co., \$46 each. Building manholes on drains: Bryan & Co., \$40 each; Logan Co., \$50 each Long Co., \$46 each. 15,700 ft. 8-in. terra cotta pipe on 17 streets: Bryan & Co., \$1.19; Logan Co., \$1.40; Long Co., \$1.22.

Evansville, Wis.—Construction of sewer system; work comprises approximately 7,936 lin. ft. of 8-in. sewer, 5,491 lin. ft. of 10-in., 450 lin. ft. of 12-in., 223 lin. ft. of 15-in., 3,303 lin. ft. of 18-in., 42 manholes, 2 septic tanks, inverted siphon; A. C. Schreitter, Manitowoc, \$24,904.88; H. J. Hickey, Milwaukee, \$24,768.08; H. Hohensee, Milwaukee, \$23,810; W. O. Bahr, Manitowoc, \$22,571.38; F. C. Robinson, Manitowoc, \$22,247.30; Sweeney Bros., Reedsburg, \$21,518.61; F. E. Kaminski, Watertown, \$19,967.79; E. R. Harding, Racine, \$19,838.29; N. F. Reichert, Racine, \$19,530.26; J. T. Blake, Madison, \$19,277.25; Robert Nelson, Racine, \$16,453.51.

WATER SUPPLY

Gadsden, Ala.—Citizens will vote on \$50,000 bonds to rebuild, improve and extend water system.

Huntsville, Ala.—Council has authorized purchase of water purification plant to be installed at pumping station.

Mena, Ark.—City has passed ordinance for construction of water works.

Tracy, Cal.—City has decided to give franchise to private corporation to install water works.—H. R. Youngblood, City Clerk.

Winters, Cal.—Contract will soon be let for water works from plans of the O'Neill Engineering Co.; cost about \$20,000.—W. J. M. Farland, City Secretary.

Washington, D. C.—Consul Alfred A. Winslow, of Valparaiso, has reported that the Chilean Government has decided to put in water works at Valienar, at estimated cost of \$53,690 United States gold, and complete water systems at Guindos, Buin, San Bernardo, and San Joaquin, at estimated cost of \$128,042. Address No. 6376, Bureau of Manufactures.

McDonough, Ga.—Council has ordered plans for water works; J. B. McCrary & Co., Atlanta, Ga., will make survey of city and submit plans.

Oglethorpe, Ga.—Citizens will vote April 12 on \$18,000 bonds to install water and lights.

New Athens, Ill.—Plans are being prepared by C. A. Dedinger, Chemical Bldg., St. Louis, Mo., for construction of water works to cost about \$28,000.

Odell, Ill.—City will issue \$7,000 bonds for water works improvements.

Rockford, Ill.—Citizens will soon vote on \$200,000 bonds for installation of water works system.

Broad Ripple, Ind.—Installation of water works system is being considered.

Monticello, Ind.—Board of Public Works will soon let contract for water works improvements.

Mulberry, Kan.—Citizens will at once vote on \$17,000 bonds to build water works plant.

Baltimore, Md.—About April 1, Chief Engineer Alfred M. Quick, of Water Department, will call for bids for constructing the new million dollar filter plant near Lake Montebello; several weeks later he will call for bids for building new 21,000,000-gal. impounding reservoir on the Gunpowder River above Loch Raven.

Avon, Mass.—Town will extend water mains at cost of \$15,000.

Holyoke, Mass.—Water Board is considering advisability of building small reservoir near high-service reservoir with capacity of 1,000,000 gals.—T. J. MacCarthy, City Engineer.

East Grand Rapids, Mich.—Town is considering \$40,000 bond issue for construction of water works and sewer system.

Milan, Mo.—Hiram Phillips, Consulting Engineer, Third National Bank Bldg., St. Louis, Mo., has been selected to prepare plans for construction of water works system; cost \$25,000.—J. W. Bingham, Mayor.

Bridgeport, Neb.—Town Board is considering election April 4 on \$18,000 bonds for water works.—R. H. Willis, Engineer.

Riverhead, L. I., N. Y.—Town is considering the construction of water plant. John Hogen is interested.

Tarboro, N. C.—Citizens will vote May 1 on \$25,000 bonds for proposed water works;

plans by Gilbert C. White, Durham.—Paul Jones, Mayor.

Cincinnati, O.—Council has passed ordinances authorizing Water Works Department to contract for sterilization plant at the California filtration plant at cost not to exceed \$6,000; two water turbines with electric generators, at \$5,500; two wash water pumps for filtration plant, at \$6,000.

Lowellville, O.—Citizens have voted to install water works system; cost between \$50,000 and \$75,000.

South Charleston, O.—Citizens will vote May 2 on \$22,000 bonds for water works.

Bridgeport, Okla.—Plans and specifications have been prepared by Oklahoma Engineering Co., 120 Broadway, Anadarko, for extension of old water works at cost of \$8,000.

Carnegie, Okla.—Oklahoma Engineering Co., 120 Broadway, Anadarko, has prepared plans and specifications for construction of a water works.

Welch, Okla.—Cooke-Gregory Engineering Co., Keystone Bldg., Joplin, Mo., is preparing preliminary plans for construction of water works.—J. H. Van Arsdale, City Clerk.

Hermiston, Ore.—Council is planning to construct distributing system, including reservoir and pumping plant south of town.

Toledo, Ore.—Council is considering construction of water works system.

Clarion, Pa.—Clarion Water Co. has employed Engineers Chester & Fleming, Pittsburgh, to design and install water filtration plant.

Coatesville, Pa.—Council has appropriated \$1,000 to Board of Health to be used in sinking artesian well.

Vineland, Pa.—Borough Council has instructed the Superintendent of Public Works to purchase another engine to keep pace with growing demand for water and electric light.

Bridgewater, S. D.—All bids opened on March 6 for water tank and tower have been rejected.—David B. Huston, City Engineer.

Clarksville, Tenn.—City is considering opening bids about May 1 for erection of buildings for water works; steel, brick and concrete structures; cost about \$15,000; water works will require two turbine centrifugal pumps and steel standpipe of 290,000 gals. capacity; \$50,000 to \$60,000 to be expended.—Hazlehurst & Anderson, Atlanta, Ga., Engineers; S. J. Love, Superintendent City Water Works.

Sherman, Tex.—Citizens have voted \$20,000 bonds for improvement of water works.

St. Albans, Vt.—Mayor S. C. Greene has recommended increasing of water supply.

Blacksburg, Va.—City is considering construction of water works.—F. W. Eheart, Mayor.

Colonial Beach, Va.—City has selected Harry Stevens, Union Trust Bldg., Washington, D. C., to prepare plans and specifications for water works and sewerage system.—H. W. B. Williams, Mayor.

Lexington, Va.—City has selected N. Wilson Davis, Harrisonburg, as engineer in charge of construction of water works; 800,000 gals. capacity; will lay pipe from 30,000,000-gal. impounding reservoir, distance of 11 1/2 miles.—Samuel B. Walker, Jr., Mayor.

Seattle, Wash.—Cost of laying water mains in North 50th st. has been estimated at \$22,700; Board of Public Works has received plans and specifications for laying mains in Alike ave.

Charleston, W. Va.—Fire Chief Rand has recommended improvements and extensions of water system for better protection against fire.

Battleford, Sask., Can.—Water works system will be installed in spring; estimated cost, \$100,000.—H. C. Adams, Secretary-Treasurer.

Scottstown, Que., Can.—Citizens are considering the installation of water and sewerage system; cost, about \$40,000. Engineer A. Dufresne, Sherbrooke, has prepared plans.

CONTRACTS AWARDED

Colton, Cal.—To the Fairbanks-Morse Co., 425 E. 3rd st., Los Angeles, for air compressor for municipal water works, \$2,392; to Frank J. Kimball, 1 W. Hellman Bldg., Los Angeles, for air lifts, \$3,150.

Oceanside, Cal.—To United States Pipe Co., San Francisco, for c-i. pipe, \$34.15 per ton, and fittings, \$62 per ton; total cost about \$13,000.

Turlock, Cal.—To Wm. Heafey, Chestnut and Pierce sts., San Francisco, for extensions to water system; cost \$16,431.

Chicago, Ill.—To the Platt Iron Works Co., Dayton, O., for installation of two 25,000,000-gal. motor-driven centrifugal pumps for the 22d st. pumping station at \$53,949; other bids were: Worthing, Bassler & Co., six bids, \$39,468 to \$40,593; Alberger Pump Co., \$41,517; Lathbury D'Oliver Co., \$41,562; Camden Iron Works, \$46,434; L. H. Prentice & Co., two bids, \$52,023 and

\$52,719; Platt Iron Works Co., four bids, \$53,249 to \$53,610; Gudele Bros. & Co., two bids, \$48,200 and \$55,300; each unit is a horizontal-shaft single-stage pump direct connected to an alternating-current motor capable of delivering 25,000,000 gals. daily under total head of 115 ft.; contract includes bed plates, starting apparatus, switchboards and equipment, exciters and transformers to step down the current from 12,000 to 440 volts, wire connections, suction pipe from the pumps to the well, discharge piping to 4 ft. outside of the building, two check valves and four hydraulically operated gate valves.

Lake Mills, Ia.—To Des Moines Bridge and Iron Co., for erection of standpipe, \$2,286.

New Orleans, La.—Furnishing c.-i. pipe and castings for water works, to U. S. Cast Iron Pipe and Foundry Co., Chattanooga, Tenn., as follows: 4-in., \$26 per ton; 6-in., \$25; 8, 10 and 12-in., \$24.50; 14 to 48-in., \$24, and specials, \$50 per ton.

Detroit, Mich.—Building Fairview pumping station, to Langley & Jaynes, 68 Toledo ave., \$19,200.

Mt. Clemens, Mich.—To Fairbanks-Morse & Co., Beloit, Wis., for pumping engine for water works, \$5,660, and to Wm. Baragwanath & Son, Chicago, Ill., for condenser, \$560.

Madison, Minn.—Drilling well to F. F. Gray & Co., Milwaukee, Wis., \$3.25 and \$4.16 per ft.

Hornell, N. Y.—Construction of storage reservoir and pipe line to Gray & Miller, city, \$40,440.22; contract for pipe to United States Cast Iron Pipe Co., \$26,286.39.

Cincinnati, O.—Laying 12-in. water main in North Bend road, from Cheviot to College Hill, to J. J. Brown, lowest bidder, \$14,274; Evan Evans was highest bidder, \$21,141.

Cherokee, Okla.—Water and light extension: To Ludlow Co., for furnishing hydrants and valves; to the Oklahoma Engineering Co., Anadarko, for general construction; to E. J. Merkle, representing Skinner Engine Co., for high speed engine, \$1,360.

Seattle, Wash.—Laying water mains on West Andover st., to Jahn Construction Co., \$26,976.

Neenah, Wis.—To C. W. Nelson, city, for construction of intake and reservoir for water supply and power.

Sheridan, Wyo.—To Jas. Kennedy, of Fargo, N. D., for laying about \$8,694 ft. 14 and 10-in. mains, \$24,833.

Hamilton, Ont., Can.—To Chadwick Bros., city, for furnishing compression stop and corporation cocks and 50 hydrant drop valves.

BIDS RECEIVED

Harlowtown, Mont.—Construction of water works, Lindstrom & Oren, \$9,390; Gans & Anderson, \$9,885; J. S. Penson, \$7,749; R. M. Bardsen & Thorpe, \$7,800; William Garrard, \$8,310.—C. M. Thorpe, Bozeman, Engineer.

New Brighton, S. I., N. Y.—Furnishing, constructing and erecting pumping station near the existing Grant City driven well plant, Borough of Richmond, (a) building, (b) 100 cu. yds. excavation, per sq. yd., (c) 50 cu. yds. concrete per cu. yd., (d) totals: W. H. C. Russell, (a) \$40,000, (b) \$1.25, (c) \$12, (d) \$40,725; Jas. I. Valentine, (a) \$38,724, (b) \$1, (c) \$11, (d) \$39,374; Concord Construction Co., (a) \$28,770, (b) \$5c., (d) \$6.25, (d) \$29,167; Wechsler & Nichols, (a) \$30,400, (b) 40c., (c) \$9, (d) \$30,890; Chas. H. Peckworth, (a) \$34,741, (b) \$1.50, (c) \$12, (d) \$35,491; Thos. J. Buckley & Co., (a) \$30,679, (b) \$1.50, (c) \$7.50, (d) \$31,204; Mitchell Construction Co., (a) \$29,735, (b) 50c., (c) \$7, (d) \$33,735; Masonry Construction Co., (a) \$32,890, (b) 65c., (c) \$7.75, (d) \$33,342; Thos. McKeon, Inc., (a) \$32,973, (b) \$1, (c) \$10.80, (d) \$33,613; I. T. Walsh Construction Co., (a) \$31,400, (b) 60c., (c) \$8, (d) \$31,860; P. Wolff & Sons, (a) \$43,861, (b) \$2, (c) \$16, (d) \$44,861; Kelly & Kelley, Inc., (a) \$30,965, (b) \$2, (c) \$7, (d) \$31,515.

New York, N. Y.—Water improvements, (a) hauling and laying water mains and appurtenances in various streets east of Park ave., Bronx, and (b) furnishing, delivering and laying water mains in Moshulu Parkway, at intersection with Jerome ave. and in Jerome ave. and removing existing water mains: James Burns, 147 East 125th st., (a) \$27,378, (b) \$24,099; Wilton Construction Co., Elliott ave., Williamsbridge, (a) \$24,774; Hanover Construction Co., 215 West 125th st., (a) \$42,841, (b) \$29,554; J. M. Rodgers, 121 West 125th st., (a) \$27,277, (b) \$23,888; Soraci Construction Co., 170 Broadway, (a) \$40,955, (b) \$34,548; L. D. Gregory, 25th st. and 1st ave., (a) \$20,610, (b) \$25,779; Hagerty & Drummond Co., 41 Park Row, (a) \$29,725; P. N. Lewis, 4th ave. and 21st st., (b) \$29,859; Londino & Gallo, Brooklyn, (b) \$36,168; furnishing, constructing and erecting a pumping sta-

tion near existing Grant City driven well plant, Richmond Borough, W. H. C. Russett, \$40,725; Wechsler & Nichols, \$30,890; T. J. Buckley Construction Co., \$31,204; the Masury Construction Co., \$33,441; Thomas McKeon, Inc., \$33,613; P. Wolf & Son, \$44,861; Concord Construction Co., Brooklyn, \$29,167; Chas. H. Peckworth, \$35,491; Mitchell Construction Co., \$30,135; James I. Valentine, \$39,374; J. F. Walsh Construction Co., \$31,860; Kelly & Kelley, \$31,515.

Dallas, Tex.—Furnishing 4,800 ft. of 36-in. water pipe: United States Cast Iron Pipe and Foundry Co., \$25.70 a ton, delivered at Dallas; Hardy Greenwood, \$22.50 at Galveston, or \$25.80 at Dallas.

Seattle, Wash.—First ave. W. et al. water mains: Dicken & Rightmire, \$8.-\$31.70; Allain & Hull, \$8,766.50; Will Kopta, \$9,252.95; J. T. Donaldson & Co., \$9,642.64; Best Construction Co., \$9,568.98; Ferguson Construction Co., 423 Arcade Bldg., \$8.-749.83.

LIGHTING AND POWER

Montgomery, Ala.—Richard Tillis has secured engineers to prepare plans for erection of an electric lighting plant which will furnish light and power.

Helena, Ark.—Plans are being prepared for power house and gas plant to be erected by Helena Gas Co. Address General Manager O'Brien.

Elsinore, Cal.—Council has passed ordinance granting M. A. Gardner and M. L. Cambern franchise to construct, lay, maintain and operate gas pipes and mains for purpose of carrying gas for heat and light.—C. P. Carter, City Clerk.

Longmont, Cal.—City is considering municipal operation of electric light and power plant.

Tustin, Cal.—County Board of Supervisors will receive bids shortly for installation of electric lighting system in Tustin and vicinity.

Washington, D. C.—District Commissioners have ordered erection of several more miles of 100-cp. glowing lamps.

Fort Meade, Fla.—D. O. Rodgers, of Wauchula, and Engineer J. G. Fancy, of the American Diesel Engine Works, are at the head of a movement to organize stock company of Fort Meade, Bowling Green and Wauchula people with capital stock of \$50,000 to erect modern power house to generate electricity for heating, lighting and power purposes in these towns.

McDonough, Ga.—Council has ordered plans for electric light system; J. B. McGrady & Co., Atlanta, will make survey of city and submit plans.

Oglethorpe, Ga.—Citizens will vote April 12 on \$18,000 bonds to install lights and water.

Columbus, Ind.—Indianapolis, Columbus and Southern Traction Co. is planning to let contract for construction of dam in Driftwood River, construct canal six miles in length and erect and equip power house for generation of electricity.—Will G. Irwin, President.

Pendleton, Ind.—Town has sold \$5,000 bonds for installation of electric light plant.

Sioux City, Ia.—Plans for electric power plant which Council has considered erecting in vicinity of Main st. pumping station have been submitted to Councilman G. B. Healy; cost \$27,000.

Mulberry, Kan.—Citizens will at once vote on \$8,000 bonds to install electric light plant.

Bowling Green, Ky.—City will install engine and centrifugal pump in electric light plant; bids will be asked.

Paducah, Ky.—McCracken County Commissioners are considering graving of 20½ miles of road this year.

Everett, Mass.—Everett Gas Co. is considering extension of its mains about eight miles; cost about \$32,065.—W. W. White, General Manager.

Springfield, Mass.—Gas and Electric Light Commissioners have granted United Electric Light Co. of this city permission to issue shares of new capital stock for improvements.

Taunton, Mass.—Council is considering giving Committee on Public Works authority to make contract for care of street lights other than electric lights, and authority to contract for naphtha, glass, etc., for the same class of lights.

Elsie, Mich.—Citizens have voted \$5,000 bonds for lighting purposes.

Hastings, Mich.—Citizens will vote in April on \$120,000 bonds to establish water power plant which will operate municipal electric pump and pumping station.

St. Louis Park, Minn.—Village Council has granted Minneapolis General Electric Co., Minneapolis, 25-year franchise to light the village; company is to install system within six months.

St. Paul, Minn.—The Senate has passed bill giving city authority to enter into con-

tract with street lighting companies for periods of two years.

Handsboro, Miss.—City has granted franchise to Gulfport and Mississippi Coast Traction Co. to construct electric light and power system in and through city; Supervisors of Harrison County, Gulfport, has granted company franchise to construct system along road between Gulfport and Biloxi; company will construct three-phase, 18,000-volt transmission system over country road, through Handsboro and in Biloxi, distance about 15 miles.

Kingston, N. Y.—Electric substation Newburgh Light, Heat and Power Co. near Highland Station has been burned.

Chimney Rock, N. C.—North Carolina Interurban, George L. McKay, General Manager, Rutherfordton, will construct power houses.

Ashtabula, O.—Council has appropriated \$10,000 for use of the city lighting plant which will double its capacity; two boilers will be installed to cost about \$6,300; bids will be asked for in the near future.

Heavener, Okla.—Heavener Light and Power Co. will construct electric light plant; cost of plant \$5,000.—E. M. Cooper, Manager.

Baker City, Ore.—Estimates will be prepared for municipal lighting plant; plan to construct pipe line from Elk Creek Salmon Creek, including construction new reservoir of 3,000,000 gals.

Forest Grove, Ore.—Council has granted 25-year franchise to Independent Electric Co. for the transmission of current and erection of poles over certain streets.

Medford, Ore.—Colonel Frank R. Prest, and Managing Director of Rogue River Electric Co., will let contracts within few weeks for construction of new plant on the Upper Rogue River, near Prospect; cost in neighborhood of \$1,000,000.

Harrisburg, Pa.—Legal notices are being published in Lehigh, Schuylkill, Columbia, Northampton, Bucks and Montgomery counties stating that application will be made April 3 by W. A. Lathrop, Rollin Wilbur and H. F. Baker, of Philadelphia, for charters for about 60 electric companies in these five counties.

Two Lick, Pa.—Indiana County St. R. ways Co. has decided to erect power plant which, according to plans, will be duplicate of present plant.—John G. St. Clair, Secretary.

Edgefield, S. C.—Town is considering establishment of electric light plant.

Walterboro, S. C.—John D. Glover, G. Brown, T. J. Blanchard and others are interested in establishment of electric light plant.

Miller, S. D.—The Miller Electric Co. is considering installing 100-h.p. boiler and tungsten street lighting system and additional lines in several parts of city.—Kellough, Manager.

Nashville, Tenn.—Extension of mains into suburbs is being urged Mayor Howse.

Stowe, Vt.—Village Trustees will contract with Morrisville Electric Light & Power Co. for power to light streets, village and vicinity and also for commercial and house lighting purposes; a vote to empower Trustees to erect plant with necessary equipment.

Hampton, Va.—Newport News and Point Railway and Electric Co. is considering improving power plant.

Mishicot, Wis.—Ira Beyer is interested in proposed establishment of electric light plant.

Albemi, B. C., Can.—Albemi District Electric Light and Power Co. has been incorporated to supply light and power.—W. G. McAllister, Secretary.

Magog, Que., Can.—Electric lighting power plant will be installed this summer; specifications prepared by Messrs. Ross & Holgate, Montreal.

CONTRACTS AWARDED

Louisville, Ky.—By Kentucky Electric Co. for furnishing 2,000 and a 4,000 l. turbo generator, one 1-100 kw. turbo chiller, one 1-100 kw. motor generator chiller, to General Electric Co., Schenectady, N. Y.; to Babcock-Wilcox Co., Bayon N. J., four boilers, each with 5,000 sq. ft. heating surface, four superheaters and four stokers; Louis S. Strong, Chief Engineer of company, with Sargent & Lundy of Chicago, are Engineers who will be in charge of erection of plant, which will cost \$600,000.

Annapolis, Md.—By Anne Arundel County Commissioners to Consolidated Gas & Electric Light Co., Baltimore, 5-year contract for furnishing electric current lighting Brooklyn, Curtis Bay and other sections of the Fifth district contiguous Baltimore city; contract is renewal; lamps, \$77; 40-cp. incandescents, \$26.

-cp. incandescents, \$30.75; 80-cp. incandescents, \$34.50, and 200-cp. incandescents, 7.25.

West Caldwell, N. J.—Borough Council has executed a three-year contract with the Public Service Electric Co. providing lighting of that municipality with lights.

Schenectady, N. Y.—By East Creek Light and Power Co. to General Electric Co., to supply electrical equipment for new station at Ingham Mills on East Canada Creek.

Coraopolis, Pa.—Furnishing machinery for electric light and water plant, to Buckeye Engine Co., for engine of 225-h.p.; to Truethers-Wells Co. for two engines, one of 150 and the other 175-h.p.; to Crocker-Wheeler Co. for three generators, and the Vestinghouse Electric and Mfg. Co. for switchboard, and Reineke-Wagner Co. for pump with a capacity of 1,500,000 gals. of water daily.

Marcus Hook, Pa.—By Council for electric street lighting, to Beacon Light Co., Chester.

Fort Worth, Tex.—To Nutt Light & Power Co. to furnish electrical power to pump artesian water supply at rate of 2-10 cts. per kilowatt hour; contract is for five years.

FIRE EQUIPMENT

Phoenix, Ariz.—National Board of Fire Underwriters has recommended establishment of two new auto hose companies. Purchase of 2,000 ft. of 2½-in. fire hose, new ladders for ladder truck, installation of boxes, appliances, etc., and general improvement to fire alarm system.

Bridgeport, Conn.—Architect will soon be expected to draw plans for \$15,000 engine house to be built on Putnam st.

Bloomington, Ill.—Fire Chief Henry Mayer recommends purchase of aerial hook and ladder truck and additional hose.

Cœur d'Alene, Ida.—Fire Chief O'Rourke will investigate cost of motor combination hook and ladder truck and chemical engine with 3,000 ft. of hose.

Athol, Mass.—Board of Fire Engineers has recommended purchase of combination fire truck.

Attleboro, Mass.—Town has voted to purchase \$5,500 auto truck.

Greenfield, Mass.—Town is considering purchase of auto truck.

Hull, Mass.—Town has voted to erect \$10,000 fire station.

Methuen, Mass.—Town has voted to appropriate \$6,000 for purchase of combination chemical and hose automobile.

Saugus, Mass.—Citizens have voted to purchase auto combination chemical and hose with two ladders at cost of \$5,500.

Duluth, Minn.—Work will soon begin on erection of \$4,000 fire hall at Lakeside.

Springfield, Mo.—Fire Chief H. McLaughlin has recommended purchase of additional fire apparatus.

Newmanstown, N. J.—Newmanstown Fire Co. will build its own home, engine house and hall.—Dr. J. H. Horne, President.

Paterson, N. J.—Police and Fire Commissioners will expend over \$250,000 in next few months to equip fire department with auto fire engines.

Perth Amboy, N. J.—Fire Chief Theodore Anderson has recommended equipment for the various houses, including combination hose and chemical wagon for McClellan Engine Co.

Thorofare, N. J.—Fire company is considering erection of fire house.

Tarrytown, N. Y.—Columbia Hose Co. has presented petition to North Tarrytown Board of Trustees asking that \$2,500 be raised for purchase of automobile hose wagon.

Barberton, O.—Council is considering erection of hose house in western part of city.

Tiffin, O.—Central fire station has been condemned; city is preparing to erect new station.

Erie, Pa.—Fire Chief McMahon has recommended erection of two fire stations.

Mauch Chunk, Pa.—Fire companies of city are considering installation of alarm system.

Thornton, R. I.—Johnstown Town will vote April 8 on \$300 appropriation for hook and ladder truck for fire company at Graniteville.

Chamberlain, S. D.—Council has decided to erect fire hall.

Moundsville, W. Va.—City is considering purchase of auto fire truck.

CONTRACTS AWARDED

Shelbyville, Ky.—Installing electric fire alarm system to Star Electric Co., Binghamton, N. Y., \$1,805.

Paterson, N. J.—Furnishing 2-passenger Bulck car for Fire Chief John Staggs to Hughes Garage, Prospect St., \$1,128.

BIDS RECEIVED

Dallas, Tex.—Furnishing 2,000 ft. of 2½-in. fire hose, 400 lbs. pressure, Enreka Fire Hose Manufacturing Co., 90c. to \$1.20; Voorhees Rubber Manufacturing Co., 90c. to \$1.10; Fabric Fire Hose Co., 90c. to \$1.10; Briggs-Weaver Machinery Co., \$1.10; Boston Woven Hose and Rubber Co., 90c. to \$1.10; Chicago Fire Hose Co., 85c. to 95c.; Ben F. Wolfe & Co., 85c. to 95c.; Diamond Rubber Co., 65c.

BRIDGES

Grass Valley, Cal.—Bennett st. bridge has been condemned by City Trustees and new concrete bridge has been ordered erected.

Grand Junction, Col.—Construction of a bridge over Grand River at Main st. is being considered.

Stites, Ida.—Bids will soon be received by Idaho County Commissioners for construction of the bridge over Salmon River; \$15,000 has been appropriated.

Batavia, Ill.—Bids will be received about April 1 for construction of concrete bridge over east branch of Fox River; cost about \$29,000.

Greensburg, Ind.—Decatur County Commissioners have ordered plans and specifications for construction of two and repair of 12 bridges.

Huntington, Ind.—Commissioners of Huntington County have prepared plans and specifications for construction of 20 bridges and culverts; bids will soon be asked.—J. B. Vernon, County Engineer.

Vincennes, Ind.—County Commissioners will ask new bids for building three bridges.

Cedar Rapids, Ia.—Council has sold \$150,000 worth of bridge bonds to the Continental Commerce Savings Bank, Chicago; proceeds will be used to erect concrete bridge across Cedar River at 3d ave.

Leavenworth, Kan.—Joseph O'Neil, City Engineer, is preparing estimates for proposed bridge across Three-Mile Creek on 3rd st.

Salina, Kan.—Contract for 50-ft. steel girder bridge across Dry Creek on high-road of Smolan will be let by County Commissioners next month.

Winslow, Me.—Concrete bridge will be erected over Mile Brook Stream; \$4,000 available.

Duluth, Minn.—Park Board is receiving bids for erecting eight bridges on Lester River.—Address S. F. Swirley, 118 Manhattan Bldg.

Pitman, N. J.—If borough and Washington Township will build approaches Gloucester County Board of Freeholders stands ready to erect bridge over creek for new highway from Pitman to stone road.

Hugo, Okla.—Choctaw County will vote April 18 on \$120,000 bonds for construction of 21 bridges.

Medford, Ore.—Plans have been prepared by City Engineer W. W. Hannon for erection of proposed \$12,000 Gold Hill bridge.

Doylestown, Pa.—Bucks County Commissioners have granted three new bridges, one over Newtown Creek, in Newtown Township; at Schwenk's Mill, in Hilltown Township, and the third on the line between the borough of Ivyland and Warminster Township.

Providence, R. I.—Plans are about completed for construction of bridge at Hunts River on Post road between Providence and the Pier by towns of North Kingstown, Warwick and East Greenwich.

Smithville, Tenn.—De Kalb County is considering construction of bridge across Caney Fork; cost about \$12,000.—T. J. Potter, President County Commissioners.

Galveston, Tex.—County Board will ask for bids for erecting of bridge over Todd's Bayou.

Vanderbilt, Tex.—Jackson County Commissioners, Edna, are considering construction of bridge across Lavaca River.

Fredericksburg, Va.—Road Commissioners of Spotsylvania County are asking new bids for erecting bridge over Hazel Run.

Rocky Mount, Va.—Board of Supervision is considering erection of bridge across Pico River.

Marinette, Wis.—City Engineer A. L. Hillis has completed plans for proposed Middle bridge, to be constructed jointly by cities of Marinette and Menominee, Mich.; Engineer's estimate of cost \$145,000, not including approaches and street work.

CONTRACTS AWARDED

La Salle, Ill.—By Board of Supervisors for construction of bridge over Indian Creek, near Leland, to Decatur Bridge Co., Decatur, Ill., approximately \$2,000.

Paris, Ill.—Paris Bridge Co., city, for construction of bridge over Sugar Creek in Elbridge Township.

Nebraska City, Neb.—To H. T. Ward & Co., Lincoln, for bridge building and cement work for Otoe County for coming year.

White Plains, N. Y.—Constructing two reinforced concrete bridges over Bronx River and contracts, Bronxville bridge, to O'tourke Construction Co., Yonkers, \$8,887, and Tuckahoe bridge, to E. J. Doyle & Co., Albany, \$6,742.

York, Pa.—To General Supply and Construction Co., to erect concrete bridge across Furnace Creek, \$1,237.50.

Fredericksburg, Va.—By Road Commissioners, Spotsylvania County, for building concrete bridges: Gayle's Run, to Roanoke Bridge Co., \$1,432; Massaponax Run bridge, on the C. H. road, to same company, \$1,183; Massaponax Run bridge, on Telegraph road, to E. W. Woodward, Richmond, \$1,466.25.

Milwaukee, Wis.—Constructing reinforced concrete highway bridge over Kinnickinnic River at Chicago ave., to Czaropata Construction Co., city, \$5,750.

Superior, Wis.—Building bridge over Nemadji River to Hennepin Co., Minneapolis, \$4,940; 60-ft I-beam at Wentworth to Russell Construction Co., city, \$2,400; concrete arch on Hawthorne road to same, \$720.

BIDS RECEIVED

Los Angeles, Cal.—Construction of reinforced concrete bridge across Arroyo Seco, near the Ostrich farm at South Pasadena. (a) for work complete, (b) hand railings and pylons, (c) 80 concrete piles, per ft., (d) Class A concrete per cu. yd., (e) Class B, (f) Class C, (g) reinforcing steel, per lb.; J. D. Kneen Construction Co., Santa Monica, bid (a) \$149,000, (b) \$6,750, (c) \$12,500 per pile, (d) \$10, (e) \$9, (f) \$8, (g) 5c.; Chas. Stansbury, H. W. Hillman Bldg., bid (a) \$153,964, (c) \$10, (d) \$9, (e) \$8.00, (f) \$8, (g) 4c.; J. F. Hall-Martin Co., Stimson Bldg., bid (a) \$157,500, (b) \$7,100, (c) \$12, (d) \$9, (e) \$7.50, (f) \$6, (g) 3½c.; Mercereau Bridge and Construction Co., Pacific Electric Bldg., bid, (a) \$169,600, (c) \$25, (d) \$8, (e) \$8, (f) \$8, (g) 5c.; the F. O. Engstrom Co., 5th and Seaton sts., bid, (a) \$248,239, (c) \$24, (d) \$10, (e) \$8, (f) \$7, (g) 4c.; the Cement Products and Construction Co., bid, (b) \$5,171; T. J. Shea, 1616 Ingraham st., (a) \$140,700, (b) \$6,500, (c) \$1 per ft., (d) \$10 per cu. yd., (e) \$8.50, (f) \$6.50, (g) 5c. per lb.

Cedar Rapids, Ia.—Building bridge over Cedar River at 3rd st., B. J. Sweatt, Boone, lowest bidder, \$155,988.50.

White Plains, N. Y.—Construction of two bridges over the Bronx River (a) from Yonkers to Tuckahoe, at Underhill st., and (b) from Yonkers to Bronxville, at Swain st.; McDonald & Murray, Yonkers, (a) \$8,889; E. J. Doyle & Co., Yonkers, \$7,788; O'Rourke Construction Co., (a) \$8,887, (b) \$9,227; Wilson & English Co., New Rochelle, (a) \$9,600, (b) \$11,500; James Garofano, Mt. Vernon, (a) \$8,965, (b) \$9,875; Atkinson Co., New York, (a) \$9,300, (b) \$9,450; Frank Nordoe, Mt. Vernon, (a) \$8,190.50, (b) \$9,900.50; Ensigner Co., New York, (a) \$8,918, (b) \$9,418; S. W. Speirs, Jr., Co., New York, (a) \$11,156, (b) \$13,970; Westchester Engineering Co., city, (a) \$11,989, (b) \$15,993; Coughlin & Louman, (a) \$10,289, (b) \$12,269; Howard & Worm, (a) \$10,005, (b) \$12,968; Kennedy Co., Albany, (a) \$9,373, (b) \$9,373; N. Fagnani & Bro., Tuckahoe, (a) \$12,370, (b) \$14,670.

Philadelphia, Pa.—Widening the Chestnut st. bridge from 60 to 70 ft.; American Paving and Construction Co., \$101,900; M. & J. B. McHugh, \$108,600; Owego Bridge Co., \$119,930; Stockel Steel Co., \$136,000; John McMenemy, \$135,000.

Janesville, Wis.—Erecting bridges: Racine st., Central States Bridge Co., \$14,490; Worden-Allen Co., \$16,480; Milwaukee Bridge Co., \$16,750; the Hiel Co., \$16,900; T. McGrath Cons. Co., \$16,931.29; Hayes Bros., \$18,860; Fourth ave., Central States Co., \$21,850; Hiel Co., \$24,500; Worden-Allen Co., \$24,560; T. McGrath, \$25,590; Hayes Bros., \$25,810; Milwaukee Bridge Co., \$26,950.

MISCELLANEOUS

Los Angeles, Cal.—Finance Committee will recommend that the identification bureau of the police department be allowed \$1,509 asked for filing cabinets, measuring instruments for the Bertillon system and other needed equipment.

Niles, Cal.—Board of Supervisors will consider erection of \$2,500 jail.

Oakland, Cal.—Playground Commission has decided to request Board of Education for permission to equip three school yards as playgrounds for use during coming summer vacation.

Susanville, Cal.—Supervisors have decided to ask new bids for erection of proposed county jail.

Vallejo, Cal.—Board of Works has decided to ask for bids for constructing proposed municipal wharf. —Wm. J. Torrey, City Clerk.

Waterbury, Conn.—Preliminary plans have been prepared by Architect E. E. Benedict for the proposed alterations to city hall, which call for new public comfort station in basement, addition to Town Clerk's office, addition to vault, new fire-proof vault for the City Engineer and other alterations.

Dover, Del. Council has decided to improve Hurd Park.

Gainesville, Fla.—Machua County is considering erection of modern jail.

Pensacola, Fla.—Bids will soon be asked for furnishing spring uniforms for police and fire departments.

Tampa, Fla.—Board of Public Works will secure plans of local architect for erection of \$50,000 library.

Huntington, Ind.—Erection of city crematory is being considered.

Michigan City, Ind.—Establishment of public playground is being considered.

Thayer, Kan.—Citizens have voted to erect \$5,000 city hall.

Louisville, Ky.—City has sold \$500,000 city hospital bonds to John W. & D. S. Green.

Louisville, Ky.—Board of Public Works, D. R. Lyman, Chief Engineer, desires correspondence with persons or firms relative to installation of garbage disposal plant.

Hammond, La.—City has decided to erect jail building.

Lake Charles, La.—Livaudais & Favrot, New Orleans, will prepare plans for erection of proposed city hall.

Baltimore, Md.—Plans for new city stables to be erected on Greenmount ave. have been finished by Building Inspector Preston; building will start soon; cost about \$2,500.

Boston, Mass.—Commissioner Rourke, of Department of Public Works, has rejected bid submitted by Bath Iron Works to build double screw ferry boat for \$149,500.

Brookline, Mass.—Health Department has been allowed \$4,000 to provide for better system of collecting ashes.

Detroit, Mich.—Marcus Polasky has applied for 50-year franchise for building of subway system at estimated cost of \$400,000 per lin. mile.

Saginaw, Mich.—Board of Park and Cemetery Commissioners will ask Council for necessary authority to construct lodge house at Forest Lawn, to cost \$11,000.

Duluth, Minn.—Mayor M. B. Cullum has recommended light grade crossings; extension of municipal garbage collection; extension of park system; installation of workhouse and progress in municipal dock proposition.

St. Louis, Mo.—City is considering construction of steel scavenger dump barge, 36 ft. beam, 100 ft. long, 2-ft. draft; estimated cost \$9,500.—W. B. Dryden, Secretary Board Public Improvements.

Central City, Neb.—Merrick County is considering election on erection of court house.

Ocean City, N. J.—Council has ordered specifications for extension of the boardwalk from 17th ave. to 23d ave.

Bronxville, N. Y.—Citizens will soon vote on \$100,000 expenditure for park lands.

Cincinnati, O.—Police Chief Jackson is visiting Detroit, Cleveland and other cities to inspect new methods of using police patrols.

Columbus, O.—Council will consider \$100,000 bond issue for erection of city prison.

Toledo, O.—Council has authorized issuance of \$75,000 bonds for park and boulevard improvements.

Hugo, Okla.—Citizens will vote Apr. 18 on \$125,000 bonds to build jail and court house.

Allentown, Pa.—Water Board has decided to establish playground for children along Little Lehigh.

Erie, Pa.—Council has finally passed \$38,000 bonding ordinance for installation of garbage plant.

Philadelphia, Pa.—Working plans will be prepared by Architect John Windrim, Commonwealth Bldg., for proposed city convention hall.

Pittsburg, Pa.—Council is considering \$15,000 appropriation for merry-go-rounds in three parks and \$10,000 for comfort station and shelter house in Olympia Park, and \$14,000 for same in McKinley Park, south side.

Charleston, S. C.—Police Chief Boyle is considering purchase of auto patrol; \$1,500 available.

Parker, S. D.—City hall, cost \$15,000, will be erected this summer.

Humboldt, Tenn.—City is considering bond issue for erection of city hall.

Temple, Tex.—City is preparing to erect crematory; committee from Council, composed of Mayor Hamill, Aldermen J. J. Booker and W. W. Swain, will visit various cities to secure data.

Paris, Tex.—Citizens have voted \$10,000 bonds for public comfort station.

Weatherford, Tex.—Commissioners' Court has decided upon plan for improvement and beautifying of court house yard, and as soon as the specifications are completed County Judge is authorized to advertise for bids for work; the plans have been drawn up by Superintendent of Public Works C. W. Camp.

Opportunity, Wash.—Town has voted \$2,000 bonds for town hall.

Benwood, W. Va.—Plans by Dixon Engineering Co. have been accepted for erection of proposed \$7,200 crematory.

Grand Rapids, Wis.—Warren H. Manning, landscape gardener, Boston, Mass., will draft city plan of improvements, which include park system along both sides of Wisconsin river.

CONTRACTS AWARDED

Birmingham, Ala.—To Varley & Bauman for furnishing summer uniforms for police department, \$18,250 each.

Chico, Cal.—Erecting municipal building to E. D. Sharp, city, \$30,726.

Los Angeles, Cal.—Board of Public Works has consented to transfer of the contract for collection of garbage from Charles A. Alexander to the V. D. Reduction Co., a corporation.

Jacksonville, Fla.—Furnishing Police Department with summer uniforms to Cheatham-Alderman Co.

Amite City, La.—Erecting city hall to John D. Ward, city.

Holyoke, Mass.—Removing garbage, to Ernest E. Proulx, \$2,400 per year.

New Bedford, Mass.—Furnishing auto truck for street department, to Harry E. Borden, agent for Johnson Service Co., \$2,000 on board cars at Milwaukee.

Minneapolis, Minn.—Furnishing auto ambulance to Thos. B. Jeffery Co., Kenosh, Wis., \$3,800.

New Brighton, S. I., N. Y.—Regulating grading and paving South st. ferry a proach and for constructing subway due at the St. George ferry terminal, State Island, to the Uvalde Contracting Co., Broadway, New York City, \$9,055.

Rochester, N. Y.—By Board of Contract and Supply, Building No. 2, Exposition Park, to A. Frederick & Sons Co., \$15,490; Building No. 4, Exposition Park, to H. Sickles Co., \$29,826.75; macadam roadways and cement walks for Exposition Park, William Aikenhead, Jr., \$14,618.

Hamilton, O.—By Board of Control for police patrol system to be established in this city, to Home Telephone Co. at annual rental for 20 boxes, system complete, for \$720 per annum for period of five years \$3,600.

Philadelphia, Pa.—By Acting Director Hasskarl for deck and coal scow, to be utilized in connection with municipal dredging plant, to C. Hillebrandt, of Esopus, N. Y., lowest bidder, \$2,745; next lowest bid was the Kensington Shipbuilding Co.'s, \$2,960; John H. Mathis Co., of Camden, N. J., submitted bid of \$2,982.

Seattle, Wash.—Furnishing apparatus for inspection of weights and measures to V. & L. E. Gurley, \$1,491.75.

Ripon, Wis.—Street sprinkling for the ensuing season, to Charles Kuehn, \$770; city to furnish water.

BIDS RECEIVED

Boston, Mass.—Boston Disposal Co. has made proposition to dispose of all the city garbage, except that in East Boston and West Roxbury districts, for 54½¢ per ton or approximately \$235,000 a year.

Holyoke, Mass.—Removing garbage for two years, E. E. Proulx, \$4,800; James T. Reidy, \$3,100; Michael Fitzgerald, \$6,600; S. Beaulieu, Jr., \$3,120; all of Holyoke; John S. Miller, South Hadley Falls, \$3,300.

Eveleth, Minn.—Furnishing 500 numbered garbage cans: Helps-Shea Hardware Co. city, 15x25 in., 16 gals., \$2.12 per can; 18x26 in., 24 gals., \$2.55 per can; Polski Bros. city, 18x26 in., 24 gals., \$2.50; 15x26 in., 16 gals., \$1.76 per can; 17x26 in. \$2 each; 18x25 in., \$2.37 each.

Brooklyn, N. Y.—Construction of Re Hook playground, at Richards, King Dwight and Pioneer sts., J. W. Fiske Iron Works, 56 Park pl., New York, \$16,225; Frank J. Gallagher, 490 Park pl., New York \$21,474; Kelly & Kelley, Inc., 45 E. 42d st., New York, \$19,984; John MacArthur, 22 Armond pl., Brooklyn, \$20,076; Wm. Werner 657 Vanderbilt st., Brooklyn, \$17,295; Norton & Gorman Contracting Co., 339 Douglass st., Brooklyn, \$19,969.

Pittsburg, Pa.—Collection and disposal of the city's garbage, American Reduction Co. bid for collecting rubbish of old Pittsburg at \$185,700, and Allegheny Garbage Co. \$66,500 for taking care of garbage on the north side.

Dallas, Tex.—Furnishing to city two street sweeping brooms: Studebaker Bros. Co., of Texas, \$285 each, delivered; Austin Western Company, Limited, \$260 each, delivered; W. T. Fulton Company, \$265 each.

TOO LATE FOR CLASSIFICATION

STREET IMPROVEMENTS

Leavenworth, Kan.—Board of City Commissioners has decided to pave Shawnee st. with brick.

Baltimore, Md.—State Roads Commission has authorized County Commissioners of Worcester County to proceed as soon as possible with construction of Pocomoke City end of the Pocomoke City and Snow Hill road; also authorized Chairman of the Commission to advertise for bids for construction of New Market and Monrovia road in Frederick County.

Adams, Mass.—Town has voted to pave and relay Commercial St. at cost of \$45,000.

Westport, Mass.—Town has voted \$2,000 appropriation for macadamizing Blossom road.

Laconia, N. H.—Board of Public Works has asked for appropriation of \$11,500 for bituminous macadam work coming season.—Chas. A. French, City Engineer.

Brownsville, Tex.—Citizens have voted \$80,000 bonds for paving.

Dallas, Tex.—Bids will be asked for paving Germania St., Swiss to Ross Ave.

Taylor, Tex.—Cameron Precinct is considering \$200,000 bond issue for good roads.—Richard Cretz, County Judge.

Franklin, Va.—Town Council is planning to place concrete curbing along Main st. Wood is now in use. Street Commissioner Jackson has been authorized to make experiments with concrete.

Seattle, Wash.—Board of Public Works has approved plans and specifications for grading and filling Alki ave.; grading and curbing 63rd ave., S. W., and Alki ave., and improving four other streets.

Superior, Wis.—Purchase of a motor road roller by Roads and Bridges Committee of County Board for use in the construction of macadam and clay roads throughout Douglas County has been authorized by Board; cost from \$2,400 to \$2,800, and will weigh not less than eight nor more than ten tons.

Brantford, Ont., Can.—Bids will be called shortly for paving Market St., between Colborne and Erie ave.

CONTRACTS AWARDED

Hutchinson, Kan.—Laying 7,800 ft. of curbing to J. H. Shears & Son, 33c. per lin. ft.

Watertown, N. Y.—To W. C. Jones for curb and gutter in two streets, \$1,879.13; to M. R. Klock for Arsenal St. curb, \$1,244.54.

Cincinnati, O.—To B. Niehaus for grading corner of Burnet Woods at Clifton ave. and Calhoun st., \$10,175.

Oklahoma City, Okla.—Paving streets to Cleveland Trinidad Asphalt Co., \$147,185.90; to Western Paving Co., \$351,815.57.

Dallas, Tex.—Paving Live Oak st. with bitulithic to Texas Bitulithic Co., \$2.30 per sq. yd.; total, \$69,026.88; resurfacing Lamar st. to Municipal Paving Co., \$1.50 per sq. yd. for new and 75c. for repair work on old concrete base.

Fort Worth, Tex.—To Texas Bitulithic Co. for paving portions of 5 streets, \$2,083, with 40c. for extra excavation.

Seattle, Wash.—Grading and curbing Fillmore st. to Rowan & Anderson, 1105 Klumbourne st., \$2,845.

SEWERAGE

Clinton, Ia.—Council has ordered asking of bids for completing sewer system in District No. 4.

Duluth, Minn.—Mayor M. B. Cullum has recommended provision for solution of sewage problem.

Seattle, Wash.—Bids will be readvertised for building Virginia st. brick sewer; plans have been approved by Board of Public Works for sewers on two streets.

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FIG. 1. PRIMARY AND SECONDARY CONTACT BEDS UNDER CONSTRUCTION

SEWAGE DISPOSAL WORKS AT BORDENTOWN

Include Screen Chambers, Sedimentation Tanks, Contact Beds, Settling Basins, Sand Filters and Sludge Pit — Tanks of the Emscher Type, with Gallery Beneath Them — Air Operated Dosing Device

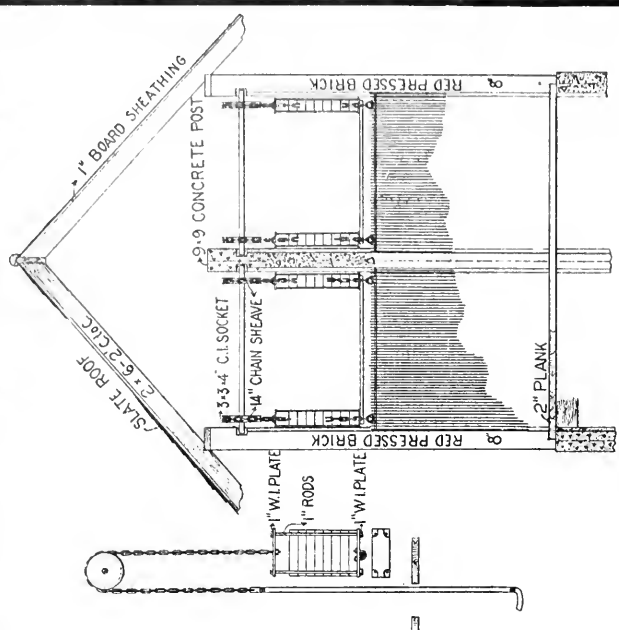
By E. G. KASTENHUBER, JR.

The sewage disposal works recently completed at Bordentown, N. J., embracing screen chambers, sedimentation tanks, contact beds, settling basins, sand filters and sludge pit, each, excepting the last mentioned, being in duplicate, comprise a plant designed to produce an effluent of exceptional purity.

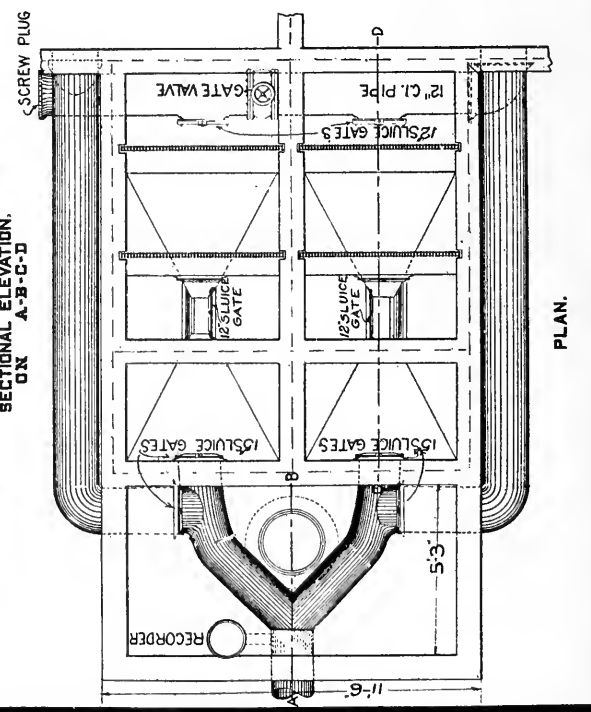
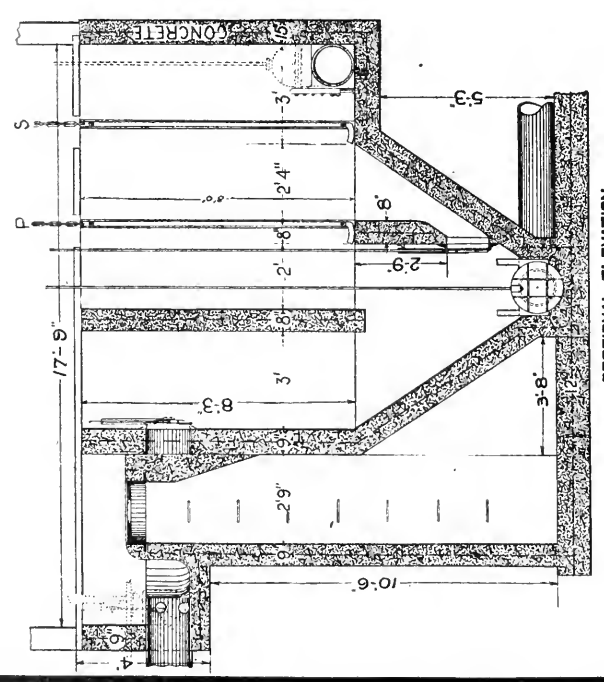
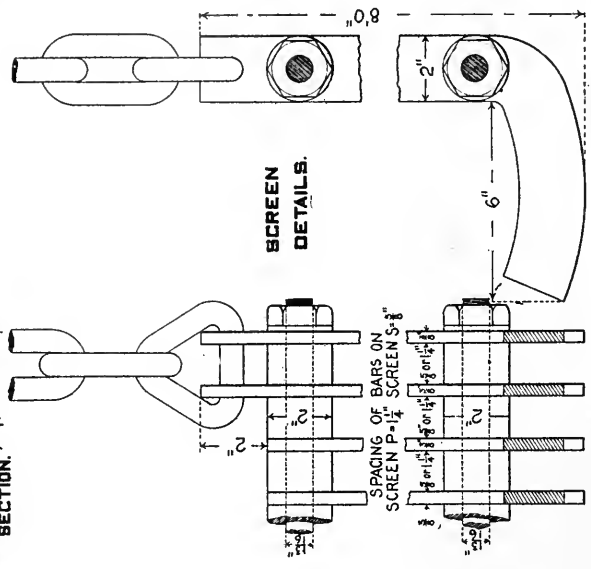
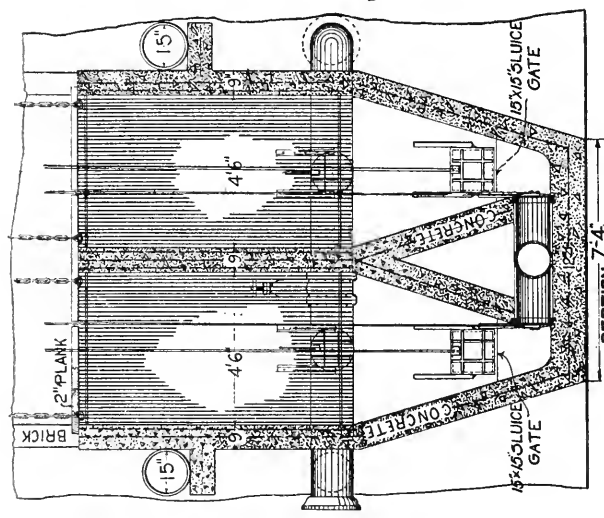
The sewage is delivered by gravity to the screen chamber through a 15-inch terra cotta sewer, which is split into two channels just in front of the walls of the chambers, one of these channels entering each of the chambers. Each of these channels is fitted with gates and each has a gate-fitted spur leading from it to a by-pass, by means of which the sewage

can be delivered directly to the sedimentation tanks. The screen chambers are of monolithic concrete construction, and comprise duplicate hopper-bottomed tanks, each fitted with two sets of screens hung vertically in guide slots and extending from above the surface of the sewage down to weirs, the tops of which are level with the tops of the hopper bottoms, and across the full width of the chambers. The screens are constructed of flat wrought-iron bars $\frac{1}{8}$ x 2 inches, pierced at the top and bottom by $\frac{13}{16}$ -inch round rods and spaced $1\frac{1}{4}$ inches apart in the first, and $\frac{5}{8}$ inch apart in the second screen. The bottom of each rod is bent forward hook-wise

SCREEN CHAMBER

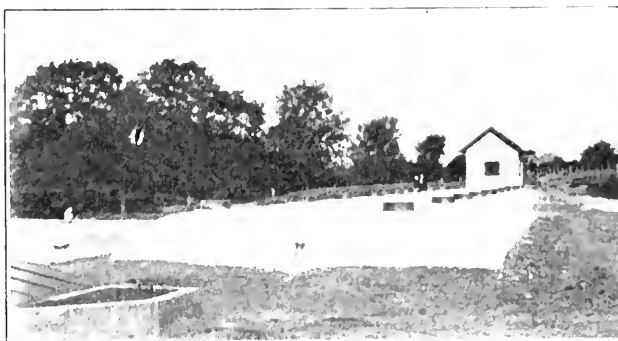


SCREEN & COUNTER BALANCE.



ix inches so that bulky solids which have been stopped in front of the screens will not slide off when the screens are raised for cleaning. Each screen is hung from a shaft, set in the walls of the superstructures, by chains passing over 14-inch chain sheaves and weighted at the other end by counterbalances. These latter are connected by a piece of railroad iron. This arrangement permits of the screens being raised for cleaning. This chamber is intended to separate from the sewage only the coarse matter such as paper, rags and other refuse which should not enter the sewers, but, through neglect or ignorance on the part of servants and householders, is usually present in more or less large quantities. Such refuse can be taken from the screens, dried and disposed of by burning. Any finer particles which may be settled out of the sewage in its passage through the screen chambers, will be drained out from the bottom of each of the hoppers through gates which lead to a 12-inch drain leading from the outlets under each structure to the outlet of the plant. This drain has its upper end in a manhole just in front of the screen chamber proper. A gated branch leading from this drain ends in the sludge pit. The space beneath, formed by the sloping sides of the hoppers of the screen chambers, opens into the manhole mentioned and at one end gives access to a like gallery under the sedimentation tanks. A substantial building, 12 x 18 feet, of vitrified brick paving brick with wrought-iron door and window shutters and slate roof, houses the screen chambers, the manhole at the upper end of the sludge drain and the "Dibble" recording gauge with which the mouth of the sewer is equipped.

The sedimentation tanks are 150 feet long by 17 feet high and 12 feet wide and are constructed as one structure. The bottom six feet of each side of each tank is built on a one to one slope, thus forming a long, narrow trough. This slop-



SEDIMENTATION TANKS AND SCREEN CHAMBER

The screen chamber (see Fig. 2) is in the building in the background. From this the sewage flows into the sedimentation tanks, whose two long arched roofs are the prominent feature of this photograph. The effluent from these passes through the control chamber (Fig. 6), one end of the roof of which is seen in the foreground of the above.

ing bottom is composed of heavily reinforced concrete, 12 inches thick on the sides which form the gallery between the tanks and 9 inches thick on the sides which were built against the excavation. From the tops of these troughs the side walls, the outside ones 9 inches thick and the middle partition wall 12 inches thick, rise vertical for 6 feet, or to the normal flow-line of the tanks. From these walls is sprung an arched roof 12 inches in thickness, over each tank. The end walls of the tank are 15 inches thick. The side walls are reinforced by buttresses extending from the springing line of the arches to the line of the bottom of the whole structure.

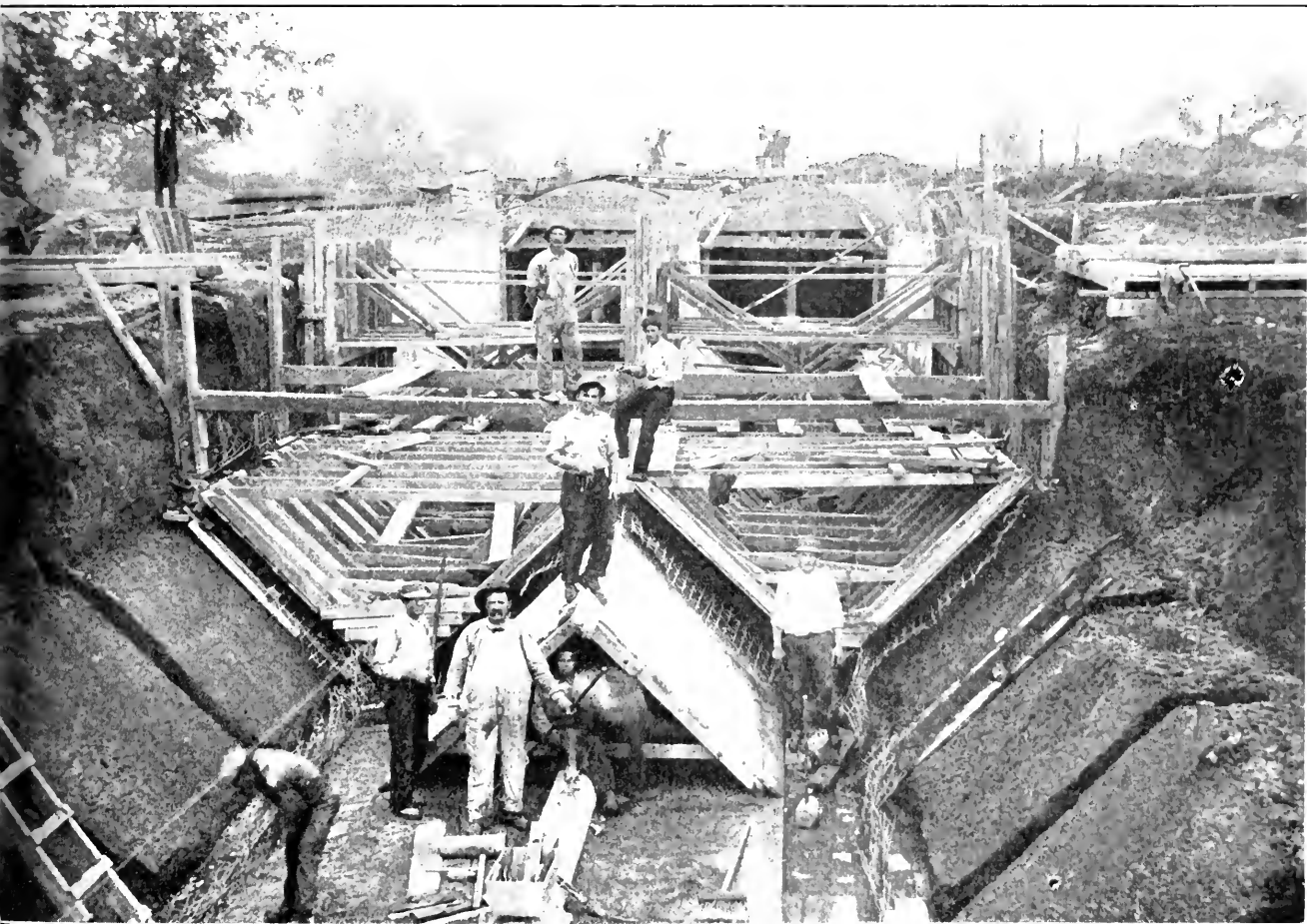


FIG 4. SEDIMENTATION TANKS. PLACING FORMS

The reinforcement is seen in place. The trenches for the side buttresses have been dug. The gallery for the sludge pipe is seen in the center of the excavation, the pipe being shown already in place. The forms for the roof arches are seen in the background.

The intakes from the screen chambers are placed six feet below the flow line, and those from the by-pass are at the flow line. All these are baffled to secure an even distribution of the flow across the full width of the tanks. At the outlet ends a concrete weir, resting on a shelf extending two feet into the tanks from the end walls, extends across the tanks. The inverted V-shaped space formed by the sloping sides of the bottoms of the adjacent tanks forms a gallery which contains the valves by means of which the sludge is drawn off from the bottoms of the tanks. Along the center of this gallery, with its bottom slightly below the floor level, is the 12-inch drain; and from it at right angles, and at 25-foot intervals, 6-inch pipes extend into the bottoms of the tanks, gate valves on which, placed just inside the gallery, control the drainage of the sludge.

Access to the tanks themselves is possible through ten standard manhole frames and lids placed at intervals of fifteen feet, center to center, along the crown of each arched tank cover, these having perforated lids to permit of ventilation.

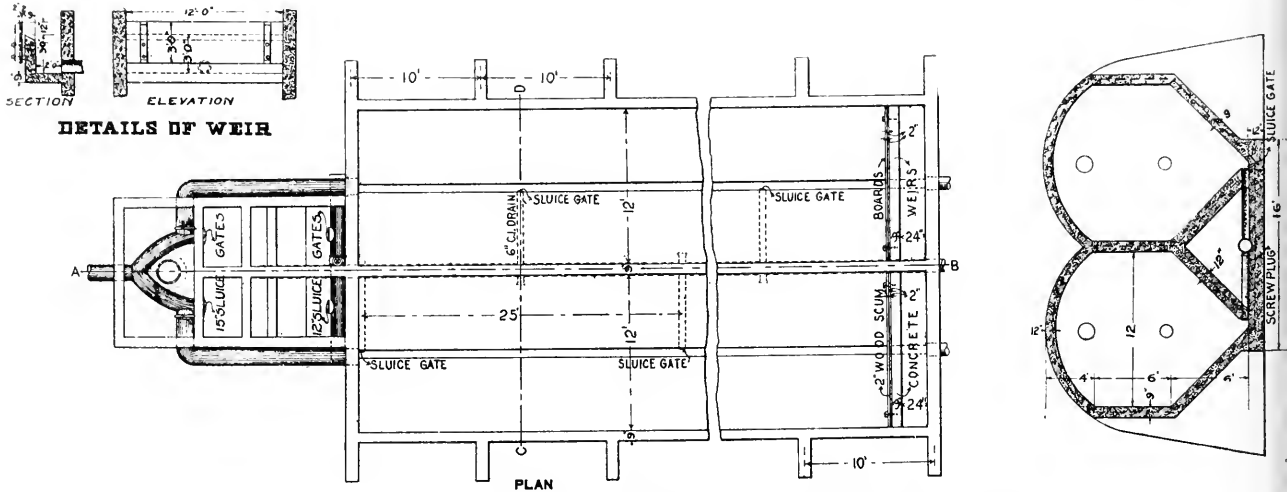


FIG. 5. PLAN OF SCREEN CHAMBER AND SEDIMENTATION TANKS

These tanks were designed for eight hours detention period for a 250,000-gallons flow per day for each tank. The tanks, when completed, furnished a fine specimen of water-tight concrete of extremely thin section. When filled with water only two small leaks, discharging streams about one-eighth of an inch in diameter, developed, both of these being stopped with ease. The seepage is barely noticeable.

From the sedimentation tanks the sewage flows through gated outlets to a dosing device designed by the Pacific Flush Tank Company. By this ingenious apparatus the sewage is fed automatically in rotation to the contact beds. By the manipulation of valves the order of feeding can be changed as desired and any two beds can be cut out of service in-

definitely. The device is operated entirely by air pressure developed by the sewage itself through four "Adam's feed" with their accompanying syphons and domes.

The contact beds are in two series, each of four beds, higher or "primary" series and a lower or "secondary" series. They are so designed, however, that either series may be passed whenever desired. The beds are of the underfed type and both are of identical construction, except that the secondary beds are filled with a liner material. The floors of each series of the beds cover a rectangular area of 80 x 200 feet and are 4½ inches thick and are of reinforced concrete. Each series is divided into four beds by walls 4½ feet high, 9 inches thick at the top and 3 feet thick at the bottom. The floor of all drain to the middle of each bed, where a gutter runs from end to end longitudinally. Specially designed U-shaped tiles 5½ inches wide by 6½ inches high, cover the floors in close laid, transverse rows, cemented together. The ends of the tile along each side of the gutters support and are lapped about 4 inches by coping stones 2 inches thick, which span the gutter. Over this drainage system the filter material, compos-

of crushed trap rock in two of the beds of each series, and selected washed gravel in the other two, is placed to within 6 inches of the tops of the walls.

To insure ample ventilation of the beds, six ten-inch ventilating pipes, placed in rows of three on each side of each bed, were brought from the ends of the U tile drains to one foot above the surface of the stone, where each was fitted with a swiveled hood.

The sewage delivered by the dosing device from the sedimentation tanks enters the primary contact beds at the upper end on the floor line, fills the bed to within six inches of the top of the stone, is held for any desired period of contact by air-locked syphons, installed by the Pacific Flush Tank Company, and then automatically discharged either to the secondary contact beds or, if so desired, into the main drain. The installation of valves is such that a primary bed can be discharged into either of the two secondary beds below it, and the beds can, any of them, be cut out of service or drained by hand should necessity arise.

From the secondary contact beds the sewage is fed to a settling basin 350 feet long, 3 feet deep and 15 feet wide at the bottom. On account of the possibility of the sewage freezing in this basin during the night and other periods of light flow, the ends and sides next to the contact beds of this basin were built on a slope of approximately two to one. This slope is expected to take care of any damaging thrust which even a thick layer of ice would otherwise exert against the walls of the basin, which are 4½ inches thick.

A cross-wall divides this settling basin into halves, each having inlets from the two adjacent contact beds and an outlet leading to the sand filters. Gates are so arranged that either half of the basin can be cut out, and the contact beds can

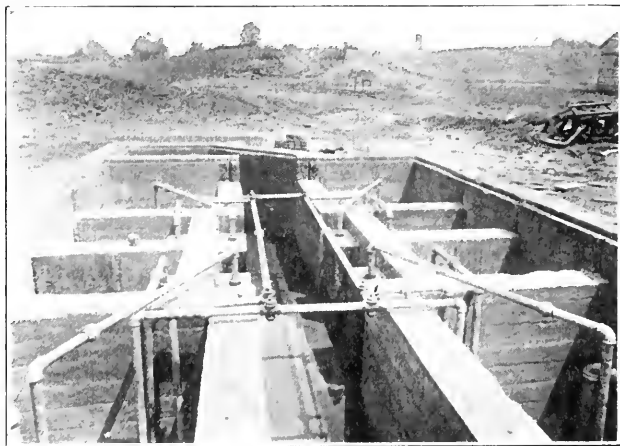


FIG. 6 CONTROL CHAMBER, DOSING DEVICE

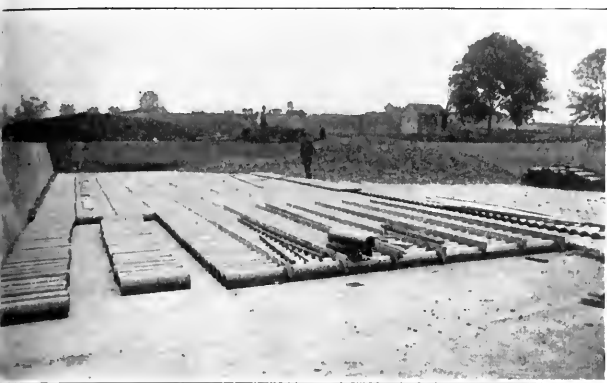


FIG. 7. LAYING U-TILE, PRIMARY CONTACT BEDS



FIG. 8. PRIMARY CONTACT BEDS COMPLETED

The effluent from the sedimentation tanks is discharged, through the dosing device, into the primary contact beds, from which it passes to the secondary contact beds (see Fig. 1). In Fig. 8 are seen the swiveled hoods or cowls for ventilating the beds. In laying the U-tile, the ends were kept in line and slightly apart to permit the effluent to drain into them, by placing boards on edge between the rows.

emptied into either half. Access is had to the main drain gates in a manhole, which is built into the partition wall of the basin. The outlets from the basin to the sand filters are wired and baffled by concrete walls.

Sand filters, in two sets of two each, form the final stage of treatment. The effluent from the settling basin is delivered to these through 12-inch terra cotta drains. The sand filters are of the usual earth bank construction with 2½ feet depth of sand and tile under-drainage system. The feeds are of the inverted type, with circular concrete distributing tables, 3 feet in diameter, at the surface of the sand. The filters discharge, through their under-drains, into manholes on the main drain line thence into a small creek which is tributary to the Delaware River.

Owing to the fact that it was impossible to keep the outlets of the sand filters above what was known to be the maximum flood level of the creek, a dyke was constructed around a low area, thus forming a basin or storage reservoir, into which the effluent from the plant can be turned during flood periods. This reservoir has a capacity for several days' flow.

The sludge pit is of the usual type, and it is proposed to connect others of the same sort when this is filled to the level of the incoming pipe.

W. W. Young, of New York, designed the plant and had charge of the construction, the writer representing him as resident manager. The Pitt Construction Company, of Pittsburgh, were the contractors.

SEWAGE DISPOSAL IN CALIFORNIA

The January *Bulletin* of the California State Board of Health contains a brief review of the work done in that state in the way of constructing sewage disposal plants. The report states: According to records on file at this office (known to be incomplete) the following sewer systems and disposal plants have been completed and put into operation during the year:

Shop	\$3,975.	Sewage disposal tank.
Ontario	4,750.	Septic tank.
Pasadena	16,000.	Septic tank.
Santa Clara	24,623.	Disposal plant and sewer ext'n's.
Whittier (bonds)	110,000.	Sewer system and septic tank.
East San Jose	29,900.	Sewer system and disposal plant.
Wintersfield	14,500.	Septic tank.
Imperial	33,346.	Sewer system and disposal plant.
Dayfield	21,785.	Sewer system and disposal plant.
Redi	49,041.	Sewer system and disposal plant.
Los Banos	28,639.	Sewer system and septic tanks.
Lawman	23,079.	Sewer system and septic tank.
San Anselmo (bonds)	15,000.	Sewer system.
Pluma	27,808.	Sewer system and septic tanks.
Corona (figures not available).		Sewer system and septic tanks.
Total	\$403,346.	

In addition to these money has been provided and construction begun, or is soon to be begun, in thirteen cities for new sewer systems, in eleven for sewer extensions and in ten for sewage

disposal plants, the estimated costs of these totaling \$1,389,634. In addition, the names are given of twenty-seven communities where improvements of this kind are under advisement.

The report states that many of these are being built not only because of an awakening to the appreciation of these as a matter of public duty and sanitation, but also because it is "good business," in that it will attract to these communities a larger percentage of the new settlers which are so much desired by all sections of the state.

NEW YORK'S HEALTH RECORD

Figures concerning the death rates in New York City during the past forty-three years indicate a very gratifying decrease in such rates. In 1868 the death rate was 27.90 per thousand population, and during the nine years from 1868 to 1876 inclusive the death rate varied from a minimum of 26.36 to a maximum of 30.96. From that time on there has been a gradual and remarkably consistent decrease in the death rates, the fluctuations being much less than are found on inspecting the figures for a great many cities. Between 1877 and 1893 inclusive the death rate had fallen to an average of 25.07, the maximum having been 29.03 and the minimum 22.76. Between 1894 and 1904 inclusive the average had fallen to 20.42, the maximum having been 23.00 and the minimum 18.10. During the period of 1905 and 1910 inclusive the average death rate was 17.30, the maximum having been 18.42 in 1905 and the minimum 16.06 in 1909. The rate for 1910 was practically the same as 1909—16.10.

An inspection of figures classified according to causes of death show that there has been an enormous reduction in mortality in ages below 45, but an increase in mortality in ages over 45. A great deal of the reduction in death rate has been among the children. There has been a decided reduction in mortality from smallpox, typhoid fever, diphtheria and pulmonary tuberculosis, but an increase in the death rate from pneumonia, cancer, Bright's disease and heart disease. This would apparently indicate, as is known to be the case, that the work of the health authorities has been directed very largely against the infectious diseases.

An inspection of the figures indicates some things which would not perhaps be generally expected. For instance, density of population seems to be of minor effect, local and personal hygiene having much more influence. For instance, some blocks with a population of 2,700 persons per acre have a mortality less than other blocks with only one-half that density. A much more important influence, apparently, is the nationality. For instance, taking typical blocks inhabited almost entirely by persons of given nationalities, it is found that the death rate among the Irish is about 50 per cent higher than the general rate of the entire city, while that among the Chinese, Syrians and negroes is double the average city rate. Italians show a very high death rate from broncho-pneumonia, although

their general death rate is but slightly above the general city average. Among the foreign population the only ones listed whose death rate is below the general city average are the Russians, Poles, Austro-Hungarians and Germans.

The department believes that it must endeavor to make some efforts toward reducing the death rates from non-infectious diseases; to effect which it is necessary to educate the people to moderation in the use of alcohol and tobacco and greater care in looking after their general physical well being.

DISPOSAL OF GARBAGE AT NEWPORT

For some time the city of Newport has experienced serious difficulty in satisfactorily solving the problem of the disposal of the city's garbage. Dumping grounds were provided at the outskirts of the city and contracts were awarded for the collection of garbage. In this way a large area at the south end of the harbor has been filled in during several years past and improved in such a manner by the planting of trees, placing of soil and sod and construction of paths and roads that it was finally transformed into a very attractive harbor park on what is now a part of the boulevard.

From time to time dumping grounds in various parts of the city have been entirely filled in until now the Representative Council is confronted with the problem of what to do with the garbage. House refuse of animal and vegetable matter has in the past been carried out to sea and there dumped, but even this method is made undesirable by long-shore tide and winds which have cast it along the beaches and rocks in the vicinity.

Several weeks ago Col. William H. Morse, of New York gave before the Board of Health and its guests a lecture, illustrated with lantern pictures, on garbage and cremation plants, and largely as a result of this lecture the Representative Council, at a meeting held on March 13, decided upon a crematory as the solution of the present situation in Newport, and voted to appoint a committee to act in co-operation with the Board of Health and inspect or investigate crematories now on the market and in operation in other cities. Five hundred dollars has been appropriated to defray the expenses of this committee.

MILWAUKEE REFUSE INCINERATOR

In our issue of December 23 we gave figures of the quantities of refuse burned during the first six months of operation of the new Milwaukee incinerator, and the costs per ton. Further details for the same period are given below, sent us as a copy from the books of the city department in charge of the plant. These figures give the amounts of each class of material burned and the costs for the six months from June to November, 1910, both inclusive. It is stated, in commenting upon this record, that during this time the crew were all new to the operation of the plant, and that since June the cost per ton has steadily decreased and probably will be brought still lower.

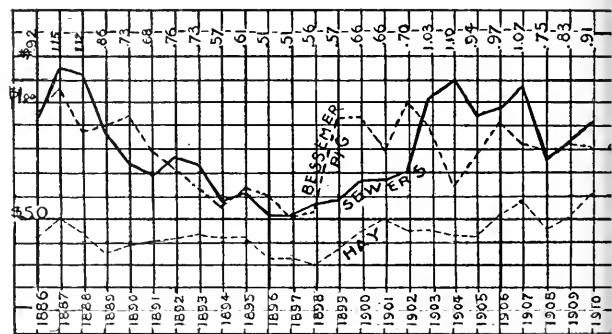
Figures are also presented, for comparison, for the old plant during the same months of the previous year. This plant dis-

posed of garbage only, while the new plant disposes of garbage, which was a little greater in 1910 than 1909, and a of the ashes, rubbish and manure of the city.

An inspection of the figures in detail offers a possible explanation of the gradual reduction in cost, in addition to greater expertness of the crew, in the gradual increase in the percentage of ashes, which suggestion is given somewhat more fully by the fact that in June, when the percentage of ashes was greater than in the two or three following months, the cost was less than during those months. This, however, should not be taken for granted without a much more thorough study of the figures and conditions.

YEARLY VARIATION IN COST OF PIPE SEWERS

By E. S. RANKIN, Engineer of Sewers, Newark, N. J.
HAVING occasion recently to look into the average cost of pipe sewers for the purpose of ascertaining how this cost varies from year to year, a tabulation was made of all contracts let by the city of Newark for the past 25 years for 12 inch pipe sewers with an average depth of from 8 to 10 feet. These figures were selected as furnishing the greatest number of contracts for any one size and depth. Contracts requiring especially difficult work, such as rock or quicksand excavation were eliminated, the object being to secure as nearly possible the real variation of cost.



COST OF SEWER PIPE COMPARED WITH IRON AND HAY

The results obtained are plotted on the annexed diagram, figures representing cost per foot of sewer complete.

For comparison there is also plotted on the same diagram the average price of Bessemer Pig Iron at Pittsburg, from a table published by "The American Metal Market and Daily Iron and Steel Report," and also the average price of hay, from figures furnished by the United States Department of Agriculture. This was selected as being less subject to speculative influences than wheat or other grains.

The result is interesting as showing that contract costs follow the same general trend as the cost of these two standard products and that there is a difference of over 100 per cent between the low point of 1896 and 1897 and the high point of 1887 and 1904.

MILWAUKEE REFUSE INCINERATOR

Data for first six months' operation, June to November, 1910

	Total Quantity Tons	Average per Day Tons	ALL BY WEIGHT.				Total cost Disposal of Refuse 1910*	Cost per Ton of Refuse 1910†	Total Cost Disposal of Garbage 1909	Balance in Paved of 1910
			Per cent. Garbage	Per cent. Ashes	Per cent. Rubbish	Per cent. Manure				
June§	5,170	198	58	25	9	3	\$4,956.04	\$0.96	\$5,691.60	\$735.
July	4,760	183	67	17	11	5	5,146.48	1.07	6,451.84	1,305.
Aug.	4,861	180	71	14	12	3	5,074.96	1.04	6,662.64	1,587.
Sept.	5,341	205	67	20	11	2	4,698.74	.88	6,914.24	2,215.
Oct.	5,370	206	64	22	12	2	4,405.21	.82	5,453.60	1,048.
Nov.	5,373	217	55	32	12	1	4,208.83	.78	5,473.52	1,264.
Av. and totals.	30,875	198	64	22	11	3	28,490.26	.92	36,647.44	\$8,157.

* Costs for 1910 do not include oil, waste, repairs, etc., amounting to \$1,281.66 for six months, about half of which represents permanent improvements.
 † Quantities of garbage greater in 1910 than in 1909 by about 8 per cent.
 § Four per cent of street sweepings not included in table.

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A. PRESCOTT FOLWELL, Editor

F. E. PUFFER, Assistant Editor

Business Department

S. W. HUME, President

J. T. MORRIS, Manager. A. PRESCOTT FOLWELL, Secretary

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MARCH 29, 1911.

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Diminishing Death Rates

NEVER before in the history of the world, probably, has life been held so valuable as now, and never before has the death rate been as low. On another page are given the rates in New York City for the last thirty-three years, which show a reduction from 28 per thousand to about 16 per thousand—over 40 per cent. While New York is to be congratulated on these figures, it is by no means exceptional in this improved condition. For instance, the figures for London, England, show a decrease of nearly 40 per cent during the same period, from 24.4 to 15.0. The figures of the actual lives saved are even more startling in their magnitude than the percentages. Assuming a population of four and a half million for New York, a saving of 12 per thousand means that under present conditions there are 54,000 less deaths per year than would have been the case thirty-three years ago. If the conditions have equally improved over the entire country with its ninety million population, we have an annual saving of 1,080,000 lives per year by

improved sanitation, medical and surgical practice and other features of modern civilization which make to preserving health and life.

If we consider the matter a little further, the figures are still more encouraging. It is, of course, out of the question to expect that any acts or precautions of man can render the human race immortal. A certain number of deaths—probably nine or ten per thousand—are inevitable unless the average length of life be increased beyond the maximum attained by any except the very unusual cases. If we take these figures to be ten per thousand, the preventable deaths thirty years ago in New York were about eighteen per thousand and at present are about six per thousand; in other words, the preventable deaths have been reduced by two-thirds.

This is certainly a remarkable showing and cause for great honor to physicians and sanitarians.

New York Pavements

AN item has recently appeared in a number of daily papers throughout the country discussing the unsatisfactory condition of the pavements in New York City, stating that the only solution appears to be the spending of \$10,000,000 to \$15,000,000 in replacing many of them with entirely new pavements and giving the startling information that it is the intention of the authorities to use a *metal* pavement for this purpose. Just where the reporter obtained this item of alleged information it is difficult to say, but it is possible that he may have heard some one use the term "road metal" and evolved the rest. We can state positively that there is no idea in the Highway Department of New York of using any metal in the construction of pavements in the future, but that the only innovation at present considered is that described by us a week or so ago—the smooth, close-joint stone block pavement.

That portion of this item, however, which states that New York streets and New York traffic have reached a condition which makes it advisable to modify previous methods of construction and maintenance has some foundation of fact. On another page of this issue is a statement concerning the asphalt pavements which, although the author is interested in laying asphalt pavements, is in general a fair and accurate statement of conditions and reasons therefor. Traffic in New York avenues is increasing and the diversion of this from one or more avenues while these have been torn up for subway construction (which has been almost continuous for several years past) has tended to increase this concentration of traffic and hasten the wearing out of the pavements. As the author of the article referred to states, neither asphalt pavement nor any other kind should be expected to wear indefinitely, even though frequently repaired; and the point has been reached in New York where many miles of asphalt pavement have outlived their economic usefulness and should be replaced entirely with new pavement. In his book on street paving George W. Tillson, Engineer of the Bureau of Highways of Manhattan, stated that the life of granite could hardly be expected to exceed 25 years nor that of asphalt 18 years, and under the intense traffic conditions in New York these figures are perhaps too high.

Unfortunately a great many miles of pavement have reached the end of their economic life at the same time and the city is called upon to make an immediate outlay of \$10,000,000 or more for new pavements, the alternative being a continuation of the present unsatisfactory condition of most of its avenues together with a rapidly increasing annual cost of pavement maintenance.

This condition of affairs is made additionally burdensome to the city because of the fact that these pavements were paid for by bonds which still have many years to run, and for decades yet to come it will be necessary for the taxpayers to meet the interest not only on the bonds required to relay the worn-out pavements, but also on those issued to construct them originally.

We desire to especially emphasize this phase of New York's predicament as a lesson to other municipalities. It is just and

proper that the taxpayers of a city should continue to pay for a pavement which they are using so long as they continue to use it, rather than that pavements should be paid for out of the tax levy of two or three years only. But there can be no defense of the practice of distributing the cost of a pavement over twenty-five or even fifty years when it is certain that the usefulness of the pavement will have departed in ten or fifteen years. In other words, bonds issued for constructing city pavements should be ten or at most fifteen-year bonds, and should never have a life longer than this. There is an alternative method of solving this problem in case there seem to be good reasons for issuing long-term bonds, such as ability to sell them to better advantage. This plan is to create a paving sinking fund into which should be paid each year such amount as will be sufficient to relay the pavement at the termination of its probable life. There is the additional argument in favor of this method that the amount made available by the sinking fund at the time when the pavement requires renewing need be only that necessary to replace the surface and not the foundation, since it may be assumed that the latter will outlive several surfaces. It is questionable, however, whether a careful calculation of the annual payments for interest and sinking fund on the long-term bonds, the interest received on the sinking fund deposits, and the interest on a series of short-term bonds would not show a balance in favor of the latter.

NEW YORK'S ASPHALT PAVEMENTS

DANIEL T. PIERCE

In the current discussion of the condition of New York's streets, and of the cure for this condition, there are certain facts that should be considered in arriving at the merits of the subject.

The paving most complained of falls into two classifications: Asphalt that has given good service, but is now worn out and must be replaced; and asphalt that was not properly constructed, and therefore requires more constant repair than it is possible to give it in order to keep it in proper condition.

In the first class is the Fifth avenue pavement (from Ninth to Fifty-ninth street) which was laid in 1897-98. It has carried the heaviest traffic found anywhere in the United States for thirteen years—a record few other pavements can match.

In the second class are pavements laid according to faulty specifications, by unskilled contractors, and with inferior material; and pavements laid on unsuitable foundations, such as Belgian block.

The community is now paying for past errors of judgment and for its unwillingness to face the fact that no pavement will last forever. There appears to be nothing in the city's experience with good asphalt that reflects discredit upon this form of pavement when properly constructed and maintained.

The construction of smooth surface pavements in the Borough of Manhattan began in 1888 when 34,000 yards of sheet asphalt were laid in various localities, followed by 27,000 in 1889 and increasing to 130,000 in 1890. By 1895 748,160 square yards of sheet asphalt had been laid in Manhattan by the Barber Asphalt Paving Co. alone, and by 1900 1,169,939 sq. yds.

Any form of pavement subjected to considerable traffic should hardly be expected to have a life of more than ten years. The granite blocks which were laid on Fifth avenue in 1886 were removed in 1897 because they were worn out. It would be but reasonable to suppose that the 750,000 yards of asphalt surface laid before 1896 would have already been entirely replaced. As a matter of fact a large proportion of these pavements on residence streets and those of moderate travel are in a satisfactory condition to-day, and are maintained at a reasonable cost. Park avenue between Thirty-fourth and Fortieth streets was paved in 1889 and after 22 years is in a condition not open to criticism and which will permit it to be maintained economically for some years to come. The same can be said of many other residence streets.

Many of these streets were not constructed upon a proper foundation, or they would be in a much more satisfactory

condition at the present time, notwithstanding their age. In these streets the asphalt surface was placed directly upon the old stone block pavements, the blocks of which are not rigid and will not support without yielding the constant passage of heavy trucks. It is not surprising that many streets of this character of construction are worn out, in every case having survived beyond the period to which their usefulness could be expected to extend, in view of their foundations. As a matter of fact, with the exception of Fifth avenue and a few other streets, none of the pavements in New York are supplied with a concrete foundation adequate to support the traffic to which the pavement is subjected. The city having constructed pavements of such a type, it should expect to replace them with a more modern type when repairs reach such a cost as to make it economical to do so. This, however, has not been done, and as a result there is a large area of worn-out pavement which cannot be economically or satisfactorily maintained. Had the old asphalt pavements been replaced with new ones built on modern lines criticisms would not now be made.

The entire area of asphalt pavements in the Borough of Manhattan is 5,230,484 sq. yds. and of this 2,460,089 yards, or 47.2 per cent, is not under guarantee, and its maintenance is in the hands of the borough officials. At least half of this area is worn out and should be replaced, but a realization of this fact has not been reached, either by the public, the borough engineers or the Board of Estimate and Apportionment, although the engineers are now beginning to realize this fact and agree that an expenditure of ten million dollars would be necessary to put the streets of New York in a proper condition, a figure which would, of course, be appalling to the Board of Estimate. The situation, unless something is done, will grow worse from year to year.

It seems plain that the pavement problem in Manhattan to-day is due to lack of good judgment ten years or so ago in the construction of many of the streets (although an adequate return for the money has been received), to failure to appreciate the fact that a pavement should not be expected to wear indefinitely, and to lack of information on the part of the public. No permanent improvement in the condition of our streets can be accomplished until there is an awakening to the facts of the situation and a demand from the public that new pavements shall replace those that are worn out.

MANHOLES IN WINNIPEG

In Winnipeg, Man., the standard manholes and catch basins are built of concrete, but to avoid the expense of either taking out forms from the interior of the structures or the use of collapsible forms, or in fact of using portable forms at all, the standard structures are composed of a series of rings placed one upon the other, the rings being made in forms at the city yard and delivered where and as required. Manholes are built of concrete rings, the upper ones 2 feet 6 inches in internal diameter, 4 in. thick and 12 in. high. The four bottom rings have the same diameter and height but are 6 inches thick, and the three bottom ones are split in halves at the sides and between the two halves are placed concrete blocks, an 18-inch block being used at each side in the bottom ring, a 12-inch block in the second ring, and a 6-inch block in the third ring. This makes the bottom of the manhole approximately oval, 2 feet 6 inches by 4 feet, and draws it in to a circular section 4 feet from the bottom.

The catch basins are constructed of rings in a manner similar to the manholes and are generally 8 ft. deep and 3 ft. in diameter at the bottom; drawn in to 2 ft. 3 in. at the top, by using for the three top rings a series decreasing in diameter 1/2 inches at a step. This causes each of the top rings to overhang the next below 1/2 inches all around. As the thickness is 4 inches this gives a 2 1/2 inch bearing on the ring beneath.

In laying up these manholes and catch basins the joints between successive rings are cemented with Portland cement mortar. This construction is not used for the flush tanks, and it probably would not be sufficiently water tight.

NEWS OF THE MUNICIPALITIES

Current Subjects of General Interest, Under Consideration by City Councils and Department Heads—Streets Water Works, Lighting and Sanitary Matters—Fire and Police Items—Government and Finance

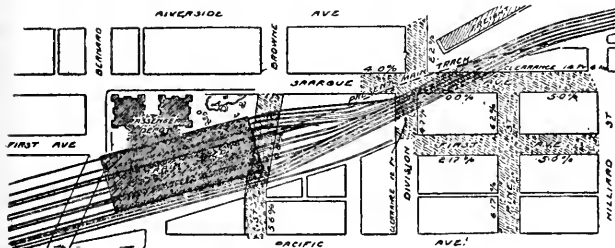
ROADS AND PAVEMENTS

Pavements Destroyed by Heavy Hauling

Portland, Ore.—The moving of an immense traction sewer-digging machine weighing about 25 tons, by Paquet, Gebisch & Joplin, from East Stark street to Holgate street, in the Sellwood district, where it is to be used in digging the Holgate street sewer, caused considerable damage to hard surface pavements en route. The tremendous weight of the digging machine caused the pavement to crumble beneath the wheels, the greatest damage being done in the Ladd tract and on Division street. The route chosen was largely over hard surface pavements and where the pavements were laid on filled ground. City Engineer Morris took up the matter with City Attorney Grant, and it was decided to ask the City Council to pass an ordinance prohibiting the running of such heavy machinery over the streets of the city without first obtaining a permit from the City Engineer. The former declared that no pavement would withstand the weight of so heavy an object, and if such machines are to be moved, some means must be provided, so that the pavements will not be damaged. The owners of the digger will have to pay for the repair of the streets they damaged, it is said.

Will Eliminate Grade Crossings Near Terminal

Spokane, Wash.—The accompanying plan shows the complicated changes in streets necessary to accomplish grade separation with the Northern Pacific at Division street and Sprague avenue, and gives a view of the Northern Pacific's proposed new passenger terminal, including the new depot which is to occupy the present park triangle at Bernard and Sprague. The change in street grades at Sprague and



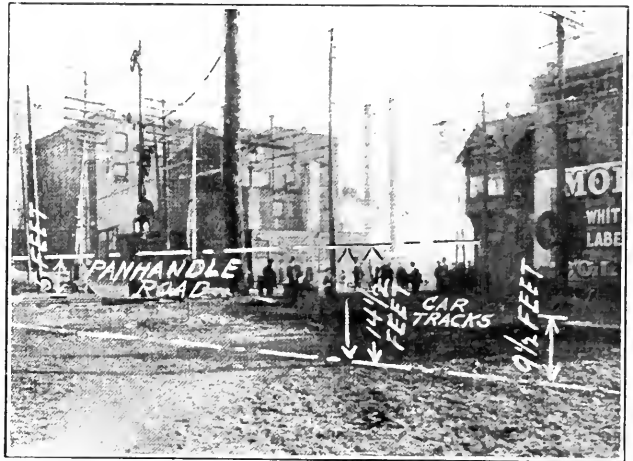
Division alone will cost the road \$200,000. Streets shaded have to be regraded. Their new grades between each block are shown by the figures "0.0 per cent.," "5.0 per cent.," etc. The present double track of the road where it crosses the intersection of Sprague and Division is widened to six tracks and has to be moved south several feet in order to be carried over the two streets by separate viaducts. The clearances of both these viaducts are shown. Bernard street will eventually be opened by a subway as shown in the cut.

Oiled Pavements Prove a Success

St. Augustine, Fla.—The oiling of San Marco avenue from the end of the brick pavement to the waterworks station is proving a most valuable experiment. A trip over the road with Mayor Masters and Street Commissioner Cray revealed a splendid highway. The shell paving was swept clean, the dust being worked off from the base with the street sweeper. The oil was then applied highly heated and on top of this was thrown fine shell and gravel. As the oil works up through this covering more is scattered on and in this way the material is firmly bound together with the asphaltic base which forms 50 per cent. of the road oil applied. A tank car of the road oil was purchased from the Standard Oil Company and it has covered approximately a mile. Besides Fort Marion Circle, San Marco was oiled to the city limits and on to the waterworks. The change wrought is already wonderful and it is stated that within a few weeks the road will be in still better condition.

Grade Crossing Elimination in Pittsburg

Pittsburg, Pa.—The Try street crossing, for many years a serious hindrance to traffic and a menace to life, is to be done away with. According to Public Works Director Joseph G. Armstrong work will soon be started. An agreement has been reached by the administration officials, the Pittsburg Railways Company and the Pennsylvania Railroad which insures the passing of the crossing. The cost will be about \$318,000, it is estimated, of which the railroad will pay \$131,200, the city \$116,800 and the railways com-



Courtesy Pittsburg Dispatch. GRADE CROSSING, SHOWING PROPOSED CHANGES.

pany \$70,000. The plan is to elevate the railroad tracks 5 feet and lower the street car tracks 9.5 feet, making a total clearance under the railroad tracks of 14.5 feet. A 5 per cent. grade in Second avenue to Ross street and a 3 per cent. grade eastwardly for a distance of about 700 feet will be the result. The assurance that the dangerous crossing is to be abolished comes after years of seemingly fruitless negotiation between the city and the railways company.

Several States May Be Connected by Boulevard

Wilmington, Del.—The proposition made by General T. Coleman duPont to build a boulevard the entire length of Delaware at a cost of \$2,000,000 and present it to the State will result in other commonwealths continuing this big improvement, in a measure at least, from the Delaware line. The General Assembly at Dover will, it is expected, formally accept the offer this week by passing an amendment to the General Incorporation law permitting the incorporation of boulevard companies. It is stated that the residents of Worcester County, Maryland, are arranging to build an improved road to connect with the duPont boulevard at the latter's southern terminus, Selbyville, Del. It is intended to have the modern road run through Maryland to the Virginia line, where it will doubtless be taken up by the authorities of Northampton and Accomac counties. Other counties on the eastern shore of Maryland may emulate this example with parallel highways of up-to-date construction.

Tracks Declared a Nuisance

Brownsville, Tex.—The City Council passed a motion declaring the railroad tracks of the Brownsville & Gulf Railroad, which extend for about a mile through the heart of the city, to be a public nuisance and the city marshal was instructed to see that the same was abated at once. The road extends from near the tracks of the St. Louis, Brownsville & Mexico to the tracks of the Rio Grande Railway, and the only traffic that has passed over the road-bed for years has been flat cars loaded with wood for use on the Rio Grande engines. The cars are hauled back and forth by mules.

SEWERAGE AND SANITATION

Begin Work on Storm Sewer

Chico, Cal.—Work on Chico's new storm sewer system started last week. The first soil was turned on First street, near the Southern Pacific Railroad tracks. If the weather conditions continue favorable the contract will be pushed through to completion as rapidly as possible.

Bryan Sewer System

Bryan, Texas.—Ground was broken here last week for the \$12,000 sewer system for this city.

Sanitary Department Inspectors Bear Expense of Uniforms

Tampa, Fla.—There are no marks of provincialism about the present sanitary department. They are going to be uniformed. There being no money in the appropriation for these uniforms, the inspectors are paying for them out of their own pockets. Incidentally the sanitary inspectors have to own their own horses and pay for and keep up their own buggies. In a short while every one of the eight or nine inspectors who serve the city in the department in question, under Chief W. J. Bailey, is going to be out in neat khaki clothes, coats cut sack, with the words "Sanitary" neatly lettered on the jacket lapels. Campaign hats will complete the outfit, while instead of the heavy badges which they are now wearing—which resemble a breast-plate of y^e olden times man-at-arms—they will wear neat little badges, a circlet of nickle properly lettered about a red cross. The net result is going to be a neatness which is always commendable; a distinct advance over the civilian attire which now, and has always heretofore marked the dress of the sanitary officers.

Plan to Take Waterway Around City

Portland, Ind.—Plans are being prepared by City Engineer O. O. Clayton for the taking around the city of the waters now carried by Miller's branch, running through the business part of the town. For years this waterway has been credited as a breeder of disease during the summer months, as well as a source of overflow to business houses in the lower portion of the city at every freshet. About eighty-five properties, specially benefited, will probably be assessed, with a general assessment over the city of approximately \$3 per lot.

Sewage Pours Into Water Mains

Lockport, N. Y.—An alarming discovery was made a short time ago when it was found that for some time past a large trunk line sewer carrying refuse from the City of North Tonawanda has been pouring its filth into the river at a point where, it was incidentally discovered, there was a leak in Lockport's intake pipe big enough for a man to walk through. The first attention to the condition was the suspicion at the pumping station that there was something wrong with the water being pumped. A thorough investigation was made at the station for the cause of the water being in such condition. It was found that near the main shore where the intake pipe, which is about eight feet under the bottom of the river, takes an upward turn, the current in the river had washed away the ground from under the pipe and uncovered the bottom of the bell which is located at the joint, leaving an opening large enough for a man to walk through. One of the principal trunk sewers in North Tonawanda, draining a large portion of the city north and south of Wheatfield street, empties into the Niagara river at the foot of Wheatfield street a few feet above this leak in the Lockport pipe. Necessarily, refuse carrying any amount of contamination was drawn into the well and pumped into the Lockport water mains and into homes in this city. Temporary repairs were made at once. The well in the pumping station was cleaned out and an enormous amount of refuse taken from it.

New Sewer System for Binghamton

Binghamton, N. Y.—Plans for intercepting sewers for the city, conducting the sewage of the entire city to a sewage disposal plant located below the city limits, have been approved by the State Commissioner of Health. The work is to be completed by September 1, 1914. The estimated cost of interceptor and disposal plant is \$320,000.

Anti-Spitting Ordinance Will Be Enforced

Louisville, Ky.—To enforce the anti-spitting ordinance, plain-clothes policemen will be placed on Louisville street cars within the next few days. It has been determined to break up the practice and the officials say that they feel that they must impose the law's penalty on all offenders, not so much as a punishment to them as an example to others, and as an earnest of the department's determination to enforce the ordinance. The City Health Department issued 100,000 little red slips yesterday upon which were printed warnings not to spit in public places. The little red slips will be given to street car conductors who have been instructed by the Louisville Railway Company to hand them to anyone caught spitting in the cars. The janitors of theatres, churches, public buildings, railway stations, office buildings, restaurants, saloons and other places, where men are accustomed to congregate, will also be supplied with the little slips.

Pure Food Ordinances for Dallas

Dallas, Texas.—City Attorney J. C. Collins, in consultation with City Chemist Dr. Landon C. Moore, drafted an ordinance regulating the handling of milk and the sanitary condition of dairies. Another ordinance will prohibit the exposure to dust of foodstuffs when on sale.

Paper Towels for Schools

Hackensack, N. J.—Ten thousand paper towels have been authorized by the Board of Education for the use of the pupils in the schools. It is claimed that paper towels used once and thrown away are more sanitary than a cloth towel used continuously by different pupils, and it is aimed to eliminate as much as possible the danger of contagion.

Drinking Cup Must Go.

Burlington, Vt.—The quarterly bulletin of the Vermont State Board of Health, bearing date of March 1, contains the copy of a regulation adopted by the State Board February 9, prohibiting the use of the "common drinking cup" in all public places, parks, fountains, school houses, factories, mills, work shops, libraries, railroad stations and railroad trains from and after May 1 next.

Topeka, Kan.—The State Board of Health last week sent a communication to all the hotels of the state informing the proprietors that the Board has adopted a resolution prohibiting the use of the common drinking cup in their hotels.

Trenton, N. J.—A bill has been passed by the Legislature forbidding the use of the common drinking cup for public places.

Office of City Bacteriologist Created

Portsmouth, Va.—The ordinance providing for a City Bacteriologist to be selected by the Board of Health and elected by the Council, has been passed by the Council. The ordinance provided that the officer should receive a salary of \$75 per month, but this was changed by amendment. There were two amendments offered, one by Dr. Bilisoly that the bacteriologist be required to also serve the water commission, and one by Mr. Hawks, that the salary be \$800 per annum, and these were carried.

Hypochlorite of Lime Substituted in Water Purification

Erie, Pa.—Hypochlorite of lime solution has been substituted for copper sulphate solution in the purification and sterilization of the city water supply. The change was made by the water commissioners last week and has been reported to be in perfect working order. For the present the new plant is under the direction of Engineer Jennings, who came from Chicago to put the system into operation. The change has been recommended by the three experts brought here by the Water Board to conduct an investigation. It has been concurred in by the State Health Department. Two reasons are given for the adoption of the lime solution in preference to the copper solution. The first reason is that it is used generally where purification and sterilization of water supply has to be carried on. The second reason is that the expense of the lime solution is considerably less than the copper sulphate. The State Health Department adopted the copper solution largely because it could be started easily and quickly.

Trunk Sewer Can Be Built Under Estimated Cost

Newark, N. J.—Estimating the cost of the construction of the proposed Passaic Valley trunk sewer at \$15,000 less than the estimate of the engineers of the Sewerage Commission the contracting firm of McArthur Brothers, of New York, has submitted a report to the commissioners showing that the entire construction work on the sewer could be done for \$12,235,000. The commission's engineers estimated that the work would cost about \$12,250,000. The McArthur firm is one of the best known constructing firms in the United States. The firm at present is engaged in building an Ashokan reservoir for New York City, which is a contract for \$12,000,000. The estimate was submitted by the New York firm at the request of the Passaic Valley sewer commissioners, who wished to have a reputable contracting firm present an estimate of the cost with a view to showing that the work could be done as the commissioners claimed for \$12,250,000. It had been contended by those fighting the sewer that it could not be built for anything near that figure.

Double System of Sewers for Bridgeport

Bridgeport, Conn.—That section of the North End on both sides of Main street, from Wheeler avenue northerly, will be the first to be benefited by the Hering sewer system which has received the endorsement of the Board of Apportionment and the Common Council. The Aldermanic committee on sewers has inspected the territory preparatory to a recommendation to the Council of the construction of a storm water sewer, the first to be built in accordance with the plans of Mr. Hering, the sewer expert of international reputation, for a double sewer system. The territory that is to be drained has a sanitary sewer that is of sufficient capacity to meet the demands of the present. The storm water sewer to be constructed at once will be paid out of the regular appropriation of the Board of Apportionment of \$22,500 for sewer construction and the Dindley street trunk sewer extension will be paid from the proceeds of the \$100,000 bond issue for further sewer work in accordance with the Hering plan. This city now has one storm sewer in Iranistan avenue, constructed some time ago to meet peculiar conditions which existed in that territory. In the future the city will build storm sewers where they are needed and from year to year the Hering plan will be followed until such time as the double system is in good working order. In future years all of the sewage will be carried away by sanitary sewers and rain fall will be disposed of in a special sewer.

Sewerage Improvements Will Not Make River Water Safe

Yonkers, N. Y.—At a recent joint meeting of the Common Council and the Water Supply Committees, testimony of experts was heard regarding the possibility of using the Bronx River as a source of water supply. Both Expert Allen Hazen and City Engineer Samuel L. Cooper expressed the opinion that the city should entertain little hope of solving the water problem by going to the Bronx River, even after the Bronx sewer has been constructed. Sewer construction has never yet been known to purify streams, Mr. Hazen said, and Mr. Cooper reiterated it. Of course, said Mr. Cooper, if you employ powerful enough methods and a sufficient amount of money you can make drinking water out of sewage itself. But, he added, the Bronx River is so far polluted that it would be inadvisable to use it and Mr. Cooper held that it would hardly serve the ends of economy to transfer the water from that stream to the city mains.

Buy Drinking Water for City Schools

Buffalo, N. Y.—The lowest of several bids to supply the public schools with pure drinking water, as recommended by the Health Department and the Committee on Schools, has been reported by Commissioner Ward as 20 cents a gallon, which would cost the city \$281 a day to supply all the public schools. For the 65 days remaining of the present school term this would amount to \$18,800. This would allow each child a pint a day. It was decided to supply this water as the ice will soon break up and then will come the danger of contamination of the water from ice drifting down from Erie, where a typhoid epidemic has been raging this winter. By the time the children return to school in the fall the schools will have been equipped with filters.

WATER SUPPLY

Profit in Municipal Water Works Will Reduce Rate

Youngstown, O.—Youngstown users of city water have reason to expect a reduction in water rates by next year at least. The report of the State Examiner made public several days ago establishes this fact since the water department has been conducted at a substantial profit for several years past and patrons are entitled to this gain. For various reasons no general reduction in rates will likely be made this year. The chaotic state in which the municipalities of Ohio now find themselves because of the many different taxation measures proposed for passage by the legislature makes any reduction in the revenue of the city's water department inadvisable at present. In addition to this the city is now undertaking an immense departure in the water supply line in the proposed construction of the Milton reservoir, to which the excess revenue from this department can be profitably applied.

Municipal Water Plant Highly Profitable

Los Angeles, Cal.—If the municipal water system of Los Angeles were sold for what it proved itself to be worth last year there would be a little more than \$46 coming to every man, woman and child in Los Angeles, providing the money were equally distributed. Moreover, if the money it has earned above expenses since 1902 were now lumped and equally divided, every man, woman and child would get about \$19.68. These figures show graphically what it means to the city to conduct the most successful example of a municipally-owned public utility in the United States. The city water department is that. There is no other city in America, it is said, where municipal ownership has proved such a brilliant and practical experiment. Last year—that is, for the year ended June 30, 1910—according to the city's books, the water department earned \$1,107,199. Its operating expenses were \$239,792, and its profit therefore was \$867,407. This profit makes it possible to put a capitalized value on the plant. The amount represents 5 per cent. interest on a capitalization of over \$17,000,000. The actual physical value of the plant is about \$6,000,000.

Municipal Water Plant Asked for in Citizens' Petition

Superior, Wis.—A petition is being circulated in the interest of the purchase by the city of the water plant of the Superior Water, Light & Power Company. This petition will be presented to the Common Council in the near future. The petition mentions two alternatives by which the city can secure a water plant. One is to buy the water company's plant at a fair valuation and the other is to build and maintain a separate system. It is asserted that Duluth with a municipal water plant is giving consumers water at half the rate charged here and asks to have the question of issuing bonds submitted to the electors.

New High Service Pump Installed

Milwaukee, Wis.—The official test has been made of the 12,000,000 gallon high service pump No. 8 in the North Point pumping station. The pump was installed by the Allis-Chalmers Company at a cost of \$63,000. It is now felt that the city is well fortified against the summer season so far as water supply is concerned.

Report of Water Commissioners Shows Increase

Merrimac, Mass.—The Board of Water Commissioners report that during the past year they have added 34 services, making a total of 476; laid 25 service pipes, making a total of 416. There are 20 services shut off at this number; six are double services where only one is being used. During the year 30,028,996 gallons of water have been pumped. Water takers have consumed a much larger proportion of the water pumped than ever before, the receipts being \$4,575.41, exceeding last year's receipts by \$1,491.08. For several years the commissioners have been trying various compounds for removing scale from the boilers without success. Some two months ago the inspector advised the commissioners to take water from the swamp for the boilers. They acted on his advice and it has proved a success, as it has already removed large quantities of the scale, leaving the parts perfectly clean.

STREET LIGHTING AND POWER

Lighting System Has Been Completed

Lodi, Cal.—City Superintendent John Henning, who recently prepared a wiring and lighting system for this city, has announced to the Trustees that his task has been completed and the work nearly finished. Most of the new lights have been installed in East Lodi, which has been poorly lighted heretofore. They are of the Tungsten type and are 80 candle power.

Effort to Reduce Lighting Rate May Cause Litigation

Toledo, Ohio.—An electrical lighting war, involving 6,500 Toledo residence consumers, extensive litigation and an alternative intimation by the company that it would cut off domestic service made unprofitable by a reduced rate, is the threatened result of the adoption by council committee on lighting of a schedule providing a five cent net rate for residence lighting. President A. E. Lang, of the Rail-Light, promptly told the committee that the company absolutely will not accept the proposed rate, and Attorney Rathburn Fuller announced that if it is ratified by Council the company will bring suit to enjoin the city from putting it into operation.

Hopes to Make Municipal Light Plant Pay

Cleveland, Ohio.—S. G. Beckwith, superintendent of the municipal lighting plant is preparing a report which he will submit to the Director of Public Service in the near future showing just why, in his opinion, the plant has not paid in former years. He states that there is no reason why a power plant run by the municipality should not pay as well as one run by private corporations; that it should do more than merely pay the actual cost of running; it ought to pay an interest on the investment sufficient at least to cover the depreciation from wear and tear. If it is not doing that it is a failure. The growth of patronage of the plant is steady and, Mr. Beckwith believes that with proper economy in management it will be able to care for itself without the appropriation of funds raised by taxation.

Remove Poles and Wires

Wishawaka, Ind.—Ideas expressed at the March meeting of the Business Men's Association that wires and poles be removed from the principal streets of the city and placed in alleys, wherever such a change is practicable, are having some fruit, as the city electrical department recently started work transferring some of the city's wires to poles in the alleys in the fire limits. Within the next few months through the movement started by the merchants and aided by the city, the main streets of the city and the business district may be entirely freed from the poles and wires.

Light Plant Acquired by City.

Alliance, Neb.—The controversy between the City of Alliance and the Electric Light and Power Company has now been finally settled by the city taking over the plant for \$55,000. Warrants have been issued for \$40,000 and the balance of \$15,000 will be paid in three annual installments of \$5,000 each.

Municipal Plants Pay

Sharpsburg, Pa.—Albert H. Young, borough clerk of Sharpsburg, has filed with the Bureau of Statistics at Washington a report of the financial condition of the municipal lighting plant and water works of Sharpsburg. The report shows that the cost of each arc lamp is \$32.60 per annum, and that during the last ten months the plant earned a profit of \$5,000. This profit accrues from the sale of current for commercial lighting. It is also shown that the water works has a profit of \$7,000 for a corresponding period. The light plant and water works represent an investment by the borough of \$100,000.

Says City's Contract Will Damage Plant

Trenton, N. J.—The Atlantic City Gas Company has filed a petition with the Board of Public Utility Commissioners protesting against the city's installing a drainage canal and general underground drainage system, claiming that it will compel the company to take out two 20-in. trunk mains and a 20-in. pumping main which supply gas to the city, result in great inconvenience to the public and damage the company to the extent of \$20,000.

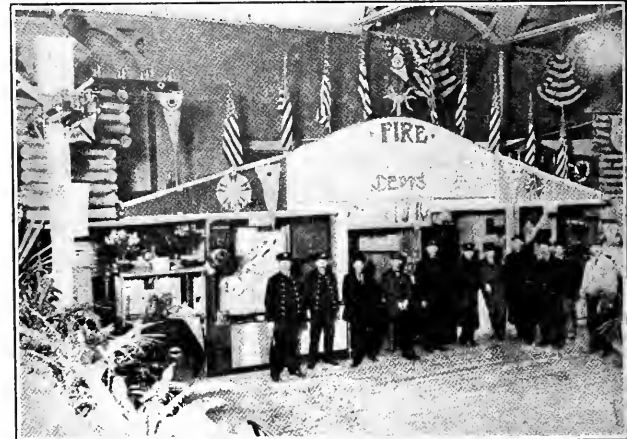
FIRE AND POLICE

Fire Ordinance Regulating Theaters

Janesville, Wis.—City Attorney H. L. Maxfield has completed the drafting of an ordinance regulating the operation of moving picture machines, theaters and amusement halls in this city, safeguarding the public in the case of fire in these amusement places and requiring the owners to take precautions to prevent any conflagrations. The measure is most complete and covers all possible contingencies regarding fire prevention in moving picture halls and theaters. Among the matters which are treated in the ordinance as drafted is a section governing the moving picture machine which provides that various equipments be provided to minimize the possibility of fire and that it shall be located in an enclosed galvanized room lined with asbestos sheeting. The chief of the fire department is empowered to inspect all apparatus after it has been installed, which shall be within two months after the passing of the ordinance. It is also his duty to enforce the provisions in the measure regarding the equipment necessary.

Police and Firemen's Booth at Municipal Show

Toledo, O.—The police and firemen's booth is one of the popular places in the Municipal Exhibit at Memorial Hall. Citizens, young and old, were attracted to the engrossing process of "looking in" upon the mysteries which the Police Department has for them through the medium of the telephones having direct connection with the central station. There are a dozen waiting for each receiver and



Courtesy Toledo Blade

BOOTH AT THE MUNICIPAL SHOW

the clerks and officers in the booth have a busy time answering all the curious questions asked them. By this practical method people are getting a better insight into the complicated, yet really simple, methods taken by the police and fire departments to safeguard property and prevent crime or to capture the criminal after its commission. The booth has all the charms of the mysterious and is splendidly conceived and handled for the purpose for which it was conceived—the enlightenment of the people of Toledo.

Want Women on Police Force

Jersey City, N. J.—It is possible that women may be regular members of the police force in New Jersey if a bill now pending in the Legislature at Trenton is passed. The measure provides for appointment of women to the police force in every town and city in the State. It is not framed with the intention of having the women police perform all the functions of the departments, but has as its object their assignment to duty in dance halls, moving picture theatres, public parks and other recreation centres. In twelve cities in the United States the plan of having women policemen do the light work has been tried with good results, it is said.

New Night Police Signal Installed

Warsaw, Ind.—In order to give better protection to the citizens of Warsaw, the City Council has decided to place in service a night police signal, in the form of a red electric light, placed in a conspicuous place in the heart of the city and operated by a switch at the telephone station.

GOVERNMENT AND FINANCE

Plans Parole System for Municipal Court

South Bend, Ind.—The South Bend City Court will take on a more metropolitan air with the establishment of parole system, similar to that in vogue in many of the larger cities. Prisoners given suspended sentences will appear before the Magistrate once a week to report his or her behavior, in accordance with a plan outlined by Judge Farabaugh recently. The measure will become effective at once.

City to Buy all Utilities

Winnipeg, Man.—Winnipeg is about to become the greatest exemplar of municipal ownership on the continent. The City Council last week decided to buy out the Winnipeg Electric Company, controlling the street railway, electric light, power and gas franchises. With this effected the city will own all the public utilities here.

Commission Government Elections

Wilmington, N. C.—By popular vote Wilmington adopted the commission plan of government, the vote being practically unanimous, there being only 22 votes cast against the measure out of a total of 1,200.

Wyandotte, Mich.—Wyandotte is the fourth Michigan city to adopt the commission form of government. Contrary to the prophesies of the city officials, the proposition was carried at a special election by a tremendous majority. The vote was 777 for and 298 against.

Aberdeen, S. D.—At a special election Aberdeen voted to adopt the commission form of government, conducting its municipal affairs by the aid of a mayor and four commissioners instead of by the mayor and council system. The vote stood: For the commission form, 1,003; against, 535.

Oklahoma City, Okla.—Oklahoma City adopted the commission form of government by about 1,200 majority.

Peoria, Ill.—Government by commission was defeated by a majority of 735.

Spokane, Wash.—What is declared by experts to be the most advanced practical plan of municipal government by commission in America is now in operation in Spokane. Five commissioners, chosen from among 92 candidates at a special election on March 7, when women exercised the right of the ballot for the first time in the history of the city, have been formally inducted into office, retiring Mayor Nelson S. Pratt and 10 Councilmen.

City's Share of Street Railway Profits

Chicago, Ill.—The city's share of the net receipts of the Chicago City Railway Company, which controls the surface lines in the southern part of the city, will be \$829,914, or 5 per cent of the net receipts. This is an increase of \$355,000 over last year, which is accounted for in the reduction of operating expenses. The money, which will be turned into the city treasury by April 10, is the fourth payment by the company since the passage of the franchise ordinance in 1907 and makes a total in four years of \$2,593,026.

Propose Annual Assessment for Sidewalk Space

Erie, Pa.—The matter of forcing merchants to pay a revenue to the city for signs extended over the sidewalks and for show cases, display cases, fruit and grocery stands, bulletin boards and other outdoor advertising devices placed on city property was discussed at the meeting of the joint street committee of Councils last week. Councilman Biederker called the attention of the members of the committee to the proposition, which, he said, was one way in which the municipal finances might be increased. Five dollars a square yard was the value set on street sidewalk space.

Auto Pay Car Is Planned

St. Louis, Mo.—An ordinance to equip the city with an automobile pay car, in which representatives of the City Treasurer will travel to the city institutions and other outlying districts to pay off city employees, was introduced into the Council at a recent session. The automobile is to be assigned to the City Treasurer's office, and is to be equipped with a stationary strong box for safeguarding the funds transported and stations for armed guards. An appropriation of \$4,000 is carried by the bill.

Argue Greater City Bill

Harrisburg, Pa.—Over 400 residents of Allegheny County, representing Pittsburg and various boroughs and townships and a number of residents of Wilkes-Barre, Scranton and other cities, attended the public hearing held in the hall of the House of Representatives last week on the Allen bill to permit annexation of territory contiguous to municipalities. The bill allows annexation by the combined vote of the district to be annexed and the community to which it is to be annexed. The bill was presented with the support of Mayor William A. Magee and prominent residents of Pittsburg, and is designed to extend the limits of that city by taking in surrounding towns. It was stated to-night that the bill would affect 35 boroughs in the vicinity of Pittsburg and would also enable numerous other cities to expand, Wilkes-Barre, for instance, being able, if the bill passes, to enlarge its area from 4½ square miles to 23, and to obtain a population of 135,000, which would put it in the second class with Scranton. The bill would also enable Harrisburg to annex Steelton, and York to take in the boroughs about its boundaries. It was stated to-night that the bill is favored by residents of Erie, Meadville, Lancaster and other cities, as well as Pittsburg.

Will Vote on Annexation

Freeport, Ill.—The voters of Freeport will have a chance to increase the city's population by about 300 at the city election April 4. It was decided by the City Council at a special meeting to place the annexation of a part of Silver Creek township on the ballot and an ordinance to that effect was passed. The petitions for annexation were signed by 71 property owners and by 32 voters of Silver Creek, making a majority of 32 property owners and six voters for annexation.

Citizens Protest Against Officials' Extravagance

Milwaukee, Wis.—Resolutions protesting against "extravagance on the part of the present city administration" were adopted at a mass meeting of 150 taxpayers last week in the Twentieth Ward, one of the strongest Socialist wards in the city.

The resolutions adopted follow:

Whereas, the present administration has shown by its acts that it does not propose to live up to its proclaimed promises; and

Whereas, it is squandering the taxpayer's money without giving him an opportunity to express his wishes in regard to the expenditure of that money; and

Whereas, it is now prevailing upon the State Legislature to pass bills which would enable the city to engage in the ice business, slaughter house business, plumbing business and undertake to make public improvements by engaging with whom, when and at the price it sees fit, thereby laying a foundation for corruption of the worst type; and the Council

Whereas, it open and flagrantly goes contrary to Councilman of the people of the city, as was plainly demonstrated with the assents refusal to submit the river park proposition of the people, because, in its words, "they would vote down the project at this time."

Whereas, the practices inaugurated they are prepared to government by the present administration census figures for this dangerous precedents and are not found only 34,670 people pledges; and it serves daily 47,789

Whereas, the present administration seven days by the twenty-two to introduce into our city a system that each served an average of "Somers system," which coverage of 409 places. Figured station has shown some very valf to a family this makes a ble to the conditions in our city 6,000.

Resolved, that we, the citizens of Milwaukee, in mass meeting, City Hall has been started on the new do most earnestly and land, on the site of the structure demanner in which the City Hall was started, by Henry L. Brown, of Philadelphia by the present Mayor. It is rumored that some citizens

Resolved, that we, the citizens of Milwaukee, at this time will of the \$1,000,000 river park by injunction.

test against the introduction of City Limits Acquired for Park

valuation, urging the City Council.—The Spokane Park Board has acquired be continued until the city limits for a park. Sufficient and desirable land outside the city limits for a park. Superintendent of Parks John W. Duncan states that he has vote of the people for the improvement of the new park, which

The rescinded plan has no name.

STREET CLEANING AND REFUSE DISPOSAL

Destructor Plant the Best Solution

Paterson, N. J.—The report of William F. Morse, the Sanitary Engineer who was employed by the Board of Works for the purpose of making an investigation of Paterson's waste disposal problem with the idea of making a recommendation as to what had best be done in this city has been presented to the board. The report is a lengthy one, but his recommendations may be summarized in the statement that he recommends the construction of a main destructor plant of 100 tons daily capacity at a cost of about \$100,000 and a yearly maintenance cost of \$21,800; together with the erection of another smaller plant in the over-the-river section, with a capacity of about 40 tons, at a cost of approximately \$60,000, with a maintenance cost of about \$10,000 a year. In addition to this, there would be the cost of collecting the garbage and bringing it to the plants for destruction, which would be in the neighborhood of \$16,000. This would mean an annual total maintenance cost of about \$47,800. To offset this there is an estimated revenue from the plants for horsepower and clinker product of about \$20,000.

Leavenworth Will Have Clean-up Day

Leavenworth, Kan.—Mayor Abernathy will be petitioned by a committee from the Civic League to issue a proclamation for a clean-up on May 13. If granted the women of the league will start immediately to interest the members of the Junior League, a children's auxiliary. They have been instrumental in making the clean-up days of the last two years successful. Clean-up day is original with Leavenworth. It was inaugurated by the Civic League. Many cities of the United States have taken this means of making their streets and vacant lots presentable to visitors and a pleasing sight to their citizens. Trash of all kinds is gathered by the workers and removed by wagons. It is the intention of the workers to finish the clean-up in one day.

City to Co-operate with Board of Trade in Clean-up

Paterson, N. J.—Extensive plans have been made by a committee of the Board of Trade for a "clean-up" day for Paterson. One of the matters which has been worrying the members of the committee is as to how they should get rid of the great quantities of dirt and refuse which would be gathered by the citizens during the progress of the campaign, for if the committee was forced to hire the necessary wagons and teams it would mean the expenditure through a great deal of money. The matter was called to the attention of the members of the Board of Public Works, and it was decided that the city would dispose of all the refuse in barrels, boxes or piles.

Alliance to Buy Street Flusher to Take Place of Sweeper

Alliance and Wash.—Within the coming week the new Alliance has finally decided which the Purchasing Committee of the for \$55,000. Warrington will be in operation on the paved streets of \$15,000. After having the machine explained and the cost of \$5,000 each. Viewed similar machines in operation.

Municipal Committee Decided in its Favor

Sharpsburg, Pa.—At the last meeting decided that they should buy this machine by money by buying this machine. The committee found it satisfactory. The city of Sharpsburg, has filed with the Board of Public Utilities a report of the findings. It would be necessary to buy a street lighting plant and water works. This would involve an expenditure of \$7,000. This profit accrued to the city. The newly acquired commercial lighting. It is also necessary to purchase a street sweeper and water works represent a total cost of \$100,000.

Says City's Contract Will Be

Trenton, N. J.—The Atlantic City Gas Company has petitioned with the Board of Public Utilities protesting against the city's installing a gas main in the downtown district as a ball and chain. The city health department has now been used to take out two 20-in. main which supply gas to the city. The gas company has done only to the extent of \$20,000.

RAPID TRANSIT

Municipal Street Car Line

Seattle, Wash.—One of the first acts of the new city administration will be to advertise for sale \$800,000 in bonds for the construction of a municipal street car line. Then will begin the most extensive experiment in public owned surface lines since Tom Johnson's attempt at Cleveland. With the \$800,000 the city proposes to construct and operate a 13-mile trunk line from Ballard, one of its northernmost wards, to the Rainier Valley in the south end crossing the central business district and intersecting all the existing lines of the Seattle Electric Company, a Boston-owned corporation. Instead of building a track through the three miles in the center of the city the Government line will use a section of the Seattle Electric Company's tracks by virtue of a "common user" clause in its franchise. From the northern end of this section to Rainier Valley the city will parallel the tracks of the Seattle, Benton & Southern, an independent interurban line that has given patrons and city officials much trouble for several years. Through much of the distance the city will lay its tracks on the same streets used by the interurban, placing them outside the existing tracks if that company refuses to sell or make agreement for joint use. From the southern end of the joint track to Ballard the city will build an entirely new line through territory not now enjoying good street car service. It will follow around a hillside for three miles and will draw all the patronage of those living above the line, for now those people have to climb several blocks of a typical Seattle hillside to reach an existing line. It is expected that this three miles of line will open up to settlement a large area, comparatively close in, that is now sparsely settled.

Electric Freight Line Proposed

New Bedford, Mass.—Prominent citizens of the north end of the city, who have threshed the matter over thoroughly, have come to the conclusion that they would like to have the Union Street Railway Company lay tracks extensively through the north end which would supply the mills in that territory with freight which would be delivered at late hours of the night or very early in the morning. One of the features of the proposed railroad is that in daytime the lines could be used by passenger cars to transport mill operatives of these north end mills which are situated on the water front and now a long way from the car lines. Should the idea be properly handled and passed the freight would not go through the city until after 11 or 12 o'clock at night and would stop at daylight. All possible danger would be eliminated in this way, and those who are behind the movement are enthusiastic over what they think can be developed into a very useful builder of the north end.

Postal Boxes in Cars

Washington, D. C.—Washington soon may have street car letter boxes. The scheme already has been tried successfully in several other cities. Announcement was made at the Postoffice Department recently that the local street railway companies are being communicated with regarding the installation of letter boxes on each car passing the city postoffice or any of its substations. At first but a few mail boxes will be installed, but if the idea is found feasible the boxes will be placed on a majority of the street cars of Washington, according to present plans. Passengers can post their letters on the street cars without the necessity of alighting and looking for a mail box. The boxes can be emptied every time the cars pass the postoffice, and the delivery of the mail thus expedited.

Vestibules for Street Car Crews

Dover, Del.—The Senate last week passed the House bill providing that electric cars shall be equipped with enclosed vestibules from November to March for the protection of conductors and motormen. When the bill passed the House it also provided for rubber curtains on summer cars for the protection of the crews on rainy days. The Senate amended the curtain requirement out of the bill.

Want Lights on Cars

Michigan City, Ind.—The Common Council is again after the Northern Indiana Railway Company to display colored lights on its cars designating their destination. An ordinance has been passed, but the Council has been informed that it is not being enforced.

Pay-As-You-Enter Cars in Texarkana

Texarkana, Ark.—Texarkana is rapidly becoming one of the most metropolitan small cities in the country. Pay-as-you-enter street cars will be introduced in Texarkana during the coming summer. It is expected that the cars will be in use by July 1.

MISCELLANEOUS

Illegal Appointment of Commissioner of Public Works Brings Trouble

Milwaukee, Wis.—The illegal appointment of Harry E. Briggs as Commissioner of Public Works has had a far-reaching effect. Special taxes for 1910, aggregating \$848,872.74, have been invalidated; buyers of nearly all of the delinquent taxes refused to accept the city certificates amounting to almost \$160,000; every assessment of benefits and damages made by Mr. Briggs is invalid, and half a hundred suits probably will be brought against the city as a result of the failure of the Council legally to adopt chapter 297 of the laws of 1907 providing a one-man board of Public Works. Steps have been taken by the Council to remedy the blunder committed by the Socialist Council on April 19, 1910, in attempting to change the law without referring it to a committee as required by law.

Smoke Ordinance Passed

Knoxville, Tenn.—Not a single vote was recorded against the smoke ordinance that was passed at the meeting of the City Council last week. The ordinance passed provides for the prevention of smoke pouring from the stacks and chimneys of all hotels, apartment houses, factories and plants in the city where a boiler is used. It further provides that the building inspector shall assume the duties of smoke inspector. The ordinance does not become effective until June 1, 1911. To prevent working a hardship the owner of a factory or building where the smoke consumer must be put on can by applying to the building inspector secure a permit to extend the time six months, but no permit will be granted after January 1, 1912. The ordinance makes it the duty of the building inspector to inspect the various places where he finds the smoke ordinance violated and to notify the owners of the property to install a smoke consumer within sixty days. The ordinance further makes it the duty of the building inspector when a party does not comply with this notice to have him cited before the recorder and makes the non-compliance with the ordinance a fine of not less than \$3 nor more than \$50. The building and smoke inspector will at once take notice of the new ordinance and begin to send out notices to present offenders. An unusual amount of interest in the smoke nuisance ordinance has been manifested and the announcement of its passage was received with enthusiasm by members of the City Beautiful League who have been behind the movement.

City to Buy Site for Playground

Providence, R. I.—The Board of Contract and Supply of the city of Providence have voted to purchase the Garibaldi playground on Brayton avenue and West Exchange street. The decision was reached after the board had made a tour of inspection of several possible sites for playgrounds in the neighborhood. The land, which is owned by the Providence Land and Wharf Company, includes 49,519 square feet and the price to be paid will be approximately 40 cents a square foot. It has been for two years very successfully utilized by the Providence Playground Association as a playground. According to Mayor Henry Fletcher, the chairman of the Board of Contract and Supply, the need of a playground in that vicinity has been plainly demonstrated by the great number of children in the immediate vicinity, who have had the advantage offered for play the past two years through the efforts of the Providence Playground Association.

Will Start a Municipal Restaurant

Kansas City, Mo.—Kansas City is going into the restaurant business and no longer will those who visit Swope Park, in this city, forgetting to take their lunch, be compelled to go hungry while they roam over the 1,324 acres within its confines. The City Park Board has decided that hereafter a real old-fashioned country dinner will be served on the grounds during the summer. The lunch stand, which has heretofore been leased, will be operated by the city and, besides the dinner, meals can be obtained at any time. Charges for the food sold at the park will be regulated so as to only pay the actual expense of the business. As all city employees must take the civil service examination, the cooks, waitresses and waiters will have to pass this before they can be employed. All of the equipment used in a first-class restaurant will be purchased by the city for use in its café.

Plan Municipal Athletic Field and Running Track

Spokane, Wash.—Establish four large playgrounds containing between eight and twelve acres each. Provide small playgrounds in the vicinities of many of the large ward schools. Install an athletic field and quarter-mile running track for the use of all athletes in the city. Provide at least 15 small neighborhood parks at various points about the city. These are the salient features of a comprehensive plan being worked out by W. J. C. Wakefield, one of the members of the Spokane Park Commission. "These are some of the important features which I intend to recommend and strive to see inaugurated in Spokane's park plan as soon as the \$1,000,000 authorized at the election is available from the sale of the bonds," states Mr. Wakefield.

Foreign Tress for Topeka

Topeka, Kan.—The United States Bureau of Plant Industry, Peter Bissett, expert plant introducer, will send to Superintendent of Parks E. F. A. Reinisch a number of each of 11 species of foreign trees to be planted in the park nurseries. Eight species from China and one each from Russia, Madeira and Arizona. Two species of five plants each are Conifers: a pine from China, attaining a height of from 80 to 100 feet, bearing edible nuts, and a cypress from Arizona 40 to 70 feet high when full grown. The plants are sent here for trial to test their hardiness in this climate and other characteristics. They will be closely observed and reports made to the Department of Agriculture, Bureau of Plant Industry. The plants remain the property of the city and will be used in permanent park planting.

Public Playground Needed

Michigan City, Ind.—Steps were taken last week at the Common Council meeting to provide Michigan City with a public playground. A communication was submitted by a committee of the Charities Association asking the Council to look into the matter and upon motion of Councilman Hanley a committee was appointed to meet with the association's committee to talk the matter over.

Census Dispute at Joliet

Joliet, Ill.—Joliet officials declare they are prepared to claim a mistake in the count in the census figures for this city. While the census department found only 34,670 people the post office department reported it serves daily 47,789 patrons. A record was kept for seven days by the twenty-seven carriers and it was learned that each served an average of 1,733 people and an average of 409 places. Figured on a basis of four and one-half to a family this makes a population of approximately 46,000.

Rebuilding City Hall

Cumberland, Md.—Work has been started on the new City Hall for Cumberland, on the site of the structure destroyed by fire a year ago, by Henry L. Brown, of Philadelphia, the contractor. It is rumored that some citizens opposed to the erection of the City Hall at this time will try to stop the work by injunction.

Land Outside City Limits Acquired for Park

Spokane, Wsh.—The Spokane Park Board has acquired 124½ acres of land outside the city limits for a park. Superintendent of Parks John W. Duncan states that he has made no plans for the improvement of the new park, which as yet has no name.

Artistic Cement Work May Be Done by City

Los Angeles, Cal.—Artificial stone seats and other cement work in the parks may be made soon by a separate department of the city under the direction of the Park Board, if present plans do not miscarry. The equipment necessary to work of that kind is said to cost comparatively little, consisting mostly of a designing room, pattern shop and small work room. In addition, a man who is an artist, designer and workman all in one is said to be necessary, and the members of the Park Board declare there is just such a man employed in the department now. If the cement plant is established he probably will be placed in charge.

Free Meals at Schools

Boston, Mass.—A bill has been introduced in the Legislature providing for free meals for children at public schools. It is said that if a child does not get sufficient food to develop the brain he is wasting time in school. The plan of feeding school children is very generally followed in Europe and has been adopted in some cities of the United States.

Attempt to Force Wires of Telephone Under Ground

El Paso, Tex.—The first move for burying the telephone and telegraph wires underground in the residence district is being made. The property owners along Upson avenue from Santa Fé to Fisher streets are making an effort to have the telephone and lighting wires placed in conduits under the surface of the street before the paving is laid. The conduit for the telephone wires into the Anson Mills Building has been laid across Pioneer plaza and the paving replaced. The conduit leads from the cable in "Sheldon avenue" to the basement entrance to the Mills building.

Offer Prizes for Beautification

Norfolk, Va.—Public-spirited citizens have offered cash prizes amounting to about \$200 in an effort to interest people in beautifying the city. The points of excellence upon which the judges to be appointed by the Woman's Club, Board of Control and Business Men's Association will render their awards are: 1. The best kept grass lawn in the city. 2. The best kept parkway-areas and street trees in the city. 3. The most artistic arrangement of shrubbery, flowers and trees upon the lawn. 4. The most beautiful vine or rose-covered house or porch in the city. 5. The most beautiful vines and plants inside or outside window boxes in the city. 6. The neatest, cleanest and best kept school ground and the street block of which the school grounds form a part, in the city. 7. The cleanest and best kept back premises, yards and gardens in the city.

Council Rewards a Horse

Minneapolis, Minn.—Twenty years of faithful service given the city by a horse so moved the hearts of the city fathers that they voted a reward of merit to the deserving animal. The horse is Billy, which has been running with the ambulance. Chief Corrison pleaded with the police committee to retire the horse to a life of ease for the rest of its days, and the committee recommended to the Council that this be done. Billy was turned over to the Humane Society and will be left to roam at will about the workhouse farm.

St. Louis Plans for a City Beautiful

St. Louis, Mo.—The bill establishing a City Plan Commission to plan for a City Beautiful was passed by the House of Delegates last week and now goes to the Mayor. The bill carries no appropriation and provides for a commission of 15 members.

File Petition for Park Plan Election

Columbus, O.—The petitions which the Chamber of Commerce have had in circulation for several months asking for a special election on the question of creating a park commission for Columbus have been filed with the Board of Elections. They have practically double the number of names required for the calling of the special election, and, according to the law, the Election Board has no alternative but to fix the date and make other arrangements for the election. It is expected the date will be announced within the next few days. The law provides for the calling of the election within 30 days after the filing of the petitions.

City to Acquire State Fair Grounds

Memphis, Tenn.—Memphis is considering the matter of purchasing the grounds of the Tri-State Fair, formerly Montgomery Park, one of the best race courses in the country, and making of it a public park and a place for the annual fair. It is proposed to issue \$400,000 or \$500,000 in bonds for the purchase and improvement of the property. The proposition is to operate it on the plan adopted in Dallas to meet similar conditions. The Dallas plan of maintaining an agricultural and live stock exhibition, which is recognized as one of the leading public attractions of its nature in the United States, was adopted after the fair was operated for a number of years at a financial loss. It was seen that they could not go further without public aid and the city of Dallas then came to the rescue with a scheme similar to the one proposed for Memphis. During the days of the Fair in Dallas the Fair Grounds are in charge of the Fair Association. During the rest of the year it is in the hands of the city and is used for public park purposes. The contract entered into between the city and the Dallas Fair Association was signed in 1904. Since that time it is said the association has earned net something over \$450,000, besides paying out nearly as much in premiums and prizes, \$350,000 in permanent improvements and having left a cash balance of about \$65,000. The city of Dallas has derived the benefit also in the visitations of over two and a half million people since 1904 and has sent its name far and wide on the merits of the annual exposition. The contract between the Dallas association and the city of Dallas further provides that the city shall assume no liabilities incurred by the agricultural show, that the city shall have the use of the grounds eleven months and a half each year for park purposes, that the earnings of the association shall be used in maintaining the park and that the balance, if there is any, shall go to the fund for retiring the bonds.

Municipal Dental Clinic Started

Tacoma, Wash.—An entirely new form of philanthropy is to make its appearance in Tacoma this Spring. Children of the poor are to have their teeth examined free of charge by the best dentists in the city, who will fill cavities, stop decay and relieve sufferings of the little ones who are at present obliged to exist in agony because their parents or guardians lack the means to pay for dental care. The dentists, through the Tacoma Dental Society, will take turns giving their services free of charge, receiving the little sufferers every Saturday afternoon in a municipal dental clinic to be established in the City Hall.

Expert Plans Park for City

Tacoma, Wash.—S. J. Hare, the noted Kansas City landscape architect, has arrived in Tacoma to study the great reserve of 637 acres preparatory to providing the Park Board with general and detail plans for its development. Mr. Hare's work will consist of preparing a scheme to be followed by all who may hereafter undertake to beautify the park. It will consist of opening new roadways, providing proper drainage systems, locating propagating houses, outlining what is needed for adequate fire protection, planning walks, drives, picnic grounds, re-arranging the zoo and adding new features to it, setting aside room for a palm house and a water garden for tropical plants and birds in connection with it, besides making innumerable recommendations relative to improvements which may suggest themselves from time to time. A boulevard system leading to the park is one of the important additions that will be provided when possible to make the approach so much like the park itself that one would scarcely know when he entered it.

Child Labor Law Affects Many

Evansville, Ind.—Between 400 and 500 children between the ages of fourteen and sixteen years will be affected in Evansville and thrown out of employment when the new child labor law becomes effective the latter part of April or early in May. Heeding the bulletin issued last week from the legal department of the Indiana Manufacturers' Bureau advising all manufacturers to discharge all children between the ages of fourteen and sixteen by April 1 many Evansville men who employ children have begun to lay off those who will be prohibited from working under the new law.

LEGAL NEWS

A Summary and Notes of Recent Decisions—Rulings of Interest to Municipalities

Defective Crossing—Negligence

Gallagher vs. City of Tipton.—There can be no recovery for injuries to a pedestrian from stepping off from a gutter crossing constructed on a general plan of street improvement adopted by a city, but if the crossing is not an ordinary one over a gutter, but the city has negligently constructed the crossing over a deep hole without placing guard rails at the crossing or maintaining a street light there, the city will be liable for injuries received from stepping off from such a crossing.—Kansas City Court of Appeals, Missouri, 133 S. W. R., 135.

Construction of Charter—Initiative and Referendum

Southwestern Telegraph & Telephone Co. vs. City of Dallas.—Dallas City charter, granted by Special Acts Thirtieth Legislature, provides by Chapter 71, Article 3, Paragraph 1, that all powers conferred on the city, unless otherwise provided, shall be exercised by the mayor and four commissioners designated as the board of commissioners. Article 2, Section 8, Paragraph 27, gives the city power, by ordinance, to regulate and fix the charges of local telephones. Paragraph 7 provides that "the right is hereby delegated to the city of Dallas, acting through its board of commissioners," to regulate the charges made by corporations, etc., exercising a public privilege and to change such regulations, but forbids such change except after notice and a fair hearing. Article 8, Paragraph 1, provides that "any proposed ordinance" may be submitted to the board by petition signed by 5 per cent. of the electors voting at the last mayoralty election, when the board shall submit such ordinance without alteration to a vote of the people, and upon its adoption by a majority of the electors it shall go into force. Article 2, Section 1, Paragraph 2, provides that the specification of particular powers shall not be a limitation upon the general powers granted, the intention being that the city shall exercise all powers of municipal government not otherwise prohibited. Held, that Article 8, Paragraph 1, did not authorize a submission to the electors of ordinances upon any subject of legislation named in the charter, but only upon subjects to which the initiatory method was applicable, and an ordinance regulating telephone rates could not be presented to the electors for adoption, since a fair hearing on the reasonableness of the rate fixed, as required by Article 2, Section 8, Paragraph 7, could not be had by that method, and hence such an ordinance adopted by the electors was invalid.—Supreme Court of Texas.

Defective Sidewalk—Proximate Cause of Injury

City of Franklin vs. Smith.—In an action against a city for personal injuries sustained by a defective sidewalk the complaint alleged that, while plaintiff was walking along the sidewalk exercising due care, suddenly and without fault of plaintiff "he was precipitated violently to the sidewalk, his feet striking the said raised flagstone at said point on said sidewalk with such force that the first metatarsal bone of the right foot was fractured and broken." Held, that the complaint did not allege that the negligent condition of the sidewalk was the proximate cause of plaintiff's injuries and was demurrable on that ground.—Supreme Court of Indiana, 93 N. E. R., 993.

Selection of Paving Material—Bonds

Bell et al. vs. City of Shreveport et al.—Under the provisions of Act No. 10 of 1896, empowering cities to improve streets and alleys and to levy special taxes on abutting real estate and railroads, the paving material must be selected by the council before bids are invited and the bids must be for cash. Where by a vote of the taxpayers a city council was authorized to levy special taxes and to issue negotiable bonds for paving purposes the insertion in the submission ordinance of a provision that the bonds may be negotiated for work does not affect the validity of the bond issue.—Supreme Court of Louisiana, 53 S. R., 928.

Municipal Electric Plant—Prior Franchise

Houma Lighting & Ice Manufacturing Co., Limited, et al., vs. Town of Houma et al.—A contract made by a municipality for some public improvement, payable out of the revenues of future years, will not be interfered with by this court when the evidence shows that it is reasonable and that the financial condition of the municipality is such as to warrant the belief that the future revenues will be sufficient to pay for it without exceeding the limit of taxation. The granting by a municipality of a franchise to operate a lighting system does not confer an exclusive privilege on the grantee and does not prevent the municipality from subsequently erecting a system of its own.—Supreme Court of Louisiana, 53 S. R., 970.

Violation of Ordinance—Findings—Conclusiveness

Stutsman vs. City of Cheyenne.—A judgment rendered on conflicting evidence on a trial for a violation of a municipal ordinance will not be disturbed by the Supreme Court on writ of error.—Supreme Court of Wyoming, 113 P. R., 322.

City Employees—Hours of Labor

State ex rel. Pleasant, Co. Atty., vs. City of Ottawa et al.—Section 1, Laws 1891, providing that eight hours shall constitute a day's work for all laborers, workmen, mechanics or other persons employed on behalf of any city of the State, applies to the engineers and firemen who operate the water and electric light plant of the city of Ottawa.—Supreme Court of Kansas, 113 P. R., 391.

Use of Street by Railroad—Injunction

New York Central & Hudson R. R. Co. vs. City of New York.—Where the State Legislature, pursuant to an exclusive right, granted a franchise to a railroad company to occupy certain streets in a city for railroad purposes, and the railroad company, in the exercise of such franchise, maintained tracks in the streets for many years, the right to enforce a removal of the tracks, if any, either as a nuisance or because the franchise had expired by limitations, vested in the State and not in the municipality.—New York Supreme Court, 127 N. Y. S., 513.

Care of Streets—Negligence

Josupeet vs. City of Niagara Falls.—The liability of a city for negligence of its agents in keeping the streets in condition is not limited to the traveling public, but extends to the safety of its employees, and the provisions of the employer's liability act apply to cities as well as to individuals or private corporations, and hence a city is liable for the negligence of a foreman of a street gang in directing an employee to work under an overhanging bank which had been cracked by dynamite, of which he was ignorant, so that he was injured by the fall of the bank, the act of the foreman being that of a vice principal.—New York Supreme Court, 127 N. Y. S., 527.

Change of Grade of Street—Benefits

Powell et al. v. City of Columbia.—The benefits that may be considered, in reduction of damages to abutting property by a change of grade of a street, are only the special benefits conferred on the property by the grading of the street, as distinguished from the benefits to all the property in the locality, and not the benefits conferred by the paving and curbing of the street.—Kansas City Court of Appeals, Missouri, 134 S. W. R., 76.

Contractors' Bonds—Liability of Sureties

Board of Education of City of St. Louis v. United States Fidelity & Guaranty Co.—Under Rev. St. 1899, requiring contractors for public work to give bond to secure payment for materials and labor, whether by subcontract or otherwise, and giving materialmen and laborers the right to sue on the bond, a bond which stipulates for the payment to the persons furnishing materials used in the work, and which authorizes an assignment of the bond to subcontractors, materialmen, and laborers, who at the instance of the contractor have furnished work or material for the work, binds the surety to answer for the default of the contractor, or the school authorities on the default of the contractor, but does not bind the surety to answer for the default of a third person unless he derives his right to do the work by contract with the contractor.—St. Louis Court of Appeals, Missouri, 134 S. W. R., 18.

MUNICIPAL APPLIANCES

Division Plate for Constructing Cement Curb and Gutters

Rocco De Gregory, Easton, Md., has invented a form holder and division plate for use in the construction of combined curb and gutter. The plate is made of metal 3-16 or 1/4 inch thick and of a size conforming to the width of gutter and depth of curb. Practically no braces, cleats, clamps, stakes or support of any kind are needed with the use of the above plate. It is pro-

vided with slots or recesses open at their upper end and of a depth to receive the wooden forms or strips. The pivoted latches B are turned on against forms which are thus forced tightly against that part of plate forming curb and gutter. The forms are made thinner than the width of slats, so that they can be removed easily. In fact, the pivoted latches B being rounded, receding backward at their lower end, get loose automatically when the finisher takes the forms apart; a gentle lift is enough to take each form up.

The plate is also provided at its lower ends with vertically adjustable legs C formed of steel slotted strips, through which extends a thumb screw. By properly adjusting these legs the plates may be supported, even though the surface may be uneven.

The plate is made higher at the curb and the gutter forming portions D than the extensions forming slats E so that when forms are in place nothing is in the way; and even edging tools can be run over edges to give same a slightly appearance.

The slot in front of curb F is beveled at lower end and so is the form that goes in it that the finisher may finish gutter surface up to curb before taking any of the forms off.

The slot at end of the gutter forming portion of plate G is made of the exact width of strip at bottom, usually 2 inches for 2 x 4 strips, and 1/4 inch wider at top where latch C forces it against plate. Form holders for sidewalks are made like slot, leg and latch at gutter forming end of plate G, C, B and E and rounded on edges D.

Form holders for single curb or coping are made with deep slots like the part forming back of curb; the front slot widening or battering downwardly to give that cross section of curb the proper shape.

In order to supply the wants of those not believing in clean-cut joints, a portion of lower edge of plate can be cut away, A, see dots, that the combined

curb and gutter may have a continuous bond at that place.

The wooden forms after planing and shaping them to fit loosely in slots are provided with angle irons on edges to make them rigid and to protect edges from wear. They are rabbeted on the ends so as to fit the next one and can be joined any where either right on slots or plates or between plates, then joints at suitable intervals can be provided in walks or in curb and gutter by the use of a number of plates.

Leading from the lights and bells are wires running to a switchboard in the station by which means the system is worked. In place of a patrol box there have been erected small enclosure throughout the precinct in which there is a telephone connected with the station house and also a button similar to the hook used in the present patrol boxes, by which means a wagon call may be sent to the station house by touching the button.

If at any time a patrolman is wanted his post number is touched on the switchboard in the station house, and it happens to be at night the little red light on his post will brighten up and he will answer the telephone in the box. If it happens to be during the day the bell attached to the red light wiring, at the same time informing him that he is wanted at the station house.

In lifting the receiver of the telephone in the boxes the patrolman registers his time the same as pulling a lever in the present system. A large card is arranged in the station house and as the receiver opens a hole opposite the post number and time is registered.

The system will make it a trifle easier for the patrol sergeant in locating his men, but he will be required to visit them on their posts just the same.

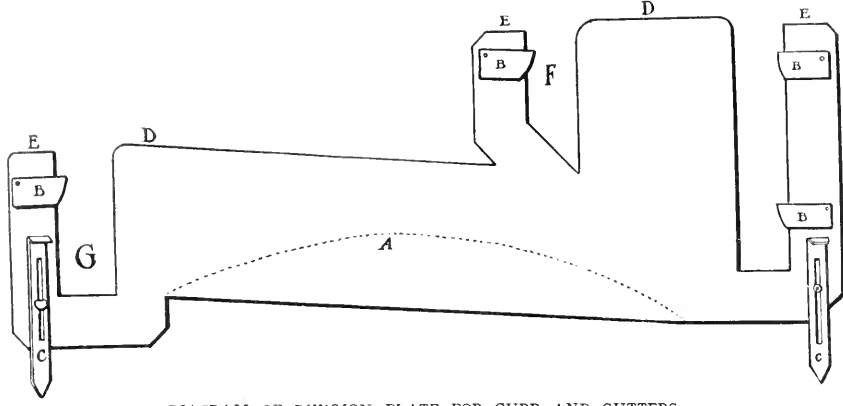


DIAGRAM OF DIVISION PLATE FOR CURB AND GUTTERS

Police Signal System

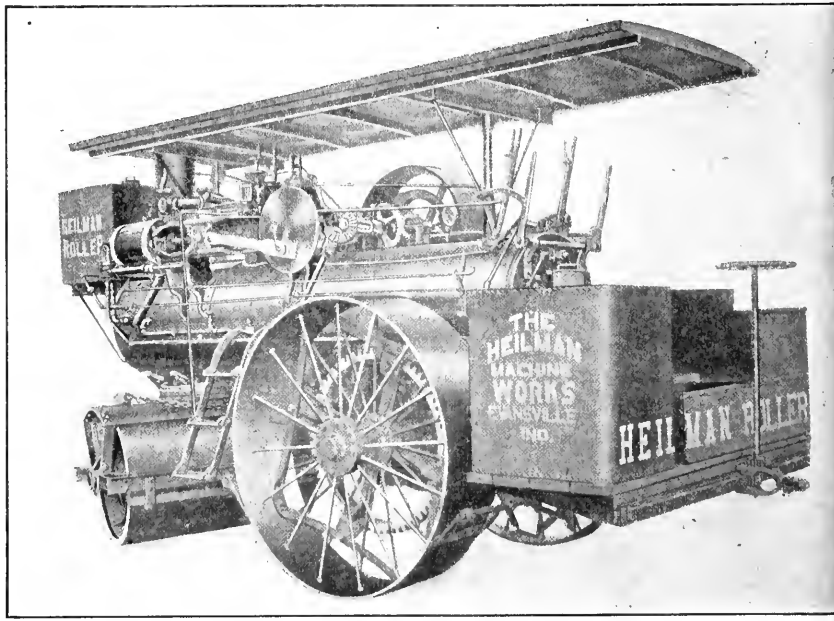
What is known as the Miller plan for calling patrolmen while on duty, the system owned by the National Police Signal Company, 200 Ellicott Square, Buffalo, N. Y., may be adopted by the Niagara Falls, N. Y., Police Department in the near future. Lewis Miller, formerly connected with the Rochester Police Department, is the inventor of the new plan, and he expects to demonstrate its working to the Police Commissioners in a short time. The plan has been tried in Rochester and other cities and has been found to work successfully.

At equal distances apart on an officer's post a galaxy composed of more than 60 red lights to which is attached

Traction Road Roller

The Heilman Machine Works, Evansville, Ind., manufacture a traction road roller, shown in the illustration, suited specially for road construction. To facilitate the use of road scrapers and plows drawn by the engine an adjustable hitch bar has been devised for adjusting the hitch to either side of the platform. The following are some of the details of the specifications:

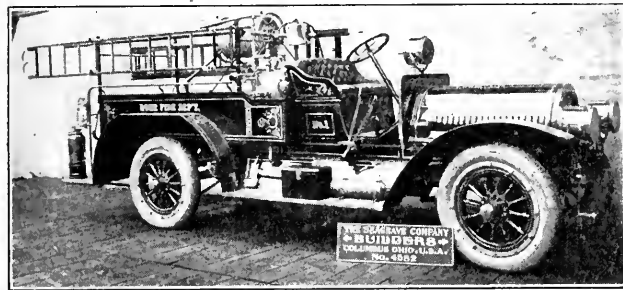
The boiler shell is 5-16 inch thick double riveted. The crown sheet and



TRACTION ENGINE AND STEAM ROLLER

sides of fire box are 5-16 inch thick, and both flue heads and throat sheet are 7-16 inch, wagon top sheet is 5-16 inch thick. All rivets are $\frac{5}{8}$ inch diameter spaced according to Hartford Steam Boiler Insurance & Inspection Company's rules. The stay bolts are 13-16 inch thick, spaced $4\frac{3}{4}$ inches between centers. The boiler is guaranteed for a safe working pressure of 150 pounds per square inch.

The engine has the Heilman spring semi-balanced valve, girder type frame, improved reverse motion, friction clutch and power steering gear. Rear drive wheels are 67 inches diameter, 18 inches face, 2 inches thick rim fitted with removable taper shank spurs or spikes (for plowing and breaking up roads) and taper steel plugs for clos-



SEAGRAVE MOTOR COMBINATION HOSE AND CHEMICAL WAGON.

ing the holes when used as a roller. The hubs of the wheels are fitted with removable thimbles or boxes. The engine is double geared, and the master gears are $4\frac{1}{2}$ inches face, 2 inches pitch. All of the gearing is made of an alloy of best cast iron and steel; the compensating gears are of the best cast steel.

The forward roller is composed of four (4) heavy cast wheels turned smooth, with a total width of 58 inches. These wheels turn loosely on a 4-inch shaft which is supported in suitable cast boxes riveted to a steel saddle frame, which in turn is fastened by an arched cast steel double trunnion to the saddle under the shell of the boiler, having ball bearings, making a durable, revolving table for easy steering, which adapts itself to the unevenness of the ground. The forward roller will tilt 13 inches either end without striking the boiler and either hind roller may rise 16 inches above the other, while the front roller remains level. Spring tension scrapers are provided for cleaning the wheels.

Combination Motor Wagons

THE Seagrave Company, Columbus, O., have furnished to the city of Rome, Ga., one of their motor combination hose wagons and chemical engines, shown in the illustration. The chemical tank has a capacity of 50 gallons. Two hundred feet of chemical hose are carried on a reel. The wagon body has a capacity of 1,000 to 1,500 feet of $2\frac{1}{2}$ -inch fire hose. The ladder equipment consists of a 16-foot roof ladder and a 24-foot extension ladder. The apparatus is driven by a Seagrave blower cooler motor. The four cylinders are $5\frac{3}{4}$ -inch bore, 6-inch stroke. The horsepower is 50. The transmission is three speed. The drive is by double chains to rear wheels. Speed, 40 miles an hour. The frame is channel steel braced with cross members. Tires in the Rome engine are pneumatic, but on account of the strong frame solid tires may be

used. There are two large gas headlights in front and a revolving searchlight on the dash. All lights are filled with electrical lighters.

Contractor's Motor Dump Wagon with Steel Tires

THE Briggs Labor Saving Specialty Company, Waterloo, Ia., have placed on the market a motor-driven dump wagon which on account of the use of iron wheels they expect will prove to be a practicable wagon for the use of contractors. The cost of the wagon is, of course, far below that of the dumping trucks so far manufactured by automobile manufacturers and the cost of rubber tires is eliminated. To accomplish this result something has to be sacrificed in the way of speed. The wagon is built at present in two sizes, two yards and two and a half.

A lever at the side of driver's seat provides means for tilting the box or body. As the box or body is dumped the end gate swings up automatically. The box is so balanced and supported that it does not touch the ground when dumped. Box is returned from dumping position to loading position by crank used in starting engine which fits shaft of drum on which cable connection with top of box is wound. The wheels are of solid metal with flat treads and lugs. The drive is from sprocket on transmission to center sprocket on differential or jack shaft. From the jack shaft the drive is taken to rear wheels by means of chains. The sprockets are provided with cut teeth. "Diamond" roller chains are used throughout. The construction of the differential shaft or jack shaft is very substantial. The main shaft extends the entire length across frame and drives the small sprocket on one end. The sprocket on opposite end is driven by a sleeve from differential. The hangers for mounting differential shaft to frame are provided with roller bearings also with an adjustment for taking up any slack in the chains.

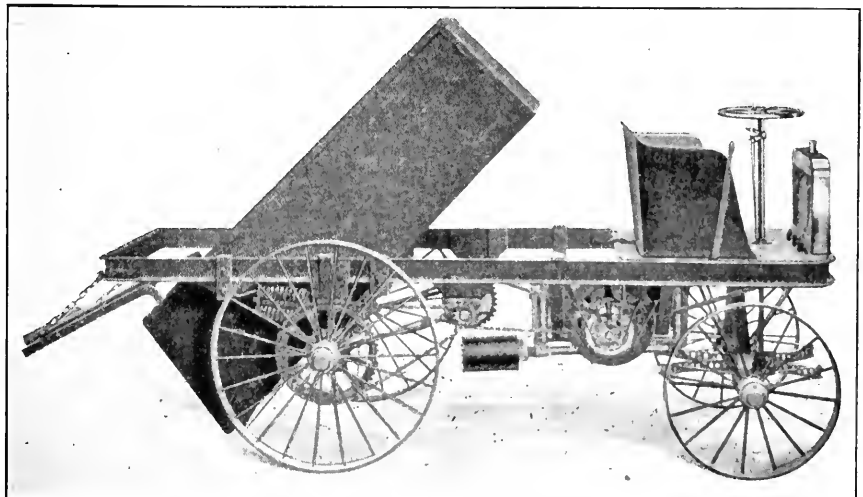
The transmission is of the planetary type which gives two speeds forward

and one reverse. There is no shifting of gears, as all gears are always in mesh. On high speed, 8 miles per hour, no gears are in action. A brake is provided on transmission. This brake is operated by a foot pedal. The low speed and the reverse speed are also operated by foot pedals. A lever at right of driver's seat operates the high-speed clutch. When this clutch is thrown in all gears are locked and the entire transmission revolves as a unit. The governor throttle control, also the spark advance control, is mounted just below the steering wheel, as shown in illustrations.

The motor used on this wagon is the Model E motor manufactured by the Anderson Motor Company, Anderson, Ind. This motor is of the horizontal opposed type, $5\frac{1}{2}$ -inch bore by 5-inch stroke. The engine is equipped with a six feed mechanical oiler, magneto, water pump, timer, Schebbler carburetor and all accessories. The motor with transmission attached next to fly wheel is mounted under the frame by means of heavy iron straps. The crank case is of gray iron of a design rendering it very strong for its weight. It is composed of two pieces, divided longitudinally through the crank case bearing center, thus permitting the top half to be removed without tearing down the whole engine. The lower half can also be removed without taking the engine apart. The cylinder and valve boxes are cast in one piece and are completely surrounded by water jackets. Lubrication is accomplished by means of a mechanical oiler driven by a spiral gear on time shaft inside of crank case.

New Sprinkling and Flushing Hydrant

The Mueller Manufacturing Company, Decatur, Ill., and New York City, has placed a new sprinkling and flushing hydrant on the market. It is designed for either public or private use. It is especially urged for public use to obviate the use of fire hydrants for any other purpose than that of the suppression of fires. In private installations it is of service in garages, markets and manufactories or, in fact, wherever large quantities of water are needed for flushing or sprinkling. The connection at the main is made with a Mueller corporation cock. The top of the box is flush with the curb. All iron parts are galvanized and the other parts are of brass. The box delivers a 2-inch stream and is made in lengths of $2\frac{1}{2}$ to 8 feet.



CONTRACTORS' MOTOR DUMP WAGON.

NEWS OF THE SOCIETIES

Memphis-to-Bristol Highway Association.—The association was organized for the purpose of building a highway across the State of Tennessee, a distance of about 540 miles. Branches have been organized in 38 counties and 15,000 men have signed an agreement to work for two days on the construction of the road. The sum of \$50,000 has been subscribed for bridge and culvert material, signboards, road material, lumber, road machines and various supplies needed. An overseer has been selected for sections of a mile or less. Assistant overseers have been appointed for sections of 900 feet. August 14 and 15 have been selected for constructing the road. By that time the materials will be delivered along the road where needed. Arrangements have been made for feeding the men, and it is expected that 25,000 men will report for work at the time selected and that the work will be finished.

National Electric Light Association.—A public meeting will be held April 8 at the Engineering Societies' Building, New York City, to discuss the relation of the National and State Governments to the conservation and utilization of water power.

Fire Chiefs of West Virginia.—Chief Altmyer, Wheeling, has taken the initiative in the formation of a State Fire Chiefs' Association.

Engineers' Society of Northwestern Pennsylvania.—Members of the society are considering the investigation of problems of public interest. If the plan is followed out special committees will be appointed to make reports to the society and these reports may be given to the public, thereby providing valuable information for the people from the standpoint of engineers who look at the practical side of the questions. The trolley questions and water department problems have been suggested as proper fields of inquiry. City Engineer B. E. Briggs, who is at the head of the society, is favorable to the proposed idea of making special investigations. He has already appointed one of the members to get information on the garbage disposal plant idea as worked out in other cities and reported in scientific journals. The engineers met last week to hear a talk on a new style of heating and ventilating from an expert.

Municipal Engineers of the City of New York.—At the regular meeting, March 22, a paper on "A Proposed Method of Interpreting the Elevations of All Portions of a Street Surface from the Established Grades" was read by Vernon S. Moon. On Saturday afternoon, March 25, an excursion was made to the new plant of the Consolidated Gas Company, Astoria, Long Island.

Road Supervisors of Washington County, Pa.—The annual convention was held at the Court House, Washington, Pa., March 21. The topic, "Road Legislation and Laws," was discussed by State Senator Carter Judson and Representatives Feeney, Holland and Bentley. R. W. Irwin spoke on "Roads of To-day, and How They Can Be Improved." William Wylie, Washington, D. C., spoke on "The Best Way to Grade and Drain Clay Roads." Boyd E. Warner spoke of "The Care of Improved Roads in the Country." There was a general discussion on the methods of constructing bridges and culverts.

Indiana Municipal League.—The program for the annual meeting of the league, which meets at Marion, Ind., in June, was completed at a meeting of the program committee and the local committee. Lemuell Darrow, Mayor of Lafayette, president of the league and chairman of its program committee, and Joseph T. McNary, excouncilman of Logansport and a member of the committee, were present, together with Fred B. Robinson, Marion, third member of the program committee. The local committee was composed of Finley P. Mount, city attorney, chairman; Bernard Price and M. L. Claypool, councilmen; S. M. Coffman, of the Commercial Club, and A. A. McClain, editor of the Crawfordsville "Journal."

The two committees met in the Elks' home and spent most of the morning and afternoon in formulating the program. The committees first decided that the meeting should be held in the Masonic Temple Tuesday, Wednesday and Thursday, June 20, 21 and 22. The program, subject to slight changes, was arranged as follows:

Tuesday, June 20, 10 a. m.—Reception of visitors. 1.30 p. m.—Welcome address, Mayor Wert, Crawfordsville; response, Mayor Lew Shank, Indianapolis; How Can Cities Develop Parks and Playgrounds? Prof. Woods, superintendent of South Bend School; discussion, Prof. M. B. Thomas, Wabash College; Should Cities Be Authorized to Appropriate Money for Public Band Concerts? John O. Willson, Mayor of Marion; discussion, Paul Jameson, of Newcastle. 7.30 p. m.—Should Women Be Permitted to Vote in City Affairs? (by prominent women to be selected;) Can the Smoke Nuisance Be Eliminated? W. K. Martin, of Crawfordsville; discussion, Samuel E. Spohn, Mayor of Goshen; Building a City; Mayor Thomas C. Knotts, of Gary; discussion, F. B. MacGregor, of Madison; Home Rule for Cities, A. E. Veneman, Speaker of the House; discussion, Judge Timothy E. Howard, President of City Council of South Bend; ten-minute talks by citizens of Crawfordsville; opening of query box.

Wednesday, June 21, 9.30 a. m.—Report of the meeting of the League of American Municipalities at St. Paul. Does the Proposed Constitution of Indiana Benefit Cities and Towns, and Does the 2 Per Cent Limit on Indebtedness Prevent Ownership of Public Utilities? E. B. Stotsenburg, of Evansville; discussion, F. P. Mount, of Crawfordsville; Should the Public Accounting Law Be Amended or Repealed? Jonas G. Howard, Councilman of Jeffersonville; discussion, Senator Hauck, city attorney of Lawrenceburg; How Shall the Price of Water, Gas, Electricity and Heat Be Regulated When Furnished by Private Corporations? Judge Lawrence Becker, of Logansport; Should the Street Improvement Law Be Amended, and Should Cities Pay Any Part of the Assessments Against Street and Alley Crossings? City Attorney of Terre Haute; discussion, Mayor Foster, of Anderson; exhibition run by city fire department. 1.30 p. m.—Reports of section leaders of the league; opening of query box. Track Elevation and Grade Crossings, Henry C. Hogan, city attorney of Fort Wayne; discussion, Senator Robert E. Proctor, city attorney of Elkhart; District Workhouses, the Rev. Mr. Kiplinger, chaplain of prison at Michigan City; discussion, Mayor W. W. Zimmerman of Richmond. Should Mayors of the Fifth-

Class Cities Appoint Police and Fire Departments and City Attorney? John Harris, Mayor of Bloomington; discussion, Frank A. McCauley, Councilman of Huntington; Municipal Initiative, Referendum and Recall, Roy Shattuck, of Brazil; discussion, A. D. Cuningham, City Attorney of Lafayette; Municipal Sanitation, Ezra Shoccraft, of Purdue University; discussion, Dr. E. C. Laehr, Mayor of Noblesville; Wednesday evening to be filled by local committee.

Thursday, June 22, 9 a. m.—Query box; Pedestal Cluster Lights; How to Get Them, Elza Rogers, Mayor of Lebanon; discussion, John Herzog, Mayor of Mishawaka; Collection and Disposal of Garbage, Dr. D. A. Davidson, Mayor of Princeton; discussion, James D. McDowell, Mayor of Vincennes; Shall School Trustees Be Elected by the People? Albert J. Field, Mayor of Bedford; discussion, J. B. Cooper, City Attorney of Columbus. Various social events will be arranged for the visitors by the citizens of the city.

Municipal Art Society of Hartford, Conn.—A municipal exhibit under the auspices of the society is being held in the Donchian Building. On the landing at the head of the stairs is a collection of fine pictures under the society's special direction which City Engineer Frederick L. Ford obtained while in Europe in 1909. One of these shows what is what in Berlin in the way of street signs. Another picture preaches that Munich is clean because women do the street cleaning. Yet another is a view of the statue of Lafayette in the Louvre.

Just inside the main hall is a set of placards showing statistics about the work of various city departments. For instance the collector in 1889 dealt with a far different situation than he does now. The total amount of the tax assessed in that year was \$1,399,201.99 and in 1908 it was \$1,653,685.83. The amount of money collected has increased and the cost of collecting has decreased. Next to the placards is the Police Department booth. This has a picture of Chief Gunn, who is in charge part of the time. Detective Sergeant Henry L. Hart is in charge the rest of the period. The new red light system is shown by a practical model. The Bertillon system is also demonstrated. The police roster for 1866 is shown, and is to be contrasted with that for the present year. Then there are riot guns and surgeons' instruments and handcuffs and other things interesting to ordinary observers of the "finest" in the world.

Association for Standardizing Paving Specifications.—This is now the name of the society formerly known as the Organization of City Officials for Standardizing Paving Specifications. Copyrighted proceedings of the meeting held in New York in January of this year are now ready for distribution. Information relative to membership, use of copyrighted matter and cost of proceedings will be furnished upon application to the secretary, John B. Hittell, Chief Engineer of Streets, City Hall, Chicago.

Wisconsin Association of Police Chiefs.—The legislative committee of the association, which includes 70 cities in its membership, recently appeared before the Legislature to urge the passage of the Albers bill, which authorizes Fire and Police Commissioners of all cities, excepting Milwaukee, to fix the salaries of the members of the Fire and Police Departments under them. At present this authority is vested in Common Council.

Congress of Technology.—Among the papers to be presented at the Congress of Technology, Massachusetts Institute of Technology, Boston, Mass., April 10-11, 1911, are the following:

The Life-Saving Corps of the Technical School, Severance Burrage, '92, Professor of Sanitary Science, Purdue University, Lafayette, Ind.; The Technical School Man in Public Health Work, Harry W. Clark, '85-'87, Chief Chemist, State Board of Health, Boston, Mass.; Sewage Disposal with Respect to Offensive Odors, George W. Fuller, '90, consulting hydraulic engineer and sanitary expert, New York City; The Pollution of Streams by Manufacturing Wastes, William S. Johnson, '89, sanitary and hydraulic engineer, Boston, Mass.; Profitable and Fruitless Lines of Endeavor in Public Health Work, Edwin O. Jordan, '88, professor of bacteriology, University of Chicago, Chicago, Ill.; Present Status of Water Purification in the United States and the Part That the Massachusetts Institute of Technology Has Played, George C. Whipple, '89, consulting engineer, New York City; Factory Sanitation and Efficiency. C.-E. A. Winslow, '99, associate professor of biology, the College of the City of New York, New York City.

American Society of Civil Engineers.—A committee consisting of seven members of Chattanooga and ten members of surrounding cities has been appointed to attend to local arrangements in connection with the annual convention to be held at Chattanooga, Tenn., June 13-16. The names of this committee are as follows: William Dunbar Jenkins, chairman; E. E. Betts, H. S. Bosler, W. H. Converse, J. A. Fairleigh, C. H. Fisk, D. H. Wood, all of Chattanooga; W. W. Harts, Major U. S. E., Nashville; G. F. Rowell, Guild, Tenn.; W. M. Gardner, Memphis; W. H. Courtenay, Louisville, Ky.; J. W. Kendrick, Birmingham, Ala.; J. N. Hazlehurst, Atlanta, Ga.; T. G. Dabney, Clarksdale, Miss.; W. S. Lee, Charlotte, N. C.; J. E. Sirmine, Greenville, S. C.; W. F. Reichardt, Little Rock, Ark.

Calendar of Meetings

- April 6-8.**
American Electrochemical Society.—Annual Meeting at New York City.—Secretary, Joseph W. Richards, Lehigh University, South Bethlehem, Pa.
- May.**
City Commission Congress.—Meeting, Galveston, Tex.—Mayor Lewis Fisher, Chairman of Committee, Galveston, Tex.
- May 11.**
Massachusetts Highway Association.—Quarterly Meeting in conjunction with the New England Conference on Street Cleaning, Springfield, Mass.
- May 15-17.**
National Conference on City Planning.—Philadelphia, Pa.—Flavel Shurtliff, Secretary, 19 Congress street, Boston, Mass.
- May 18-19.**
Ohio Society of Mechanical Steam and Electrical Engineers.—Annual Convention, Youngstown.—F. E. Sanborn, Secretary, Ohio State University, Columbus.
- May 23-25.**
National Fire Protection Association.—Annual Meeting, New York City.—F. H. Wentworth, Secretary, 87 Milk St., Boston.
- May 23-26.**
National Good Roads Association.—Fourth National Good Roads Congress, Birmingham, Ala.—J. A. Rountree, Secretary, Birmingham, Ala.
- May 29-June 2.**
National Electric Light Association.—New York City.—T. C. Martin, Secretary, 31 West 39th St.
- June 5-14.**
National Probation Officers' Association.—Boston, Mass.—Roger N. Baldwin,

Secretary, 903 Security Building, St. Louis, Mo.

June 6-10.
American Water Works Association.—Thirty-first Annual Convention, Powers Hotel, Rochester, N. Y.—John M. Diven, Secretary, 14 George street, Charleston, S. C.

June 7-14.
National Conference of Charities and Correction.—Boston, Mass.—Alexander Johnson, Secretary, Ft. Wayne, Ind.

June 7.
National Association for the Study and Prevention of Tuberculosis.—Denver, Col.—Dr. Livingston Farrand, Executive Secretary, 105 East Twenty-second street, New York City.

June.
New England Conference on Street Cleaning.—Springfield, Mass.—Corresponding Officer, Carol Aronovici, 55 Eddy street, Providence, R. I.

June 11-16.
International Association of Chiefs of Police.—Eighteenth Annual Convention, Rochester, N. Y.—Major Richard Sylvester, Superintendent of Police, Washington, D. C., President.

June 13-18.
New York State Association of Chiefs of Police.—Annual Convention, Rochester, N. Y.

June 13-16.
American Society of Civil Engineers.—Annual Convention, Chattanooga, Tennessee.—Charles Warren Hunt, Secretary, 220 West 57th St., New York.

June 21-22.
National Conference of Poor Law Officials.—Boston, Mass.—Dr. Robert W. Hill, President State Board of Charities, 105 East Twenty-second street, New York City.

September 19-22.
American Hospital Association.—New York City. J. N. E. Brown, M.D., Secretary, Toronto General Hospital, Can.

September 24-30.
International Congress on Tuberculosis.—Rome, Italy.—Professor Ascoli, Secretary-General, Via Lucina, Rome, Italy.

September 26-29.
American Society of Municipal Improvements.—Grand Rapids, Mich.—A. Prescott Folwell, Secretary, 239 West Thirtieth street, New York City.

October 4-6.
League of American Municipalities.—Annual Convention, Atlanta, Ga.—John MacVicar, Secretary, Des Moines, Ia.

PERSONALS

BARRY, J. EDWARD, Democratic candidate for Mayor of Cambridge, Mass., was elected by a big majority.

CLAUSSEN, OSCAR, has been appointed City Engineer of St. Paul, Minn., succeeding L. W. Rundlett, who will remain in the municipal service as Superintendent of Construction of the water Board.

COWPER, Dr. C. W., who has been appointed a Medical Inspector in the Health Department, resigned his post in the Board of Aldermen, as he could not legally hold the two positions.

CURRY, CHARLES, has been elected Superintendent of Highways, Danville, N. Y.

EYRES, W. L., of Austin, Tex., has been appointed Superintendent of the Water Works at Lafayette, La.

FARLEY, JOHN M., who has been Consulting Engineer for the past twenty-five years on various State and municipal works, has organized the firm of Farley & Braunworth, Consulting Engineers, with offices at 527 Fifth avenue, New York City, and in Trenton, N. J. They will specialize in sewerage and sewage disposal, and water supply and water purification. Mr. Braunworth was formerly principal assistant engineer to Mr. Farley, and is a specialist in sanitary engineering.

FARRETT, J. W., has been elected Mayor of Lawrenceburg, Tenn.

FEBEE, JAMES L., has been appointed Resident Engineer, Atlantic City Drainage, Atlantic City, N. J. Mr. Febee

was formerly connected with the Water Department at Wilmington, Del.

GIBBS, E. C., has tendered his resignation as Mayor of Ida Grove, Iowa, on account of ill health.

HALLIDAY, ALEX., the Socialist candidate for Mayor of the city of Two Harbors, Minn., was elected by a large plurality.

HAMILTON, ALEX., has been elected Mayor of Tallapoosa, Fla.

HANSON, EDGAR F., has been re-elected Mayor of Belfast, Me., for the seventh term.

HARE, SIDNEY, Landscape Architect of Kansas City, Mo., has been visiting Tacoma in consultation with the authorities as to improving Point Defiance Park.

HINDLEY, WM. J., a Congregational clergyman, has been elected Mayor of Spokane, Wash.; Chas. W. Fassett, President of the Chamber of Commerce, was elected Director of Public Utilities, and David Coates, formerly Governor of Colorado, now a Socialist writer, will have charge of public works.

HOWALD, HAROLD, for nine years City Engineer of Massillon, Ohio, has resigned.

HUGHES, EDWARD F., who for many years has been identified with the water works business, and who is at present a Water Commissioner of Watertown, Mass., has opened an office as Consulting Engineer at 8 Oliver street, Boston.

LEMON, WALTER T., whose term as a member of the Board of Public Works of St. Paul, Minn., expired last week, has been reappointed by the Mayor for the full term of three years. Mr. Lemon was made a member of the board about three months ago to complete the unexpired term of Peter Van Hoven, who resigned to become a State Senator.

MARABLE, JOHN, formerly City Engineer of Clarksburg, Tenn., for nine years, died in that city February 22 at the age of 60.

MARCILLE, ALBERT O., has been re-elected Mayor of Biddeford, Me.

MYERS, L. J., City Engineer of Ardmore, Okla., has been appointed a member of the committee on vitrified brick paving of the Association for Standardizing Paving Specifications, of which Geo. W. Tilson, City Engineer of New York, is President.

NOYES, REUEL J., Democratic, has been elected Mayor of Augusta, Me.

PARKS, JAMES W., has been elected Mayor of Aberdeen, Wash.

PARKS, OREN E., has been reappointed Town Engineer of Westfield, Mass.

PAYNE, JOHN BARTON, has been elected President of the Board of South Park Commissioners of Chicago.

SLIPPY, RALPH P., has opened an office for the general practice of civil engineering in the Marsh-Place Building, Waterloo, Iowa.

SHURTLEFF, FLAVEL, Boston, Mass., an attorney representing the Russell Sage Foundation, is making a tour of various cities for the purpose of studying the commission form of government.

WARD, M. P., has been elected Chairman of the Board of Health of Lynn, Mass.

WATTS, THOMAS, JR., has been re-elected Mayor of Coal Creek, Tenn.

WAY, J. ROMAN, has been chosen president of the Board of Trade of Williamsport, Pa.

WELCH, W. E., has been elected Mayor of Rainier, Ore.

WORKS, SENATOR S. B., of Mankato, Minn., at the invitation of the South St. Paul Commercial Club, gave an address before that body, explaining the commission form of city government.

YOST, HOWARD MC., has been appointed City Engineer of Massillon, Ohio.

TRADE NOTES

Cast Iron Pipe.—Chicago—Market is active and many small municipalities are in the market. Gas companies have been liberal buyers. Orders of from 50 to 200 tons constitute the bulk of the business. Quotations: 4-inch, \$25.50; 6 to 12-inch, \$24.50; 16-inch and up, \$24. Birmingham—New business appears to have been light, but better prices are being maintained. Quotations: 4 to 6-inch, \$22; 8 to 12-inch, \$20; over 12-inch, average, \$19. New York—Several large lettings are in sight, including about 10,000 tons for New York City. The demand from private water and gas companies is keeping up well. Quotations: 6-inch, carloads, \$21 to \$22.

Lead.—Market is stronger. The leading interest is keeping price up at 4.50c., New York; outside sellers have advanced their price to 4.40c.; St. Louis price, 4.25c., with probability of higher quotations.

Cement Freight Rates.—The Alpha Cement Co., Manheim, W. Va., have brought suit against one hundred railroads before the Interstate Commerce Commission, alleging discrimination against it by the carriers in favor of the Universal Portland Cement Co.

Carbon Tetrachloride.—Carbon tetrachloride is an unflammable liquid which may be used in many arts as a substitute for benzene. It may also be used as a fire extinguisher, as its vapor smothers fires. High cost and lack of information as to its adaptability to the arts have hitherto limited its use. Owing to improvements in manufactured carbon tetrachloride may now be purchased at a much lower price than formerly.

Electric Companies Merged.—The Public Service Commission has approved the consolidation of the Geneva-Seneca Electric Company and the Wayne County Gas and Electric Company into the Central New York Gas and Electrical Company.

Blaw Collapsible Steel Centering.—The Blaw Collapsible Steel Centering Company, Westinghouse Building, Pittsburgh, Pa., announce the removal of their Eastern sales office from the present location in the Park Row Building, New York, to more commodious quarters in the City Investing Building, 165 Broadway, New York. This change in effect May 1. They announce further the location of their permanent Western sales office at 1008 Ashland Block, Chicago, Ill.

Bonding New and Old Concrete.—H. J. Livingston, 11 Pleasant street, Baltimore, Md., is sending out a description of "Livingstone," a bonding material for uniting new and old concrete. The material, the pamphlet states, contains neither hydrochloric nor sulphuric acid and will not weaken the cement used in the bond. It is recommended for a number of purposes besides bonding layers of concrete, including the attachment of hard wall plaster to concrete walls, for which purpose it has been used satisfactorily. One gallon of the material will, on the average, cover 250 to 300 square feet.

Power House Accessories.—The Liberty Manufacturing Company and Elliott Company of Pittsburgh, Pa., manufacturers of power house accessories, will move their New England office from 102 High street, Boston, Mass., to the Oliver Building, 141 Milk street, Room 954, where their representative, Mr. Herbert E. Stone, will be glad to see their customers and friends.

Concrete Mixer and Hoist.—The Waterloo Cement Machinery Corporation, Waterloo, Ia., has designed a combined concrete mixer and hoisting plant. Made specially for use in the building of cement houses at Gary, Ind., it is suitable for any purpose where concrete is to be elevated vertically a moderate height. The fact that it also has a traction plant makes its field of usefulness a wide one. From the hopper the mixed concrete is drawn into buckets, which are then hooked by hand to a vertical conveyor. The elevator runs continuously. Should a workman, however, fail to remove a bucket no harm can ensue, as they will simply continue on their course without spilling. The different features of the plant are all controlled by independent friction clutches.

Contractors' Equipment.—The Wm. J. Oliver Manufacturing Company, of Knoxville, Tenn., which makes a large variety of dump, ballast, mine and flat cars for standard and narrow gauges, mining plant, derrick fittings and hoisting engines, has opened an office at 50 Church street, New York, in charge of R. L. Sites, assistant to the president.

Damp Proofing.—The Antihydrine Company, Washington Building, New Haven, Conn., has prepared a leaflet which gives briefly the objects to be attained in the application of "antihydrine" as a damp-proofing and stain-proofing compound on brick, stone, concrete surfaces and fireproofing material. The compound is made of a high grade of asphalt, prepared in combination with several chemicals which give it the property of forming a continuous glossy and impervious coating upon porous surfaces. It is applied cold with a brush. Directions for its use are included in the leaflet.

Reorganize Water Company.—The Taylor Water Company has been reorganized on its new management with the election of the following officers: A. J. Zilker, president; George Shelley, of Austin, vice-president; Noyes D. Smith, of Austin, secretary-treasurer; H. A. Bittick, superintendent; Walter Schultz, bookkeeper; Spencer Carradine, collector.

Manager of Electrical Plant.—The City Controller of Winnipeg, Man., will soon advertise for a manager for the \$3,500,000 municipal power plant now nearing completion.

Chemical Engineer.—William Miller Booth, Syracuse, N. Y., announces that he has opened a branch office at 299 Broadway, New York City. In the New York office Mr. Booth will take care of chemical and engineering work as in the Syracuse office.

Triangle Mesh Reinforcement.—The American Steel and Wire Company, 30 Church street, New York City, has prepared a 110-page book giving full details of tests made by and under the supervision of the building bureaus of the various boroughs of New York City upon slabs reinforced with triangle mesh reinforcement manufactured by the company. Practically all of the tests were made in 1910. In each case full details are given regarding the span, thickness of slab, size of reinforcement and loading, and these data are followed by the report of the responsible municipal officer on the results of the tests. Drawings illustrate in every case the type of construction. The last half of the book shows views of buildings and other structures in New York City in which this reinforcement has been used.

Stokers.—Birch, Riley & Co., of New York City, sales agents for the Universal stoker, have opened a Boston office in the Oliver Building, 141 Milk street, Room 954, where Mr. Charles F. Sammons, M. E., will have his New England headquarters.

Double Geared Traction Engine.—The Woods Brothers Thresher Company, Des Moines, Ia., has developed double geared type of traction engine. This engine is built with a center crank and two gear trains, one on each side. The special advantages claimed for this construction are the elimination of a side strain and the development of the maximum tractive effort.

Steel Furniture and Metal Lath.—The General Fireproofing Company, Youngstown, Ohio, announces that owing to the remarkable growth in its steel furniture and Herringbone metal lath business it has sold its entire business to the General Reinforcement Company, Youngstown, O. This move has been made to gain necessary additional manufacturing facilities which will permit specializing along the metal lath and furniture lines in which the General Fireproofing Company is pioneer.

New Chemical Engine Company.—The Hansen Continuous Chemical Fire Apparatus Company, St. Louis, has been incorporated with a capital stock of \$50,000. Dr. F. William Runde is president; Edward M. E. Hansen, vice president, and L. A. Ragan, secretary. The company will manufacture a chemical fire engine invented by E. M. E. Hansen.

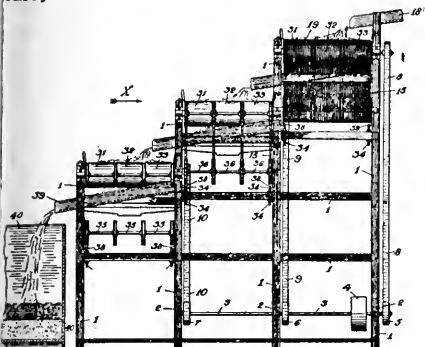
Power Transmission Machinery.—The Link-Belt Company states that its sales office, formerly located at 8 State street, Boston, Mass., has been moved to more commodious quarters at 131 State street, Boston, to take care properly of the increasing demand for Link-Belt elevating, conveying and power transmission machinery and chains. Lawrence Spillan is in charge.

Sewer Pipe.—The American Sewer Pipe Company, Akron, Ohio, has commenced work on its new plant at Brazeau, Ind., which it hopes to have ready for occupancy by July 1.

Steel Reinforcement for Concrete.—A leather bound handbook has been issued by the Pittsburgh Steel Product Company, an identified interest of the Pittsburgh Steel Company, Wallace H. Rowe, president. It gives tables and other data relative to Pittsburgh standardized reinforcement for concrete. The company has prepared this blue book to enable engineers, architects and builders to design concrete structures without laborious mathematical computations. The girder, beam and slab tables have been computed so that under a dead and live load and figured on the basis of the "straight line formula" the tensile stress in the steel will not exceed 16,000 pounds per square inch and the compressive stress in the concrete will not exceed 650 pounds per square inch. Illustrations are given of the Pittsburgh standard bars and of typical frames and standard reinforcement for beams, girders and slabs. The tables have been prepared after formulas recommended by a joint committee on concrete of the American Society for Civil Engineers, American Society for Testing Materials, American Railway Engineering and Maintenance of Way Association and the Association of American Portland Cement Manufacturers.

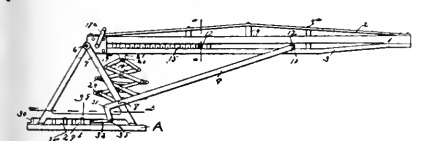
PATENT CLAIMS

985,809. GRAVEL OR ORE SCREEN. Frederick J. Hoyt, Redlands, Cal. Serial No. 442,615.
A gravel or ore screen, comprising a frame having therein a horizontally-disposed, transversely movable endless screen, cylinders or rollers at each end to carry said screen, said rollers having



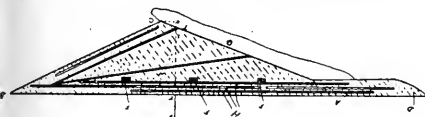
grooves at intervals and sprocket chains in said grooves extending from roller to roller, the screens being secured to said chains at intervals, and means for producing tension on said chains and keeping said screen taut.

986,352. FIRE APPARATUS. Burdett B. Briggs, Creston, Iowa. Serial No. 466,377.
The combination with a support, a ladder pivoted thereon, links pivoted at one end to said support at points remote from the pivot of the ladder, and the free ends of



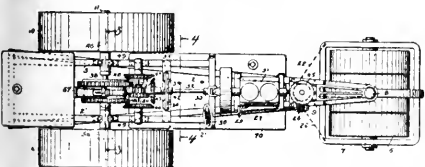
the links attached to a cross-rod, movable on said cross-rod, a credit sleeve connected to said cross-rod, a screw mounted on the base end of the ladder and engaging said sleeve, for the purpose set forth.

985,841. DAM. Frank E. Roff, Richfield Springs, N. Y. Serial No. 513,561.
A dam constructed of cantilever form in



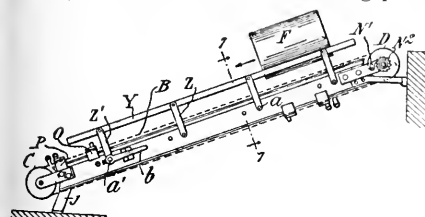
vertical cross-section, having the deck extending obliquely to receive the water load.

986,290. ROAD ROLLER. Pliny E. Holt, Stockton, Cal. Serial No. 525,978.
In a road roller, a main frame comprising a triangular frame and a rectangular frame resting upon and rigidly secured to said triangular frame; separate main axes mounted on horizontal pivots fixed on the



main frame; traction rollers journaled on said axes; means for adjusting the angle of said axes and locking the same; a steering truck mounted under the main frame; and a motive and power transmitting mechanism mounted on the main frame and engaging said traction rollers.

986,483. ELEVATOR FOR ASH - CANS AND THE LIKE. Rudolph Messlin, New York, N. Y. Serial No. 509,127.
An apparatus of the character described, including in combination an inclined elevator and skids permanently attached thereto, said elevator and skids being pro-

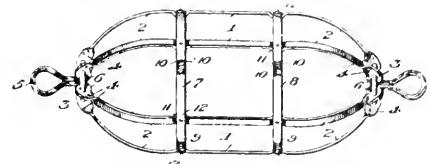


portioned for use with the same articles and adapted to be brought alternately into

operative position, so that such articles may be elevated and lowered by the same apparatus.

986,462. SEWER - CLEANER. John M. Holdaway, Provo, Utah. Serial No. 569,988.

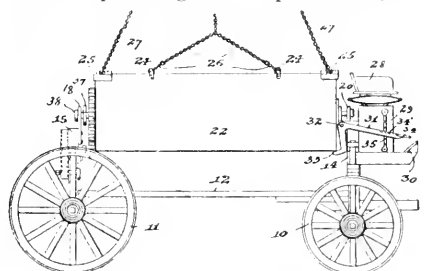
In a sewer cleaner, the combination with longitudinally extending ribs, of a con-



tractible split circular knife secured thereto having a cutting edge disposed in the direction of the length of said cleaner.

986,582. DUMPING - WAGON. Charles Lynch, Chicago, Ill. Serial No. 557,806.

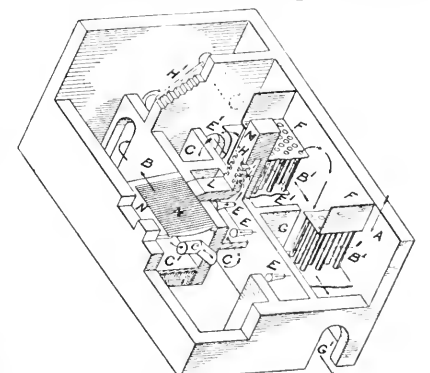
In a dumping-wagon, the combination of a wagon frame having a pair of bearings, a load-conveying box comprising two parts hinged together at the top, means to tie said two parts together to prevent the box



from opening and discharging its contents, trunnions secured to the opposite ends of said box and fitting in said bearings, and means to turn said box on its trunnions to discharge its contents, substantially as described.

986,594. REFUSE-DESTRUCTOR. Frank Percy Rudder, Derby, England. Serial No. 390,126.

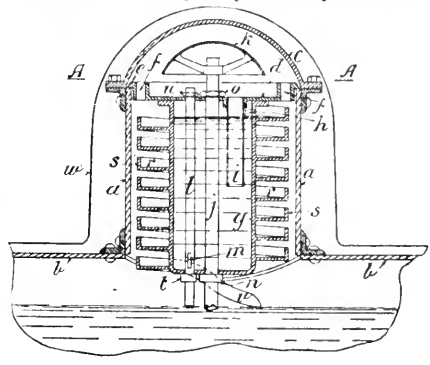
In a refuse-destructor the combination of a grate; a refuse drying plate; an air heater adapted to be heated by the products of combustion; means for providing communication between the grate and the



air heater; means for conducting the heated air to the grate, and means for directing products of combustion into contact with the refuse upon said drying plate, and then returning said products to the grate.

986,886. WATER HEATER AND PURIFIER. John Edward Wood, Nottingham, England. Serial No. 529,427.

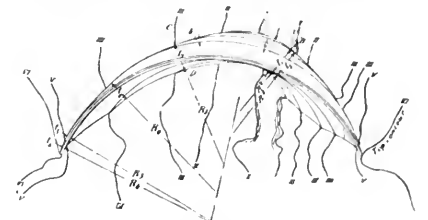
In a water heater and purifier the combination of a water inlet pipe, a cowl for breaking up the feed water, a tray on to which the water falls, a settling tank, an inlet from the tray directly into the



tank, and a helical evaporating tray surrounding such tank and an outlet from the tank to the tray.

986,718. DAM CONSTRUCTION. Lars Jorgensen, Berkeley, Cal., assignor of one-half to Frank G. Baum, San Francisco, Cal. Serial No. 586,969.

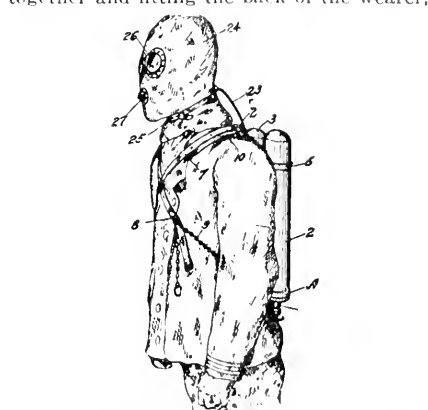
An arch dam for a cañon or the like comprising a plurality of superposed arch-shaped elements of varying radii the radii



of such elements varying with the widths of the cañon at the corresponding levels of such elements and bearing a definite relation to such widths.

986,907. RESPIRATORY APPARATUS FOR FIREMEN OR OTHERS. Charles E. Chapin, Elmhurst, Cal. Serial No. 546,877.

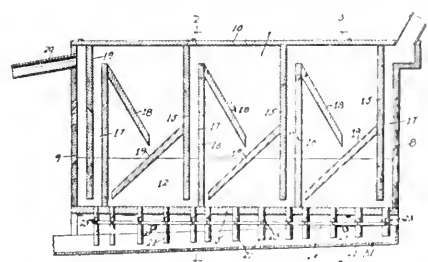
In a respiratory apparatus, the combination of a harness consisting of upper and lower loop members suitably connected together and fitting the back of the wearer,



means for securing the harness on the wearer, and a battery of cylinders detachably fitting said harness, each of said cylinders having a separately controlled valved outlet, and certain of the valves having means appreciable to the touch for distinguishing them.

986,897. WATER - PURIFIER. Edward Bowman and Joseph A. Wallace, McGill, Nev. Serial No. 521,119.

The herein described water-purifier comprising a casing, a chamber therein, spaced partitions at opposite sides of the chamber forming inlet and outlet channels, the former discharging into the bottom and the latter leading from the top of said chamber, oppositely inclined baffles in said chamber, disposed at different elevations and one overhanging the other, and means



for discharging sediment from the bottom of said chamber and said channel, said means comprising a plurality of discharge tubes, a valve in each discharge tube, a crank handle operatively connected to each valve, a link connecting all of said crank handles, ratchet teeth formed on the lower edge of said link, a bracket supported by said casing, a shaft journaled in said bracket, a toothed member mounted eccentrically on said shaft and operatively engaging the teeth on the link and means for rotating said shaft.

987,060. PAVING-BLOCK. Frank Galgano, New Rochelle, N. Y. Serial No. 569,573.

A block, embodying a recess in its under side, said recess extending to near the upper surface of said block, leaving a frangible portion forming a normally unbroken upper surface, said recess when said frangible portion is broken being adapted to receive a lifting tool.

THE WEEK'S CONTRACT NEWS

Relating to Municipal and Public Work—Street Improvements—Paving, Road Making, Cleaning and Sprinkling—Sewerage Water Supply and Public Lighting—Fire Equipment and Supplies—Bridges and Concrete Work—Sanitation, Garbage and Waste Disposal—Police, Parks and Miscellaneous—Proposals and Awards

To be of value this matter must be printed in the number immediately following its receipt, which makes it impossible for us to verify it all. Our sources of information are believed to be reliable, but we cannot guarantee the correctness of all items. Parties in charge of proposed work are requested to send us information concerning it as early as possible; also corrections of any errors discovered.

BIDS ASKED FOR

Table with columns: STATE, CITY, RECEIVED UNTIL, NATURE OF WORK, ADDRESS INQUIRIES TO. Includes sub-section 'STREET IMPROVEMENTS' and 'SEWERAGE' with various project details and contact information.

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
SEWERAGE (Continued)				
New York	New York	Apr. 3, 2 p.m.	Reconstructing outlet sewer and appurtenances at the foot of 79th St., East River.	Geo. McNaney, Pres. Boro. Manh.
Arkansas	Arkadelphia	Apr. 4	Constructing about 48,000 ft. sanitary sewers.	E. M. Hall, Chm. Comrs. Sewers.
Iowa	Clinton	Apr. 4	Constructing main and lateral sewers in various streets.	W. E. Hayes, City Clerk.
New Jersey	Trenton	Apr. 4, 8 p.m.	Constructing sewers in Spruce Street and Wilson Street and Drain in Federal Street.	Harry B. Salter, City Clerk
California	Boulder Creek	Apr. 5	Constructing sewer in Railroad avenue.	James M. Mallock, Town Clerk.
Illinois	Chicago Heights	Apr. 5, 7:30 p.m.	Constructing Storm Sewer No. 3.	W. E. Leinertz, Secy. B. Loc. Imp.
Wisconsin	South Milwaukee	Apr. 6, 5 p.m.	Constructing about 7,299 ft. of sanitary sewer and constructing sewage purification plant.	John H. O'Connell, City Clerk.
Minnesota	Albert Lea	Apr. 7, 5 p.m.	Constructing 3,475 lin. ft. 8-in. pipe sewer.	W. Barneck, City Engr.
Sask., Can.	Moose Jaw	Apr. 10, 8:30 p.m.	Furnishing and laying about 30,700 lin. ft. tile pipe sewer, building manholes, etc., separate bids. Con. sewage disposal plant, etc.	W. F. Heal, City Clerk.
Pennsylvania	Chambersburg	Apr. 10, 8 p.m.	Bldg. system of san. sewers, outfall sewer & sewer disp. plant.	S. K. Shryock, Chm. Sewer Com.
New Jersey	South Orange	Apr. 11, 8 p.m.	Bldg. sanitary sewers in the Hilton district.	Edward Arcularious, Twp. Clk.
Pennsylvania	Grove City	Apr. 11	Constructing sewers, 8 to 24-in. terra cotta pipe.	L. L. McKay, Boro. Secy.
Maryland	Easton	Apr. 15, noon	Constructing, complete, about 6 mi. pipe sewers, 8 to 15-in., Y branches, manholes, grading etc., Clyde Potts, 30 Church St., New York City, Engineers.	M. M. Higgins, Pres. Sewer Com.
Wisconsin	Kenosha	Apr. 15, 2 p.m.	Constructing Main Trunk sewer.	W. J. Scholey, Chmn.
Minnesota	Winona	Apr. 17	Constructing 8, 12, 15, 18 and 20-in. pipe sewers, manholes and catch basins.	O. B. Leland, Asst. City Engr.
Ohio	Amherst	Apr. 20	Constructing sewer system and sewage disposal plant.	City Clerk.
California	San Jose	July 3	Construct septic tank for County hospital.	City Clerk.
WATER SUPPLY				
Sask., Can.	Saskatoon	Mar. 31, noon	Installing mechanical filtration plant.	W. B. Neil, City Comr.
Oregon	Astoria	Mar. 31	Con. gate, well and high serv. dis. system for hill section of city.	City Clerk.
New York	Troy	Mar. 31, 11 a.m.	Furn. valves, sluice gates and appurtenances required in construction of reservoir; and for cast iron pipe and specials.	Edwin L. Grimes, City Engr.
Minnesota	Minneapolis	Mar. 31, 7:30 p.m.	Furnishing sleeves and valves and gasoline trench pump; also hauling water works mater. & supplies & bldg. water tower.	Henry N. Knott, City Clerk.
Wisconsin	Wauwatosa	Apr. 1, 2 p.m.	Furn. one duplex compound steam driven, air compressor, 90 lbs. steam pressure; cap. 500,000 gals. per min.; also one air receiver or tank suitable size for use with compressor.	Edward Coulthard, City Clk.
Pennsylvania	West Telford	April 1	Constr. water works; approx. cost \$30,000.	H. Z. Walpole, Secy. Water Co.
Washington	Tacoma	Apr. 1, noon	Constructing concrete lined reservoir; pipe line from Green River Crossing to reservoir, retaining wall, stand pipes and a telephone line from Headworks to reservoir.	Nicholas Lawson, Comr. Lt. & Wt.
Illinois	Lyons	Apr. 2	Constructing brick and concrete building for pumping station; installing deep well pump, power head and motive power and appurtenances.	President Bd. Village Trustees.
California	Vallejo	Apr. 3	Laying 14-in. pipe and 8-in. pipe in various streets.	Board of Public Works.
Texas	Galveston	Apr. 3, noon	Installing 10,760 lin. ft. of water main.	A. T. Dickey, City Engineer.
Ontario, Can.	Welland	Apr. 3, noon	Constr. of one unit water-power driven water-works pump, 3,000,000 Imp. gals. daily cap., incl. turb., pipes, valves, etc.	R. Cooper, Chm. Water Comms.
Nebraska	Lodgepole	Apr. 3	Constructing water works.	City Clerk.
Ohio	Cincinnati	Apr. 3, noon	Constructing 2 turbine water wheels.	John J. Wenner, Clk. B.I. Pub. Serv.
New York	New York	Apr. 3, 2 p.m.	Furnishing, placing, repairing, replacing and emptying vault pans in vicinity of Mt. Kisco.	Henry S. Thompson, Comr. W. Sup.
California	Chico	Apr. 4, 7:30 p.m.	Furnishing about 600 ft. of No. 14 steel or iron pipe 8 and 10-in. diameter, double riveted and dipped in asphaltum.	B. F. Hudspeth, City Clerk.
California	Ft. Baker	Apr. 4	Reconstructing pump house, installing machinery, laying 6-in. water main and erecting steel water tank.	G. McK. Williamson, Q. M., U. S. A.
Ohio	Lakewood	Apr. 4, noon	Constructing an elevated water tower.	Clerk Bd. of Public Affairs.
Pennsylvania	Somerset	Apr. 5	Constructing concrete storage reservoir.	C. I. Shaver, Boro. Secy.
New York	Keesville	Apr. 5	Constructing reservoir, laying water pipe, etc.	J. B. Mace, Pres. Bd. Water Comms.
Pennsylvania	Chambersburg	Apr. 7, 8 p.m.	Constructing a diversion dam and intake chamber, a reservoir of 200,000 gals. capacity and a standpipe.	C. O. Wood, Chmn. Water Comms.
Iowa	Sioux City	Apr. 8	Installing 3 centrifugal pumps with d. c. motors.	G. B. Healy, Supt. Pks. & Pub. Prop.
Sask., Can.	Moose Jaw	Apr. 10, 8:30 p.m.	Furn. and lay. about 20,700 lin. ft. c. i. water main; sep. bids.	W. F. Heal, City Clerk.
Oklahoma	Ada	Apr. 10, 8 p.m.	Furn. pipe and machinery for extension and improvement of water system; about 66,000 lin. ft. of 12 in. pipe line, either of steel or cast iron, required. Goodwin & Harper, 920 Scarritt Bldg., Kansas City, Mo., Engineers.	W. B. Jones, City Clerk.
Maine	Ft. McKinley	Apr. 15	Constructing chemical water softening plant.	Capt. Jos. F. Gohn, Con. Q.M.U.S.A.
Montana	Helena	Apr. 20, 8 p.m.	Con. water works system, reservoir, pipe line & distri. system.	J. A. Mattson, City Clk.
North Carolina	Morehead	Apr. 20	Installing water works.	G. D. Canfield, Chm. W. W. Com.
BRIDGES				
New York	Fredonia	Apr. 1, 2 p.m.	Constructing concrete arch over Candaway Creek.	Frank H. Moir, Town Clerk.
Kansas	St. John	Apr. 3, noon	Con. 2 cement and steel bridges & repairing 1 cement bridge.	R. C. Ardrey, Co. Clk.
Pennsylvania	Allentown	Apr. 3, 10 a.m.	Repairing 5 wooden bridges.	J. S. Troxell, Clk. Bd. of Comms.
Kansas	Hill City	Apr. 4, noon	Constructing bridge.	Ben. S. Smith, Co. Clerk.
North Dakota	Cando	Apr. 4, 1 p.m.	Constructing 150 ft. more or less of concrete and steel bridges.	Frank Shanley, County Auditor.
Pennsylvania	Reading	Apr. 4, 10 a.m.	Erecting 3 reinforced concrete bridges in Berks County.	A. L. Rhoades, County Compt.
Indiana	Brazil	Apr. 4, 11:30 a.m.	Constructing a bridge at Clay City.	E. A. Stagg, County Auditor.
Indiana	LeGrange	Apr. 4, 2 p.m.	Constructing 1 wooden, 1 iron and 5 concrete bridges.	C. S. Willard, County Auditor.
Ohio	Columbus	Apr. 5, noon	Grad. roadway, con. abutments & approaches of various bridges.	F. M. Sayre, Co. Audr.
Indiana	Shelbyville	Apr. 5, 10 a.m.	Constructing 4 reinforced concrete bridges.	G. R. Huntington, County Auditor.
Indiana	Rockport	Apr. 5, 10 a.m.	Constructing 25 bridges.	John T. White, County Auditor.
New Jersey	Jersey City	Apr. 5, 3:30 p.m.	Repairing and placing in good condition Hudson Boulevard Bridge over Pennsylvania Railroad.	J. C. Sweeney, Clk. Blvd. Comms.
Ohio	Germantown	Apr. 6, 10 a.m.	Constructing concrete steel arch bridge over Little Twin Creek.	J. O. Donovan, Clk. Bd. Co. Comms.
Indiana	Fort Wayne	Apr. 8, 10 a.m.	Constructing a steel bridge of 2 spans 171 ft. each; also remodeling two old steel bridges, building concrete abutments and one culvert; also furnishing I-beams and bridge plank.	Calvin H. Brown, County Auditor.
Indiana	Vincennes	Apr. 8, 10 a.m.	Constructing 3 bridges in Knox County.	John T. Scott, Aud. Knox Co.
New Jersey	Camden	Apr. 10, 11 a.m.	Constr. conc. culvert over Bates' Mill Stream; alternate bid for wooden bridge at same place.	Fred'k W. Gercke, Chm. Bridge Com.
Kansas	Kansas City	Apr. 10	Repairing 5th St. Bridge over Kansas river.	Frank M. Holcomb, County Clerk
Ohio	Xenia	Apr. 12, 11:30 a.m.	Con. superstructure & approaches of the Louis Hill Bridge.	Board of Co. Comms.
Indiana	Decatur	Apr. 14	Constructing the Abe Egley bridge.	Board of Co. Comms.
Wisconsin	Kenosha	Apr. 15, 4 p.m.	Rebuilding and altering Middle St. Bridge.	R. H. Moth, City Engr.
Kansas	Lawrence	Apr. 15, noon	Constructing 2 stone abutments and 32-ft. girder span.	W. R. Green, County Clerk.
Ohio	Warren	Apr. 17, 1 p.m.	Construct concrete bridge over Little Squaw Creek, Liberty twp.	Fred T. Stone, County Auditor.
LIGHTING AND POWER				
Minnesota	Minneapolis	Mar. 31, 7:30 p.m.	Furnishing alternating current generator.	Henry N. Knott, City Clerk.
Missouri	Kansas City	Mar. 31, noon	Furnishing 1 automatic cut-off steam engine for direct connection to 200 kw. direct current 220 volt generator; 1 generator of 200 kw., 220 volts direct current connected engine.	Leo. M. Gilday, Clk. Co. Court.
Kentucky	LaGrange	Apr. 1	Installing second-hand 65 H. P. gas engine and producer for soft coal; 45 kilowatt D. C. multipolar comp. 250 volt generator; also poles, overhead and underground wire, cross-arms etc.	J. C. Emmick, Manager.
Ohio	Cincinnati	Apr. 3, noon	Light. by electricity streets, etc., for ten years beginning June 1.	John J. Wenner, Clk. B.I. Pub. Serv.
Sask., Can.	Rouleau	Apr. 4	Pumping machinery, electrical machinery, pole line, etc., producer gas plant, c. i. or steel water mains, valves etc.	W. H. Stewart, City Secy.-Teras.
Minnesota	Eveleth	Apr. 4	Furn. 6 blocks of ornamental street light. sys., about 46 posts.	D. P. McIntyre, City Clk.
Mississippi	Newton	Apr. 4, 4 p.m.	Constructing electric light plant.	G. M. Beaver Mayor.

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
LIGHTING AND POWER (Continued)				
New York	Auburn	Apr. 4, 8 p.m.	Constructing subways and laying 19,700 lin. ft. straight iron pipe laterals, 190 iron pipe bends and 23 double manholes, including sewer connections.	J. S. Hanlon, City Clerk.
Omaha	Fort Nebraska	Apr. 10, 11 a.m.	Constructing an extension of the electric lighting system, at Fort Omaha	Capt. W. L. Clarke, Con. Q. M., U.S.A. W. F. Heal City Clerk
Sask., Can.	Moose Jaw	Apr. 10, 8:30 p.m.	Furn. 2 electrically driven centrif. pumps and auto starters.	
Nebraska	Omaha	Apr. 11, 8 p.m.	Lighting streets with incandescent street lamps, three years including extinguishing, cleaning, repairing and maintaining and painting posts once a year.	Dan B. Butler, City Clerk.
Alabama	Troy	Apr. 17	Furn. 1 stationary steam engine, 400 H.P., 150 lbs. initial pressure; 1 electric generator, 250 kva., 60 cycles 3-phase, 2,300 volts; 1 pump, electrically driven capacity not less than 500 gals. per minute against 200 lbs. working pressure; 1 motor to drive pump; transmission line material for 3-phase line 3 1/2 miles long, size of wire No. 4 B&S.	A. B. Campbell, Supt. E. & W. Dept. Magnus Peterson Secy. Civic B. Con.
Manitoba, Can.	Winnipeg	May 1, 11 a.m.	Furnishing ornamental lighting standards.	
FIRE EQUIPMENT				
Pennsylvania	So. Bethlehem	Apr. 3, 8 p.m.	Furnishing 1,000 ft. of fire hose.	Denis McFadden, Chm. Fire Com.
Ohio	Lakewood	Apr. 3, noon	Furnish 1 steam fire engine or 1 auto. fire engine.	B. M. Cook, City Clerk.
New York	New York	Apr. 3, 10:30 a.m.	Furnishing two 75-ft. aerial hook and ladder trucks of self-propelling design.	R. Waldo, Fire Commissioner.
Washington	Tacoma	Apr. 6, 3 p.m.	One-third size steam Fire Engine.	L. W. Roys, Comr. Public Safety.
New Jersey	Jersey City	Apr. 7	Furn. 1 first-size steam fire engine & 85-ft. aerial hk. & lad. truck	Michael J. Pagers, City Clk.
New Jersey	Paterson	Apr. 21	Furn. automobile hook and ladder outfit and converting 2 first-class fire engines into gasoline-propelled vehicles.	T. S. Standeven, City Clk.
New Jersey	Princeton	July 5	Furn. auto pumping engine.	E. M. Updike, Chm. F. & W. Com
MISCELLANEOUS				
Minnesota	Minneapolis	Mar. 31, 7:30 p.m.	Furnishing 1 automobile for use of fire department; one automobile runabout for sewer department and 2 commercial auto trucks of about 2,000 lbs. capacity.	Henry N. Knott, City Clerk.
Minnesota	Duluth	Mar. 31, 10 a.m.	Sprinkling streets for season of 1911; and furnishing 400, 600 or 800 tons of calcium chloride.	Olof G. Olson, Pres. Bd. P. ub. Wks.
New Jersey	Elizabeth	Apr. 3	Oiling pavements for season of 1911.	P. J. McGurn, Chm. Com. Hwys.
Florida	Tampa	Apr. 3, noon	Building county jail.	County Commissioners.
South Carolina	Charleston	Apr. 4, 7 p.m.	Furnishing for one year iron castings; brick, lime and portland cement; lumber; curbing; terra cotta pipe; concrete sidewalks; laying terra cotta pipe; hauling stone curbing; furnishing crushed stone; purchase and removal of manure.	J. H. Dingle, City Engineer. Wm. H. Sanderland, City Clerk.
Connecticut	Waterbury	Apr. 5, 4 p.m.	Altering building to conform to requirements of mod. fire sta.	R. O. Owen, City Secy.
Texas	Rotan	Apr. 6	Constructing two story brick city hall building.	City Clerk.
Missouri	Kansas City	Apr. 6	Erecting engine house at 60th St. and Troost Ave.	Ed. Metz, City Clerk.
Missouri	Hutchinson	Apr. 7, 3 p.m.	Sprinkling various streets.	J. S. McCullough, Chm. Bd. Pub. Wk.
Wisconsin	Fond du Lac	Apr. 7, 3 p.m.	Sprinkling various streets.	
Minnesota	Duluth	Apr. 8, 8 p.m.	Constructing piers of concrete, and moving buildings when piers are finished.	
Ohio	Ashland	Apr. 12	Erecting city hospital building.	F. L. Packard, Architect.
New York	Binghamton	Apr. 12	Furnishing 12,000 ft. oak lumber.	City Clerk.
Kansas	Hutchinson	Apr. 14, 3 p.m.	Sprinkling various streets.	Ed Metz, City Clerk.
Ontario, Can.	Goderich	Apr. 15	Erect. municipal building Combined Town Hall and Fire Hall.	L. L. Knox, Town Clerk.

STREET IMPROVEMENTS

Troy, Ala.—Council has adopted plans and specifications for paving on North Three Notch and College sts.

Texarkana, Ark.—Council is considering establishment of Improvement District No. 13; work includes draining, grading, guttering and macadamizing.—John P. Kline, Mayor.

Van Buren, Ark.—Construction of macadamized road from this city to Mulberry is being considered; distance about 20 miles; cost about \$50,000. F. D. Scott is interested.

Coronado Beach, Cal.—Contracts will soon be let for paving 7th, 10th and "E" sts.

Los Angeles, Cal.—City Engineer Homer Hamlin has recommended paving of Ave. 64 with asphalt and vit. block gutters.

Hartford, Conn.—Plans are being prepared by Division Engineer E. C. Welden for following State road work: Town of Somers, 10,000 lin. ft. survey on the main highway to Ellington, and 12,700 lin. ft. survey on Somers st.; town of Ellington, 20,000 lin. ft. survey on Ellington turnpike; town of Coventry, 21,000 lin. ft. survey from South Coventry to Coventry.

Thompsonville, Conn.—Selectmen have decided to macadamize Pearl and South Pearl sts.

Washington, D. C.—American Consul has reported that an official in Oceania is about to purchase steam roller for use on roads, and at later date will purchase others, as there is none in the region at present; weight of roller desired should be 4 or 6 tons, and in writing its exact weight, all dimensions, capacity, cost f. o. b. San Francisco, and illustrations should be given; matter is to be taken up at once. Address in French, if possible, No. 6410 Bureau of Manufactures.

New Castle, Del.—Council will open bids Apr. 3 for \$30,000 street paving bonds.

Wilmington, Del.—Having been authorized by Legislature to issue bonds for purpose, New Castle County Levy Court is planning construction of about 30 miles of good roads this summer.

Rome, Ga.—Hazelhurst & Anderson, Candler Bldg., Atlanta, have been selected as engineers for proposed pavement, sewer and construction work.

Boise, Ida.—Bids will be received Mar. 31 by Emily L. Savidge, City Clerk, for \$220,000 Paving Dist. No. 15 bonds.

Greencastle, Ind.—Council has passed ordinance for improving four streets around the public square; work will cost about \$15,000.

Hartford City, Ind.—County Commissioners have decided to devote \$4,000 more to improvement of roads throughout county.

Council Bluffs, Ia.—Councils considering resolution providing for repaving of Main st. and Broadway.

Dayton, Ky.—Street Committee has been instructed to receive bids for reconstruction of 6th ave.

Tonganoxie, Kan.—City has decided to pave Main st. with macadam.

Alexandria, La.—Rapides Parish Police Jury will consider election on \$200,000 bonds for road improvements.

Augusta, Me.—Mayor Reul J. Noyes has recommended macadamizing of portion of Water st.

Chestertown, Md.—Council has decided to macadamize streets.

Port Deposit, Md.—Ceil County Commissioners have decided to macadamize road between the town and Battle Swamp.

Holyoke, Mass.—Board of Aldermen is considering macadamizing of Brown ave. and macadamizing or paving of Jackson st.

Charlotte, Mich.—Council has voted to submit proposition to bond city for \$19,000 at the spring election; money will be used for street improvements.

Detroit, Mich.—Bids will soon be asked for paving with cedar block on concrete base. Fort st.; cost \$17,500; Ellery st., \$24,960; Beaufait ave., \$17,077.

Duluth, Minn.—Board of Works will ask bids for improving Juniata and Wyoming sts. with tarcon.

Columbus, Miss.—City desires delivered prices on 6,000 lin. ft. of granite curbing; stones to be about 5 x 18 in. by 6 ft.; street and alley corners to be radius of 6 ft. and 3 ft. respectively.—E. S. Donnell, Mayor.

St. Joseph, Mo.—More than twenty-one miles of macadam road leading out of St. Joseph will be oiled at cost of the county this year.

Hackensack, N. J.—Street Committee will soon ask bids for street work, including sidewalks and curbing.

Jersey City, N. J.—Finance Commission-

ers have authorized repaving of Ocean ave. Myrtle to Gates ave.

Perth Amboy, N. J.—Paving of portion of Division st. with vit. brick is being considered.

Trenton, N. J.—Board of Freeholders will consider resurfacing of Trenton-Princeton road at total cost of \$60,000; length 9 miles.

Trenton, N. J.—Council is considering paving of seven streets with fibertine; 20 st., Broad to Lalor st., with asphalt, and Quarry alley with Belgian blocks.

Westfield, N. J.—Town Engineer Varr will purchase tarvia and crushed stone for road repairs.

Albany, N. Y.—Council has accepted bill of Assemblyman Hinman providing for improvement of State st., Broadway to the river front, at a cost of not to exceed \$500,000.

Bronxville, N. Y.—Public Service Commission, Second District, has approved plans for elimination of grade crossings on the Harlem Division of the New York Central Railroad; cost will approximate \$150,000.

Canastota, N. Y.—Village has voted to pave Peterboro st. for distance of nearly two miles.

Cornwall, N. Y.—Citizens have voted to construct sidewalks.—Address Village President Clarkson.

Dewitt, N. Y.—Town Board has appropriated \$1,600.60 for highway improvements to be made during summer by Town Superintendent of Highways Thomas Baker.

Hudson, N. Y.—City has decided to repave Warren st. with vit. brick on 6-in. concrete base.

Hudson, N. Y.—Bids will be received in April for paving, probably with vitr. brick, cost about \$25,000.—Wm. Wortman, Secretary Board of Public Works.

Irvington, N. Y.—Public Service Commission, Second District, has approved plans for elimination of the Main st. grade crossing on Harlem Division of the New York Central Railroad; cost will approximate \$80,000.

Lyons, N. Y.—Twelve and one-eighth miles of county highway to be built in 1912 with State aid have been designated by Wayne County Board of Supervisors.

Montour Falls, N. Y.—Citizens have voted \$6,000 for brick pavement.—Geo. M. Post Village President.

Belham Manor, N. Y.—Citizens have voted \$6,000 expenditure for repairing 1,200 lin. ft. of sidewalks and \$7,000 for laying 10,000 ft. of new sidewalks.

Potsdam, N. Y.—Citizens have defeated proposition to raise \$13,000 to pave Market st.

Poughkeepsie, N. Y.—Board of Aldermen has ordered macadamizing of three streets and paving of three others; Board of Works has recommended paving of six streets.

Pulaski, N. Y.—Citizens have voted to raise \$2,000 to construct and repairing stone crushed roads.

Utica, N. Y.—Board of Contract and Supply has rejected bids for paving Canal and Ray sts.

Whitesboro, N. Y.—Citizens will vote April 4 on paving four streets.

White Plains, N. Y.—Board of Supervisors has approved plans for new roads in Westchester County to be built with State aid, as follows: 4.6 miles running through towns of Lewisboro and Bedford, cost \$62,500; 1.8 miles in town of Rye, cost \$24,700; 5.68 miles, the Cross River road, running through town of Lewisboro to Connecticut State lines, cost \$81,000.

Yorkville, N. Y.—Citizens have decided to improve Whitesboro st. at cost of \$19,500.—Edw. M. Coughlin, Village President.

Carthage, N. C.—Moore County will vote Apr. 4 on \$100,000 of bonds for road construction.

Cincinnati, O.—City Engineer Shipley has submitted approximate estimates for improvement of Fairmount ave., Harrison ave. to Iroquois st., at \$18,990, and Neff ave. from Wilder ave. to Maxwell Place with macadam at \$14,241.

Cincinnati, O.—County Commissioners have approved plans and specifications for resurfacing, general overhauling and oiling of Colerain pike from city to Poole road; estimated cost \$6,366; culvert to take place of an old bridge on West Fork, at Winter's place, \$2,948; bridge over south fork of Taylor's Creek, foot of Dog Trot road, \$873; retaining wall on Eight Mile road in front of Henry Kremer's place, \$5,410; repair of washout on Eight Mile road, at Ayer's place, \$2,795; approaches to lift bridge at Hartwell, \$576.

Clyde, O.—Bids will soon be received for about 1 1/4 miles of paving.—H. M. Bacon, City Clerk.

Massillon, O.—Council has decided to pave another mile of streets this summer.

Perrysburg, O.—Council has decided to pave seven blocks on 2d st. with brick; cost \$48,000.

Falls City, Ore.—City Engineer Beezley has made surveys for construction of two miles of macadamized streets; work will commence immediately.

Springfield, Ore.—Council has decided to pave several blocks on Main st.

Claysville, Pa.—Rebuilding of county road from this town through Donegal Township to Acheson is being considered; distance 6 miles.

Pittsburg, Pa.—Council will consider street repaving work to cost \$146,200, sidewalk work to cost \$2,000, and concrete steps on Tunilla st., \$1,800.

Wilkes Barre, Pa.—County Commissioners will on April 6 consider plans and specifications for construction of road in Jackson Township.—W. C. Price, County Solicitor.

York, Pa.—Highway Committee has decided to ask for bids for repaving asphalt paving on streets upon which guarantee has expired.

Greenville, Tex.—Council will soon advertise for bids for contracts to pave streets.

Salt Lake City, Utah.—Engineering and Sewerage Committee will recommend immediate purchase of street paving and repairing plant.

Colfax, Wash.—Council has passed ordinances for paving Main st.

Dayton, Wash.—Columbia County has rejected all bids received for maintenance of county roads.

Tacoma, Wash.—Department of Public Works has decided to pave North L st. and four other streets with asphalt.

Tacoma, Wash.—Council has passed ordinance for improvement of River and Canal sts.

Fairmont, W. Va.—City will receive proposals for grading and paving with brick, Gaston ave., 3d to 5th st., 2,670 sq. yds.; 4th st. from Fairmont ave. to Walnut ave., 290 sq. yds.; Market st., Merchant st. to Columbia, 1,960 sq. yds.; Merchant st. from Newton st. to Ferry st., 1,450 sq. yds.—S. B. Miller, City Engineer.

Wheeling, W. Va.—Board of Control has decided to pave Wheeling Hill.

Monroe, Wis.—Council has decided to pave North Jefferson st. with brick.

Stevens Point, Wis.—City will soon ask bids for several miles of macadam paving; cost about \$25,000.—J. Carley, City Clerk.

CONTRACTS AWARDED

Little Rock, Ark.—To M. D. L. Cook, city, for construction of 6,800 sq. yds. of asphalt paving on 10th st. from Main to City Park; cost \$15,000.—E. A. Kingsley, Superintendent of Public Works.

Los Angeles, Cal.—Street improvements: Daly st. to Barber Asphalt Paving Co., Central Bldg., \$7,185; Vine st. to A. W. Leeseemyer, \$1,886; Normandie ave., to Geo. H. Oswald, \$1,102; Hasse st. to T. E. Shafer, \$11,923; Boyd st. to Fairchild, Gilmore Wilton Co., Pacific Electric Bldg., \$8,212; Mesa st. to H. H. Curtis, \$7,177.

Belleville, Ill.—To Hoeffken Bros. for improvement of Jarrott and C sts., \$37,697.55; other bidders, Reeb Bros., \$38,434.95; A. F. Franks, Jacksonville, \$39,438.25; Meyer & Thomas, East St. Louis, \$40,143.10; Albion Block will be used. Improvement of Douglas ave. and Sycamore st. to Reeb Bros., \$28,110.05; other bidders, Hoeffken Bros., \$28,682.70; A. F. Franks, Jacksonville, \$29,331.75; Meyer & Thomas, East St. Louis, \$30,053.50; Egyptian block, manufactured at Murphysboro, Ill., will be used.

Chicago, Ill.—Furnishing 10,000 sq. yds. of sectioned wood pavement to be delivered and used as directed for repaving bridges to Geo. P. Cullen & Co., 78 LaSalle st., Chicago; 2 1/2-in. pavement \$2.35 per sq. yd., 3 1/2-in. pavement \$2.70 per sq. yd.; sidewalk construction to H. P. Larsen, 1542 N. Rockwell st.; Thos. D. Joy, 3911 W. Van Buren st.; Banstrow Supply Co., 6084 Ridge ave.; Siewart Colom, 3865 Milwaukee ave.; Skafgard Concrete Construction Co., 4024 W. North st.; Jas. J. Ferry, 92 Sigel st.; Deming & Wendt, 84 LaSalle st., and General Cement Construction Co., Milton Place.

Brazil, Ind.—Building 7,655 ft. of gravel road in Clay County, to Edgar J. Schaeffer, \$9,349.

Portland, Ind.—Building gravel road in Jay and Randolph counties, to Daniel Wallace, Ridgeville, \$17,749.

Seymour, Ind.—Constructing gravel road in Vernon Township, to Sam Small, city, \$7,995.

Red Oak, Ia.—Paving with brick, to Hamilton & Schwartz, Shenandoah, \$1.83 per yd.

Louisville, Ky.—Paving with asphalt at cost of \$70,000 to American Standard Asphalt Co., for bulk of work; to Barber Asphalt Co., work on 6th st. and to S. S. Saxton Co., on Avery st.

Hagerstown, Md.—To Victor Cushwa & Sons, to furnish sand, cement and sand pipe for year.

Boston, Mass.—Furnishing crushed stone and screening in various city districts during year ending Feb. 1, 1912: in the South Boston district, to Lane Quarry Co., \$1.47 per ton of 2,000 lbs.; East Boston, Rowe Contracting Co., \$1.48; Charlestown, Coleman Bros., \$1.47; West Roxbury, Thomas F. Minton, \$1.10; Dorchester, T. F. Bradley, \$1.19 1/2; other bidders: South Boston, J. C. Coleman & Sons, \$1.65; Bleiler Contracting Co., \$1.50; John F. Beatty, \$1.55; Hugh Nawn Contracting Co., \$1.60; W. J. Emerson, \$1.48; East Boston, Coleman Bros., \$1.53; Hugh Nawn Contracting Co., \$1.70; Essex Trap Rock and Construction Co., \$1.55; Charlestown, Rowe Contracting Co., \$1.50; Hugh Nawn Contracting Co., \$1.70; Essex Trap Rock and Construction Co., \$1.55; West Roxbury, West Roxbury Trap Rock Co., \$1.13; Hugh Nawn Contracting Co., \$1.10; Dorchester and Ashmont, West Roxbury Trap Rock Co., \$1.47; P. F. Donovan, \$1.32; Hugh Nawn Contracting Co., \$1.50; W. J. Emerson, \$1.34; Lane Quarry Co., \$1.47.

Boston, Mass.—To Standard Oil Co. of New York for furnishing 400,000 gals. of emulsion oil and 400,000 gals. of emulsified road oil.

Detroit, Mich.—Paving with cedar blocks on concrete foundation, with Amherst curbing: Chalmers ave. from Freund to Jefferson ave., to T. E. Currie, 20 McGraw Bldg., \$7,680; Hazel st., National to Wabash ave., to J. A. Mercer, 21 Hammond Bldg., \$8,939; Montclair ave., Charlevoix ave. to city limits, to T. E. Currie, \$7,142; Spruce st., 12th st. to Wabash ave., to J. Orath, 31 McGraw Bldg., \$4,818; Willis ave., McDougal to Mt. Elliott ave., to T. E. Currie, \$15,855.

Muskegon, Mich.—Furnishing and delivering 14,200 cu. yds. of road building materials, to Lake Shore Stone Co., Milwaukee, Wis., \$18,319.

Columbia, Mo.—Building 11,750 sq. yds. of pavement, to J. A. Stewart, \$24,899.

Kansas City, Mo.—Building 1 1/2 miles of concrete paving through Westmoreland district, to Weaver Bros., about \$25,000.

Webb City, Mo.—Paving 6,960 sq. yds. asphalt and macadam to Webb City Paving and Improvement Co., 58 1/2 c., 8,266 sq. yds. to W. F. Plumber & Co., Springfield, 79 1/2 c.; macadam foundation; setting 4,718 lin. ft. concrete curb and gutter to W. F. Plumber & Co., 61 c.; other bidders, Webb City Co., \$2,019, and M. Gilloiz, \$2,830; laying 3,921

sq. yds. concrete sidewalks, gravel foundation, to M. Gilloiz, 85 c.; excavation 50c. per cu. yd.; filling 50c. per cu. yd.

Elizabeth, N. J.—Supplying stone for use on roads in Springfield Township, to Steward Hartshorne, chips 65c., 1-in. 90c., 3/4-in. 90c., dust 90c.; prices per ton at quarry; to James Morrison, Springfield, 29 1/2 c. per ton, also to grade and repair Short Hills ave., \$85.

Haddon Heights, N. J.—Laying over 25,000 lin. ft. of cement curb, to Albert D. Pine, of Camden.

Perth Amboy, N. J.—Paving, to Hastings Pavement Co.; Lewis st., \$10,855; Hobart st., \$7,564; King st., \$6,657; Fayette st., \$5,549; Barber Asphalt Paving Co. only other bidder.

Trenton, N. J.—Repairing asphalt pavement, to Filbertine Co.

Westfield, N. J.—Building crosswalks, to J. W. Manhattan.

Albany, N. Y.—Building State roads: Road No. 886, Greene County, to De Graff & Hogeboom, Kingston, \$55,871; Road No. 887, Greene County, to De Graff & Hogeboom, \$36,118; Road No. 5096, Genesee County, to Hucknall Construction Co., Albion, \$50,000; Road No. 874, Hamilton County, to Creedon & Pitou, New York, \$49,670; Road No. 5077, Lewis County, to Thomas Shaughnessy Co., Albany, \$35,600; Road No. 5078, Madison County, to Newport Construction Co., Newport, N. Y., \$31,800; Road No. 409, Montgomery County, to Joseph Walker, New Paltz, \$82,863; Road No. 837, Oneida County, to Joseph Walker, \$49,950; Road No. 838, Oneida County, to Fred W. Begent, Newport, N. Y., \$7,787.67; Road No. 839, Oneida County, to A. C. Brewer, Oriskany Falls, \$12,946.90; Road No. 840, Oneida County, to Kennedy Roofing and Paving Co., Utica, \$57,965; Road No. 877, Oneida County, to John Hyde, Rome, \$12,419.50; Road No. 5079, Oneida County, to Kennedy Construction Co., Albany, \$18,973; Road No. 556, Onondaga County, to Central City Paving Co., Syracuse, \$32,479; Road No. 557, Onondaga County, to Thomas Meehan & Sons, Philadelphia, \$65,458.80; Road No. 655, Onondaga County, to Central City Paving Co., Syracuse, \$12,657; Road No. 669, Onondaga County, to Meehan & Son, Philadelphia, \$72,517.01; Road No. 5080, Onondaga County, to Paddock & Williams, Memphis, N. Y., \$33,975; Road No. 772, Oswego County, to Joseph H. Connors, Fulton, \$43,990; Road No. 825, Oswego County, to Monroe Roads Co., Pittsford, \$36,212; Road No. 826, Oswego County, to Folk & Menzies, Buffalo, \$56,999.99; Road No. 5082, Oswego County, to Charles O. McComb, Syracuse, \$37,990; Road No. 5083, Oswego County, to Chas. O. McComb, \$30,420.

Albany, N. Y.—State road work: Road 879, Shakers-Watervliet, Albany County, 6.40 miles, to John E. Consalus, city, \$76,600 for Trinidad; Road No. 858, Whitney Point-Upper Lisle, Browne County, 4.27 miles, to T. H. Gil & Co., Boston, \$46,316; Road No. 687, Fair Haven-Sterling-Martinville, Cayuga County, 5.30 miles, to Mosier & Summers, Buffalo, \$62,000 for residuum; Road No. 666, Plymouth-Kirk, Chenango County, 4.90 miles, to E. D. Baker, Binghamton, \$53,548 for residuum; Road No. 777, Plattsburg-Codyville, Clinton County, 4.33 miles, to Spellman-Oliver Co., Chateaugay, \$39,970 for residuum; Road No. 5,074, Scho-dock Center-Volatie, Part 4, Columbia County, 4.30 miles, to Thos. Shaughnessy & Co., city, \$48,900 for residuum; Road No. 712, Amenia-Sharon Station, Dutchess County, 2.25 miles, to Lane Construction Co., Meridian, Conn., \$20,619; Road No. 884, Malone-Port Covington, Part 1, Franklin County, 3.58 miles, to St. Regis Construction Co., city, \$42,222.22 for residuum; Road No. 885, Moera-South Bombay, Franklin County, 8.58 miles, to Jas. Anderson, city, \$84,429.93 for residuum; Road No. 5,076, Malone-Nevira, Franklin County, 5.22 miles, to Jas. Anderson, city, \$59,579.38 for residuum; Road No. 625, Theresa-Antwerp, Part 2, Jefferson County, 5.37 miles, to Dale Engineering Co., Utica, \$54,120 for residuum; Road No. 626, Burr's Mills-South-Champion, Jefferson County, 4.56 miles, to Semper Bros., Watertown, \$49,917.70 for residuum; Road No. 659, Brunswick Center-Lansing Rensselaer County, 5.07 miles, to J. W. Flinn, Waterford, \$55,488 for residuum; Roads No. 5,072 Ext., Livingston-Hudson, Parts 1 and 2, Columbia County, to General Construction Co., Bridgeport, Conn., \$101,859 for residuum.

New York, N. Y.—Regulating and repaving with sheet asphalt pavement: To Sicilian Asphalt Paving Co., 41 Park Row, for improving 29th st. from Lexington ave. to 4th ave., \$10,899; to W. J. Fitzgerald, 457 West 45th st., for improving 11th ave., 42d to 62d st., at \$92,264; East 20th st., East River to 1st ave., \$18,823; portion of 34th st., \$24,519. Curbing and laying sidewalks on Hunters' Point ave., Jackson ave. to Van Dam st. Borough of Queens, to the

M. Di Menna Construction Co., 212 Hughes ave., \$11,550; other bidders: Leace Bros., \$12,500; Green Contracting Co., \$12,500; W. H. Robertson, \$12,800; Astoria Contracting Co., \$12,900; Frazer Co., \$12,310; Deagon Realty and Terminal Improvement Co., \$11,115; Henry J. Mullen, \$11,918.

Yonkers, N. Y.—Furnishing 8,000 cu. yds. of trap rock, to Manhattan Trap Rock Co., \$1.05 per cu. yd.

East Youngstown, O.—To E. A. Grubb for putting in all new sidewalks for village within next year, 95¢ c. per sq. ft.

Stamford, Tex.—Paving four blocks of streets with Bassam, to Ocklander Bros., Waco.

Spokane, Wash.—Grading streets in West Grove addition, to J. C. Kennedy, \$121,980.

Sheridan, Wyo.—Bismarck General Engineering Co., Bismarck, N. D., has been awarded contract to supervise the placing of 69,000 yds. of creosote block paving.

BIDS RECEIVED

Trenton, N. J.—Thos. J. McGovern, lowest bidder for paving West End ave. with 8-in. macadam and laying concrete gutters; bid for pavement, 80c. per sq. yd.

Albany, N. Y.—State road improvement; contracts held over: Road No. 679, W. Stephentown-Stephentown Center, Rensselaer County, 4.14 miles; J. W. Whalen, Whitehall, \$36,574; Fred E. Ellis, Melrose, Mass., \$51,306; Olin T. Benedict, Pittsfield, Mass., \$59,379; Cunningham-Woodard Co., Hudson Falls, \$45,400; Richard Hopkins, Troy, \$44,832; S. B. Van Wageningen, Rondout, \$46,000; Charles E. Horne, Millburg, Mass., \$59,800; Amos D. Bridges' Sons, Inc., Hazardville, Conn., \$53,983; Edward J. Rourke, Arlington, Mass., \$54,043; Joseph McCormick, East Providence, R. I., \$49,830.

Road No. 680, Stephenson Center, Massachusetts, Rensselaer County, 3.92 miles; John W. Whalen, Whitehall, \$35,588; Cunningham-Woodard Co., Hudson Falls, \$39,445; The Lane Construction Co., Meriden, Conn., \$26,640; Ryder & Sanders Construction Co., Troy, N. Y., \$33,491; S. B. Van Wageningen, Rondout, N. Y., \$36,000; Amos D. Bridges' Sons, Inc., Hazardville, Conn., \$41,998; Joseph McCormick, East Providence, R. I., \$39,970; Fred E. Ellis, Melrose, Mass., \$33,790; Olin T. Benedict, Pittsfield, Mass., \$46,072.

Road No. 5072, Extension Livingston-Hudson Parts 1 and 2, Columbia County, 8.70 miles; Frank J. Gallagher, Brooklyn, N. Y., \$112,000 for Residium, \$117,000 for Bermudez and \$115,852 for Trinidad; Joseph Walker, New Paltz, \$105,532; \$116,728; and \$109,544; Brown & Lowe Co., Schenectady, \$112,668, \$117,804 and \$116,322; Catskill Supply Co., Catskill, \$106,480, \$111,740 and \$111,740; Herlihy Contracting Co., Glens Falls, \$105,312, \$121,000 and \$119,500; James E. Martin, Poughkeepsie, \$113,000, \$118,000 and \$110,800; General Construction Co., Bridgeport, Conn., \$104,859, \$109,495 and \$108,995. Road No. 4074, Extension Schodack Center-Valatie, Parts 3 and 4, Columbia, Rensselaer, 7.20 miles; Frank J. Gallagher, Brooklyn, N. Y., \$94,550 for Residium, \$99,070 for Bermudez, and \$97,940 for Trinidad; Brown & Lowe Co., Schenectady, \$94,999, \$99,519 and \$98,389; Herlihy Contracting Co., Glens Falls, \$105,000, \$110,000 and \$109,000; Di Martino & Musso, Scranton, Pa., \$83,251, \$88,274 and \$88,000; Lane Construction Co., Meriden, Conn., \$91,000, \$95,500 and \$94,400. Road No. 763, Hollowville-Crarryville, Columbia County, 7.14 miles; Herlihy Construction Co., Glens Falls, \$108,900 for Residium, \$116,000 for Bermudez and \$115,000 for Trinidad; D. Martino & Musso, Scranton, Pa., \$68,980, \$72,180 and \$72,065; Joseph Walker, New Paltz, N. Y., \$120,167, \$123,687 and \$122,807; Thomas Meehan & Sons, Philadelphia, Pa., \$124,301, \$127,821 and \$126,941; James Sewart & Co., New York City, \$117,000, \$120,520 and \$120,520; James E. Martin, Poughkeepsie, \$111,994, \$106,800 and \$115,800; General Construction Co., Bridgeport, Conn., \$103,490, \$106,490 and \$106,000; DeGraff & Hogeboom, Kingston, \$104,436, \$108,500 and \$108,500. Road No. 5084, Schodack Center-Valatie, Part 3, Rensselaer County, 2.90 miles; Lane Construction Co., Meriden, Conn., \$40,950 for Residium, \$42,750 for Bermudez, and \$42,300 for Trinidad; Thomas Meehan & Son, Philadelphia, \$39,581, \$41,606 and \$41,156; Olin T. Benedict, Pittsfield, Mass., \$46,000, \$47,174 and \$46,800; Dorpian City Construction Co., Schenectady, \$39,892, \$41,656 and \$41,215; Di Martino & Musso, Scranton, Pa., \$32,898, \$34,620 and \$34,500; Thomas F. Shaughnessy Co., Albany, \$37,800, \$42,000 and \$42,000; Wiltzie & Rigley, Rensselaer, \$39,961, \$41,851 and \$41,379. Road No. 790, Cohoes City Line-Boghts Corner, Albany County, 2.17 miles; Thos. H. Carr, Troy, \$25,200, Residium; Grattan Construction Co., Cohoes, \$22,990; Fred E. Ellis, Melrose, Mass., \$25,078; Thomas Meehan & Sons, Philadelphia, Pa., \$23,911.20; Kennedy Construction Co., Albany, \$27,873; Ryder & Sanders Construction Co., Troy, \$21,918; John B. Dower,

Ballston, \$26,670. Road No. 695, Otto-Cattaraugus, Cattaraugus County, 1.21 miles, no award, amounts exceeding the appropriation; Miller & Nickenburgh, Buffalo, \$13,751.75; James Stewart & Co., New York, \$14,690.50; George S. Van Winkle, New York, \$15,449.95. Road No. 697, Otto-E. Otto, Sec. 2, Cattaraugus County, 2.27 miles, no award, amounts exceeding the appropriation; Miller & Knickenberg, Buffalo, \$29,441.40; James Stewart & Co., New York, \$26,154; George S. Van Winkle, New York, \$25,265.60.

Brooklyn, N. Y.—Furnishing and delivering to Bureau of Highways broken stone and screenings of trap rock: (a) in the Fourth Ward, (b) in the Second, Third and Fifth Wards; Clinton Point Stone Co., (a) \$38,697, (b) \$21,735; Manhattan Trap Rock Co., (a) \$39,574, (b) \$21,424.

New York, N. Y.—Regulating and repaving with granite block on a concrete foundation 10th ave. from 23d st. to 30th st., Rafferty Bros., W. 52d st., lowest bidder: 5,590 sq. yds. granite block with cement joints, except the railroad area, \$2.53, and 3,150 sq. yds. granite block with cement joints, within railroad area, no guarantee, \$2.53; 3,340 sq. yds. old stone block to be purchased and removed by contractor, 1c.; 1,660 cu. yds. Portland cement concrete, 1c.; 1,850 lin. ft. new bluestone curb, 7c.; 1,490 lin. ft. old bluestone curb reset, 20c.; 1,920 sq. ft. new granite bridgestone, 75c.; 210 lin. ft. header stone, 30c.; total, \$31,814.

York, Pa.—Paving, Standard Bitulithic Co., \$2.20 per sq. yd. for bitulithic paving on South Richland ave. aggregating 5,000 yds.; East Gas alley, aggregating 550 yds.; South Hartley st., aggregating 2,120 sq. yds.; West Philadelphia st., aggregating 7,000 sq. yds.; The Barber Asphalt Co., \$1.74 per sq. yd. for asphalt on West Philadelphia st.

SEWERAGE

Phoenix, Ariz.—As soon as bonds are sold, bids will be asked for construction of extensions to sewer system.—Olmstead & Gilleule, Los Angeles, Engineers.

Hollister, Cal.—Plans are being prepared by the City Engineer for extension of municipal sewer system.

Oakland, Cal.—Voters of annexed district will vote on bonds to provide adequate sewers for various sanitary districts of the territory on April 14.

Jacksonville, Fla.—Citizens will vote April 6 on \$60,000 bonds to install complete sewerage system and electric lights.

Pensacola, Fla.—Board of Bond Trustees will soon ask bids for proposed sewer work.

Sparta, Ga.—City Council will construct sewer system; has decided to receive bids at once; John D. Walker, Mayor.

Nampa, Ida.—Plans are being completed by Burns & McDonnell, Consulting Engineers, 823 Scarritt Bldg., Kansas City, Mo., for sanitary sewers, and bids will be asked some time in May; estimated cost of complete improvements, \$150,000.

Dawson Springs, Ky.—City Sewer Commission is arranging for construction of proposed sanitary sewer system.

Baltimore, Md.—Ordinance authorizing submission of \$10,000,000 sewerage loan to voters at May election has been passed by Council and will be signed by Mayor Mahool at once.

Jackson, Mich.—Citizens will soon vote on bonds as follows: Harmon drain extension, \$5,500; Harmon drain laterals, \$18,037; 6th, 7th and 8th Wards laterals, \$13,065, and miscellaneous sewers, \$12,510.—A. W. D. Hall, City Engineer.

Albany, N. Y.—City Engineer Walter Melius has filed with Dr. Eugene H. Porter, State Commissioner of Health, plans for construction of an intercepting sewer along river front.

Dolgeville, N. Y.—Village has voted \$12,000 appropriation for extensions to sewer system.

Franklinville, N. Y.—Citizens have voted \$600 appropriation for plans and specifications for proposed sewer system.—J. K. Button, Village President.

Thomasville, N. C.—Board of Aldermen will ask new bids for \$75,000 sewerage and water works bonds.

Colwyn, Pa.—Council is considering \$20,000 loan for sewage disposal plant.

Womelsdorf, Pa.—Bids will be received early in May for sewage disposal plant for Bethany Orphans Home; probable cost, \$2,700. P. A. Shaw, Reading, Engineer.

York, Pa.—Highway Committee has decided to ask for bids of construction of storm water sewers in Richland ave.

Rock Hill, S. C.—Bids will at once be asked for construction of sewerage system; \$285,000 sewerage, light and water bonds sold to A. B. Leach & Co., New York.—J. W. Cothran, Engineer in Charge; John T. Roddey, Mayor.

Eagle Lake, Tex.—Citizens will vote on \$30,000 bonds for construction of sewer system and water works.

Basin, Wyo.—Plans are being prepared by Burns & McDonnell, Engineers, 823 Scarritt Bldg., Kansas City Mo., for sewer, water works and lighting improvements; cost \$75,000; bids will be asked in April.

North Toronto, Ont., Can.—Ratepayers have voted \$265,000 bonds for construction of sewerage system.

CONTRACTS AWARDED

Ft. Collins, Col.—To Foster & Doll, Denver, for building sewer in Sewer Dist. No. 29, \$18,692.

Atlanta, Ga.—Construction of Intrenchment Creek disposal plant and intercepting sewers leading thereto, to Chester A. Dady, New York City, for disposal plant, \$192,577; to Nichols Contracting Co., city, for the Dulbosa aqueduct, \$7,170; to Dysard Construction Co., city, for the Parker aqueduct, \$5,400; to Noll Construction Co., Chattanooga, Tenn., for section 3 of intercepting sewer, \$36,634; Noll Construction Co., for section 4 of the intercepting sewer, \$28,630; to Mackle-Crawford Construction Co., for constructing Collier's bridge, \$7,400.

Elkton, Md.—Building sewer in West Elkton, to Chalkley Halton, Wilmington.

Medford, Mass.—Furnishing sewer pipe to Berry & Ferguson, Boston.—Fred. L. Cushing, Clerk, Sewer Comrs.

Virginia, Minn.—Building sanitary sewer in southern part of city, to H. L. Bartlett Co., city, \$3,555.70.

Syracuse, N. Y.—Constructing north section of Harbor Brook intercepting sewer and for improving corresponding section of brook, to John Young and George C. Dounce, under name of Young Contracting Co., \$88,121.

Russell, O.—To Scherer & Mountain, Ironton, for constructing sewers, \$10,891.

Glassport, Pa.—Constructing sewer on Ohio ave. and Plum Alley, about 3,915 ft. 6, 12 and 18-in. terra cotta pipe sewers to McLaughlin Contr. Co., Pittsburg.

Cameron, Tex.—To Hamilton Bros., of Chicago, for installing sewerage system; approximate cost \$15,000.

Moundsville, W. Va.—To B. F. Sweeten & Son, Camden, N. J., for constructing sewerage system, \$121,180.80.

BIDS RECEIVED

Moundsville, W. Va.—Constructing sewer system; Henning Vineyard Co., Evansville, Ind., \$222,912.50; Thorney Pietro, Morgantown, \$145,943.80; Whiting Middleton Construction Co., Baltimore, Md., \$268,217.21; J. J. Kerns, Knoxville, Tenn., \$162,965.30; P. B. McCleans, Newport, Ky., \$174,087.30; Van Meter Construction Co., Steubenville, O., \$132,215.65; Althous Construction Co., St. Louis, Mo., \$201,609.42½; Trainer & Scanlan, Huntington, \$169,562.50; James Ferry & Sons, Pittsburg, \$157,500; Boser & Maloney, Bellaire, O., \$147,511.20; Central Construction Co., Pittsburg, \$165,000; M. O'Heron Co., Pittsburg, \$196,608.75; John W. Stringer, Rayland, O., \$148,726.75; Thomas S. Savage, Parkersburg, \$149,932.30; W. H. & C. F. Thompson, Baltimore, Md., \$174,692.90; B. F. Sweeten & Son, Camden, N. J., \$121,180.80.

WATER SUPPLY

Gadsden, Ala.—Citizens will vote April 24 on \$50,000 bonds for completion and improvement of water works system.

Alameda, Cal.—Union Water Company has made plans to incorporate factory and warehouse district with its Alameda water system and will lay large mains throughout section.

Alameda, Cal.—Alameda Police and Fire Commissioners have recommended installation of auxiliary salt water cistern system throughout district, each cistern to be of sufficient capacity to allow six engines to draw water from it; cisterns will be supplied with water from estuary by large underground pipes.—I. N. Chapman, City Engineer, has begun surveying ground for the auxiliary system.

Norwich, Conn.—National Board of Fire Underwriters has recommended immediate construction of additional supply a Stony Brook and installation of number of mains, hydrants and gate valves.

Gunnison, Col.—Plans and specifications have been completed for water works and lighting improvements to cost \$90,000.—Burns & McDonnell, 823 Scarritt Bldg., Kansas City, Mo., Engineers.

Washington, D. C.—Appropriation of \$45,100 will be available July 1 for laying water main to Benning and Kenilworth.

Wilmington, Del.—Water Commissioners have announced that water mains, which have been in service for many years, will have to be renewed.

Colquitt, Ga.—Citizens have voted \$7,500 bonds for extension of water system.

Eastman, Ga.—City had plans prepared for construction of water works extension;

about three miles 6-in. and 8-in. mains, and about two miles 2-in. galvanized service pipe; material will be purchased and contract for construction let at once.—Arthur Few, 620 Temple Ct., Atlanta, Engineer-in-Charge.

Sparta, Ga.—City will receive bids at once for construction of water works.—John D. Walker, Mayor; W. H. Stansell, Clerk.

Swainsboro, Ga.—Citizens will vote April 17 on \$10,000 bonds for installing water works and electric lights.

Columbus, Ind.—Engineer has been employed to prepare plans for installation of modern filtration plant.

Kendallville, Ind.—Council has decided to extend water mains at cost of \$2,134.95.

Seneca, Kan.—Plans for increasing water supply have been completed; bids will be asked April 7; amount of bond issue \$15,000.—Burns & McDonnell, 823 Scarritt Bldg., Kansas City, Mo., Consulting Engineers.

Dawson Springs, Ky.—J. W. Holmes, Superintendent of water plant, Paducah, has made survey of city and will prepare plans for water works; gravity reservoir is to be located on hill southeast of city; water will be pumped into reservoir from three wells on hill; about 10,000 ft. of mains are to be laid; cost \$12,000 to \$15,000.

Baltimore, Md.—Water Board has approved plans for proposed equipment of Mount Royal pumping station; cost \$175,000.—Walter M. Quick, Water Engineer.

Amherst, Mass.—Plans are being prepared for extension of the mains of the Amherst Water Co. to village of South Amherst via Shays st.

Longmeadow, Mass.—Citizens have voted \$9,000 loan for enlarging water works.

Clio, Mich.—Council has asked estimates for installation of water works.

Duluth, Minn.—City will at once ask bids for \$200,000 water and light bonds.

Duluth, Minn.—Water and Light Department is planning to install miles of water and gas mains during year.

Biloxi, Mass.—Superintendent of Water Works E. L. Castanea has recommended installation of 85 hydrants, 13,000 ft. of 4-in., 4,300 ft. of 6-in. and 1,800 ft. of 8-in. pipe; cost about \$60,000, minus cost of proposed pumping station improvements.

Culbertson, Mont.—Thomas S. Shepard, Engineer, Denver, Col., has been elected to advise city regarding the installation of municipal water works system.

Lewistown, Mont.—Citizens have voted \$100,000 bonds for rebuilding water works system.

Pembroke, N. H.—Citizens have appointed committee, Rufus B. Robinson, chairman, to investigate feasibility and cost of constructing water works.

Trenton, N. J.—Water Department has practically completed arrangements for immediate installation of temporary purification plant to be put in actual service before end of May.

Holland Patent, N. Y.—Village has voted \$4,000 bonds to install 8-in. pipe in place of present 4-in. water mains from pumping station, distance 1,650 ft.

Medina, N. Y.—Citizens have defeated proposition to expend \$25,000 to install water works system.

Mount Morris, N. Y.—Map of course of pipe line from springs between Oakland and Hunt, which will furnish water for proposed water system, has been completed by Engineers Witmer & Brown; bids will soon be asked.

Newark, N. Y.—Citizens have voted to raise \$5,900 for water works equipment and \$2,500 to extend water mains.

Newport, N. Y.—Village has voted \$15,000 bonds to improve water system.

Pleasantville, N. Y.—Citizens have voted to spend \$3,500 on extension of water system.—Chas. Hoyt, Village President.

Tarrytown, N. Y.—Citizens have voted \$70,000 bonds to enlarge water supply.

Wolcott, N. Y.—Citizens have voted to install water works.

Thomasville, N. C.—Board of Aldermen will ask new bids for \$75,000 water works and sewerage bonds.

Niles, O.—Engineers Burgess & Long, Columbus, have submitted plans for installation of proposed filtration plant.

South Charleston, O.—Citizens will vote May 2 on \$22,000 bonds for water works.

Sapulpa, Okla.—Plans are being prepared for new water works plant; bids will be asked some time in April; estimated cost \$260,000.—Burns & McDonnell, 823 Scarritt Bldg., Kansas City, Mo., Consulting Engineers.

Newport, Tenn.—Citizens will vote April 29 on bonds for installation of system of water works.

Bartlesville, Okla.—Citizens will vote April 25 on bonds for furnishing city with adequate supply of pure water.

Portland, Ore.—Extensions to city water system aggregating \$332,000 have been ordered laid by Water Board.

Glen Rock, Pa.—Citizens will vote April 11 on \$8,000 loan to improve water supply.

Eagle Lake, Tex.—Citizens will vote on \$30,000 bonds for construction of water works and sewerage system.

Roscoe, Tex.—Citizens have voted bonds for water works.

Spokane, Wash.—Water Engineer Walter Lindsay will recommend installation of proposed high-pressure water system in downtown section; plans prepared; cost \$150,000.

Superior, Wis.—Superior Water, Light and Power Co. is planning to enlarge pumping station in east end, install reservoir and enlarge mains.

Moorcroft, Wyo.—Plans have been completed by Burns & McDonnell, Consulting Engineers, 823 Scarritt Bldg., Kansas City, Mo., for water works improvements costing \$15,000; bids will be asked in May.

CONTRACTS AWARDED

Chicago, Ill.—To H. Kramer & Co., 730 S. Canal st., for furnishing and delivering to the Water Department shops, 2352 S. Ashland ave., 12,000 lbs. ingot copper, \$13.75 per cwt., and 12,000 lbs. copper trolley wire \$13.30 per cwt.; to Gardiner Metal Co., 1374 W. Lake st., for furnishing and delivering 200 tons pig lead to City Water Department, \$4.65 per cwt.; furnishing 2,300 tons, 36-in., and 1,000 tons, 30-in. c.-i. water pipe to United States Cast Iron Pipe and Foundry Co., Rookery Bldg., \$23.75 per ton; furnishing and delivering 50,000 lbs. No. 1 red scrap brass to the Water Department repair shops, 2352 S. Ashland ave., to H. Kramer & Co., 730 S. Canal st., 11½¢ per lb.; furnishing and delivering to the Water Department approximately 15 tons lead pipe, \$5.04 per cwt., to Gardiner Metal Co., 1374 W. Lake st.; furnishing and delivering 9 36-in. gate valves to the Roseland pumping station, 104th st. and C. & W. I. Ry., to the Ludlow Valve Mfg. Co., 217 La Salle st., \$710 each; furnishing and erecting smoke flues for the Roseland pumping station, to John Mohr & Sons, 349 W. Illinois st., \$4,558; furnishing and delivering cotton waste to various pumping stations to Crerar, Adams & Co., 10.5¢ per lb.; furnishing c.-i. water pipe of various sizes to city, to United States Cast Iron Pipe and Foundry Co., The Rookery, \$23.85 per ton; total \$119,900; taking borings in Lake Michigan to the Great Lakes Dredge and Dock Co., Tacoma Bldg., \$5 per lin. ft.; furnishing and delivering gate valves to Rensselaer Valve Co., 98 Jackson Blvd., Chicago, six 36-in., \$440; four 30-in., \$165; five 20-in., \$90; ten 16-in., \$52; furnishing tile pipe to the Water Department to Wm. E. Dee & Co., 108 La Salle st., 30,000 lin. ft. 4-in., 3.2-5¢ per ft.; 600 lin. ft. 6-in., 5¢; 600 ft. 9-in., 10¢.

Lena, Ill.—By Village Board, to the Lena Electric Light and Power Co. for pumping of water to supply the water works; contract is for a period of 10 years, \$1,560 per year, company to install new pump, village to maintain tank and line of water mains.

Hoisington, Kan.—Furnishing material and improving water works, by Rollins & Westover, Beals Bldg., Kansas City, Mo., engineers; for two 75-gal. per min. deep well pumps and one 500-gal. per min. duplex pump, to the Platt Iron Works, Dayton, O., \$2,150; twenty-four 4-in. hydrants, twenty-one 4-in. valves and six 6-in. valves, to The Ludlow Valve Co., Troy, N. Y., \$928; wood pipe, to Wyckoff & Son Co., Louisiana, \$1,300.

St. Charles, Mich.—Constructing water works and an electric light plant from plans of Geo. C. and Arthur M. Morgan, 169 Jackson Blvd., Chicago, Ill.; To Holmes, Pyott & Co., Chicago, structural steel for job, \$255; Federal Cement Tile Co., Chicago, Ill., cement tile roofing laid, \$532; Coon De Visser Co., Detroit, tubular boilers and breeching, \$1,490; Platt Iron Works, Dayton, O., w.-i. pipe suction and intake, \$526; Geo. B. Limbert & Co., Chicago, Ill., pumping machinery and heater, \$340; Ridgway Dynamo and Engine Co., Ridgway, Pa., engine and generator, etc., \$2,390; Ft. Wayne Electric Co., Ft. Wayne, Ind., arc lamps, etc., \$720; Electric Appliance Co., Chicago, Ill., transformers, wire, etc.; Michigan Pipe Co., Bay City, pipe and specials, bid, 8-in., 62½¢; 6-in., 54½¢; 4-in., 40½¢, and specials, 4¢ per lb. and Chapman Valve Mfg. Co., Chicago, Ill., hydrants and valves.

Fairbury, Neb.—To Marshall Bros., Las Animas, Col., by the city, for construction of extensions to water works system and electric light plant, \$9,778.

Sanford, N. C.—Constructing standpipe, 100 ft. high, 20 ft. in diameter, capacity 236,000 gals., to S. Coffield & Sons, Atlanta, Ga.

Canton, O.—To the C. N. Carpenter Supply Co., city, for furnishing c.-i. pipe for year, at \$30 per ton; to Canton Culvert Co., only bidder, for contract for furnishing corrugated pipe; size of pipe runs from 8 to 72 inches.

Troy, O.—Water mains from intersection of Water and Adams sts. to County In-

firmery: To Jas. B. Clow & Sons, Chicago, Ill., for material, \$3,995, and to U. S. Constr. Co., of Columbus, O., for labor, \$2,298.

Dallas, Tex.—To the United States Cast Iron Pipe and Foundry Co. for 4,800 ft. of 36-in. pipe for the water works department, \$25.70 per ton, cost \$24,158; construction of concrete foundation for pumping engines at White Rock station, to the Fred A. Jones Co. at \$1,255.50; other bidders were the Hughes-O'Rourke Construction Co., \$1,383.75; Dallas Paving Co., \$1,620.

Watertown, Wis.—Drilling well on west side of river, to F. M. McCarthy, Minneapolis, Minn., \$2,866.25; other bidders: Swensen Artesian Well Co., Minneapolis, \$4,496.50; W. H. Carter Contracting Co., Chicago, \$4,192.50; E. A. Mendenhall & Son, Watertown, \$3,053.75; laying pipe line across river and connecting with reservoir and pumps, to Otto Biefeld & Co., \$2,885; other bidders: E. L. Bartlett, \$2,900; F. E. Kaminski, \$2,950.

Lethbridge, Alta., Can.—To Lethbridge Iron Works Co., for supplying manhole covers, \$3.20 per cwt., delivered anywhere in Lethbridge; Canadian Iron Corporation bid \$3.10 f. o. b. Lethbridge.

Winnipeg, Man., Can.—To I. Benoit, St. Boniface, Man., for installing 1,000,000-gal. reservoir, \$32,330.

BIDS RECEIVED

Boston, Mass.—Furnishing supplies: 8,000 lbs., more or less, No. 1 composition cast-ings, 30,000 lbs., more or less, No. 2 composition castings, 3,500 lbs., more or less, No. 3 composition castings; Essex Brass Foundry Co., Cambridge, 20¾¢, 18¾¢, and 14¢; J. H. McCafferty & Co., 434 Harrison ave., 22½¢, 21½¢, and 14¢; all per lb.; furnishing No. 1 castings: 72,000 lbs. curves, 88,000 lbs. sleeves, 100,000 lbs. gates, 119,000 lbs. hydrants, 17,000 lbs. hydrant posts, 115,000 lbs. shoes, 167,000 lbs. branches, 26,000 lbs. reducers, 12,000 lbs. caps, 43,000 lbs. offsets, 200,000 lbs. No. 2 iron castings: Mechanic Iron Foundry, No. 1, 2.7¢ per lb.; No. 2, 2.35¢; Davis & Farnum Foundry, 2.7¢, and 2.45¢; Foxboro Foundry, 2.84¢, and 2.24¢.

Minneapolis, Minn.—Furnishing 175 double steamer hydrants: James F. Clow & Sons, Chicago, Ill., Eddy, \$39 f. o. b. Minneapolis, 700 lbs.; Chickasaw Iron Works, Minneapolis, without frost jackets, \$46.85 f. o. b. Minneapolis; with frost jackets, \$53.50 f. o. b. Minneapolis, 1,200 lbs.; Darling Pump and Mfg. Co., Williamsport, Pa., \$40 f. o. b. Minneapolis, 800 lbs.; Rensselaer Valve Co., Chicago, Ill., without jackets, \$39.25 f. o. b. Minneapolis, 795 lbs.; Columbian Iron Works, Chattanooga, Tenn., \$35.80 and \$31.85 f. o. b. Chattanooga, 800 lbs.; Florence Iron Works, Philadelphia, Pa., with jackets, \$36; without jackets, \$24 f. o. b. Minneapolis, 982 lbs.; Kennedy Valve Co., Elmira, N. Y., \$45.74 and \$43 f. o. b. Elmira, 740 lbs.

New Brighton, S. I., N. Y.—Water improvements: (a) furnishing and driving wells, furnishing, delivering and laying suction mains and appurtenances in Southfield Blvd., between Grant City and Old Town Rd.; (b) same work in Southfield Blvd., between Grant City and Whitlock Blvd., between Grant City and Whitlock Blvd., 299 Bway, N. Y. City, (a) \$31,963, (b) \$31,963; Phoenix Constr. Co., 41 Park Row, N. Y. City, (a) \$29,260, (b) \$30,360; D. Bonacci, (a) \$44,436; (b) \$45,276.

Dallas, Tex.—Laying the concrete foundation for pumping engine at White Rock pumping station: Hughes-O'Rourke Construction Co., \$6.75 per cu. yd., with earth excavation at 35¢, and rock excavation \$3.50; Dallas Paving Co., \$7.50 per cu. yd. for concrete, \$4.50 for rock excavation; Fred A. Jones Co., \$7.40 per cu. yd. for concrete, \$1.90 for rock excavation.

LIGHTING AND POWER

Birmingham, Ala.—Board of Revenue has issued order granting, in so far as Board has authority, right to the Birmingham Railway, Light and Power Co. to lay gas mains in all streets, avenues, alleys and public places in survey of Corey outside limits of the city of Birmingham, and along 'Possum Valley road from southern boundary of survey to offices of American Steel and Wire Co.

Scranton, Ark.—A. P. Kincaide, Paris, Ark., will ask Council for electric light franchise.

Harrisburg, Ark.—Morris Hayutin has decided to improve Harrisburg Electric Light & Power Co.'s plant, lately purchased.

Morgan Hill, Cal.—Board of Trustees has passed ordinance granting to the Coast Counties Light and Power Co. right to erect, maintain and operate electric transmitting system.

Newport Beach, Cal.—Citizens will soon vote on \$55,000 bonds for electric light plant; if carried the city may take over the present plant and enlarge it, or it may construct entirely new plant. L. S. Wilkinson, City Clerk.

Denver, Col.—Central Colorado Power Co. is planning extensions of its transmission lines that will cover practically all central portion of State; cost about \$350,000. C. A. Fitch, 30 Church st., New York, N. Y., Purchasing Agent.

Gunnison, Col.—Plans and specifications have been completed for lighting and water works improvements, including a 215-h.p. water power development on the Gunnison River; estimated cost \$90,000; bids will be asked in May.—Burns & McDonnell, 823 Scarritt Bldg., Kansas City, Mo., Consulting Engineers.

South Jacksonville, Fla.—Citizens will vote April 6 on \$60,000 bonds to install electric lights and sewerage system.

Colquitt, Ga.—Citizens have voted \$7,500 bonds for erection and equipment of electric light plant.

Oglethorpe, Ga.—Citizens will vote April 12 on \$18,000 bonds for construction of electric light plant and water works.

Swainsboro, Ga.—Citizens will vote April 17 on \$40,000 bonds to install electric lights and water works.

Garrett, Ind.—Council is considering enlargement of municipal electric light plant.

Richmond, Ind.—Council has endorsed bill for ordinance appropriating \$10,000 for purchase of engine for municipal electric light and power plant; engine will be purchased as quickly as possible.

Sedan, Kan.—Bids will be received about May 1 for construction of an electric light plant from plans of N. B. Wall, of Caney; cost, about \$20,000. C. D. Inglesfield, owner of the Sedan Ice, Light & Power Co.

Sanford, Me.—Town has voted to raise \$2,550 to install 50 new lights.

Rockland, Mass.—Committee has been appointed to consider advisability of establishing municipal electric light plant.

Westford, Mass.—Town will enter into the contract for lighting of streets in village of Graniteville, Forge Village, Westford Centre and Brookside with electricity; \$12,000 voted; Lowell Electric Light Co. has submitted figures.—John P. Abbott, Chairman Committee.

Duluth, Minn.—City will at once ask bids for \$200,000 light and water bonds.

Vincetown, N. J.—Water Co. is considering proposition to install dynamo for lighting town with electricity.

Las Cruces, N. M.—Board of Town Trustees has granted Las Cruces Electric Light and Ice Co. franchise to construct and maintain electric lighting and power system.

Newburgh, N. Y.—Newburgh Light, Heat and Power Co. has decided to build two transformer houses, one at Marlborough and the other in Balmville.

Richville, N. Y.—Village has voted to light streets with electricity.

Saranac Lake, N. Y.—Citizens have voted \$5,000 to light public streets during year.

Solvay, N. Y.—Citizens have granted franchise to Syracuse Lighting Co. to lay gas mains in Streets.—F. L. Worth, Village President.

Waterville, N. Y.—Village has voted to raise \$1,023 for extra street lighting.

El Reno, Okla.—Plans have been completed by Burns & McDonnell, Consulting Engineers, 823 Scarritt Bldg., Kansas City, Mo., for new power plant and water works improvements; bids will be asked some time in April; estimated cost \$65,000.

Altoona, Pa.—Council has passed ordinance granting People's Natural Gas Co., Pittsburg, franchise to lay natural gas lines.

Royersford, Pa.—Installation of municipal electric light plant is being considered.

Providence, R. I.—Board of Aldermen has adopted resolution for putting fire alarm telegraph wires underground and seeking authority to issue \$40,000 for that purpose.

Edgefield, S. C.—City is considering election on \$15,000 of bonds for construction of electric light plant; Mr. Cox, proprietor of electric light plant, Johnston, has submitted proposition to Town Council to enlarge plant and transmit electricity to Edgefield.

Trenton, Tenn.—Citizens will vote on \$22,000 bonds; \$9,300 is to be used for purchase of plant of Keenan, Wade & Wade and balance for rebuilding of plant.

Crystal City, Tex.—E. C. Robinson, St. Louis, Mo., is considering installation of electric light and power plant.

Luling, Tex.—Franchise has been granted to Luling Electric Light and Power Co. to construct, maintain and operate electric light plant for term of 20 years.

Graham, Va.—Council has granted franchise to J. Elliott Hall, Bluefield, W. Va., to construct plant and furnish city with artificial gas.

Basin, Wyo.—Plans are being prepared by Burns & McDonnell, Engineers, 823 Scarritt Bldg., Kansas City, Mo., for lighting, water works and sewer improvements; estimated cost \$75,000; bids will be asked in April.

Renfrew, Ont., Can.—Council has decided to proceed with construction of municipal power plant from plans prepared by J. B. McKee, C. E., Ottawa; estimated cost \$100,000.

Vancouver, B. C., Can.—Vancouver Gas Co. is having plans prepared for two producers and storage tanks; cost between \$400,000 and \$500,000.

CONTRACTS AWARDED

Albertville, Ala.—By Council for the electric lights, to J. B. McGrady Co., Atlanta; engine has been ordered; more than six miles of wiring in all.

Bridgeport, Conn.—By Lamp Committee, five-year contract, to American Street Lighting Co., Baltimore, to supply city with 600 or more gas or naphtha street lights at rate of \$25 per light per year.

Columbus, Ga.—To B. H. Hardaway, city by North Georgia Power Co., to build dam at Tallulah Falls, on Tallulah River.

Chicago, Ill.—By the West Chicago Park Commissioners on March 7, for furnishing and installing electric cables and connecting cables with electric substation in Garfield Park to Safety Insulated Wire and Cable Co., about \$11,895.

Logansport, Ind.—Furnishing municipal lighting plant, two 250-hp water tube boilers, coal and ash conveyors for all the boilers, new piping and the resetting and refacing of old boilers, to S. Freeman & Sons Co., Racine, Wis., \$26,833; company at once sublet to T. H. Sullivan, city, piping contract, \$7,490; to Frank Medland, city, for erection of the 225-ft. stack, \$7,490.

Richmond, Ind.—Furnishing transformers for municipal light plant for ensuing year, to General Electric Co.; engine, to Hamilton Corliss Engine Co., Hamilton, O., \$8,250.

Washington, Pa.—Furnishing light for 10 years, to Washington Electric Light and Power Co.

Coleman, Tex.—Installing additional machinery in electric light plant, to Buggs, Weaver & Co., Dallas.

Calgary, Alta., Can.—Furnishing about 200 ornamental lampposts each having five globes, to Canadian Equipment Co. and the Canada Foundry Co., \$11,400.

Vancouver, B. C., Can.—To Canadian General Electric Co. for 2,000 tungsten lamps for Granville standards, \$1,250.

Winnipeg, Man., Can.—To H. B. Camp, Chicago, for conduits, \$7.10 per duct ft.; condition, to G. M. Gest, Montreal, Que., \$36,000.

FIRE EQUIPMENT

Los Angeles, Cal.—Special Commission has estimated cost of installing satisfactory police and fire alarm system at \$102,505.—T. B. Comstock, Engineer Board of Public Utilities.

Oakland, Cal.—Finance Committee has recommended \$10,000 appropriation for erection of fire house in vicinity of 40th st. and San Pablo ave.

Norwich, Conn.—National Board of Fire Underwriters has recommended purchase of three auto combination hose wagons; 900-gal. reciprocating engine; auto for chief; rubber tires for all apparatus; equipping aerial truck with 75 or 80-ft. quick-raising ladder; providing for at least one reserve hose wagon; purchase of 600 ft. of 3-in. hose; erection of hose house and minor equipment, including installation of 15 fire alarm boxes.

Telluride, Col.—Mayor King has recommended erection of fire station and purchase of auto apparatus.

St. Petersburg, Fla.—City has decided to erect fire station at 3d st. and 3d ave. South.

Chicago, Ill.—Fire department will purchase 40,000 ft. of fire hose, 18 steam fire engines and 100 marine torch light holders with 1,000 charges, also rubber tires for apparatus; bids are asked.

Terre Haute, Ind.—National Board of Fire Commissioners has recommended equipping Ladder Co. No. 1 with 65 ft. quick-raising aerial truck with ladder pipe and plain hose wagon with 25-gal. chemical tank and 250 ft. of chemical hose; also purchase of 2,000 ft. of hose annually.

Haerstown, Md.—First Hose Fire Co. is considering erection of two-story brick fire house.

Franklin, Mass.—Special Committee will recommend erection of combined fire house and town hall on Central st.

Gloucester, Mass.—Alderman Montgomery and Fire Chief Crowe will secure prices on auto chemical combination wagon.

Groveland, Mass.—Town has voted \$115 appropriation to purchase 400 ft. of hose.

South Frammingham, Mass.—Town will build \$20,000 fire station and purchase auto chemical engine for \$2,000 and auto combination wagon for \$5,500.

Pewamo, Mich.—Village Council has voted to purchase chemical fire engine with capacity of 90 gallons.

St. Paul, Minn.—Fire Board will ask for bids for rebuilding one of present engines and change it into motor driven steamer.

Manchester, N. H.—Aldermen have voted to purchase another flying squadron for \$5,500 instead of building \$50,000 fire station.

Milford, N. H.—Town has voted to install modern fire alarm system.

Collingwood, N. J.—Fund of \$500 is being raised for purchase of needed hose and ladders.

Bogota, N. J.—Citizens have voted to install fire alarm system at cost of \$2,000.

Perth Amboy, N. J.—Fire Chief T. E. Anderson has recommended purchase of rubber-tired combination hose and chemical wagon and number of Peerless automatic head protectors.

Ridgefield Park, N. J.—Village Trustees have decided to install fire alarm system at once.—Trustee Eucker, Chairman Special Committee.

Las Cruces, N. M.—Las Cruces Volunteer Fire Company has decided to purchase shirts, caps, belts and badges for each of members; committee composed of Joe Lowe, Dave Ames, Frank Briko and Frank Islas has been appointed to secure articles.

Clayville, N. Y.—Citizens have defeated proposition to erect engine house.

Clinton, N. Y.—Citizens have voted to purchase \$800 hook and ladder truck.

Honeoye Falls, N. Y.—Citizens have defeated proposition to raise \$1,000 for installing fire alarm system.

Madison, N. Y.—Citizens have voted to purchase chemical engine.

Matteawan, N. Y.—Citizens have voted \$5,000 for auto fire engine for Beacon Engine Co.

Mamaroneck, N. Y.—Citizens have voted \$12,500 bonds to erect fire house.—Dr. John F. Hunter, Village President.

North Tarrytown, N. Y.—Citizens have voted \$2,500 appropriation for auto fire engine for Rockefeller's fire company.

Pelham Manor, N. Y.—Citizens have defeated proposition calling for \$10,000 expenditure for auto fire truck.

Port Jervis, N. Y.—Borough will purchase 1,000 ft. of hose. L. W. Woolsey, Chairman Fire Committee.

Potsdam, N. Y.—Citizens have voted \$500 for purchase of hose.

Pulaski, N. Y.—Citizens have voted \$500 for purchase of fire alarm bell and to repair tower of engine house; also \$500 for cleaning water reservoir.

Rochester, N. Y.—Board of Contract and Supply has directed Secretary Pifer to advertise for bids for 5,000 ft. of eight conductor cable and 5,000 ft. of four conductor cable for fire alarm telegraph.

Sea Cliff, L. I., N. Y.—Citizens have voted bonds to purchase steam fire engine.

St. Johnsville, N. Y.—Citizens have voted \$500 to install fire alarm system.—Dr. Geo. W. Beebe, Village President.

Seneca Falls, N. Y.—Citizens have defeated proposition to purchase \$1,600 hose wagon.

Tarrytown, N. Y.—Citizens have voted to purchase \$5,500 auto combination fire apparatus for Washington Engine Co.

Webster, N. Y.—Citizens have voted to erect fire house and village hall on West Main st.

New England, N. D.—Council has decided to build another engine house.

Allentown, Pa.—Council has passed ordinance to purchase auto for fire department.

East Mauch Chunk, Pa.—Fairview Hose Co. is considering erection of hose house.

Elgin, Tex.—Purchase of 1,000 ft. of hose, hook and ladder and hose cart is being considered.—W. H. Revcrs, Jr., Cashier, Elgin National Bank, is interested.

Tacoma, Wash.—Contract will soon be let by Commissioner of Public Safety for furnishing 24 fire alarm boxes.

CONTRACTS AWARDED

Tampa, Fla.—Building central fire station at Jefferson and Zack sts., to T. A. McGucken, \$12,950.

Boston, Mass.—Erecting quarters for Engine Co. No. 31 to Christopher F. Brown, \$10,400.

Grand Rapids, Mich.—Erecting Engine House No. 12 at Hall st. and Grandville ave. to John B. Ackerman Co., \$10,818.64.

Jersey City, N. J.—Repairing two engine houses, to Jos. Tewkes & Sons Co., Jersey City, \$3,358, and \$2,450 plumbing to Crescent Plumbing Co.

Lockport, N. Y.—Tearing down, removal and re-erection of fire alarm tower in Harrison Park on Walnut st. to Kellogg Iron Works, Buffalo, \$1,266.
 Mt. Vernon, N. Y.—To Combination Ladder Co. for two heavy fire engine tenders; cost, \$1,800.
 Chester, Pa.—To Gamewell Co., 19 Barclay st., New York City, for installing proposed fire alarm system, \$14,860.
 Dallas, Tex.—Furnishing 2000 ft. of 2½ in. hose to Eureka Fire Hose Manufacturing Co., 13 Barclay St., New York City.

BRIDGES

Birmingham, Ala.—Board of Revenue is considering erection of 21 bridges; estimates by County Engineer Gwin for \$30,000 are based on 13 concrete and 8 steel bridges.
 Santa Barbara, Cal.—Frank F. Flournoy, County Surveyor, has been directed to prepare plans for a \$40,000 concrete and steel bridge to span Santa Ynez River.
 Brooksville, Fla.—Citizens will vote on \$2,000 bonds for bridge construction.—W. A. Thaxton, Town Clerk.
 Jacksonville, Fla.—Building of bridge over St. John River, to connect this city with South Jacksonville, is being considered.
 Lebanon, Ind.—Appropriation of \$5,000 has been made for concrete bridge over Prairie Creek on North Lebanon st.
 West Point, Ky.—Contract has not yet been let for construction of a bridge over Salt River.—W. C. Montgomery, Elizabethtown, County Commissioner.
 Alexandria, La.—Rapides Parish Police Jury will consider election on \$100,000 bonds to purchase present traffic bridge or construct new one across Red River.
 Salem, Mass.—Engineer Robert R. Evans, of Essex County, is preparing plans and specifications for concrete and steel draw bridge; cost \$125,000.
 Grand Rapids, Mich.—Citizens will vote on \$125,000 bonds to replace present Leonard st. bridge.
 Saginaw, Mich.—Citizens will vote April 3 on \$40,000 for proposed Johnson st. bridge.
 Grenada, Miss.—Grenada County Supervisors will soon open bids for road work, including construction of steel and reinforced concrete bridge and repair of Cane Creek bridge, District No. 5.
 Cape May, N. J.—County Board of Freeholders has invited bids for erection of bridge at Sea Isle City connecting that resort with the mainland.
 Niagara Falls, N. Y.—Plans for proposed new concrete bridge across Gill Creek have been drawn by City Engineer F. S. Parkhurst.
 Blairsville, Pa.—Plans have been prepared for erection of concrete girder bridge having two spans, each 61 ft.; middle ends of the spans will rest on a reinforced concrete pier; cost from \$8,000 to \$12,000.
 Harrisburg, Pa.—Select Council has approved plans of City Engineer for building of bridge over tracks of the Philadelphia and Reading Railway at 13th st.
 Wilkes Barre, Pa.—Plans for erection of bridge over tracks at South st. have been approved by Council Committee.

CONTRACTS AWARDED

Los Angeles, Cal.—Building Arroyo Seco bridge, to T. J. Shea, for the general contract, \$146,700; to Cement Products and Construction Co. for the hand railings and pylons, \$5,170.
 Cedar Rapids, Ia.—To B. J. Sweatt, Boone, to build bridge across river to cost \$160,000.

MISCELLANEOUS

Huntsville, Ala.—Council will consider election on \$100,000 bonds to erect hotel and municipal building at Washington and Clinton sts.
 Chico, Cal.—City is planning to improve Bidwell Park.
 Palo Alto, Cal.—Citizens will vote April 8 on \$63,000 bonds for municipal improvements.
 Hartford, Conn.—Superintendent of Streets Chas. J. Bennett has recommended various improvements in collection of garbage.
 Pelham, Ga.—Citizens have voted \$25,000 bonds to erect municipal building.
 Huntington, Ind.—Council is considering \$7,500 appropriation for erection of crematory.
 Muncie, Ind.—Board of Park Commissioners has decided to erect shelter house in McCulloch Park.
 Richmond, Ind.—Board of Works will have to purchase new street sweeper.
 Covington, Ky.—Council has passed ordinance for issuance of \$100,000 bonds for improvement of Devou Park.
 Ville Platte, La.—Police Jury of Parish of Evangeline is considering erection of court house and jail.
 Augusta, Me.—Mayor Reuel J. Noyes has recommended need of well uniformed, efficient body of police.
 Adams, Mass.—Town has voted to erect \$10,000 addition to public library.
 Boston, Mass.—Council has rejected bid of Boston Disposal Co. to remove refuse; new bids will be asked.
 Cadillac, Mich.—County will soon vote on \$50,000 bonds for erection of court house.
 Saginaw, Mich.—Citizens will vote April 3 on \$40,000 bonds for central police station and proposed \$25,000 smallpox loan.
 Haddonfield, N. J.—Bids will shortly be asked for collection of garbage.
 Hoboken, N. J.—Council is considering enlargement of city hall at Newark and Washington sts.
 Linden, N. J.—Citizens will vote April 10 on \$23,000 bonds to erect town hall.
 Paterson, N. J.—In report to Board of Works on waste disposal problem William F. Morse, Sanitary Engineer, recommends construction of main destructor plant of 100 tons daily capacity at cost of about \$100,000 and yearly maintenance cost of \$21,800, together with erection of another small plant in the over-the-river section with a capacity of about 40 tons; estimated cost of this is \$60,000, and yearly maintenance cost \$10,000; in addition to this there would be a cost of collecting the garbage, which is estimated at \$16,000.
 Phillipsburg, N. J.—Town Council will again consider resolution calling for election on \$60,000 bonds to erect municipal building.
 Trenton, N. J.—Council is considering \$45,000 bond issue for constructing city's portion of river wall which is to be extended by State at cost of nearly \$100,000.—F. B. Lee, Secretary Special Committee on Park Lands.
 Buffalo, N. Y.—Board of Aldermen has adopted Finance Committee's recommendation for \$250,000 bond issue to cover construction and repair of market buildings, two new fire houses, police garage, bathhouse No. 3, Ernest Wende Hospital, Broadway Arsenal and dock for naval militia steamer Hawk; also \$80,000 bond issue for equipping additional refuse destruction plants.
 Buffalo, N. Y.—State Legislature is considering bill permitting issue of \$50,000 bonds for putting police signal service and fire department electric wires underground.

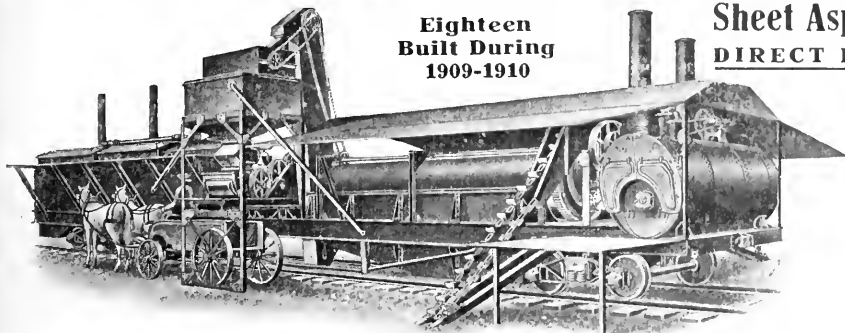
Canajoharie, N. Y.—Citizens have voted \$600 for removal and disposition of refuse and garbage.
 Hammondsport, N. Y.—Citizens have voted \$1,200 for erection of village jail. Henry Miller, Village President.
 Kenmore, N. Y.—Citizens have voted bonds for garbage disposal. R. D. C. Riedhardt, Village President.
 Sea Cliff, L. I., N. Y.—Citizens have voted bonds for dock purposes.
 Seneca Falls, N. Y.—Citizens have instructed Board of Trustees to provide for collection of swill, garbage and ashes.
 Syracuse, N. Y.—Board of Supervisors has adopted plans by Architects Makepeace and Makepeace for erection of proposed Coroners' Building on Montgomery st.; bids will be asked at once.
 Webster, N. Y.—Citizens have voted to erect village hall and fire house on West Main st.
 Philadelphia, Pa.—Council is considering ordinance authorizing installation, equipment and maintenance of a public aquarium and museum in the Fairmount Park Water Works.
 Nacogdoches, Tex.—Citizens will vote Apr. 29 on \$30,000 bonds to build jail and court house.
 Seattle, Wash.—Board of Works has adopted specifications for one 1-ton gasoline or electric truck chassis for use of the lighting department; bidders are to specify type, speed, horsepower and general characteristics.
 Milwaukee, Wis.—Council Committee on Harbor has visited the proposed lake shore drive to decide whether Park Board request for municipal scows and a tug to fill shore should be granted.
 Milwaukee, Wis.—City Budget will provide \$61,000 appropriation to install combination fire and police telegraph and telephone boxes.
 Watertown, Wis.—Board of Public Works is considering purchase of ambulance.
 Santiago, Chili.—Government has invited bids for hydraulic engineering work at ports of Valparaiso and San Antonio; expenditure in neighborhood of \$15,000,000 will be required; bids will be opened at end of July.

CONTRACTS AWARDED

Pensacola, Fla.—Furnishing spring uniforms for police and fire department, to Joe Weiland.
 Boston, Mass.—To Kindling Machinery Co., Milwaukee, Wis., for furnishing three street cleaning machines equipped with squeegee attachments, \$1,250 each.
 Boston, Mass.—Cleaning sewers: East Boston, to Richard A. Nagle, \$1.10; other bidder, A. De Stefano, \$1.49; Charlestown, to James F. Nyhan, \$1.05; Brighton, to Joseph McGreevey, 85c; other bidders: Francis B. McKinney, 90c.; Thomas F. Carroll, 87c.; Mark H. Lynch, \$1.10; West Roxbury, to same, 85c.; Dorchester, to John E. Gill, 80c.; other bidders: John J. Loonie, 90c.; Thomas F. Carroll, \$1.01; Murphy & Dolan, 97c.; James L. Pierce & Co., 96c.; D. M. Biggs & Co., \$1.05; Mark H. Lynch, \$1.10.
 Rochester, N. Y.—Sweeping and cleaning of streets: Group 1 to August Kimmel, \$1,649; Group 2 to August Kimmel, \$1,283.50; Group 3 to August Kimmel, \$1,734; Group 4 to Charles V. Hartung, \$578; Group 6 to William H. Sours, \$1, 85,081.33; Group 7 to F. G. Hauser, \$498.10; Group 8 to August Kimmel, \$1,916.58; Group 9 to George Bantel's Sons, \$2,958; Group 10 to August Kimmel, \$251.60; Group 11 to August Kimmel, \$396.39; Group 12 to August Kimmel, \$2,747.72; Group 13 to August Kimmel, \$2,747.10.

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TOO LATE FOR CLASSIFICATION

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREET IMPROVEMENTS				
Minnesota	Duluth	Mar. 31, 10 a.m.	Constructing, repairing and relaying wooden sidewalks for season of 1911. Separate bids for repairing, and relaying cement sidewalks.	Olof G. Olson, Pres. Bd. Pub. Wks.
Michigan	Green Bay	Apr. 1, 2 p.m.	Ditching and grading portion of Beaver road.	O. A. Marsac, County Clerk.
New Jersey	Irvington	Apr. 3, 8 p.m.	Flagging and curbing portion of Newton Place.	M. Stockman, Town Clerk.
Oklahoma	Muskogee	Apr. 3, 5 p.m.	Constructing concrete sidewalks on various streets and avenues	John A. Donald, Asst. City Engr.
Virginia	Windsor	Apr. 3	Laying about 400 yds. concrete sidewalks.	C. L. Griffin, Clerk.
Alabama	Gadsden	Apr. 3, 8 p.m.	Constructing 2,531 sq. yds. cement sidewalks; 191 sq. yds. driveways; 6,224 lin. ft. granite curbing; 300 cu. yds. excavation; 4 catch basins.	Chas. L. Marsh, City Engr.
Washington	Waitsburg	Apr. 5, noon	Paving, gut., curb. and extend. sidewalks on por. of Main street	H. P. Peterson, Chm. St. Com.
Maryland	Baltimore	Apr. 5, 11 a.m.	Grading, curbing and paving various streets and alleys with vit. brick, granite blocks and sheet asphalt, asphalt blocks, vitrified blocks or bitulithic.	B. T. Fendall, City Engr.
Kentucky	Lexington	Apr. 6, noon	Repairing reconstructed pikes of Fayette Co. with 2-in. stone.	C. F. Estill, Roads Supervisor.
Ohio	Elyria	Apr. 10, noon	Constructing brick pavement on portion of W. River street.	C. S. Butts, City Engineer.
Iowa	Clinton	Apr. 11, 8 p.m.	Constructing concrete steel culvert on Fourth and Lumber sts.	W. E. Hays, City Clerk.
Ohio	Cleveland	Apr. 15, 11 a.m.	Grading, draining and improving Wooster Pike Road No. 3.	County Commissioners.
New York	Johnstown	Apr. 17, 7:30 p.m.	Paving East and West State sts. with bituminous macadam and constructing stone curbs.	Grover E. Yerdon, City Clerk.
Ohio	Portsmouth	Apr. 17	Grading, ditching and culverting Eichenlauben Road.	County Commissioners.
SEWERAGE				
Minnesota	Duluth	Mar. 31, 10 a.m.	Constructing sanitary sewer in Fifty-fifth Alley West.	Olof G. Olson, Pres. Bd. Pub. Wks.
Florida	Pensacola	May 2	Constructing sanitary sewers amounting to \$100,000.	City Clerk.
WATER SUPPLY				
Manitoba	Winnipeg	Apr. 5, 11 a.m.	Furnishing a horizontal turbine pump of 2,500,000 gals. capacity per 24 hours.	M. Peterson, Secy. B. I. Control.
Arizona	Tucson	Apr. 12, 4 p.m.	Erecting a standpipe 90 ft. high of 1,000,000 gals. capacity.	L. O. Cowan, City Clerk.
LIGHTING AND POWER				
Florida	Jacksonville	Apr. 4, 3 p.m.	Installing new power station, including 1 30-ton, 3 motor, electric traveling crane; two surface condensing equipment with steam driven, circulating and vacuum pumps; 8 super heaters to be used in connection with water tube boilers of 500 H. P.; one horizontal open type feed water heater; two outside center packed plunger boiler feed pumps; transformers; re-winding, removal and re-erection in running order of two 1,500-k.w. normal rating Allis-Chalmers turbo generators; erecting chimney 200 ft. high; furnishing, erecting, cleaning and painting structural steel work.	W. M. Bostwick, Jr., Chm. B. B.
FIRE EQUIPMENT				
Ohio	Cincinnati	Apr. 7, noon	Furnishing Fire Department during ensuing year with regulation single fire plugs with 2-in. outlets and 3-in. brass nozzles; regulation double cut-off fire plugs with 3-in. outlets and 3-in. brass nozzles regulation three-way cut-off fire plugs 3-in. outlets and 3 in. nozzles.	Edw. P. Durr, Secy. D. Pub. Safe
MISCELLANEOUS				
New York	Albany	Apr. 3, 3 p.m.	Furnishing Lyon Mountain tailings: summer helmets for police; unloading and hauling gravel.	Isidore Wachsmann, Secy. Bd. C. & P. H. S. Hendricks, Dir. Bd. Free
New Jersey	New Brunswick	Apr. 6, 11 a.m.	Constructing concrete retaining wall at Spotswood.	Board Public Works.
Washington	Seattle	Apr. 7	Collecting garbage.	C. B. Welton, Clk. County Court.
West Virginia	Moorefield	Apr. 20, 11 a.m.	Constructing new county court house.	

STREET IMPROVEMENTS

Sacramento, Cal.—City Trustee Hopkins has had prepared sketch of plans for improvement of Plaza, Twenty-first and Twenty-second, B and C sts.

Santa Monica, Cal.—Council has adopted resolutions to lay asphalt concrete pavement on Ocean ave.

Vacaville, Cal.—Citizens will vote Apr. 4 on \$18,800 bonds to grade and macadamize streets.

Vincennes, Ind.—Board of Public Works has decided to improve Jefferson ave.

Mt. Sterling, Ky.—Council has passed ordinance directing building of 11,250 sq. yds. of brick streets in business section of city.

Virginia, Minn.—Council is considering paving of Spruce st.

Jersey City, N. J.—Bids will be received April 6, 3 p. m., for \$65,000 Newark plank road improvement bonds and \$210,000 boulevard repair bonds.—Walter O'Mara, Clerk Board of Freeholders.

Akron, O.—City is planning to expend \$350,000 during coming year on street improvements.—John W. Gauthier, Director of Public Service.

Montpelier, O.—Security Savings Bank Co. has purchased \$22,000 paving bonds.

Toledo, O.—Resurfacing of St. Clair st. is being considered.

Mt. Carbon, Pa.—Citizens have voted bonds for road improvements.

Providence, R. I.—Board of Contract and Supply has advertised for bids for oiling certain streets of city.

Greenville, Tex.—City is planning to pave 40,917 lin. ft. of streets.

Marion, Va.—Citizens will vote May 2 on \$250,000 bonds for improvement of public roads.

Aberdeen, Wash.—County Commissioners will extend the Westport road from Johns River to Westport at cost of \$50,000, including drawbridge.

North Yakima, Wash.—Better roads for the county have been decided on by County Commissioners and machinery to cost \$16,250 will be purchased to that end; extra

rock crusher and two complete hauling outfits will be added to present equipment.

Spokane, Wash.—City Engineer Morton Macartney has completed plans for following public improvements: Paving with asphalt-macadam, Rockwood boulevard, Arthur to Hatch st., Highland boulevard, Rockwood to Hatch, Garfield road, Rockwood to Twenty-ninth ave.; estimated cost, \$57,000; grading, curbing and sidewalking Rockwood boulevard.

CONTRACTS AWARDED

Muncie, Ind.—Paving East Adams st. to Wm. Torrence, \$5,720.01; Council and Water sts., to M. M. Gwinnup, \$10,886.50; North st., to same, \$1,974.85.

Richmond, Ind.—Paving North E st., to Linus Meredith, \$22,000.

Des Moines, Ia.—Paving contracts to amount of \$36,000, to Mayer Bros. Company, Erie, Pa.

Lawrence, Kan.—Paving to cost about \$15,000, to Contractor Gilmore and to Jas. Ritchie, Topeka.

Rochester, N. Y.—Frank st. asphalt pavement contract, to the Rochester Vulcanite Pavement Co., \$16,105; Backus st. asphalt pavement, to Rochester Vulcanite Pavement Co., \$14,807; Faraday st. macadam pavement, to William H. Sours, second, \$2,277.50; Exchange st. Medina block stone pavement, to William H. Sours, second, \$8,532.50; repairing asphalt pavement, to Barber Asphalt Co., Buffalo, 89c. per sq. yd. for asphalt and 50c. for concrete; contract will be sublet to Rauber & Vicinus, city.

Toledo, O.—Street paving: Tecumseh st., between Clover Leaf, at Fifteenth, and Division, vitrified brick, to McKinney Bros., \$8,248.90; Albion st., between Millburn ave. and Bancroft, brick, to Walters & Tansey, \$8,950.62; Forest ave., Oakwood and Bancroft, asphalt block, Asphalt Block Paving Co., \$20,568.08; Islington st., Cherry and Fulton, sheet asphalt, Andrews Asphalt Co., \$6,797.30; Bancroft st., Elm and Mulberry, to Toledo Contracting Co., \$7,208.56; Erie st., Adams and Orange, sheet asphalt, to Andrews Asphalt Co., \$8,836.40; Wheeling st., Front and York, macadam Carbo-Via,

to Garrigan Brothers, \$7,224.45; Clark s Lake Shore railroad and Nevada, macadam, Carbo-Via, to Garrigan Brothers \$11,925.22; Peck st., Lagrange and Sherman to Harris, paving brick, to Russell & Johnson Co., \$11,364.75; Mott ave., East Broadway and Dearborn, Trimble block, to F. O'Sullivan, \$11,479.40; Woodruff ave. Detroit and Smead, brick, to McKinnon Brothers, \$10,200.60; Superior st., Adams and Orange, sheet asphalt, to Andrews Asphalt Co., \$6,955; St. Clair st., Monroe and Cherry, creosoted wood block, to Russell & Jennison Co., \$27,162.

Seattle, Wash.—Grading and curbing Fifth ave., to Rufus Buck, Central Bldg \$27,335.25.

Seattle, Wash.—Building J. F. Pike road to P. E. Millan, \$2,997.

Tacoma, Wash.—Grading of Stevens s to J. H. Hokanson, \$3,548; thirteen bids the work were received, as follows: Fr Barth, \$4,429; N. A. Jones, \$4,425; Wrig & Sweeney, \$4,353; Ollie Robinson & C \$4,179; C. K. Molgaard, \$4,040; Lister Construction Company, \$3,990; Erick Matts \$3,965; Thomas Huggins, \$3,940; Salattno Chiappet, \$3,627; Galluci & De Rose, \$3,550; George Miller & Co., \$3,225; J. N. Johnson \$3,560; J. H. Hokanson, \$3,548; estimate for improvement, \$4,770.

SEWERAGE

Rio Vista, Cal.—Town Trustees have taken preliminary steps for putting sewer system within corporate limits town.

Sisson, Cal.—Citizens have voted to construct general sewer system at cost not exceed \$15,000.

Vacaville, Cal.—Citizens will vote Apr on \$2,500 bonds to build septic tank at City Sewer Farm.

Winsted, Conn.—Regarding installation \$150,000 sewer system, Engineer Chas. Patterson, Torrington, states that all inquiries should be addressed to Hon. P. Darsey.

Seattle, Wash.—City Engineer Morton Macartney has completed plans for sewer

Twenty-fifth and Twenty-sixth aves., atch to Arthur sts., estimate \$6,345; Ninth and Tenth aves., Grand boulevard to Hill- rd st., \$5,000; Garfield road, Rockwood uleriavard to Twenty-ninth ave., \$14,470; ighland and Rockwood Boulevards, in up- r roadway of each, Arthur to Hatch sts., 000.

WATER SUPPLY

Sisson, Cal.—Citizens have voted \$40,000 onds for improved water system.

Westport, Conn.—Brick extension will be ult at plant of Westport Water Co.; new quipment will be installed.

Evansville, Ind.—National Board of Fire nderwriters has recommended installation f two additional high-lift pumps of 10,000- 00-gal. cap. each and 100 ft. of 2½-in. e hose with nozzle attached in racks near ad hydrants at pumping station and ree 3-gallon hand chemical extinguishers; so extension of mains.

Herington, Kan.—Plans are being pre- ared for increasing the water supply, tak- ing water from Lime Creek; bids will be sked in April; estimated cost \$10,000. urns & McDonnell, 823 Scarritt Bldg., Kansas City, Mo., Engineers.

Cape May, N. J.—Water plant is to be aded more effective by application of an r lift device, for which bids have been sked.

Thomasville, N. C.—Board of Aldermen as voted to issue \$75,000 bonds at present and \$50,000 more after June assessment for onstruction of water works and sewerage ystem.

Mandan, N. D.—Plans have been com- pleted by Consulting Engineers Burns & cDonnell, 823 Scarritt Bldg., Kansas City, o., for water works, and bids will be sked in April; estimated cost \$65,000.

El Reno, Okla.—Burns & McDonnell, 823 carritt Bldg., Kansas City, Mo., have com- pleted plans for water works improvements nd power house; estimated cost \$65,000; ids will be asked some time in April.

Farmville, Va.—Citizens will vote in Apr. n \$65,000 bonds to purchase water plant; 5,000 of this will be used to make exten- sions and improvements.

Luray, Va.—Town has voted \$10,000 bonds o extend water system.

Vancouver, Wash.—Council has passed rdinance granting to Oregon-Washington orporation 50-year franchise to supply the ty with water over the Mayor's veto.

Basin, Wyo.—Plans are being prepared for water works, lighting and sewer im- provements; estimated cost \$75,000; bids will be asked in April.—Burns & McDon- nell, 823 Scarritt Bldg., Kansas City, Mo., Consulting Engineers.

Upton, Wyo.—Plans have been completed for water works; approximately \$20,000; bids will be asked in May.—Burns & Mc- Donnell, 823 Scarritt Bldg., Kansas City, Mo., Consulting Engineers.

Yarmouth, N. S., Can.—City will lay sec- ond 12-in. main from Lake George at cost of \$80,000; the superintendent of municipal water works is urging establishment of meter system. Consul Alfred J. Fleming is interested.

CONTRACTS AWARDED

South Bend, Ind.—Repairs at north pump- ing station, to Dean Machinery Co., Holy- oke, Mass.; central pumping station, to Corliss Machinery Co., Hamilton, O.

Patterson, La.—Construction work on the proposed water works plant, to Kelley & Jones, Opelousas.

Jacksboro, Tex.—To W. C. Shaw, Lawton, Okla., to install complete system of water works, \$24,960; provides for power house, standpipe, four miles of water mains, fire plugs, etc.

Snohomish, Wash.—Building 16 miles of gravity water mains to supply city with pure mountain water, to Atlas Construc- tion Company, Everett, \$83,250; other bid- ders were: Thos. A. Shepard, Denver, \$96,- 700; American Light & Water Co., \$92,940; G. Jaeger, St. Louis, \$88,100, he agreeing to complete contract in nine months; Ja- cobson & Boden, Portland, \$96,300.

LIGHTING AND POWER

Elkton, Md.—Council has asked for con- tracts for lighting streets the coming fiscal year with tungsten electric lamps.

Cape May, N. J.—County Freeholders are considering question of lighting Ocean City turnpike with electricity from June 1 to October 1.

CONTRACT AWARDED

Seattle, Wash.—Installing cluster lights on Third ave., to R. E. Dowie, 332 New York block, \$18,527.78.

FIRE EQUIPMENT

Hayward, Cal.—Local Fire Department is considering the purchase of a modern auto- mobile fire truck.

Evansville, Ind.—National Board of Fire Underwriters has recommended establish- ment of company provided with motor- propelled combination wagon; placing of 65-foot, quick-raising aerial ladder, pro- vided with ladder pipe, at Station 1; equip- ment of each hose wagon with 35-gallon chemical tank and 20-foot extension ladder provided with roof hooks; purchase of 2,000 ft. of hose annually and needed equipment at pumping station and for fire alarm sys- tem.

Des Moines, Ia.—Purchase of \$3,500 auto truck is being considered.

Edgerton, Wis.—Council has ordered in- stallation of fire alarm system.

CONTRACT AWARDED

Tacoma, Wash.—Furnishing supplies for Fire Department, to Maning-Myers Co., Seattle, \$728.87.

BRIDGES

Salinas, Cal.—County Surveyor L. G. Hare has estimated cost of repairing bridges and jetties at \$80,000.

Vacaville, Cal.—Citizens will vote Apr. 1 on \$15,300 bonds to build two concrete bridges and one culvert.

MISCELLANEOUS

Sacramento, Cal.—Fire Committee has rejected all bids for furnishing runabout autos for Fire Department.

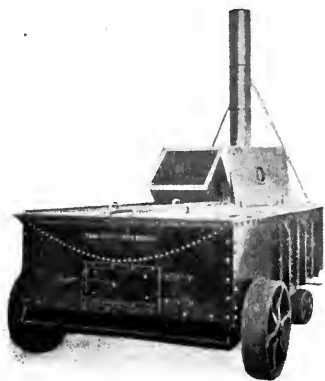
Sisson, Cal.—Citizens have voted to erect city hall and jail at cost of \$5,000.

Hagerstown, Md.—Citizens have voted \$50,000 loan for establishment of park.

Toledo, O.—Bids have been rejected and new bids will be asked by County Commis- sioners for erection of proposed tuberculosis hospital.

Corpus Christi, Tex.—Citizens have voted \$50,000 bonds for proposed municipal wharf.

Seattle, Wash.—Plans and specifications drawn by architects for public bathing sta- tion to be erected on Alki Point before coming summer season have been approved by the Board of Park Commissioners and Secretary of Board ordered to advertise for bids for construction.



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PROPOSALS

STREET PAVING

Columbia, S. C.

Sealed proposals will be received until 12 m., April 11, 1911, by the undersigned or the City Council for the City of Columbia, South Carolina, for the paving of six (6) city blocks or more, not exceeding twenty-five (25) city blocks. Each city block will average about 3,150 square yards of paving and 881 lineal feet of steel bound concrete curbing, together with the extension of concrete sidewalks and vitrified pipe drains as may be found necessary.

Bids will be received for paving with creosoted wood paving block, bitulithic pavement, bituminous concrete pavement and vitrified paving block on a five (5) inch concrete foundation, but the kind and amount of each paving to be used is to be decided by the City Council after the proposals are submitted.

Samples of vitrified block and wood block properly labeled must be submitted before April 10, 1911.

Each tender must be accompanied by a certified check drawn to the order of the Treasurer of the City of Columbia, S. C., or New York draft to the amount of five hundred dollars (\$500.00), which will be subject to forfeiture in case of failure on the part of the Contractor to enter into a written contract and furnish a bond with approved sureties in the sum of one-half of the amount of contract, within ten days after being called upon to do so.

Specifications and all available information will be furnished on application to this office.

The right to reject any or all tenders and to let the work as a whole or in parts is reserved.

JOHN McNEAL,
City Engineer.

R. C. KEENAN,
Council Supt. of Streets.
Columbia, S. C., Mar. 25, 1911.

SEWERS AND DISPOSAL WORKS

Easton, Md.

Sealed proposals will be received at the rooms of the Sewer Commission, Easton, Maryland, until twelve (12) o'clock m., on the fifteenth (15th) day of April, 1911, for furnishing all materials and doing all work necessary for the complete construction of about six miles of pipe sewers, from eight (8) to fifteen (15) inches in diameter, with Y branches, manholes, flush tanks and other necessary appurtenances, and of two sewage disposal works, including the necessary piping, grading, etc.

Plans may be seen and specifications and forms of proposal obtained at the office of the Mayor, Easton, Md., or at the office of Clyde Potts, 30 Church St., New York City, and a full set of blue prints will be forwarded to any applicant, express prepaid, upon receipt of five (\$5) dollars.

Each bid must be accompanied by a certified check on a solvent bank for three thousand (\$3,000) dollars. The Sewer Commission reserves the right to reject any or all bids, to waive any informality in the bids received, and to accept any bid which it deems to be most favorable to the interests of the Town of Easton. Bids obviously unbalanced will be rejected without consideration.

MARTIN M. HIGGINS,
President of Sewer Commission.
T. HUGHLETT HENRY,
Secretary of Sewer Commission.
(3129)

PROPOSALS

STREET LIGHTING

Omaha, Neb.

Sealed proposals are invited and will be received by the City Clerk of the City of Omaha for street lighting with incandescent street lamps, according to specifications on file in the office of the City Clerk and the Gas Commissioner of said city, such bids to be for lighting, extinguishing, cleaning, repairing and maintaining, and painting posts once a year, either separately or combined, for a period of three years, and for a period of five years, as follows:

Equipment, exclusive of lighting, extinguishing, cleaning, repairing and painting, price per lamp per year.

Lighting, including extinguishing, cleaning, repairing and painting, price per lamp per year.

Use of equipment, including lighting, extinguishing, cleaning, repairing and painting, price per lamp per year.

Gas, price per thousand cubic feet, amount to be determined either by average of meters on one per cent of lamp posts, or by averaging the consumption from rate found in one per cent of burners tested in the laboratory of the Gas Commissioner, or determined in a manner satisfactory to the Gas Commissioner.

Use of equipment, including lighting, extinguishing, cleaning, repairing and painting, together with gas, price per lamp per year.

Gas, including lighting, extinguishing and cleaning.

To avoid any misunderstanding as to the intent of the city, any bidder may apply to the Gas Commissioner for information, whose rulings will all be made in writing.

Each bid must be accompanied by a certified check made payable to the city of Omaha in the sum of \$200.00 as a guarantee that the bidder will conform to his proposal in case his bid shall be accepted.

Bids must be submitted in sealed envelopes marked "Proposal for Gas Street Lighting," and addressed to Dan. B. Butler, City Clerk of the city of Omaha, and must be on file in his office on or before April 11, 1911, at 8 o'clock p. m.

The city reserves the right to reject any and all bids.

DAN. B. BUTLER,
City Clerk.
Omaha, Nebraska, March 22, 1911.

WATER WORKS IMPROVEMENTS

Ada, Okla.

Sealed proposals will be received by the City Clerk of Ada, Okla., at his office in the City Hall, until 8 o'clock, P. M., April 10, 1911, for the furnishing of pipe and machinery to be used in the extension and improvement of the water-works system of Ada.

Bids will be opened before the City Council the same evening and bidders are invited to be present and to submit bids on the following items:

For the pipe required for the construction of approximately 66,000 linear feet of 12-inch pipe line, either of steel or cast iron.

If cast iron pipe is used the amount required will be about as follows: Class "B" pipe, 246 tons; Class "C" pipe, 2,062 tons; Class "D" pipe, 750 tons; total, 3,058 tons.

If steel pipe is used, 66,000 linear feet of 12-inch O. D. Converse joint pipe will be required.

Bids will also be received on 3,000 linear feet of steel pipe, 3/16 inch thick and 30 inches in diameter.

PROPOSALS

Also on cast iron pipe for extensions the city mains, all class "B," approximately as follows: 12-inch pipe, 135 tons; 10-inch pipe, 124 tons; 8-inch pipe, 135 tons; 6-inch pipe, 142 tons; total, 464 tons.

For special castings, about 15,000 pounds. For furnishing and erecting on foundations to be prepared by the city of pumping units, each unit to consist of one horizontal turbine water wheel, directly connected to a multi-stage centrifugal pump, each unit to have a capacity of 6 gallons per minute against a total head of 185 feet.

Plans, specifications, form of contract and proposal and full information may be obtained from the Consulting Engineer Goodwin & Harper, 920 Scarritt Block, Kansas City, Mo.

Each proposal must be accompanied by a certified check of not less than 5 per cent of the amount bid, made payable to the City Treasurer of Ada, Okla., as a guarantee that the bidder receiving the award will enter into contract with the city and furnish satisfactory bond within 10 days after the contract is awarded.

The city reserves the right to reject any or all bids, to waive any informality as to award the contracts as may be deemed to be the best interests of the city.

W. B. JONES,
City Clerk
(13 and 14)

BRICK PAVING

Dublin, Ga.

Sealed bids will be received until noon April 18, 1911, by the Mayor and Council of the City of Dublin, Ga., for furnishing material and labor necessary to pave approximately 6,000 square yards of street with vitrified brick.

Plans and specifications, with blank proposal forms, may be seen at the Office of the City Clerk, Dublin, Ga.

The City reserves the right to reject any and all bids.

A. P. HILTON,
City Clerk
M. J. GUYTON,
City Engineer

(22, 29, Apl. 5)

CIVIL SERVICE

Assistant Director, Office of Public Roads.—The United States Civil Service Commission announces an examination, April 10, to fill a vacancy in the position of assistant director, Office of Public Roads, Department of Agriculture, at \$3,000 per annum Form 304.

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VOLUME XXX

NEW YORK, APRIL 5, 1911

No. 11



PEEKSKILL FILTERS PARTLY ROOFED OVER

WATER FILTRATION AT PEEKSKILL

Covered Slow Sand Filters and Aerator and Covered Filtered Water Reservoir—Details and Cost of Construction—Results of Treatment—Why Purification Was Necessary—Reasons for Adopting Slow Sand Filtration

THE water supply of Peekskill, N. Y., is taken from Peekskill Hollow creek, which has a watershed area above the intake of about 46 square miles. The main stream has a length of about 15 miles and flows southwesterly through a long narrow valley into the Hudson river. For the most part the slopes are quite steep and the run-off is naturally rapid. There are, however, a few tributary streams which drain some more or less swampy sections. The works for utilizing this supply were built in 1876 from plans drawn by the late Chas. E. Fowler. They consisted of a crib intake dam and a wooden flume leading to a pumping station, where the water is lifted through two cast-iron force mains 4,000 feet long, one 12 inches and one 20 inches, about 357 feet to a reservoir. This reservoir has a capacity above the level of the main outlet pipe of about twenty million gallons. From this reservoir two mains lead to the city

—a new 16-inch main at the southwest end taking water at distances of 4 and 12 feet below the surface, and the old 12-inch main on the northwest side taking water at a point 4 feet above the bottom. This reservoir was constructed in a natural basin, the site having been thoroughly grubbed and cleaned of organic matter and the sides riprapped.

In 1900 the population of Peekskill as obtained by the Census Bureau was 10,358, which had increased by 1905 to 13,200. The per capita consumption in 1900 was about 70 gallons which had been increased to about double that in 1907, owing largely to the use of about 500,000 gallons daily by the new works of the Fleischmann Company. In 1907, Mr. Geo. C. Whipple was requested by the water commissioners to examine the plant in all its parts, with especial reference to methods of purifying the water. The water supply used was naturally

an excellent one. The water was quite clear except for short periods after rains, the color was low, the amount of iron was too small to be troublesome. The water was comparatively soft and the taste was satisfactory except occasionally when algae growths in the reservoir gave a little trouble.

Until a short time before Mr. Whipple's investigation the sanitary quality of the water had been fairly satisfactory, and the typhoid death-rate of the village had been low. But in January, 1908, an outbreak of typhoid fever occurred in the village, which was apparently due to the water supply. This led to an inspection of the watershed which brought to light many sources of contamination and emphasized the need of taking extra precaution against infection from the camps of laborers at that time employed on the New York aqueduct where it crossed the Peekskill Hollow creek about 1½ miles above the intake. Besides these, a number of houses along the creek were found to contribute to the danger of contamination. The typhoid epidemic referred to was but a brief one, and the Peekskill water commissioners deserve credit for taking the definite steps which they did at this first intimation of danger.

Mr. Whipple considered both slow and rapid sand filtration and also, at the request of the commissioners, the use of ozone for purifying water. He considered that the last named had not been developed to the point where it could be considered practical for such a plant. Comparing the other two he reported as follows:

Sand filtration is the best method for purifying the water of Peekskill Hollow creek. This water, as has been said, is comparatively clear and has but little odor. There is, therefore, no necessity for adding chemicals to clarify it or to decolorize it. It is better for many reasons to avoid the use of chemicals when they are not necessary. The use of alum changes some of the carbonates in the water to sulphates, that is, it changes some of the temporary hardness to permanent hardness. This is a matter which affects the ordinary householder little or not at all, but it tends to make the water somewhat less suitable for use in boilers. In some instances where alum has been used more or less trouble has been experienced from iron rust in the hot water pipes, which has occasioned complaint on the part of the consumers, especially in connection with the use of the water for washing.

A sand filter is less subject to sudden irregularities than a mechanical filter on account of the lower rates at which it is operated. The rates used in mechanical filters are twenty to fifty times as fast as those of a sand filter, and any irregularities in the operation of a mechanical filter more quickly affect the quality of effluent. Mechanical filters, therefore, require closer watching, with a man continually in attendance and with a chemist in charge of the works. The efficiency of such a filter is wholly dependent upon the constant, faithful application of the coagulant. If the supply should be suddenly stopped or even if it should be applied in too small quantities the quality of the effluent would deteriorate and harm might result. If, on the other hand, too large quantities of alum were used there would be a corresponding waste of money and there might even be danger that undecomposed alum would get into the filtered water, which is, of course, highly undesirable.

Sand filters also require watching, but as they operate at a comparatively slow rate there is far less chance of sudden derangements of the process. Analyses of the water are not needed as frequently, and in the case of such a plant as that required for Peekskill it would not be necessary to employ a permanent chemist.

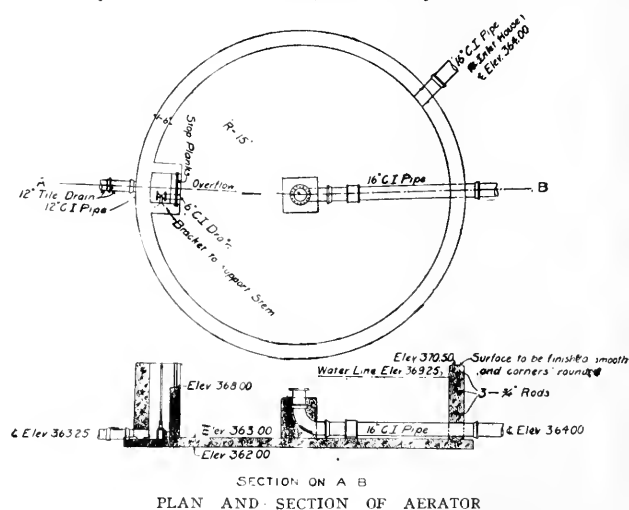
Finally, there are certain local conditions in Peekskill that make a mechanical filter less desirable than a sand filter. A mechanical filter requires the use of more "head" than a sand filter. If such a plant were placed at the pumping station there would be an additional cost for pumping, while if placed on the hill below the reservoir there would be a greater loss of pressure in the city. Alum treated water is more subject to deterioration from algae growths, if stored in open reservoirs, than a sand filtered water.

Sand filters are usually a little more expensive to construct, but are much cheaper to operate than mechanical filters.

Several locations for the plant were considered, but the best was thought to be a hill just below the reservoir, a part of which rose about 10 feet above the spillway level. As constructed, the plant was located 350 feet from the reservoir, the surface of the sand beds being about 10 feet lower than

(the spillway level. By locating the filters in this way no pumping is required, and the pressure in the village is reduced only about 15 feet, which loss in the head is of little moment. This permits the reservoir to act as a sedimentation basin. The water flows by gravity from it to the filters, advantage being taken of the 10-foot fall to aerate the water in a fountain before passing it to the filters; the object of the fountain being to get rid of any bad odors due to algae or other causes, and to put it into the best condition for filtration. Four filter beds are provided, and a pure water reservoir which holds sufficient filtered water to take care of hourly fluctuations in consumption and furnish an ample supply in case of fire; its capacity being about one million gallons. This pure water reservoir is connected with both the 16-inch and 12-inch main leading to the village. There is a by-pass around the reservoir consisting of a 16-inch pipe which connects the 12-inch and 20-inch rising mains with the 16-inch outlet pipe above the filters; the object being to make it possible to empty the reservoir for the purpose of cleaning or repairing it. The filter plant is so arranged that it can easily be doubled in capacity when the increasing consumption requires this. The site selected was on the side of the hill, there being a fall of about 15 feet in the 200-foot width of the site occupied by the beds, which required excavation and fill in grading for construction.

The estimated cost of the covered sand filter, aerator, regulating house, sand washer and all appurtenances was \$56,000; and this part of the plant was actually constructed for about \$2,000 less than this. The estimated cost of the pure water reservoir was \$10,500, of the land \$1,500, and of changes in the piping and construction of the by-pass around the reservoir \$10,000. Bids for the plant were received in August, 1908, and the completed plant was put into operation in December, 1910. The itemized quantities included 12,000 cubic yards of earth excavation



and 1,500 cubic yards of rock; 400 cubic yards of reinforced concrete and 4,100 cubic yards of plain concrete; 1,100 cubic yards of filter gravel and 4,700 cubic yards of filter sand; and in addition, piping to the plant, tile drains, two buildings and miscellaneous appurtenances. The contract was awarded to the firm of Hinman & Sproul, whose execution of the work is highly commended by Superintendent Roake.

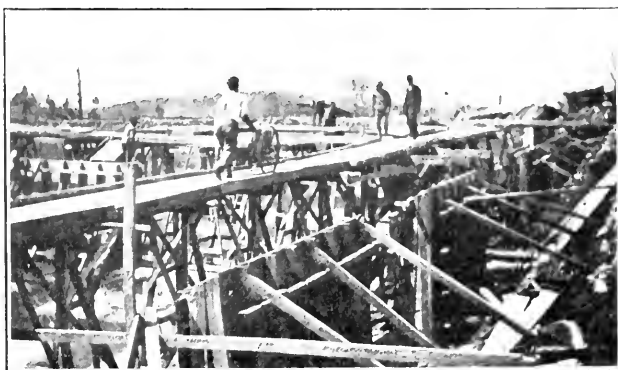
The water after leaving the reservoir flows through a 16-inch cast-iron pipe to an aerator, from which it passes to an inlet house; or it may pass directly to the inlet house without the use of the aerator. From the inlet house the water passes through a 20-inch, cast-iron raw water pipe, from which it is fed to the north side of the filters, one branch from this pipe leading to each of the four filters. The inlet corners of filters Nos. 1 and 2, and of Nos. 3 and 4 are adjacent. There is also laid from the inlet house and in the same trench as the raw water pipe a 6-inch cast-iron pressure pipe for carrying the wash water. From the south side of each filter a 12-inch cast iron pipe conducts the filtered water to the clear water reservoir, which is east of and in line with the four filter beds.

Each of these pipes is provided with a Venturi meter for measuring the discharge. There is also laid along the south side of the filter beds a line of 15-inch drain tile, from which a drain pipe is carried to each filter, these pipes being supplied with valves. There is also a branch drain carried through each of the filter partition walls, which receives the drainage from the roof of the filters through catch basins. In the middle of the rectangle formed by the four filter beds and resting upon the roofs of filters 2 and 3 is a sand court and sand washer.

The aerator consists of a circular basin 30 feet in inside diameter and 7 feet deep. The 16-inch pipe from the reservoir is brought to the center of this, beneath the floor, and rises vertically, the mouth being a few inches below the surface of the water in the aerator basin. From the aerator basin water flows through a 16-inch pipe to the inlet house, where it is discharged into a well occupying the basement of the same.

The filters are each 65 feet by 143 feet from center to center of walls. They are all covered with groined arch roofs supported by square pillars, there being 40 pillars in each filter bed. There are 27 manholes in the roof of each of the filters. The sand court, supported by the roofs of the two middle filters, is 78 feet long and 52 feet wide and is surrounded by concrete walls four feet high. The rest of the area over the filters is covered with two feet of earth. The pure water reservoir is 91 feet wide and 142 feet long from center to center of walls, and is covered with a groined roof supported by 60 square pillars.

A main drain is carried through the longer axis of each filter, this consisting of a channel four feet wide and 6 inches deep composed of concrete, the cover to the drain being a concrete slab 4 inches thick reinforced with $\frac{1}{2}$ -inch steel rods placed transversely and spaced 8 inches apart. From this main drain branch drains lead out at right angles, bisecting the spaces between the several lines of roof pillars; there therefore being eleven branch drains on each side of the main drain. These branch drains consist of half round tile with four inch radius. Around each tile was placed gravel to a depth of one foot in three grades; the lower 7 inches consisting of broken stone or gravel which had diameters from one to two inches; the next $2\frac{1}{2}$ inches having diameters of from $\frac{3}{8}$ -inch to one inch, and the top $2\frac{1}{2}$ inches varying from $\frac{3}{8}$ -inch diameter to sand. No gravel was placed within six feet of the

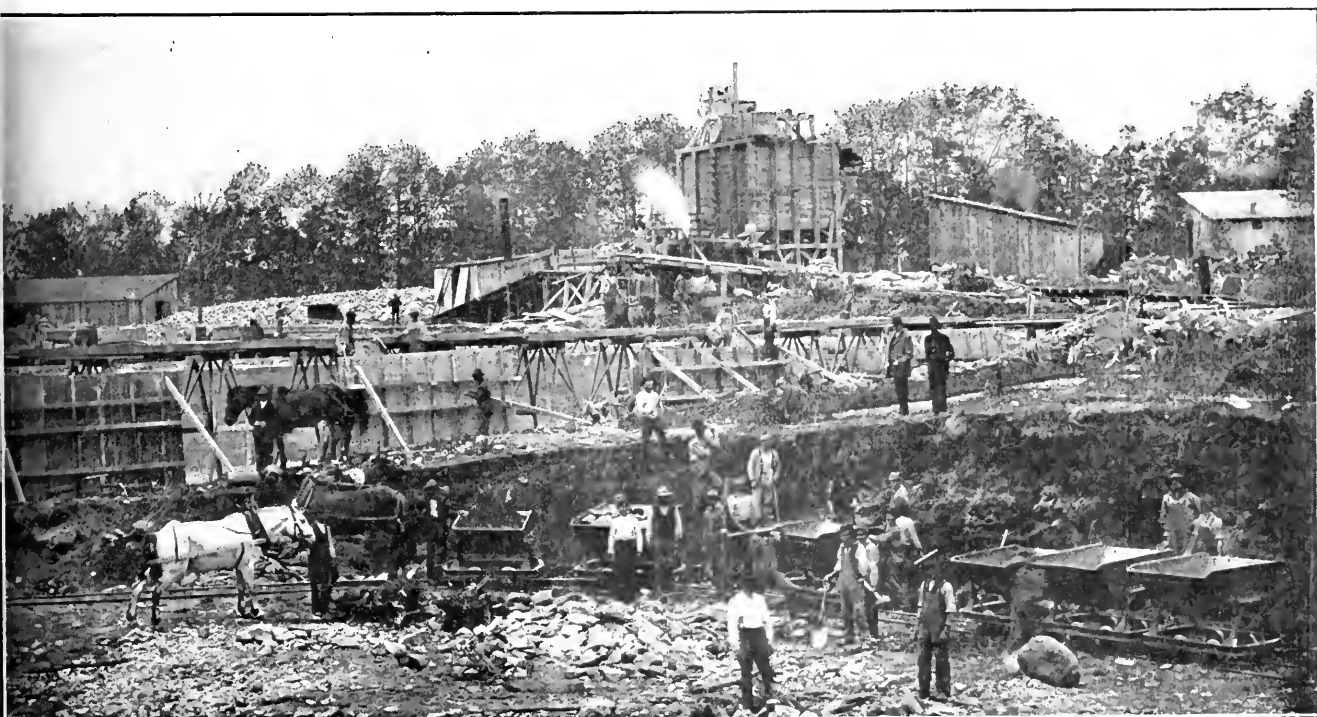


FILTER FORMS, AND RUN FOR TRANSPORTING CONCRETE BY BARROWS

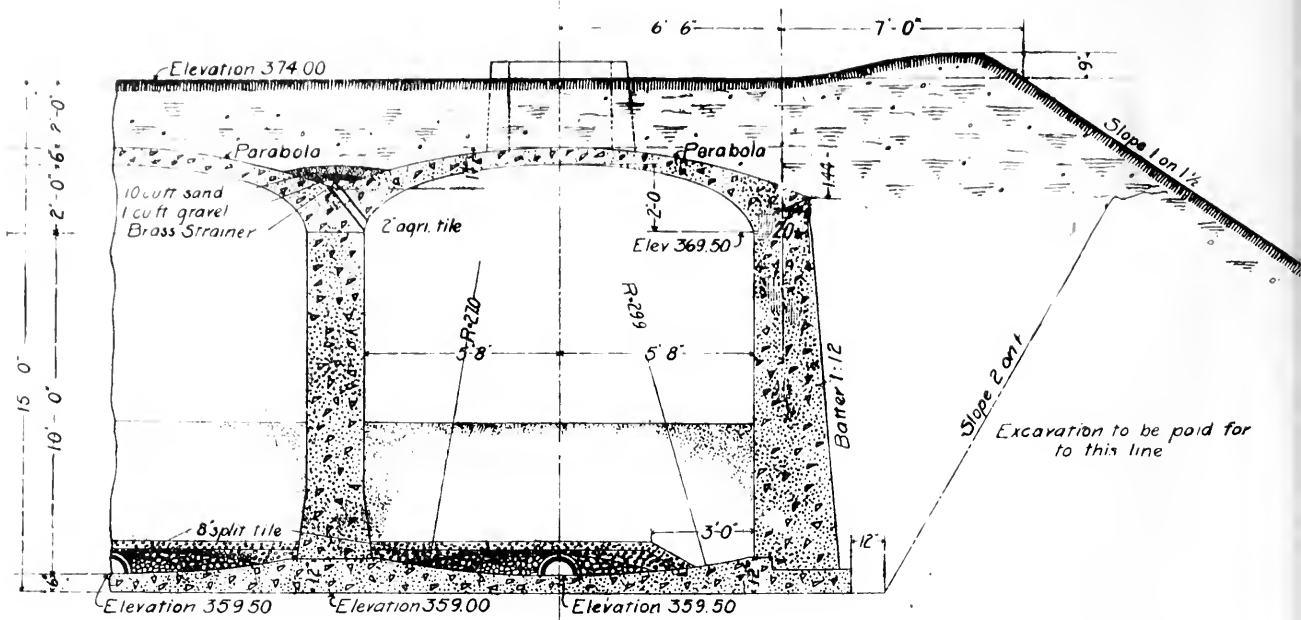
inlet chambers nor within two feet of outside or cross walls. The filter sand was placed in three layers, each about one foot thick, and was carefully placed—not dropped from a height—in order to avoid any more compacting than was necessary. The specifications for this sand called for clean sand of an effective size not less than 0.25 m.m. nor more than 0.35 m.m. and with a uniformity co-efficient of not more than 3.0. It was also specified that the sand should be free from dust and not contain more than one per cent. finer than 0.13 m.m. and be entirely free from particles over 5 m.m. in diameter; and that it should not contain more than two per cent by weight of lime and magnesia taken together and calculated as carbonates.

In constructing the main drain a groove 4 inches wide and one inch deep was left in the surface of the floor when constructing this, so as to come under each of the side walls of the drain. The slabs which compose the top of the drain were made separately in suitable lengths and set with cement mortar at all joints. The split pipe branch drains were of salt glazed pipe in two-foot lengths, laid with open joints with a space of $\frac{3}{4}$ inch between branches to allow the water to enter. The further end of each line of drains was closed by bricks piled up dry to prevent the gravel from entering.

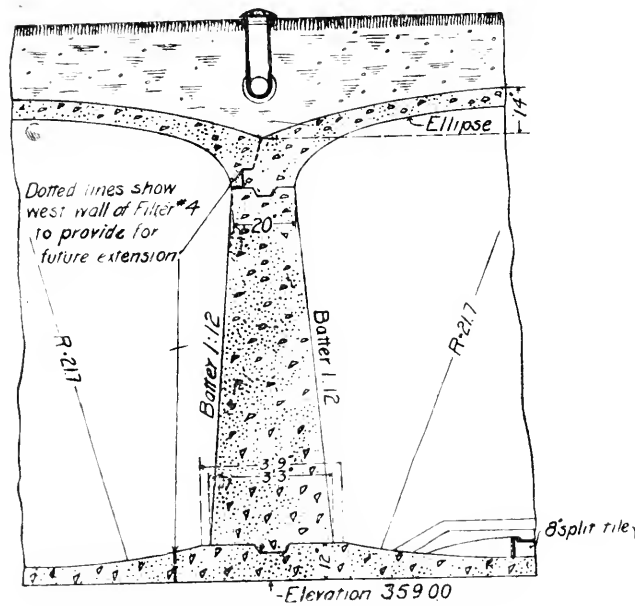
The floors of the filters were made of inverted groined arches, the drains being laid in the lowest part of the arch, where the concrete was made 6 inches thick. From this lowest



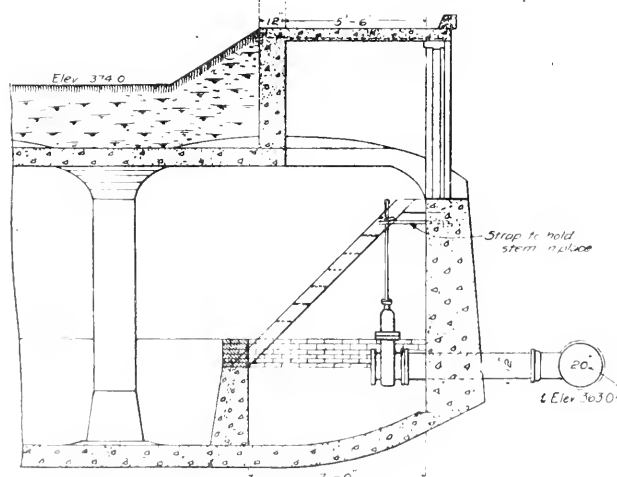
EXCAVATION FOR PEEKSKILL FILTERS



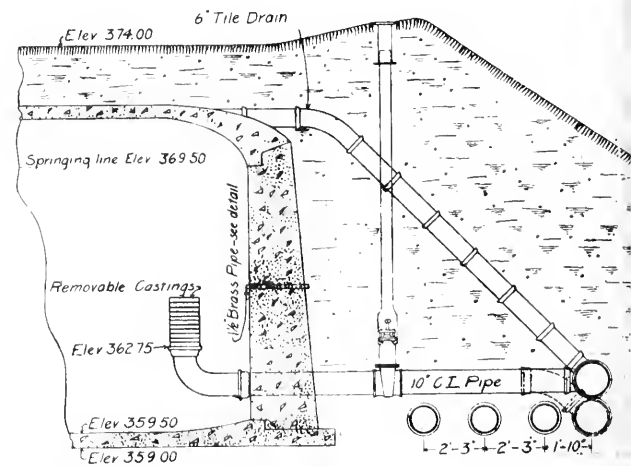
STANDARD PIER AND WALL SECTION



SECTION THROUGH DIVISION WALL



ENTRANCE TO FILTER



FILTER DRAINS

point to the springing line of the roof is 10 feet. The piers which support the roof are 20 inches square, flared at the bottom to a base 26 inches square. The distance between the piers is 13 feet from center to center. The roof arches have a rise of 24 inches and are 6 inches thick at the crown. The manholes are circular with 3 feet inside diameter and vertical walls rise 3 feet high from the inside crown of the roof arch. The roof is covered by iron covers weighing approximately 220 pounds each.

The raw water enters each filter at one corner, where it is discharged into a well about 3 by 7 feet, cut out of one corner of the filter by a concrete wall. The top 12 inches of the wall is composed of bricks laid dry. The top of this part of the wall is being kept approximately at the same level or slightly above the general level of the sand in the filter, one course of brick being removed from time to time as the sand is lowered by scraping the filter.

The floor of the sand court was made in two monolithic sections, each complete without any interruptions of the work from start to finish. This floor consists of 12 inches of concrete reinforced with 3/4-inch steel rods running in both directions and spaced 18 inches between centers. The surface of the floor was trowelled smooth, similar to the best sidewalk work. Through the center of the sand court were placed a series of concrete piers provided with vertical grooves in which to place a 2-inch plank by which the court can be divided into two courts of approximately equal size.

The pure water reservoir was constructed in practically the same way as the filter beds so far as the floor, piers and roof are concerned. In the southwest corner of the pure water reservoir is a regulator house, the basement of which consists of five rectangular wells, the whole forming a square 14 feet 8 inches on a side. To each of four of these wells is led one of the 12-inch pipes which receive the effluent from the four filters. The fifth chamber contains twelve 6-inch gauge tubes, three for each filter, which are connected with the Venturi meters by 3/4-inch lead-lined pipe, which are laid with a uniform rise upward from meter to gauge tube.

The inlet house is 10 by 12 feet inside dimensions. The basement serves as a well which receives the water from the aerator or reservoir, and from which it passes to the filters. Here is located the control valve for controlling the flow onto the filter beds. An 8-inch suction pipe leads from this well to the floor above where the pumps are located for supplying water under pressure for washing the filters; this water being supplied through the 6-inch pressure pipe previously referred to. This building is one story high above the ground and is furnished with a window and a door and covered with a tile roof.

In general the concrete work was built of two classes. That in the aerator walls and vaulting under the sand court, the covers for the main drains and for filter entrances contained reinforcement, and for this, and also for the piers under the sand court the concrete was mixed in the proportions of one barrel (380 pounds) of Portland cement to 8 cubic feet of sand and 14 cubic feet of ballast, both measured loosely. The concrete in the floors, walls, foundations for buildings and most other places consisted of one barrel of Portland cement to 11 cubic feet of sand and 19 cubic feet of ballast. The sand-washer box was built of concrete proportioned 1:8:8. Grooves were left in the faces of all concrete where they were left temporarily to be afterwards joined by new concrete, these grooves being formed by driving strips of wood into the concrete while yet soft. The walls of the filters were made in 13-foot lengths, the joints coming midway between the prolongations of the pier lines. The ends of these lengths were vertical and were provided with grooves, which were painted with tar to prevent the tongues in the adjacent blocks from adhering to them, these serving the purpose of expansion joints. No joints were allowed in the corners of the basins, all corners being made monolithic. Joints in the vaulting or roof arches were made on the summits half way between the piers, cutting the vaulting into a series of squares, each having a pier as a center. All of the concrete in each of these squares was placed at one time so as to produce a monolith.

The plant was put into operation in December, 1909, and has been and still is operated under the supervision of the firm



INTERIOR OF FILTER, MASONRY COMPLETED

of Hazen & Whipple, which also supervised the construction. The records of bacteria found in the raw water, clear water reservoir, effluents from each of the four filters and a tap in the city gave results as shown in the accompanying table. These show an average reduction of bacteria from 277 in the raw water to 30 in the clear water reservoir. The effluents from the several filters, however, averaged from 14 to 26 bacteria, and tap water averaged 65, apparently showing an increase of bacteria in the reservoir and the city mains. Of analyses for B. coli in the raw water, positive results were obtained in 44 per cent of the 10 c.c. samples, 22 per cent of the 1 c.c., and none of the 0.1 c.c. Analyses of the filtered water for B. coli have in every case given negative results.

The physical and chemical characteristics of the raw and filtered water are shown in the accompanying table, these being the average for more than a year's operation. The free and albuminoid ammonia are seen to have undergone a very considerable reduction. The turbidity also has been greatly reduced and the color, which has not at any time been seriously objectionable, has been somewhat lessened.

For the illustrations and part of the above information we are indebted to Mr. Lanning G. Roake, the superintendent of the water plant, including the filtration system.

MUNICIPAL BIDDING IN TORONTO

For a number of years the city of Toronto has made it a practice to bid itself, through the city engineer, on all paving contracts, and quite a considerable percentage of these have been awarded to the city as low bidder and performed by it by day labor. During the year 1909, of 371 contracts for concrete sidewalks 112 were awarded to the city engineer; although 49 of these were actually performed by the next lowest bidder at the price bid by the city engineer. In addition, the city engineer was awarded contracts for constructing 18 asphalt pavements, two asphalt block pavements, one vitrified block and two bitulithic pavements. The city engineer's bid was lowest on 30 other pavements, but these were transferred to the next lowest bidder at his request and at the engineer's bid.

In estimating the saving effected for the city by this system of having the engineer bid against contractors, there can be no question of what this was in those cases where the contract was transferred to the next lowest bidder at the reduced figure bid by the city engineer. The amount saved on the transferred contracts was \$5,317.00. Of the work done by the city engineer the actual cost to the city was in the majority of cases less than the city's bid, although in some cases it was somewhat greater than the lowest contractor's bid. On all of the sidewalk work done during 1909 the sum of the savings effected under the lowest contractors' bids was \$2,801.68, while the sum of the excesses over the lowest contractors' bids was \$323,774; leaving a net gain of \$2,507.94. On pavement work bid in by the city, similarly calculated, there was a net gain of \$1,012.45. In addition the department estimates that there was a saving of in-

OPERATION OF PEEKSKILL FILTERS

Date.	Raw Water.	Bacteria present per c.c.			Effluent No. 3.	Effluent No. 4.	Tap in City.
		Clear Reservoir.	Effluent No. 1.	Effluent No. 2.			
Dec. 29, 1909	100	100					
1910—							
Feb. 15, 1910	135	10	10	30	20	265	
Mar. 31, 1910	225	50	25	45	60	35	
May 18, 1910	300	50	22	26	35	43 36	
July 6, 1910	300	44	9	3	41	10 31	
Aug. 16, 1910	60	5	0	4	1	13 15	
Oct. 3, 1910	550	14	12	14	38		
Nov. 21, 1910	315	22	26	17	6		
1911—							
Jan. 25, 1911	415	7	8	4	6	7	
Average	277	30	14	16	26	22 65	

Chemical and Physical Characteristics of Raw and Filtered Water.

	Raw Water.	Filtered Water.
Turbidity	2.0	0.11
Color	25.0	20.0
Nitrogen as albuminoid ammonia	0.112	0.076
Nitrogen as free ammonia	0.024	0.006
Nitrogen as nitrites	0.001	0.001
Nitrogen as nitrates	0.06	0.06
Total residue	70.0	76.0
Loss on ignition	19.0	17.0
Fixed residue	50.0	59.0
Iron	0.17	0.13
Total hardness	38.7	45.1
Alkalinity	33.9	42.6
Incrustants	4.6	4.5
Chlorine	2.6	2.7

spection on work done by the city amounting to \$1,914. The total saving of all kinds thus calculated totaled \$10,812. We do not know to what extent overhead charges are included in the estimates of cost, but we believe that those connected with the asphalt plant, at least, were so included. Even should overhead charges not included have equalled the estimated saving, it is probable that there was a general effect of keeping all bids down which resulted in lower prices for contract work, even when these were performed by the contractor and thus were not included in the above estimate.

It should not be assumed that equally successful results could be obtained under this system by every city. To be continually successful it is necessary that the work done by the city be conducted so economically that the difference between the cost of city work and contract work should not exceed the 10 to 20 per cent profit included in the contractors' figures. It is also necessary, if contractors are to be encouraged to continue bidding, that the engineers be held strictly accountable for the cost of competitive work done by them, including in this all fixed charges, including plant depreciation, interest, etc., with due allowance for its lying idle during winter months. Probably an ideal condition would be such judicious bidding as would result in the awarding of not more than 5 or 10 per cent of the contracts to the city engineer—just enough to produce upon the contractors a sufficient moral effect to keep their bids down to the minimum consistent with good work and fair profit, preventing combinations or other methods of maintaining high prices against the city.

TEXAS WATER WORKS DETAILS

Gathered From Nine Cities—Per Capita Consumption—Minimizing Waste—Cost of Pumping—General Lack of System for Recording Data

It is a more or less common practice for councils to send committees of their members on trips to inspect pavements, sewage disposal plants, etc., in various more or less distant cities, with the idea that the information obtained will be useful to the city in solving problems involving municipal improvements of a similar nature. It is probable that there are few such trips made in which the participants do not receive information which they can and do use to the advantage of their city. We believe, however, that the same or less money could generally be invested to better advantage by sending on a similar trip the city engineer, water works superintendent or other technical man, two of the many reasons for this being that he is better able to comprehend what he sees and to appreciate the applicability of what he learns to the local conditions of his own city, and that he is apt to remain longer in the service of the city, and consequently the information so obtained at the expense of the city will be used for a longer time to its advantage.

An illustration of such an investigation conducted by an engineer is offered by Beaumont, Tex., sending its assistant city engineer, W. E. Sampson, to study a number of the water works plants in that state and Louisiana, the reason for wishing to obtain this information being that the city contemplated the purchase and operation of the water works plant. The result of this investigation was a report which occupies eight typewritten pages, in which are presented the general conclusions from the information obtained. Accompanying this report was an appendix of several score of pages giving in detail the information obtained, with tables, etc., which were referred to in the report proper. It seems probable that the council as a whole was thus put in possession of even more data than they would have obtained had they themselves made the trip, and that the actual benefit which will be derived by the city will be greater than had the same engineer accompanied the ordinary councilmanic investigation trip, with its exchange of courtesies and side issues which use up so much

of the time, which is seldom long enough, even if it were a seriously employed, to permit acquiring a thorough understanding of the plants inspected.

Several of the facts learned and conclusions derived as a result of this inspection are of more or less general interest. The fact which was most keenly appreciated by Mr. Sampson was the lack of a uniform system, or of any system at all, for recording data in general and reporting statistics of water use. "The only city visited by me in Texas," he said, "which follows even remotely this plan (the New England Water Works Association form) is Houston. Their purchasing agent is responsible for both the buying and distribution of materials, makes a complete report monthly to the superintendent concerning materials bought and prices of same, distribution of materials, to what department and by whom, etc. In the office there is kept a record or history of every hydrant, meter, etc. The card system is used almost exclusively." Concerning one of the cities, he states: "The records of the main systems are kept in a loose style, lacking in the details of importance. Hydrants, gate valves, location of mains, etc., are shown on a map, but a more detailed record of the same is being prepared. In fact, until recently no attempt has been made to maintain a correct record of badly needed current information, and, as earlier data having been lost, it has been impossible to get statistics in detail. There are no records of the make, number or location of gate valves." Of another city: "Records are not kept in such a way as to make detailed data in regard to the distribution system available." Concerning Houston, however, he states: "A very strict and thorough working system is in vogue among the plant and office employees, and the system of records and tabulation of data concerning the plant is one of the most complete of any municipally operated plants visited."

One of the classes of information sought for was the per capita consumption; but the records of this he found to be of little service. "It is very clear to see that the business consumption, factories, etc., added to that of the domestic consumers, does not give just or correct data as to the per capita consumption. Small manufacturing cities, for instance, with large business consumption, will show an unusually large per capita consumption indicating perhaps a very wasteful people when in fact conditions may be just the opposite. . . . Thus it is seen that data as now generally kept give one absolutely no idea of the amount of water required for the use of a city population, and that the business consumption is entirely independent and the records, therefore, should be kept so that the data would give one some idea of what the average per capita consumption should be." The cities visited were Waco, Galveston, Houston, San Antonio, Dallas, Fort Worth and Beaumont, Tex., and Alexandria and Shreveport, La. The lowest per capita consumption found in any of these was 75 gallons at Alexandria, while the highest was 158 gallons at Waco. Alexandria meters all services and Waco only 9.6 per cent of them.

The matter of waste was given special consideration by Mr. Sampson, and the methods for minimizing the same. The most effective and generally applied remedy for this he finds to be metering and in some cases a rigid house-to-house inspection. Alexandria, while she gives due credit for low consumption to complete metering, attaches much importance to the work of regularly employed inspectors. Even in a totally metered district there are numerous ways in which water can be used without being recorded. Large meters may be by-passed, water may be taken from fire services, the meters themselves are tampered with, etc. In addition to metering all supplies Alexandria has a Venturi meter on the main supply pipe and can thus ascertain what water is lost or stolen. Concerning metering, the superintendent of the Houston plant said: "The moral influence established by general meter installation is a countable for a greater saving of water than is the actual number of meters in service. Less than 18 per cent of the total number of consumers are supplied through meters, and the saving amounts to more than 40 per cent in per capita pumping

age. Few people waste water intentionally, and most only need to realize what the small and apparently inappreciable leak amounts to and they will usually stop it voluntarily without any urging from the water department. The policy of discriminate meter setting has created an educated public and a condition which has enabled the department to cut the selling price of water from 50 cents to 15 cents per thousand gallons in less than three years' time, at the same time increasing both the gross and net revenue without deviating from the policy of self-sustenance independent from any assistance from the general taxes." That there is an offset to the reduction of waste by meters is indicated by the report of superintendent of Galveston, Tex., who states: "The installation of meters has caused a considerable increase in the operating expenses over the flat-rate system, necessitating the employment of additional labor to read meters monthly and a force to keep the meters in repair and additional expenses incurred for meter material. While the meter system has materially increased the operating expenses there has been a great saving in the consumption of water and fuel."

Most of the plants described obtain water from artesian wells, Dallas being the only one relying entirely upon surface water, Beaumont using river water and Fort Worth partly artesian and partly surface. The maximum pressure on the mains in pounds is 50 at Houston, Alexandria and Beaumont, 60 at Galveston and Waco, 70 at Dallas and 90 at Fort Worth. In several of the cities a higher pressure is given by the pumps during fires, however, this reaching 100 pounds at Alexandria, 95 at Galveston, 125 at Fort Worth and 75 at Beaumont. The maximum meter rates vary from 15 cents in Houston and Beaumont to 40 cents in Waco, while the minimum rate is $9\frac{1}{4}$ cents in Galveston, 10 cents in Dallas, 15 cents in Houston, Alexandria, Waco and Beaumont and 30 cents in Fort Worth.

An inspection of the tables in the appendix shows that the cost of pumping in the several cities varies widely. Oil is used under the boilers in Houston, Galveston, Fort Worth and Beaumont; coal slack in Waco and wood in Alexandria. The lowest cost per million gallons of water raised one foot is 5.5 cents in Beaumont and Waco, while the highest is 24 cents in Alexandria and 21.9 cents in Fort Worth. It is seen that one of the largest and one of the lowest rates were for plants burning oil, and an inspection of the data of the Beaumont and Fort Worth pumping plants does not reveal any explanation of this. At Fort Worth, where the rate was highest, the consumption per day is double that at Beaumont, the engines were normally of higher efficiency and the boilers were water-tube in both cases. The pipe friction is probably somewhat greater in the case of Fort Worth, since the number of taps per mile are 146 as against 896 in Beaumont, and the length of mains per tap consequently greater. This, however, should not be sufficient to account for more than a small percentage of the difference. Possibly a more important element in the difference is that the Fort Worth water is largely an artesian supply, and an air-lift plant is required in addition to the regular pumping plant, while Beaumont draws its water directly from the river. On the other hand, however, Waco, whose cost of pumping is no greater than that of Beaumont, obtains its supply from artesian wells, as does also Houston, where the cost of pumping is only 6.7 cents. Should a large part of the high cost in Fort Worth be due to the air-lift pumping we would have the cost of this as about three times as much per gallon as the cost of pressure pumping in Beaumont.

Among the scattered items of interest found in the report is the statement that Fort Worth has a duplicate system installed in and around the principal mercantile district to furnish fire protection and water for sprinkling and commercial purposes, which water is obtained from the river, while water for domestic use is obtained from wells. This river water is used by the railroads and many large concerns, a rate of 10 cents per thousand gallons being charged.

The Waco department receives from the city \$10,000 a year for all fire hydrant service, and 10 cents per 1,000 gallons for the water used for street sprinkling.

DEDICATION OF PLATTED STREETS

Rights Acquired by Purchasers of Lots in Streets Delineated on Maps—Platting Equivalent to Dedication—Court Rulings

By JOHN SIMPSON

WHEN an owner of land lays it out into lots, streets and squares upon a plat or map and then sells the lots according to the plat or map the purchasers acquire an interest in the streets so laid out, which, taking the narrowest view of their right, entitles them to insist upon their being kept open at least as far as the first traveled highway. As to such purchases, the making of the plat and the selling of lots with reference to it are equivalent to a dedication by which the seller is effectually bound.

The making of the plat alone would probably be of no binding effect on the owner. That might be an indication of his intent to make a dedication, but at most it could only be an offer to dedicate which could be withdrawn at any time. But when a sale is thus made, contractual relations arise between seller and purchaser in regard to the streets. While the construction of these relations is fairly harmonious there is enough difference in the language of the courts of the various jurisdictions to be noted.

In New York the later decisions would seem to restrict the right of the purchaser to an easement over the street abutting his own lot and as far as the nearest public street, and this is also the rule in Maryland. It is also the rule in England, where all that the purchasers can claim is a right-of-way over the street adjoining the respective lots and directly thence into the public highway, and not a right-of-way over all the streets marked on a plan published with the particulars of sale. Most of the United States courts, however, take a view much more favorable to the purchaser and hold that his right covers all the streets indicated upon the general plan.

In Pennsylvania it is held that a call in the deed for streets in the plan amounts to a dedication of them to the use of the purchaser as public ways and that this is so even if the streets are not yet opened. For when the proprietor of a body of land sells and conveys it in lots according to a plan which shows the lots to be on streets he must be held to have impressed upon them the irrevocable character of public streets, and not only can the purchasers of the abutting lots assert this character, but so can all other lot owners in the general plan.

In Illinois a similar view is taken. The sale and conveyance of lots in a town according to a plan imply a grant or conveyance to the purchasers that the streets and other public places indicated as such upon the plan shall be forever open to the use of the public free from all claim or interference of the proprietor inconsistent with such use. The purchasers acquire as appurtenant to their lots every easement, privilege and advantage which the plan represents as belonging to them. They are entitled to have the streets remain open for their entire width and may enjoy the obstruction of them by structures or buildings. The right passing to the purchasers is not the mere right that they may themselves use the streets or other public places, but a right vesting in them that all persons whatever as their occasion may require or invite may so use them. And some of the purchasers as against the rights of the others cannot vacate a street designated upon such a plat whether such designation was sufficient to constitute a statutory designation or not. The seller himself has been held estopped to deny the existence of the streets as shown upon the plat, although it has not been properly acknowledged.

In Indiana the decisions are to the effect that the making and recording of a plat and sales of lots as designated thereon operate as an irrevocable dedication to the public of all streets and alleys marked on such plat as far as purchasers of lots are concerned. This is also the effect of the Alabama decisions. In Wisconsin and Texas the acts of platting and selling are held to show a dedication to the public as a street, so far as

the grantee is concerned. In Louisiana the transaction is a dedication to public use and the vendee, together with the public generally has the right to use the whole width of the street. In Rhode Island, when an owner sells one or more lots, describing them by reference to a plat, he annexes to each lot a right of way in the platted streets delineated on the plan, which neither he nor his successors can afterward intercept or control; and all the owners, though not abutters, may enforce the dedication so made. North Carolina courts hold the transaction to be a dedication of the streets vesting in the purchaser of lots a right to have them kept open. The Tennessee decisions are not harmonious, some following the Pennsylvania rule and some the later New York rule. And the Maryland courts in their later decisions show a tendency to take a view of the right more favorable to the purchaser of lots.

In New Jersey, if the owner of a tract of land plats it in lots and streets by a map filed in a public depository, and sells lots on the map by a reference thereto, or by a map publicly exhibited, he thereby dedicates the streets on the map to the public. Although the acceptance by the proper public authority is also necessary in order to make the public liable for maintaining the streets in good order, the dedication may be accepted by the proper authorities at any future time and the owner is estopped to deny the dedication, private rights having meantime intervened.

In Maine it is held that where building lots are sold by reference to a plan the purchasers obtain an interest in all the streets marked upon it and the right to have them converted into public streets as soon as the public authorities can be induced to do so. And in Virginia the sale of lots in accordance with a map or plan vests in the purchaser a right to the use of the streets appearing thereon which cannot be affected by the acts of the vendor.

The generally received doctrine seems to be the reasonable one. When the vendor of a lot, part of a body of his land, sells it with special reference to a plan on which certain streets are delineated, the natural presumption is that he intends to donate these streets to the use of the general public as a means of adding to the value of the individual lots which he sells, and also that the purchaser contracts with reference to a right to have all the streets on the plan kept open as a material part of the value of his individual lot, and not merely with the understanding that he acquires an interest in the whole width of the street abutting his lot and a right of access to his property from the nearest public street.

TORONTO STREET PAVING.

In the city of Toronto there are about 25 miles of brick pavements, and there is more or less of this class of pavement laid each year. In several cases, however, where brick pavements have been down for a number of years the residents have petitioned to have them surfaced with asphalt in order to lessen the noise. The department has used for this purpose a surface consisting of one inch of binder and two inches of asphalt. The results have been appreciated by the residents and it is expected that requests for the same treatment will be received from the taxpayers on a number of brick-paved streets. This work was not necessitated by any disintegration of the brick pavements, but the abutting taxpayers have been willing to pay for it in order to diminish the noise of the passing traffic.

The municipal asphalt plant is used to maintain all asphalt pavements out of guarantee and in a measure is effective in insuring the proper maintenance of those still in guarantee. The department also uses this plant for repairing plumbers' cuts, so-called. During the year covered by the latest public report 13,414 batches of asphalt and 2,303 batches of binder were turned out. The average cost of the several items per square yard of surface laid 2 inches thick and per square yard of binder one inch thick was as follows: *Binder*: Payroll, 5/6 cent; aggregate, 83/4 cents; fuel, 1/3 cent; fixed charges,

53/3 cents; total 157/12 cents. *Surface*: Payroll, 31/2 cents; aggregate, 321/2 cents; fuel, 11/16 cents; fixed charges, 81/2 cents; total 453/3 cents. On the average one batch of surface material lays 6 square yards and one batch of binder 12 square yards. Binder is not used in making the ordinary asphalt repairs except in cases of excessive thickness. The average cost of asphalt repairs for the year, including both surface and binder where used, was 54 cents per square yard.

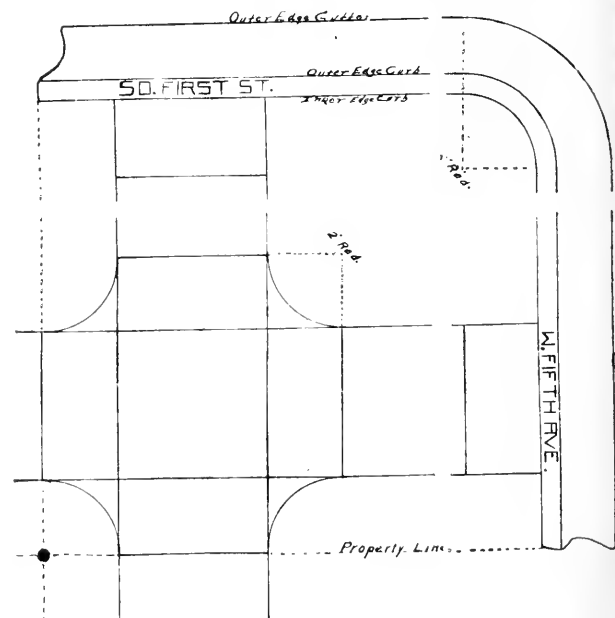
The majority of the new sidewalks are paved with cement, but a number of plank walks are still laid each year. During the year covered by this report about three-fourths of a mile of such walks were laid, most of them 4 feet wide. These cost an average of 91/2 cents a square foot. As cement walks cost only about 12 cents a square foot, and as the plank sidewalks are much less durable, ornamental and safe than the cement, we can see no argument in favor of constructing them except where it is known that the construction will be a temporary one only.

The city cleans the snow from about 400 miles of sidewalk each winter, assessing the cost against the abutting properties. The cost ordinarily averages from 31/2 to 41/2 mills per linear foot. The rate of, say, 17 cents to 22 cents for a 50-foot lot seems very low.

STREET NAMES ON CURBS

The city of Arkansas City, Kans., makes a practice of placing the street names on the top of the curb in the line of the sidewalk paving, as indicated on the accompanying drawing. The city owns a set of brass letters which are in charge of the city engineer, and these are loaned to the contractor to whom any curb and gutter work is awarded. These letters are brass, 31/2 inches high and 11/2 inches wide. With these the letters forming the street name are driven into the concrete while it is green, thus leaving the name depressed in the top face of the curb. These letters are sold by dealers in concrete workers' tools at from 15 to 25 cents each. Arkansas City has a population of about 10,000 only. In a larger place where there is considerable amount of curb construction it would probably be profitable for each contractor to own his own set of letters.

The sidewalks in Arkansas City are unusually wide, the distance from property line to curb being 20 feet. On the residence streets the pavement portion is given a standard width of 4 feet, placed 2 feet from the property line, thus leaving about 14 feet of sod space between sidewalk paving and curb. For the above information we are indebted to City Engineer J. H. Titus.



STANDARD STREET CORNER, ARKANSAS CITY

STREET RAILWAY TRACKS

Preventing Low Joints and Motion of Rails — Styles of Rails — Effect of These on Pavement, Vehicular Traffic and Pounding of Cars — Concrete Beam and Slab Construction — Welding Rails

OWING to the fact that there had been considerable complaint and dissatisfaction because of the noise and jarring occasioned by the street railway cars in Trenton, N. J., the council last fall directed the city engineer to report upon the causes of this and suggest remedies. The investigation and report were made by Assistant City Engineer A. C. Gregory, which report goes very fully into the consideration of street railway tracks. The following is an abstract of it. As is natural, the point of view of the city rather than of the company it that taken in this report.

It appeared that the noise and jarring of adjacent houses was due to unevenness and instability of the track rather than to flat wheels or other defects in the rolling stock. "From the municipality's point of view there are other reasons than those of annoyance to the senses and loss in value of taxable property why cars should ride over a firm and rigid sub-foundation. It is impossible to maintain pavements such as those the city is now building adjacent to the rails. The shock at the joints, jumping up and down of the ties and vibration of the rail all tend to disintegrate the adjacent pavement and its foundation, letting into the cracks and openings thus made water and consequently frost. It is no simple matter to design and maintain asphalt, brick, or wooden block pavements adjacent to the rails when the track is in first-class condition; and economical maintenance is impossible when the track is not in good condition." "In the opinion of the writer the main trouble will be found to resolve itself into a question of rail alignment and low joints, particularly the latter." In the case of steam railroads there is similar trouble from low joints, to minimize which the maintenance gang is kept at work continually retamping under the ties. Such retamping is impossible in the case of street railways, however, on account of the paving which covers the ties and fits up close to the rails. It therefore seems necessary to prevent the gradual working of the tie into the ground, since it is impossible to apply the remedy.

The objections to such settling of the joint ties is not only the noise and uncomfortable riding, but the rails are quickly battered at the ends so as to need replacing and the rolling stock suffers and rapidly depreciates on account of the jarring. It is therefore a matter of economy for the railroad, as well as for the paving department of the city, to construct a track which will not suffer from low and movable joints; and both the passengers on the railway and the residents along the street will be much better pleased, which has a money value for the railroad company and should receive the serious consideration of the city authorities. There is still another economy to the company, in that the power required to draw a car over a track with low or movable joints is considerably greater than—in some cases more than double—the power required for traction on a new and perfect track.

As to the remedy, increasing the depth of the rail sections will help, but only partially. One of the earlier attempts at solution was the welding of joints, the argument for this being that since the joint was the weak spot, by doing away with joints altogether and securing one continuous rail this weakness would be entirely eliminated. Another attempt at solution was the furnishing of a foundation under the rails so solid that it would not yield under the most severe traffic conditions. Both of these have been adopted very widely, in some cases one or the other, in a number of cities both together.

The solid foundation used is in most cases one of concrete. There are two general systems, that of resting each rail upon a longitudinal beam, or resting the entire track upon a slab. The latter is the more common. In Sioux City, Ia., wooden ties are spaced 10 feet center to center, with 8 inches of concrete under each tie, the concrete under the tie having a 16-inch base or bearing surface on the earth below. A concrete beam 10

inches deep is placed longitudinally under the rail between the ties and has a horizontal bearing surface of 18 inches on the soil. The concrete of this beam is brought up one inch above the base of the rail, thus holding it solidly in position. The rails are prevented from spreading by tie rods spaced 5 feet apart. The street surface between the ties and beams is concreted to form a rigid foundation for the street pavement.

City Engineer F. M. Randall, of Ft. Wayne, Ind., wrote Mr. Gregory that the use of concrete beams under the rails had proved a failure in that city and that concrete slabs only are used. In this case a slab 10 inches thick is placed at sufficient depth to permit the placing on it of white oak ties which are spaced two feet apart center to center and support the rails. Concrete is filled between the ties, giving a maximum depth of 20 inches of concrete at this point, this concrete being brought up to form the foundation for the pavement. The frequency of the ties in this case would appear to indicate that they were intended to receive the load; but in the majority of instances of slab construction the ties are placed some distance apart, say 10 feet, being provided merely to hold the rails to line and grade while the concrete is being placed.

City Engineer C. H. Rust, of Toronto, stated that in that city the construction at the present time consists of a concrete foundation 12 inches thick under the entire roadbed, this concrete being put in after the rails have been brought to line and grade. Old 4½-inch rails cut in 7-foot lengths are placed under the rails with the base up, to serve as ties, being secured to the rails by clips. The concrete foundation obtains a secure grip on the ties thus formed and holds the rails rigidly in place.

A type of roadbed known as slab and beam construction is illustrated at Charlotte, N. C. Here creosoted wooden ties were placed 12 feet apart, these ties carrying chairs upon which the rails rest. After the chairs had been spiked in place the rails were brought to line and grade and the ties thoroughly tamped to hold them there during the concreting. Concrete beams 20 inches wide and 14 inches deep were placed under the rails, the concrete being brought up flush with the bottom of the rail. At the same time there was constructed, monolithic with these beams, a slab 5 inches thick spanning from one beam to the other and thus furnishing a foundation for the pavement. At intervals of 6¼ feet the rail rests on tie plates to which are riveted stirrups projecting down into the concrete to a depth of 8 inches and thus anchoring the rail securely. Tie bars also connect the rails at intervals. At Detroit, Mich., during the past year the joints have been welded and in addition a concrete slab construction has been adopted, the slab under the ties near the joints being made 3 feet thick.

Mr. Gregory's report contains the description of a number of other constructions, all varying more or less from each other in details; but the essential features are well represented by the illustrations here given.

This portion of his report he concludes with a description of the forms of construction adopted for the city of Chicago by a board of supervising engineers which represented the city and the railway companies. There are five types. Type one consists of grooved girder rails on steel ties embedded in concrete. The depth of the concrete base is increased under each rail and under each tie. This is intended for heavy traffic street. Nine miles of single track have been built, but its further use has been discontinued until further experience has been had with it. At present preference is being given to wooden tie construction on account of the greater resilience. Type two substitutes wooden ties for the steel ties of type one. It is intended for heavy traffic streets where the track can be kept closed for sufficient time to permit the concrete to set properly. Originally there was a concrete beam under each rail and the concrete was carried 6 inches thick under the ties. This re-

quired excavating trenches, which caused considerable trouble and delay, and difficulty from the caving of the trenches. Early in 1908 the design was therefore modified and the concrete bed made of uniform thickness and the ties spaced 3 feet apart. The trench for the track was excavated to a depth $21\frac{3}{8}$ inches below grade and the bottom rolled before placing the concrete. Type 3 consists of grooved girder rails on wooden ties on a broken stone ballast. This was designed for streets in the business district where the tracks could not be kept out of use for a sufficient length of time to allow a concrete base to set. The trench for receiving the track has a uniform depth of $23\frac{3}{8}$ inches below grade. This is well rolled, and 5 to 8 inches of broken stone put in place and the ties laid on this 2 feet between centers. Concrete is filled between and over the ties to a thickness of $8\frac{7}{8}$ inches, forming the pavement foundation. The fourth type, designed for use on brick paved streets in outlying districts, consists of T girder rails on a slag foundation. The trench, made 8 feet wide for single track and 8 ft. $10\frac{1}{4}$ inches for each track in double track work, is excavated $21\frac{3}{8}$ inches below grade and rolled. In this trench is laid a bed of slag 6 inches thick, which is covered with fine slag, limestone screenings, cinders, or foundry sand in sufficient quantity to fill all voids. This material is flooded and rolled with a 10-ton steam roller to give a finished thickness of 8 inches. Ties and rails are laid on this and concrete is filled in between and over the ties. Type five consists of tram-head girder rails on wooden ties and is used for macadamized streets. The trench and foundation are prepared as in type four and on this are laid the ties spaced 2 feet between centers and slag is filled between them to a depth of $4\frac{7}{8}$ inches, on which is placed a 4-inch course of $2\frac{1}{2}$ -inch limestone as the base for the macadam. In all of these types the wooden ties are treated with chloride of zinc.

In discussing welding of joints, Mr. Gregory describes the three forms, the cast weld, electrical weld and Thennit weld. In the first, molds are fastened around the rails at the joint, the inner sides of the molds being painted with linseed oil and graphite. Molten cast iron is then poured into the molds, the heat fusing the steel of the rails sufficiently to effect a true weld.

In electrical welding a steel bar is placed on each side of the rails at the joint and a heavy current of electricity passed from one bar through the rail to the other. At the point where the current is applied the metal is fused and union takes place between the bars and the rail. This process is an extremely expensive one unless a considerable number of joints are to be welded, since it requires an expensive equipment.

In Thennit welding a mold is clamped to the joints as in cast welding and is filled with a mixture of iron oxide and aluminum, chromium being sometimes added for tempering the weld. The mixture is then ignited and an intense heat results which breaks down the iron oxide causing it to give off its oxygen to the aluminum and leave molten iron which fuses the adjacent steel of the rail and results in welding. The equipment for this is inexpensive.

Correspondence with engineers in a number of cities showed that these differed as to the effectiveness of welding in preventing low joints and insuring permanently smooth track. Reports from Indianapolis, Scranton, Toronto, Buffalo, Camden and Elizabeth, N. J., were that welding was unsatisfactory, or that good results, if they had been obtained, were due rather to improved foundation. In Rochester, Detroit, Cincinnati, Minneapolis and New Brunswick, N. J., welding was reported to have given very satisfactory results. Commenting on these Mr. Gregory says: "It will be noted that with one exception (New Brunswick) those engineers who believe in the efficacy of welding in doing away with low joints are representatives of cities where a heavy concrete base also is used, which suggests that the rigid foundation may have a good deal to do with the success of the joint. There is a pretty general idea that the welding should help, but enthusiasm is not strong over its being a remedy."

While the style of rail used has less effect upon the uneven-

ness of the track than either foundation or joint, it is a matter of considerable importance to the city since the top of the rail becomes a part of the street pavement. Mr. Gregory finds that present American practice makes general use of three classes of rails—the tramhead girder rail, the Trilby or grooved girder, and the T girder rail.

The tramhead provides a comparatively wide flange which forms the bottom of the groove and on which vehicles may travel. It was supposed that this would save the pavement from being rutted along the side of the rail by wheels of wagons, but it does not seem to have been very successful in doing so, and this rail does not seem to have many advocates among either city or railway officials.

The Trilby rail presents a smooth and level surface over the entire top of the rail except a narrow groove in which the flange of the car wheel travels. It saves the adjacent pavement to a considerable extent in that wheels do not strike the pavement in crossing the track or grind it in turning out from the groove as in the case of the tramhead rail.

The T-rail is similar to that used for steam railroads except that it is made high enough to permit the ordinary depth of city pavement to be laid without interference by the ties or rail base. In his investigation Mr. Gregory found the T-rail to be particularly in favor in the West and Middle West and that it bids fair in his opinion to be used more extensively than any other. "There can be no doubt that from the standpoint of the operating company the T-rail is by far the most economical. In track construction usually the largest single item of expense is the cost of the rail. . . . It is claimed by the advocates of the T-rail that when passing over a tramhead or Trilby rail the weight of the wheel is taken largely by the side-bearing tram of the rail, rather than directly over the web of the rail, while the load on the T-rail passes directly through the center of the head and web to the base. Also it is possible to broaden and toughen the head of the T-rail to a greater degree than either of the other two; hence the wear will be longer. Moreover, when one side of the rail is worn, the rail may be turned around and used again. An objection to the tramhead and Trilby rail is that when the bearing surface becomes worn down the flange of the car wheel travels on the flange or groove of the rail and it is fit then only for scrap. The T-rail allows flangeway for any shape or style of wheel. The T-rail is also easier to handle and much more economical and easy to maintain in good condition. It is also maintained that because of some difficulty of wagons in the crossing or getting out of the tracks where T-rail is used it has a tendency to restrict vehicular traffic to the pavement, thus permitting cars to keep to their schedule and saving the time of those on the cars. By many the matter of vehicles getting out of the tracks is believed to be the principal argument against their use. When rutting occurs along the tracks this objection assumes very serious proportions, and wagons slide along the track for a good many yards before the wheels are able to mount the rail. Among the cities in which the T-rail is popular may be cited Minneapolis, Minn., Chicago, Ill., Ithaca, N. Y., Sioux City, Ia., Ft. Wayne, Ind., Indianapolis, Ind., Detroit, Mich., Scranton, Pa., Toronto, Can., Charlotte, N. C., Denver, Col. and Salt Lake City Utah." "In the report of the Committee on Way of the American Street and Interurban Railway Association, presented at their regular convention in Denver, Col., in 1909, T-rails were recommended for all classes of pavement, the width and section of the T-rail varying with the kind of pavement and the traffic to pass over it. 'For tracks constructed for heavy service in connection with deep block pavement on streets where the traffic is confined to the railway strip, or is so congested that the railway strip is continually used by vehicles (such conditions as exist only in cities of the larger class), your committee recommends the adoption of the half-grooved (or Trilby) section recommended in 1907.'"

In concluding his report Mr. Gregory states that he is of the opinion that in the city of Trenton the ties and rails should be supported on a concrete slab where the heavier traffic occurs, with 4 and in some cases 5 inches of concrete under the tie.

For ties he suggests either steel or wood, placed only at such intervals as is necessary for securing and maintaining line and surface until the concrete has set. He advises the use of the Trilby rail on all streets which have a narrow roadway carrying heavy vehicular traffic. In such streets he believes that the city is justified in consulting the safety and convenience of the traveling public in crossing the tracks and in requiring the railway company to bear the greater expense of this as compared with the T-rail.

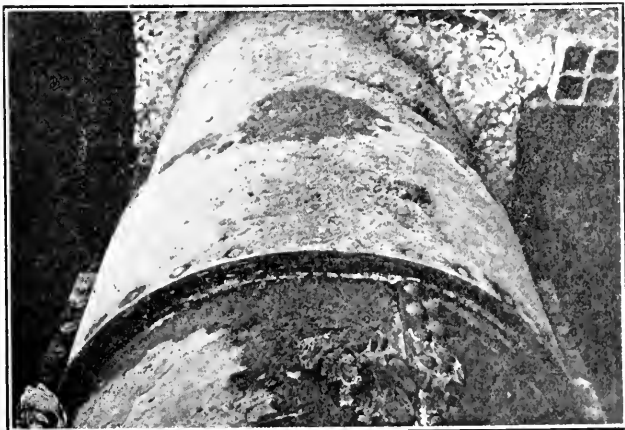
The objection to the concrete foundation, that it seems necessary to keep not only vehicular traffic but the cars themselves off the rails while the concrete is setting, is an important matter and considerable attention was paid to it in the investigation. City Engineer E. A. Fisher of Rochester considered that the concrete should be given ten days in which to set. On the other hand it was reported from Kingston, N. Y., "that with proper precautions it is not necessary to stop cars to allow concrete to set." Most cities, however, thought otherwise, Schenectady considering that this time should be not less than four days; Utica, at least one week; Syracuse, at least ten days, and longer if possible; Newark, seven days; Baltimore, three to seven days, depending on traffic conditions; Washington, 15 to 20 hours.

Where traffic conditions on the street would not permit of so long delay, the report recommends the stone ballast construction used in Chicago, in which case the rail joints should be welded, in the writer's opinion. For streets of lighter traffic it is suggested that one of the forms recommended for heavy traffic streets be modified by providing a lighter foundation. Concerning rails Mr. Gregory recommends the Trilby rail for heavy traffic streets, as stated above, but for wide streets where vehicular traffic is not especially heavy a girder T-rail is recommended, since on these streets vehicles should be encouraged to keep to the sides of the roadway to avoid delaying street cars.

REPAIRING A STEEL PIPE

In his latest published annual report the chief engineer of the Wilmington, Del., Water Department, John A. Kienle, described a somewhat novel pipe repair as follows:

About the middle of December a break occurred in our 48-in. steel distributing main at the north end of Van Buren Street bridge. This break was rather peculiar in its character, never having been recorded elsewhere where steel pipe has been used. The butt strap connecting two sections of pipe cracked between the lines of rivets, and the cause was attributed to the combined influence of settlement of the north approach to the bridge and the effects of expansion and contraction of the pipe itself. . . . As it was impossible to repair this break by using a standard 48-in. cast-iron split sleeve, it was deemed advisable to have a similar device made from $\frac{7}{8}$ -in. boiler plate. This work was done by local manufacturers in less time than patterns for a new casting could be made, and the method of using the sleeve is shown in an accompanying photograph.



REPAIR TO 48-INCH STEEL PIPE, WILMINGTON

CITY PLANNING IN AMERICAN CITIES

Width and Alignment and Grades of Streets—Location of Parks
—Size of Buildings—Control of These by City—Water
Front Development—Excess Condemnation

IN May, 1910, the Mayor of New York City appointed a Commission on Congestion of Population to study and report upon the various municipal problems connected with the congestion of population in cities. On February 28, 1911, they presented their report, which contains a most valuable amount of data and expert opinions and advice upon a number of topics, such as emigration, tenement houses, etc. Among these was a report upon the control which various large cities have over the growth and development of the street system. The data concerning this were given in the form of questions which were submitted to the cities of New York, Philadelphia, St. Louis, Boston, Baltimore, San Francisco, Cincinnati and Milwaukee, together with the replies received from each. As this is a matter which concerns city engineers and others engaged in the laying out and improvement of cities we reproduce herewith the questions and their answers in full.

SUMMARY OF THE REPLIES FROM IMPORTANT CITIES OF THE UNITED STATES REGARDING METHODS OF CITY PLANNING

Q. 1. What authority is charged with planning streets?

New York—Original plan by Borough President. Before becoming effective, approval is necessary by the Board of Estimate and Apportionment, which has jurisdiction over further changes intended by Borough President.

Philadelphia—Act of Assembly 71, Board of Surveyors, when made by direction of Select and Common Council.

St. Louis—Board of Public Improvements.

Boston—Board of Street Commissioners.

Baltimore—Topographical Survey Commission. City has adopted definite street plan, but this may be annulled by the Commission with the Mayor and City Council.

San Francisco—Board of Supervisors and Board of Public Works.

Cincinnati—No authority charged particularly with this, as all streets have to be accepted by Council.

Milwaukee—All plots must be submitted to Committee on Plots and Grades.

Q. 2. General widths of streets?

New York—Streets, 60 feet; avenues, 80 feet.

Philadelphia—Intermediate streets laid out for development of abutting property, minimum 40 feet; formerly widths of principal streets 50 feet, but recently policy is to make them from 60 to 100 feet, depending upon probable future importance as business streets or general traffic.

St. Louis—50 to 100 feet.

Boston—40 feet generally, 50 to 80 feet for more important avenues.

Baltimore—66 feet usually. A survival of old custom, based on old methods of measurements, four perches.

San Francisco—68 feet 9 inches.

Cincinnati—40 to 100 feet; 50 feet was considered an average.

Milwaukee—60 to 66, 70 and 80 ft.

Q. 3. By whom is width of street determined?

St. Louis—Board of Public Improvement.

Baltimore—Topographical Survey Commission.

San Francisco—Board of Supervisors.

Q. 4. On what grounds is width of streets determined?

St. Louis—Traffic requirements and continuity of alignment and width.

Boston—On growth of district and probable extent of use.

Q. 5. Are real estate operators permitted to develop tracts of land without sanction of City authority?

New York—Yes.

Philadelphia—Real estate operators must conform to lines and grades of streets as confirmed by Board of Surveyors.

St. Louis—Law prepared to have all plots of subdivisions approved by Board of Public Improvements. Real estate operators have found they can plot a subdivision of property laying out private streets and have plots recorded. This conflicts with the City plan.

Boston—No.

Baltimore—Owners may develop very much according to their ideas; but City cannot accept streets unless they conform

to general plan, so that non-conforming streets remain private.

Cincinnati—Yes, but streets must be accepted by Ordinance of Council.

Milwaukee—No.

Q. 6. *If not, what authority determines the development?*

Boston—Board of Street Commissioners.

San Francisco—Must, according to City Charter, submit plans to Board of Public Works and Board of Supervisors for approval.

Milwaukee—Act requiring all plots to be approved by City Council and to conform to existing streets as to width and direction.

Q. 7. *Have you experienced interference with proper junction of streets, etc., due to haphazard development by real estate operators?*

New York—Yes.

Philadelphia—Since consolidation, in 1854, we have endeavored to avoid conflicts.

St. Louis—Yes.

Boston—No.

Baltimore—Yes; often proved costly to rectify. City working on plan not only to prohibit city from accepting deeds to non-conforming streets, but also from laying water mains, sewers, providing lighting facilities or any public improvements.

San Francisco—Very little.

Cincinnati—Yes.

Milwaukee—Yes, in the early layouts.

Q. 7.a. *How have you met this difficulty?*

New York—It has often been necessary to seriously distort streets.

Philadelphia—By obtaining authority from Council for revision of a particular section or for widening or straightening an individual street.

St. Louis—By condemning triangular strips of ground to afford satisfactory street connections.

San Francisco—Traffic offsets around rectangular courses.

Cincinnati—Many met, but not overcome.

Q. 8. *What authority determines grades and composition of streets?*

New York—Treated in same way and considered part of street plan. Charter of original improvement determined by Local Board, subject to approval of Board of Estimate and Apportionment. Subsequent surface improvements within control of Borough President.

Philadelphia—Board of Surveyors determines grades. Paving is determined by Councils at recommendation of Bureau of Highways.

St. Louis—Board of Public Improvements.

Boston—Grades, Street Commission; composition, Superintendent of Streets.

Baltimore—Topographical Survey Commission determines general preliminary grades plan and City Surveyor makes actual establishment of grades.

San Francisco—Board of Supervisors.

Q. 9. *Are operators allowed to construct buildings before sewer connections are made?*

New York—Yes.

Philadelphia—Yes.

St. Louis—Yes.

Boston—Yes.

Baltimore—Yes.

San Francisco—Generally.

Cincinnati—Yes.

Q. 10. *What provision does the City make and by what authority provide main lines in anticipation of development of new districts?*

San Francisco—None in particular.

Q. 11. *What authority determines lines of transit?*

New York—Board of Estimate and Apportionment and Public Service Commission.

Philadelphia—Corporations operating the lines, with permission of Council.

St. Louis—Municipal Assembly.

Boston—Board of Street Commission and Mayor. Railroad Commission may be appealed to.

Baltimore—Board of Estimates and City Council.

San Francisco—Board of Supervisors.

Cincinnati—Council.

Q. 12. *What authority determines volume, height and proportion of lot area to be occupied by buildings other than tenements?*

New York—The Building Department.

Philadelphia—Bureau of Building Inspection.

St. Louis—Municipal Assembly.

Boston—Building Law and Building Commissioner.

Baltimore—Building Code adopted by ordinance and under supervision of Building Inspectors.

San Francisco—Board of Supervisors, by ordinance.

Cincinnati—Commissioner of Buildings.

Q. 13. *What authority determines number of stories and proportion of lot area for tenements and other dwellings?*

New York—Such control as is exercised is vested in the Tenement House Department.

St. Louis—Municipal Assembly.

Boston—Building Law, Building Commissioner.

Baltimore—Building Code.

San Francisco—Tenements, State Law; others, local ordinance.

Q. 14. *What authority determines location of parks, playgrounds, etc.?*

New York—Board of Estimate. Treatment for parks, playgrounds, open spaces, following procedure in case of plans for new street systems. Site for public buildings usually first recommended to Board by head of department interested.

Philadelphia—Councils generally, at recommendation of City Department or civic organizations interested.

St. Louis—Municipal Assembly.

Boston—Park Commission for Parks, etc.; public buildings, Public Building Department; School Committee and School House Commission for schools.

Baltimore—Parks and playgrounds, under Board of Park Commission; public buildings under no definite authority, except various boards controlling special buildings.

San Francisco—Park Commissioner and Board of Supervisors.

Cincinnati—Park Commissioners.

Q. 15. *Has any authority jurisdiction over location of factories?*

New York—No.

Philadelphia—No.

St. Louis—No.

Boston—No.

Baltimore—No, only where they may be a nuisance, when Building Inspector may refuse permit.

San Francisco—Board of Supervisors.

Cincinnati—No.

Q. 16. *What authority determines nature of the waterfront development?*

New York—Other than when controlled by Dock Department or governed by street layout, left entirely to particular interest affected.

Philadelphia—Most of waterfront owned by private interests; developed under restrictions and regulations established by Secretary of War and Department of Wharves, Docks and Ferries.

St. Louis—Board of Public Improvements.

Boston—None.

Baltimore—Harbor Board and Building Inspectors.

San Francisco—Political code of the State of California and general laws.

Cincinnati—United States Government.

Q. 17. *Any special method of determining development of adjacent area?*

New York—No. Character of development usually assumed in preparing plan, but it is often necessary to modify treatment.

Philadelphia—No authority beyond city limits.

St. Louis—No.

Boston—In outlying suburban wards (Ward 24) surveys made and plans for streets filed in office of Street Commissioner.

Baltimore—Not yet.

San Francisco—No.

Cincinnati—No.

Q. 18. *Of newly incorporated areas?*

San Francisco—No.

Cincinnati—No.

Q. 19. *Has the City the right of excess condemnation?*

New York—City is authorized to acquire such lands "as will promote public utility, comfort, health and adornment." Questionable whether this power is sufficiently broad to justify excess condemnation, as commonly understood.

St. Louis—No.

Boston—No.

Baltimore—Yes, in burnt district and entire city. Not yet in operation, though preliminary steps have been taken.

San Francisco—No.

Cincinnati—Yes.

Q. 20. *Does City acquire land for public purposes in advance?*

St. Louis—Park areas were acquired when farming lands. If developed into building lots would net substantial profit.

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A. PRESCOTT FOLWELL, Editor
F. E. PUFFER, Assistant Editor

Business Department

S. W. HUME, President

J. T. MORRIS, Manager. A. PRESCOTT FOLWELL, Secretary

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Control of Street Planning

One of the serious difficulties in the way of effective planning by cities is the general lack of control which American municipalities have over the subdivision of private lands. There is, it is true, a provision of some kind in most city ordinances that the streets so laid out must conform to a city plan, or the street plans be accepted by the city engineer or a council committee before construction, in default of which such streets will not be accepted as public streets by the city. But there is nothing which prevents a property owner from laying out the streets and selling lots upon them, the municipal authorities having no control until the streets are offered for acceptance as public highways; and then it is generally too late to make any change without hardship to innocent purchasers of lots facing thereon. But what is required in most of our cities is some plan by

which owners can be controlled in the development of the property and be prevented from selling lots until the proper city authorities have examined and approved of the general plan of subdividing the property, in order that it may conform to a general city plan and become a part of a consistent and carefully thought out whole.

Low Bids for Municipal Work

In a recent report of the city engineer of Toronto, Canada, appears the statement: "Excellent results have been secured in the bids received for work under contract, on account of extensive advertising, which has resulted in wide competition and a large saving to the city." A recent letter to this journal from the Chamber of Commerce of Boston says: "The new Boston charter precludes the Commissioner of Public Works from advertising, officially, for bids in any papers except those published in Boston. It is desirable that this matter should be given wide publicity, that the city may not be compelled to accept a non-competitive bid." (The matter referred to is described below.)

We quote these two statements in order to call attention to the fact that the publicity which cities are demanding that public service corporations give to their affairs is equally necessary for municipal business if the interests of the taxpayers are to be served. Not only the lowest price but frequently the best construction is obtained by insuring that information concerning a proposed contract reach every contractor prepared to perform such work.

There is probably no method used by grafting politicians for diverting public funds to their own pockets and those of their henchmen which is responsible for greater losses to the taxpayers than the awarding of contracts to favorites; and the limiting of competition by some means is essential to carrying out this scheme. Many cities are required to advertise all public work whose cost exceeds a stated minimum in papers outside of the city, generally those which are taken by contractors; and even when not required, this is done by most city officials who are really anxious to economize in municipal expenditures. In view of these facts, the restriction of advertising contained in the Boston charter seems suggestive of the influence, exerted for selfish purposes, of those who expect to profit by municipal contracts awarded with little if any real competition.

The information quoted above concerning the Boston charter constituted part of a letter requesting us to make public the fact that Boston invites bids for disposing of its garbage and other city wastes. The contract will be for a term of ten years from January 1, 1910. Bids will be publicly opened April 24, at noon. Information can be had from Commissioner of Public Works Louis K. Rourke.

We are glad to give this publicity for the benefit which we hope it will render to the taxpayers; and because we do not believe that many if any of the present municipal officials are in sympathy with the suppression of competition apparently aimed at by the clause of the charter above referred to. It seems to us, however, that there should be an effort made by the Chamber of Commerce and other citizens to have this clause repealed.

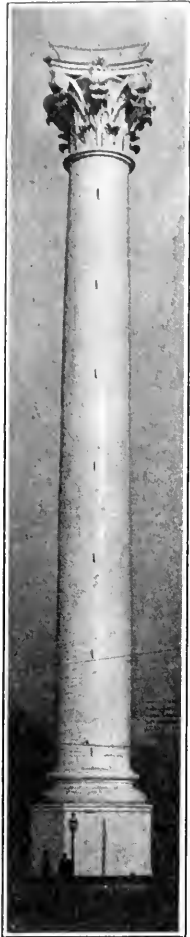
Sedimentation Tank Experiments

Preparatory to designing one of the recent sewage disposal plants of Toronto, investigations were made to determine what angle it is necessary to give the bottom of a sedimentation tank when such bottom is made sloping to concentrate the sludge, or to discharge it into a sludge tank below as in the Emscher tank. Experiments were made with a wooden tank 12 ft. 5 in. square at the top, having vertical sides for a depth of 4 feet, below which was a sloping bottom in the form of an inverted rectangular pyramid. The slope of each of the four sections of the bottom was made 30 degrees to ascertain whether the sludge would slip on that slope or not. This tank was put into service as a sewage precipitation tank, and

while so used it was found that the slopes referred to were insufficient, as the liquid had to be lowered until it reached the sludge before the latter began to slip down the inclines, and only that portion of the sludge slipped down which was above the surface of the liquid. As a result of these experiments it was decided to make the slope of the pyramidal bottom of the permanent tanks 45 degrees rather than 30 degrees.

ST. LOUIS WATER TOWER ABANDONED

THE Water Department of St. Louis has recently abandoned one of four water towers which have been in service for some time, this one having been used for 40 years as an aid in maintaining the city water pressure. The tower in question is located at Twentieth and Grand streets. It was built in 1871 by Jos. P. Kirkwood as chief engineer of the Water Department. The structure consists of an iron standpipe enclosed in a masonry tower. At first it was planned to hold the pipe in place by means of guys, but it was finally decided to enclose it in masonry which would add to the appearance as well as to the safety of the pipe.



OLD WATER TOWER
ST. LOUIS

tower has now been connected direct to the distribution system. There are three other towers still in service, but at least one of these may be abandoned in a year or so.

This tower is on one of the highest points in the city and is one of the tallest Corinthian columns in the world. It has furnished quite an attraction for tourists and will be retained as a landmark and observation tower although no longer used for its original purpose.

WASHING GRIT CHAMBER SAND

THE city of New Bedford, Mass., is preparing to construct an intercepting sewer with an outfall into Buzzards Bay. Owing to the low velocities obtainable it will be necessary to remove any sand which may enter the sewers during storm periods before it reaches the outfall in order to avoid deposits in this or in the channel near the outlet. It is generally found to be impracticable to prevent the settling out, with the sand in a grit chamber, of a considerable amount of organic matter, sufficient to create a nuisance should the sand be used for filling in near a residential district such as is found at the location of the proposed grit chamber.

The city engineer of New Bedford, Wm. F. Williams, proposes to adopt what is believed to be a somewhat new idea in meeting this condition. In reply to an inquiry from us he states that the alternatives for disposing of the sand which will collect in their proposed grit chamber are either to use it for filling near residences, to tow it to sea, or cart it to some distant point. It occurred to him that the greater part of the organic matter could be removed by passing the material through a sand washer in the same way that the sand taken from the filter bed of a water filtration system is treated.

His present purpose is to make use of an apparatus, probably the Nichols, such as is used in washing sand at the Torresdale (Philadelphia) filtration plant, Mr. Williams stating that he is satisfied that it is entirely practical to wash the material deposited in a grit chamber, passing back into the sewer the organic matter washed out, and use the sand for filling near the station without danger of its creating a nuisance.

Mr. Williams also proposes to transport the sand from the grit chambers to the washers with a sand ejector, as is done in water filter plants. He hopes that this operation can be carried on while the sewage is passing through the chamber, as this will mean a great saving in cost of pumping and should secure a better separation of the sand and organic matter. The sewage will pass through screens before entering the grit chambers, to remove paper, rags, sticks, etc.

PREFERENTIAL SYSTEM OF VOTING

THE letter printed herewith is self-explanatory. In the copy of the charter which accompanied it are found the details of the method of nominating, which are as follows: A petition of nomination must consist of not less than 25 individual certificates submitted by qualified electors, each of which certifies that he believes the person named "is especially qualified to fill the said office and is of a good moral character. I further certify that I join in this petition for the nomination of the above-named person, believing that he has not become a candidate as the nominee or representative of, or because of any promised support from, any political party or any committee or convention representing or acting for any political party." This certificate is signed under oath before a notary public. Not earlier than thirty days nor later than twenty days before the election, twenty-five or more of these certificates must be presented to the city clerk, who must then file the same if the petitions are found to be according to requirements. On the tenth day before election the clerk certifies a list of candidates nominated for the several offices and prepares ballots which contains the full list of names nominated for each office, with three columns opposite each name for indicating first, second and third choice for each office.

GRAND JUNCTION, COLO., Mar. 27, 1911.

The Municipal Journal & Engineer, New York, N. Y.,
To The Editor:

I notice mention in your issue of the 22d in regard to the manner of carrying on the election for city officers in the city of Spokane, Wash. Your article might have mentioned the fact that this plan was patterned after the system in vogue in our city. This is the so-called "Preferential System," and I think that ours was the first city in this country to adopt it.

Spokane changed from our plan to some extent, we presume to better suit their local condition. By our plan, nominations are made exactly as in Spokane except that the nominating petition specifies the office for which the candidate is placed in nomination. In our last election we had six candidates for Mayor, five for Highway Commissioner, three for Commissioner of Health and Civic Beauty, two for Commissioner of Finance and Supplies, and one for Commissioner of Water and Sewers.

This city being the first city to adopt this system, I think it only right that we should have due credit for being the pioneers in this simple and, I think, unequalled manner of getting the full expression of the voter in a municipal election.

Under separate cover I am sending you a copy of our Charter, which will explain fully this original American "Preferential System" of voting.

Very truly yours,
H. F. VORBECK,
Com. of Finance and Supplies.

NEWS OF THE MUNICIPALITIES

Current Subjects of General Interest, Under Consideration by City Councils and Department Heads—Streets, Water Works, Lighting and Sanitary Matters—Fire and Police Items—Government and Finance

ROADS AND PAVEMENTS

Paving in Allegheny County, Pennsylvania

Pittsburg, Pa.—The illustration shows the Greensburg Pike, near the county line of Allegheny County. The road is paved with brick for a distance of four miles. Eighteen miles of other roads in the county are similarly paved, most of them having been constructed in 1910. Chief Road



Courtesy Pittsburg Gazette-Times.

TYPE OF COUNTY ROAD, ALLEGHENY COUNTY, PA.

Engineer S. D. Foster receives delegations of farmers who congratulate him on the good qualities of the roads and inquire when more will be forthcoming. The brick paving costs about \$1.45 per square yard. The roads as a rule are paved 15 feet in width; there is 11 feet of graded dirt surface, and gutters complete the 30-foot width of the road.

Permanent Dustless Pavements Desired by Mayor

Newark, N. J.—In order to bring the question of permanent dustless pavements before the public and secure an opinion from property holders along whose frontage it is proposed to lay such pavements, Mayor Hinck has sent an open letter on the subject to the residents of South Mountain avenue. The residents of that street will discuss the matter, and should they be willing to have the added assessments, a request for the new improvement will be made by them to the Town Council.

Sidewalk Improvements in Tallahassee

Tallahassee, Fla.—Within the past few months more than eight miles of new sidewalks have been laid in Tallahassee. Approximately some \$35,000 have been expended in the laying of the new cement walks. And the good work still continues. There are several miles more to be laid. Tallahassee will now have among the best city streets in the State. What is most needed is sufficient appropriations by the State to keep the Capitol grounds in a good condition. What ought to be the beauty spot of the city is almost an eyesore.

Militant Women Fight Police in Paving War

Chicago, Ill.—In a hand-to-hand battle with police and laborers a score of militant women, after several of their number had been hurt, prevented the laying of pavement in the streets of West Hammond, just outside of the city, on Saturday of last week. The women had been guarding the streets, declaring that the brick being laid in the pavement was "graft bought" and not up to specifications. The contractors were obliged to call on the police and with several especially sworn deputies endeavored to dislodge the women who had camped in the street. When the women refused to leave the police tried to drive them off with clubs and a hand-to-hand conflict followed. After 15 minutes of fighting, however, the police gave it up and returned to police headquarters, where warrants were sworn out for 15 of the women.

Want School Board to Pay for Paving

York, Pa.—City officials are endeavoring to have the city school district pay for street paving in front of its properties. School buildings, like churches, are exempt from taxation and the municipality is required to pay for all highway improvements in front of non-assessable realty. It is optional with the school directors to assume the expense. Although not required by law to pay for the placing of curbing and pavements in front of the school properties, it is stated, the school board has always assumed the expense for their construction. Councilmen who appear to have been against securing additional general revenue for the city by retaining the tax rate at 8½ mills, because of the political effect, are now desirous of having the school board pay for the paving in front of the school properties. They contend that the city's funds are low and the school district could better afford to do so than the municipality.

Building Boulevard to Park

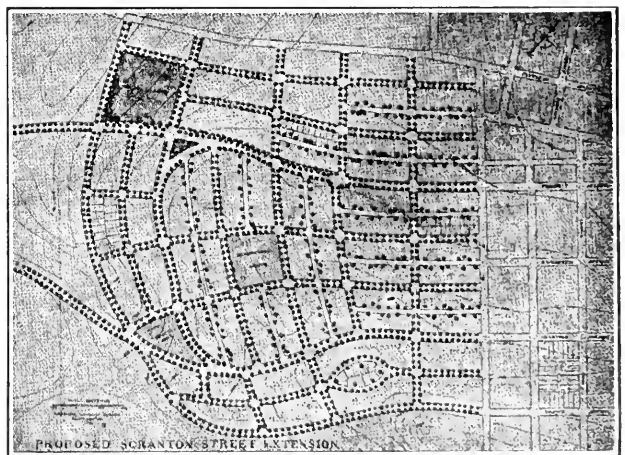
Olympia, Wash.—The city has commenced work on the boulevard leading from the city to Priest Point Park, pronounced by many to be the finest natural park on Puget Sound. It is expected that a street 30 feet wide will be completed by July 1, and it will be necessary to make one fill with the dredger now working along the waterfront.

Ordinance Protects Pavements

Louisville, Ky.—The ordinance making it unlawful to rip up a pavement by a public utility corporation before it has been down five years passed the Board of Aldermen and was signed by Mayor Head.

Proposed Street Extension Plan

Scranton, Pa.—The illustration shows a plan prepared for a proposed street extension project. The features of the



PROPOSED SCRANTON STREET EXTENSION

plans, which were prepared by John Nolen, are wide, shady streets, public parks and breathing spots. The curved streets in one section of the plan suggest one of the favorite ways of laying out residential streets in Germany.

Oyster Shells to Coat Streets of Centerville

Centerville, Md.—The Town Commissioners of this place have purchased 75,000 bushels of oyster shells, with which every street in this town will be heavily coated, after the sewer trenches have been leveled and graded. Shells make good, hard surface roads, and when covered with oil conquer the dust problem of county towns during the summer.

Ownership of Roller Pays City

Leavenworth, Kan.—Last Spring the city purchased a steam roller for use in grading and improving streets. Incidentally the machine has been the source of some revenue as it has been leased to contractors at \$10 per day

SEWERAGE AND SANITATION

Sanitary Fountains to Replace Drinking Cups

Albany, N. Y.—The Board of Education last week took the first step toward abolishing the germ-infested public drinking cup in the schools of Albany. Superintendent of School Buildings Herbert E. Bugden was instructed by the Board to install the best design of a hygienic drinking fountain in school No. 24 as an experiment.

Mount Pleasant, Utah.—The Council of this place is arranging to have three sanitary drinking fountains installed in the town for use during the summer.

New York, N. Y.—The Department of Health has issued a statement regarding the new section of the sanitary code adopted March 21, in connection with common drinking cups. The section, which takes effect October 1, says: "The use of a common drinking cup or receptacle for drinking water in any public place or in any public institution, hotel, theater, factory, public hall or public school, or in any railroad station or ferry house in the city of New York, or the furnishing of such common drinking cup or receptacle for use in any such place is hereby prohibited. As regards a substitute for the common drinking cup Commissioner Lederle says he is not recommending any device, but that either individual cups or some type of fountain in which the lips do not come in contact with the fountain itself is necessary.

Trees a Menace to Sewer System

South Bend, Ind.—Carolina poplar trees will in time ruin South Bend's sewer system, the Board of Public Works feel, and the City Board will ask the Common Council to adopt an ordinance whereby the trees may be exterminated. Action against the trees was taken in a resolution adopted by the Board last week. The Council is asked to adopt the proper ordinance at once. Members of the Board claimed the roots of the poplar trees are fast clogging drains in all parts of the city.

Progress on Baltimore's Sewage Disposal Plant

Baltimore, Md.—The present state of progress and a good idea of the completed sewage disposal plant is shown in the accompanying illustration. In the foreground are the hydrolytic tanks. In the distance, to the right, are the sprinkling filter beds. From the inlet to the tanks to the outlet on the opposite side the distance is 440 feet. The filter beds are 12 acres in area. There will be 200 sprinklers to each acre. The plant was designed and is in course of construction under the direction of Calvin W. Hendricks, Chief Engineer, Baltimore Sewerage Commission. A description of the plans of this plant was given in the MUNICIPAL JOURNAL AND ENGINEER November 24, 1909.

New Sewerage System Completed

Clearwater, Fla.—Clearwater's new sewerage system has been completed, turned over to the city and accepted. The system has been installed under expert supervision and is particularly up to date.

Will Start Work on Harbor Brook Sewer

Syracuse, N. Y.—John Young, of the Young Construction Company, plans to start work on the north section of the Harbor Brook intercepting sewer and brook improvement early next week. Concrete pipe for the sewer has been ordered and he expects that the first shipments will arrive as soon as excavation has sufficiently progressed to lay the sewer. The machinery that is to be used on the job has been secured. The sewer will be constructed before the creek improvement is undertaken. This will permit the diversion of the water from the stream to the sewer, leaving the bed dry. The brook will be deepened and the bottom lined with concrete blocks in practically the same manner as the Onondaga Creek improvement is to be carried out.

Protest Against Sewerage Measure

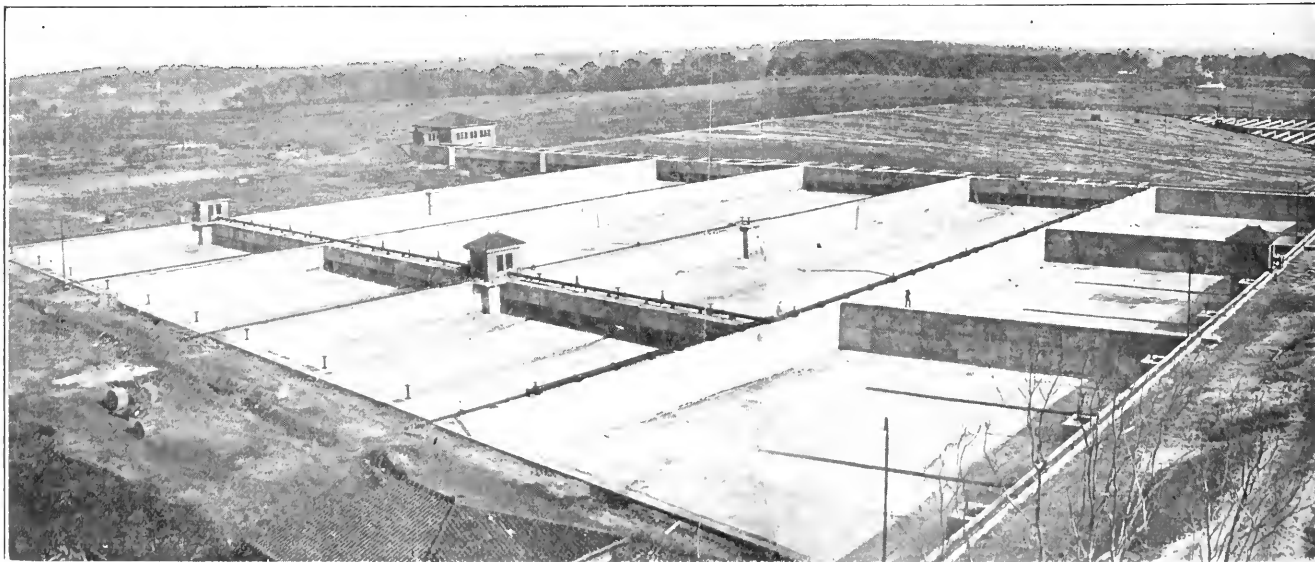
Oklahoma City, Okla.—A strong delegation of citizens of Oklahoma City, headed by Charles F. Colcord, called on the Governor and voiced vigorous protest against the sewage bill passed by the Third Legislature. The bill in question originated with Dr. J. C. Mahr, State Health Officer, and Kate Barnard, State Commissioner of Charities and Corrections. The delegation contended that the signing of the bill will cost Oklahoma County alone \$2,000,000 to \$3,000,000. The measure prohibits the dumping of sewage into streams from which drinking water of other towns and cities is drawn.

Will Oil the Waters

Marysville, Cal.—Mayor Hall has announced that the city's oil wagon will make the rounds of the city one day next week and will oil the manholes and catch basins of the sewer systems, and cover all pools of water with oil. This will be for the purpose of preventing the breeding of mosquitoes.

Chemist for St. Paul

St. Paul, Minn.—The Senate has passed Representative Perry's bill authorizing the Mayor of St. Paul to appoint a city chemist. The city chemist is to have power to inspect all gas, gas plants, gas meters, electric light plants, electric meters, electric light for public use, heat and water meters. He is also to analyze, when requested, any cement, stone, wood or other material to be used in public buildings, street paving or other public works. The city chemist is to have a salary of \$1,800, one assistant at \$1,200 and four assistants at \$1,000 each.



Courtesy Baltimore News

VIEW OF BALTIMORE SEWAGE DISPOSAL PLANT. RECENT PHOTOGRAPH BY SEWERAGE COMMISSION

WATER SUPPLY

Improvements to Water System Planned

Lewiston, Mont.—It is reported that \$100,000 will be spent here this season in improvements to the water system.

Pipe Line Completed

Denison, Tex.—The pipe line to the Shawnee Creek reservoir, the city's new reservoir, has been completed and will carry water from the reservoir to Denison, a distance of four miles. The pipe line is 14 inches in diameter and follows almost a straight line. Under the supervision of Superintendent Berry of the Water Works Department of the city 50 men have been employed for 60 days in the construction work. The line is two feet underground for the greater part of the distance, but in several places it crosses ravines on concrete piers. The cost of constructing the line is close to \$35,000. In addition to this amount some \$25,000 additional will be spent in the construction of a pump house and the installation of a big pump and engine. It is estimated that the new plant will be in operation by May 15.

Laying New Water Mains

Sherman, Tex.—Superintendent Harvey McDuffie of the Water and Light Department has just completed putting down 2,800 feet of water main in the Kerr Addition, North Sherman. The crew will be moved immediately to the Colledge Park and Frisco additions, east of Sherman, where a large amount of pipe will be put down.

Water Supply for Moorhead

Moorhead, Minn.—After working for nearly five months in an effort to find a suitable water supply for the city, A. J. Hanson has struck water at a level of 189 feet. Although this is as far as he is now directed by the City Council to go, Hanson states that he does not believe that he has as yet arrived at the right level of water, but that a few feet more would yield an abundant supply. The drill has struck a vein of gravel and Hanson is of the opinion that it is beyond this vein of gravel that pure water in abundant supply is to be found. The present well will be 10 inches inside diameter, and is but the first of a series of wells which the city intends drilling if an adequate amount of water can be found. It is the plan to do away with the present water supply from the river and to substitute one of pure artesian water.

City Will Protect Its Interest in Reservoir Site.

Oakland, Cal.—In order that Oakland's interests in the Hetch-Hetchy valley project may be protected, the finance committee of the City Council has recommended the passage of an ordinance providing for the services of two engineers to assist the Board of Engineers of the city and county of San Francisco in the preparation of the report of the department of the interior at Washington to be used at the hearing of the order to show cause now pending in that department for the revocation of the permit heretofore granted by that department for the use of the Hetch-Hetchy valley as a reservoir site. J. H. Dockweiler of Oakland and J. D. Galloway of Berkeley are named as the engineers in question, and a sum not exceeding \$4,000 will be paid them for their services by the cities of Oakland and Berkeley, the specific amounts to be based on a pro rata of the population of the cities. Mr. Dockweiler is to prepare data upon existing and further needs of water supply for the cities of Oakland, Alameda and Berkeley, and upon the possibilities of existing local sources of supply for these cities, and Mr. Galloway is to prepare data upon possibilities of reinforcing such local supplies from the Sierra Mountains and other outside sources.

Fights Water Bonds

Helena, Mont.—The third action to prevent the city of Helena from selling its water bonds was instituted in the Federal Court here last week by Senator Muffly, who is mine operator for the Broadwater Company. Muffly asserts that if the city diverts the water he will have to close his properties. He is the owner of rights subsequent to those of the city. At a recent election bonds were authorized for the purpose of installing a municipal plant.

Progress on Jacksonville Reservoir

Jacksonville, Fla.—The accompanying view shows the state of progress on the new reservoir, which is being built



JACKSONVILLE COVERED RESERVOIR UNDER CONSTRUCTION

by the Logan Concrete and Engineering Company, contractors. When completed it will hold 3,375,000 gallons of water. The area of floor and roof also, for it is of the covered type, is 70,000 square feet. The excavating, amounting to 9,000 cubic yards, was done with a drag scraper.

May Change Charter in Order to Make Water Rate

Tonawanda, N. Y.—In order to secure a large fiber plant in Tonawanda, the Common Council recently adopted a resolution whereby the city charter will be amended so that the Water Board, with the concurring action of the Common Council, may enter into a contract with any industrial concern to furnish 500 gallons or more of water per day at a rate to be agreed upon by the two city boards. Under the present charter Tonawanda cannot legally enter into a contract for a term of years to furnish water to manufacturing plants, and now that the Spalding Brothers Manufacturing Company, of Rochester, N. H., desires to locate here and get a contract for its water supply, the city is held up until the amendment is passed. Tonawanda has a surplus of water and is in position to furnish all the water that the fiber works might use. The city can grant the company its supply for one year, but no longer, at an established rate; but if the new provision of the charter is adopted the city will be in position to contract with the Spalding concern for a term of years.

Municipal Water Plant a Failure.

Gloucester City, N. J.—The operating expenses of the local water works is occupying much of the time of City Council at present. During the last few years it has clearly been proven that municipal ownership is a complete failure, according to the views taken by several members of Council, some of whom express themselves as being in favor of selling the plant with the provision that water be furnished free to the city for its fire hydrants and other public purposes. This, it is said, would furnish sufficient money to clear off half of the present public debt. Councilmen O'Hara, Barnard and Mayhugh opposed the plan to sell the plant, declaring that rates to the public would be advanced beyond all reason and that with proper management the present deficit could be converted into a balance in favor of the city. The Councilmen also declare that the expenses for repairs were ever increasing because of neglect upon the part of those in charge of the plant. It is said that with the revenue derived from the pumping station at the present time the plant should be operated successfully. The conditions will in all probability lead to an investigation. It is said many thousands of dollars of unpaid water rents are upon the city records. The Water Works Committee of City Council has been instructed to require a more stringent enforcement of the rules under which the plant is operated in the future in order to bring about better conditions.

Water Rates Will Pay for Water Plant

Franklin, Pa.—That the cost of the purchase of the water works by the city of Franklin will be defrayed from the revenues derived from water rates, as understood by the people of Franklin when the plant was purchased, was made manifest at the meeting of the Common Council when the plan recommended by the Board of Water Commissioners, being practically identical with the one now in operation, was adopted by a vote of 5 to 1. The Water Board had presented an alternative plan to be used if Councils decided that the water plant would have to be paid for by direct taxation of real estate. The manner of paying for the water plant hinged on this question, which had been discussed by the people of the city for several months. City Solicitor Thomas McGough had prepared an opinion, which, while it has not been made public, is understood to have favored the original plan of having the water works pay for itself from revenues derived from the sale of water. In consequence of this opinion Common Council took the course it did.

Freewater Gets New Water Works System

Freewater, Ore.—Work is completed by Contractor Siegel Eaton of digging the city well for the new water works system. The well is 45 feet deep and 8 feet in diameter. A feature is that no surface water can flow into it as it is cemented down a depth of 15 feet. It also has a natural filter. The city is bonded for \$16,000 and the system is to be installed by May 1. The system consists of about 15,000 feet of 8, 6 and 4-inch pipe, 16 fire hydrants, the necessary gate valves and reservoir on the hill 60 x 30 and 10 feet deep, holding approximately 140,000 gallons of water. The reservoir will be 140 feet high and the triplex power pump, operated by electricity, will have a capacity of 200 gallons per minute.

Municipal Water Works Pays

El Paso, Tex.—El Paso is making money on its water works. It is now costing the city 1½ cents less to pump water for the city and other water users than it cost the International Water Company for the same purpose, and as a result the net profit on the operation of the water plant during the month of February amounted to \$3,500.38, according to a report submitted to the City Council by Superintendent Will E. Race at the regular session.

State Engineer Inspects Water Supply at Request of City

Defiance, O.—L. H. VanBuskirk, Engineer of the State Board of Health, is in the city making an inspection of the city water supply and of the sewerage. He comes at the request of the local Board of Health, which passed a resolution on February 1 requesting the State Board of Health to send a representative here for the purpose of inspecting the impure water supplied Defiance people.

Filtration Plant a Success

Bangor, Me.—The new filtration plant at the pumping station is now complete, and Prof. J. M. Caird, of Troy, N. Y., the city's consulting chemist, who has been making a series of tests at the plants relative to the new plant, reported to the Water Board that the filters fulfilled in every particular the guarantees under the contract, and recommended its acceptance.

Take Steps to Fireproof Pumping Station

Duluth, Minn.—Mayor Cullum, City Engineer McGilvray, President Shartel of the Council and representatives of the Board of Water and Light Commissioners visited the pumping station at Lakewood to inspect it with a view of determining what steps should be taken toward making it fireproof. The pumping station has been menaced by fire several times in past summers, and it is desired by the officials of the Water and Light Department to avert all danger of the plant being destroyed by fire in the future. Last summer the plant was endangered by brush and forest fires in the vicinity, and strenuous work was required to fight off the flames, which threatened it several times. Should the pump house ever take fire it is almost certain that the machinery would be so seriously injured that it would necessitate shutting off the water supply of the entire city.

STREET LIGHTING AND POWER

Struck Gas Near Beloit

Beloit, Kan.—For some days W. H. Drinkern, at the direction of a company of Beloit business men, has been boring down into the depths of the earth on the Bert Fun farm in Round Springs township. At a depth of 150 feet the drill struck a flow of gas, which blows through the water with a roar and refuses to remain underground where the mouth of the well is covered by ordinary means. Experiments were tried and all point to the fact that there is a plentiful supply of gas on hand.

Electric Light Rates Are Cut

Santa Ana, Cal.—The City Trustees have passed an ordinance fixing the electricity rate at 8 cents. This was done over the protest of R. H. Ballard, of Los Angeles, vice president and general manager of the Southern California Edison Company. Mr. Ballard declared that the reduction from the 10-cent rate would mean a loss of \$12,000 income per year for his company, which would mean that the company would operate at a loss and would receive nothing for its investment. At the present rate he says the company gets but 2.47 per cent. An official of the company stated that the company would institute suit to compel the city to give it a rate that will give the company a fair rate. The gas rate was left unchanged at \$1 per 1,000 cubic feet.

Municipal Light Plant a Success

Norwood, Mass.—Gratified citizens are discussing the showing made in the report of the Light Board on the municipal plant. A substantial reduction in the price of electricity for lighting purposes will take effect on April 1. This latter fact has attracted attention, but aside from that the report for the year ending January 31, 1911, shows that municipal ownership and management of the electric lighting, which has been in active operation for nearly four years is a success.

Gas Company Wins Against City

Independence, Kan.—The Kansas Natural Gas Company has won its fight against the city officials and citizens of Independence. In a decision announced by Federal Judge Pollock the court held, in effect, that the gas company has a right to raise the price of gas in Independence to 20 cents a thousand feet. The present rate is 5 cents a thousand feet. The fight against the higher rate began when the city enjoined the gas company from enforcing it. This suit was brought in the County Court here. After an unfavorable decision, the gas company took the case to the Federal Court.

City Lighting Plant Shows Good Profit

Niagara Falls, Ont.—Chairman W. H. Homan of the Electric Light Committee of the City Council says that the city will turn over \$10,000 net profit from the municipal electric light plant to the general fund for the year. This will materially reduce the tax rate. The customers taking electric current from the city for lighting purposes are charged 10 cents a kilowatt hour for the current, which is considerably below the price charged to other cities of Ontario and New York State. In addition there is a 10 per cent deduction if bills are paid before the 20th of the month. Furthermore there is placed at the front door of every house in which city current is used an incandescent lamp, for which no charge is made.

St. Thomas Has Hydro-Electric Power

St. Thomas, Ont.—Hydro-electric power generated at the Falls of Niagara was formally turned on in St. Thomas last week, adding another to the list of cities in this section of Canada that are now securing the cheapest power for lighting and other purposes. The event was made the occasion for a municipal celebration at which Hon. Adam Beck, originator of the hydro-electric power legislation, was the guest of honor.

Ornamentation Governs in Choice of Street Lamps

Ft. Wayne, Ind.—In arranging for the ornamental illumination of Calhoun, Berry, Main and Court streets, tungsten lamps have been chosen as being preferable to arc lights where ornamentation is to be considered above illumination.

FIRE AND POLICE

Police Signal System Given Demonstration

Carbondale, Pa.—A demonstration of a new police call system being manufactured by the Dean Electric Company, Elyria, O., was made before members of the two branches of Councils in the City Building last week. The police call box manufactured by this concern is said to contain the very latest improvements and has several features not used in the Gamewell and other police systems. Among the new features in this system which made a strong appeal to the Councilmen was an electric flashlight on the inside of the police box, which can be flashed to any beat in the city, calling the patrolman to report to headquarters by telephone. The system also includes the telephone, ambulance and patrol call, hourly reports, etc. According to the representatives, this system could be installed in this city for a small sum, probably not exceeding \$1,000 or \$2,000, and would include the necessary wiring, installation and all details connected with the system.

Auto Police Patrol Boat in Service

Fort Wayne, Ind.—Members of the Board of Safety, Mayor Grice, Police Chief Abbott and a party of newspaper men supervised the launching of the new auto patrol at Auburn and convoyed the machine to this city, where it is placed in service. The new machine was ordered from the Auburn company several months ago, after some spirited bidding for the job. It cost the city \$2,500. Arrangements are being made now to tear out the horse stalls in the police barn and make room for the police boat, which will be mounted on a pair of wheels with a tongue so that it can be hooked onto the back of the wagon and hurry-up runs made on drowning cases.

Car Demolishes Fire Engine

Cincinnati, O.—While making a run in response to an alarm from Box 528 the engine of Company 8 was struck by a northbound Sixth street car at Wade and Baymiller streets. Two of the firemen were injured and the fire engine demolished.

Fire Pump Has Been Accepted by City

Yonkers, N. Y.—Commissioner of Public Safety James J. Reming states that the new Webb automobile fire pump has been officially accepted. The company that built the machine gave the city a certain period of time—30 days—in which to try out the pump, and as it has passed all tests the automobile is now regularly being operated. The pump was the third motor car purchased for the Fire Department.

Will Add to Fire Equipment

Mason, Mich.—Council is considering the matter of adding to the rather meager equipment of fire fighting apparatus here by the purchase of the Lansing Fire Department's chemical wagon, and the proposition was discussed considerable length at the meeting last week.

Fire District Created

Lebanon, Pa.—An ordinance has been passed by the Common Council of the city creating a fire district within which none but fireproof structures may be erected, and none but combustible materials be used in alterations and repairs.

Horse Police Patrol Soon May Be Thing of the Past

Cincinnati, O.—The horse police patrol may soon be a thing of the past in Cincinnati. The proposition of abandoning the horse wagons and substituting auto patrols is being given serious consideration by Mayor Schwab, Safety Director Small and Police Chief Jackson. It is believed that five autos could do the work of the ten wagons more expeditiously and with better results. Police Chief Jackson now is gathering data from the various cities where auto patrols are in use, relative to the cost of maintenance, and if the results of his investigation should show a reasonable proportion to the cost of maintaining the patrol wagons, all probability plans will be formed to change the character of the apparatus this year. In any event, it is practically decided to equip the outlying hill top districts with autos.

GOVERNMENT AND FINANCE

Mayor to Try Cabinet Plan

St. Paul, Minn.—Mayor Keller approves the cabinet idea inaugurated by Mayor Darius Brown of Kansas City, and will endeavor to work out a similar innovation in St. Paul, although it will be along slightly different lines. In Kansas City Mayor Brown has chosen a cabinet, consisting of a number of representative citizens not directly connected with the administration, with whom he advises on matters of public import. Mayor Keller believes the city conference committee, which is composed of the heads of the various municipal boards, should act as the Mayor's cabinet in disposing of policy matters affecting the city. The conference committee now holds monthly meetings, the principal proceedings being to file monthly reports and adjourn. The Mayor suggests the hour of meeting be changed from noon to 4 p. m., and the department and board heads devote some of the time of the meeting to consideration of important matters of policy. He believes the board heads, who are familiar with the workings of their departments, will be able to advise with the executive regarding the disposition of many important matters of policy. If the cabinet idea is carried out, and members of the conference committee apparently approve of it, it also will be arranged so the Mayor can call special meetings of the cabinet should occasion require.

City Departments Will Work Together in Future

Duluth, Minn.—Henceforth the City Engineering Department, the Board of Public Works and the Water and Light Departments will work hand in hand in all public improvements. The question of complete harmony between these three branches of the city government was settled at the regular meeting of the conference committee, consisting of the heads of the various departments and boards, held at the office of Mayor M. B. Cullum. Hereafter meetings will be called by the City Engineer, to be attended by himself and representatives of the Water and Light Department and the Board of Public Works. They will take up the various improvements which are contemplated from time to time, discussing them thoroughly with a view that no energy may be wasted. It will often happen that either two or all of the departments have work in the same streets, avenues or alleys, and that by combining their plans they will be able to make considerable savings in time as well as in money. It is expected that the city will greatly benefit in that precautions will be taken to prevent damage to the streets and to see that after any work is done on them by any one they will be left in as good shape as they were before being torn up. It was agreed, however, that each department shall find out for itself if there are any obstructions in the streets. For example, if the Water and Light Department is going to lay water or gas pipes it will find out for itself if there are already any other pipes there.

Fear City May Lose Taxes

Wilmington, Del.—Members of the city departments are agitated because of the failure of the Legislature to pass a law legalizing all the acts of the present City Council. They claim that, as the present assessment of city property was made by an illegal body, if a taxpayer should raise the issue the city would be unable to collect taxes. The Republican leaders prevented the House from passing Representative Gormley's bill on the ground that it would have made all the acts of Council legal, and they did not wish this to be done.

Higher License for Drink Stands

Bessemer, Ala.—Another live wire was sprung at the City Council meeting last week with reference to the regulation of soft drink stands. Considerable discussion was had, participated in by Mayor Lewis and almost every Alderman on the Board. The provisions of the Fuller bill were criticised as a means of raising revenue and the Mayor expressed the opinion that a better plan would be to raise the license of the soft drink stands. After much wrangling the license was raised from \$30 a year to \$200 by a vote of 5 to 3.

STREET CLEANING AND REFUSE DISPOSAL

Municipal Spring Cleaning Under Various Plans.

Norfolk, Va.—The Board of Control has declared the annual cleaning days and is now having printed many thousand circulars to be distributed in the city informing of the dates and of the fact that if any man's premises be found by the inspection following these dates in an unsanitary condition he will be prosecuted in court. In previous years three days have been the usual duration of the cleaning season, but Health Commissioner Schenck will take more time for it. Upon the Health Commissioner's recommendation the Board of Control has named nine days—three for the Ninth Ward, three for the Tenth and three for other wards of the city. The dates are as follows: Ninth Ward, April 11, 12 and 13; Tenth Ward, April 18, 19 and 20; other wards, April 25, 26 and 27.

Wenatchee, Wash.—Monday, April 3, has been named by Mayor A. C. Dallach as "clean-up day" in Wenatchee. This action was taken as the result of a report made to the City Council last week by the Wenatchee Commercial Club committee on civil improvement, the report embodying the request that the Mayor appoint such day for all yards and premises to be cleaned up as a protection against typhoid and other prevalent diseases.

Duluth, Minn.—West Duluth streets will get their annual spring cleaning this week. A. J. Meldahl, who represents West Duluth on the Board of Public Works, says that a crew of men will be assigned to the work and that Ramsey street, Central and Grand avenues will be thoroughly cleaned of the refuse which has collected during the winter months. The other streets will also be looked after.

Lansing, Mich.—A general clean-up day will be inaugurated next month, the exact date of which has not been set by the Mayor. At that time there will be a concerted movement by all property owners to remove ash heaps, rake lawns and in other ways make their premises as sightly as possible.

Clinton, Ia.—The alleys of the city must be thoroughly cleaned between the present time and the 15th of April. So says Chief of Police T. J. Hudson, in a notice to abutting property owners printed in these columns. The annual Spring cleaning of the alleys has thus been ordered, and Clinton property owners who fail to take advantage of the time given in which to clean their own alleys will be taxed with the cost of the work, which will be done under the direction of the street commissioners.

Niagara Falls, N. Y.—A step toward the transforming of Niagara Falls into a city beautiful will be taken by Mayor Philip J. Keller within a few days. He will issue a proclamation calling upon the citizens to clean their premises on a day to be fixed later. His idea is that a general cleaning up throughout the city will both give the city a better appearance and induce the citizens to show more civic pride in keeping their premises neat and clean. The date to be selected by Mayor Keller for the cleaning will be early in April.

Amendment to Provide for Garbage Gathering

Portland, Ore.—City Attorney Grant has been directed by the Health and Police Committee of the Council to prepare a charter amendment to be presented to the voters at the next municipal election providing for the installation of a municipal garbage gathering system. The bill will provide that bonds to the amount of \$75,000 shall be issued for the purchase of horses, wagons and harness and the erection of barns. Authority is given the Council to fix such charges for the collection as it deems advisable and make any other rules governing the collection of the garbage which will be found necessary in installing the proposed system.

Public Subscription Provides for Street Sprinkling

Texarkana, Tex.—Five hundred and fifty dollars has been subscribed by public-spirited citizens with which to purchase an oil and water sprinkler, and in addition to this amount the business people have pledged monthly contributions aggregating \$113.50 which will be used in paying the wages of a driver, buying oil and paying for water whenever the amount used exceeds the amount that the city will contribute.

RAPID TRANSIT

School Car Line Franchise Asked

Santa Monica, Cal.—Plans for a street car line to the site of the new high school on Prospect hill has found definite form in a recommendation of the street and bridge committee to the City Council to grant the Los Angeles Pacific franchise from Montana avenue north to San Vicente boulevard and south to the city limits. The southerly section of the proposed route will take the car line directly to the high school grounds. While making this recommendation the committee advises that the franchise of the company on Seventh street from Montana to San Vicente boulevard be forfeited. It is stated that the change will be acceptable to the Los Angeles Pacific Company and that the route along Eighth street is consistent with their purposes. It will afford the traveling public a crosstown line from the northerly to the southerly city limits.

Would Extend Car Transfers

Louisville, Ky.—An ordinance providing for a system of general street railway transfers was introduced in the lower board of the General Council at the meeting of the body last week by Thomas J. Garvey and was referred to the Committee on Railroads. Should the ordinance be enacted the Louisville Railway Company will be required to give transfers to any line for one continuous journey in the same general direction, and should another railway company be granted a franchise in Louisville passengers may transfer from the cars of one company to the cars of another going in the same general direction without paying additional fare. The measure is considered a far-reaching one and will be given careful consideration, it is said.

Trolley Extensions Planned

Petersburg, Va.—Superintendent of Railways Buchanan and Vice-President Sitterding of the Virginia Railway Power Company visited Petersburg for the purpose of inspecting the routes of the proposed extension of car line to the new ball park and of looking over the proposed site of the landing of the Matoaca bridge in Fern Park. As a result of the inspection the extension of trolley is assured.

Franchise to Extend Trolley Line Refused

Sacramento, Cal.—The City Board of Trustees, by taking no action on the question, sustained the Mayor's veto of the franchise for a car line from Fifteenth and I to Twentieth and P streets, which had been applied for by the Sacramento Electric, Gas and Railway Company. President Carmichael of the Chamber of Commerce appeared to convey the sense of that organization that the Mayor's veto be sustained, unless the street railway company consented to the restrictions that its books should be examined by the city and that its standard of construction should be considerably bettered. A communication of Manager McKim was read, setting forth that the crosstown line was asked simply as a convenience to the public and would not, at least be of any money value to the company.

Trolley Extensions in Wilmington

Wilmington, Del.—The Street and Sewer Department last week granted the Wilmington & Philadelphia Traction Company a franchise to erect poles in the city, but made provision that the company must pay 2 per cent. of its gross earnings to the city and limited the charge per kilowatt of lighting to 10 cents. The department also granted the application of the Wilmington & Southern Railway for permission to run its cars to Front and Market streets.

New Type of Street Cars for Utica

Utica, N. Y.—The Utica & Mohawk Valley Railway Company has announced that it has decided to place in service in Utica a number of pay-as-you-enter cars such as are now in use in Syracuse. The cars have been ordered from the J. G. Brill Company and are to be delivered in 100 days. They will be operated on the Genesee street line. The cars are favored by the company because they insure the collection of fares from practically all passengers whether they are a crowd or not.

MISCELLANEOUS

Schiller Park Plans Completed

Syracuse, N. Y.—Superintendent of Parks David Campbell has practically completed the design for improving Schiller Park, toward which a portion of the proceeds of the \$100,000 bond issue will be spent the coming season. An artistic arrangement of drives and walks has been laid out through the tract, which includes some forty acres of land. In front of the main entrance, which is from Third avenue, will be erected the Schiller-Goethe monument. The drives branch to the right and left, and, circling around the park, lead to what was formerly known as Round Top. Near the south end of the park will be the athletic field, which can be used for games in the summer and skating in the winter. A natural swimming pool will be near the field. The southern entrance is through Second avenue. At the east side will be a band stand with provision for seats on elevated ground. This will be located near the Elsner avenue entrance.

Plan Playgrounds for the Children

Portland, Ore.—Field Secretary L. H. Wier, of the Playground Association of America, visited Portland for a week to investigate playground conditions, and will make a close study of our playgrounds and make recommendations and suggestions for their betterment.

Cohoes, N. Y.—The movement for public playgrounds for children has invaded Cohoes, and the Saturday Club, composed of leading women of the city, are agitating plans to convert Brotherhood Athletic Park, in the western section, to a place of recreation for the juveniles. It is possible that the tentative plans will materialize this Summer. It is understood that the lessees of the park are willing to transfer the lease to the city authorities. A few changes would transform the property into an ideal playground. In the large grove at the southern end of the grounds there are swings and a fine club house that easily could be changed into a gymnasium. There is a large baseball field and one of the plans is the organization of a public schools' athletic league, such as now exists in Troy.

Tacoma, Wash.—The Tacoma Playground Association plans to maintain at least five playground points, under competent supervision, during the Summer months at an estimated expense of \$1,600. It is planned to place the work in the hands of a corps of four men and four women specially trained to teach educational play. These play centers will probably be located in Lincoln Park, McKinley Park, Wright Park, Point Defiance Park and South Tacoma.

Portsmouth, Va.—The lot known as the old Orphan Asylum lot on Swimming Point, the temporary use of which was secured by the Civic Club last year, has been put in good shape for a boys' playground and athletic park. This lot was in bad condition when the league took it in hand, but it has been much improved by plowing, harrowing, filling and finally by rolling with the street steam roller, the last process by courtesy of the street committee. The Boy Scouts, under the direction of Rev. A. C. Thomson, are putting up backstops and high wire fences for the protection of the residents' premises. The league hopes to have installed on the apparatus for the various games and sports that will go on there. It is hoped to make this playground a most beneficial force in the lives of the boys of the city.

City Council Will Open War on Users of Incorrect Scales

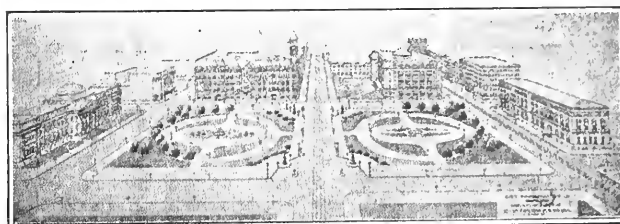
Des Moines, Ia.—Aroused to action by the report of a government inspector that the citizens of Des Moines are being victimized by short weight scales members of the council are drafting a stringent ordinance which will make the use of intentionally altered scales an offense punishable with a heavy fine. The members of the Council were amazed at the findings of the inspector. They believe that the present city ordinances do not provide a satisfactory means of prosecuting alleged users of deceptive scales. The new ordinance will be drafted with the thought in mind of warding against the practices of unscrupulous dealers, if such are to be found in the city. The federal government is not vested with authority to go any further than to call the attention of the city officials to the alleged fraudulent practices. But the councilmen will receive a report of the inspector from Washington, it is said.

Park System Planned for Billings

Billings, Mont.—Steps toward making Billings a "city beautiful" are indicated in the naming by Governor Norris of members of the Board of Park Commissioners under whose direction a system of parks will be laid out and the city generally improved to make it more attractive. The appointments by the Governor were made in conformity with a section of the State law which provides for the creation of a park commission in cities of the first class. The board is composed of six members, who serve without pay. They have absolute charge of all matters pertaining to parking and are authorized to expend whatever money is required in carrying out the work, and to supply the finances if it is necessary to create a park fund by making a fixed levy on all taxable property. Just what this will be remains to be determined by the Council, but it has been suggested that about one mill on each dollar of the city's assessable wealth will provide a fund sufficient to do considerable work of improvement. Already the city is the owner of two sites where parks can be established.

Plans for Omaha Civic Center Prepared by City Engineer

Omaha, Neb.—The illustration shows the tentative plan drawn up by City Engineer Craig for a civic center. It con-



TENTATIVE PLAN, OMAHA CIVIC CENTER

emplates the acquisition of two blocks of property at a cost of \$1,000,000 and the erection of suitable buildings.

Citizens Donate a Playground

Orange, N. J.—A number of citizens have agreed to pay for the tract of land facing Central avenue, which has been selected as a proper place for a rendezvous for the children of the city, equip it and turn it over to the city free of all encumbrances, providing the city will maintain the field in the future. The offer will probably be accepted.

Mayor Wants Benches Removed from Square

Norfolk, Va.—If the Board of Control adopts the recommendation of Mayor Riddick, loafing in City Hall square will be less attractive in the Winter when the ground is cold and the grass frostbitten. In a letter to the Board of Control recently the Mayor pronounced the benches in City Hall square a nuisance because they are used mostly, said he, by undesirable characters. He suggested that the benches should be removed. The controllers made the Mayor's letter public, but gave no intimation of their intention.

New Court House Is Dynamited in Omaha

Omaha, Neb.—Two explosions in the basement of the new million dollar court house at Eighteenth and Farnum streets created considerable excitement and brought out the police reserves. Windows were shattered in buildings two blocks away and considerable damage was done. Two floors of the basement were torn loose and the interior retaining wall was badly damaged, but the stone walls of the uncompleted building were not injured so far as could be observed. The police believe the explosion resulted from dynamite placed in the interior of the uncompleted building. A short piece of fuse was found in an adjoining part of the basement in the vicinity of where the explosion occurred.

Ordinance Governing Billboards and Signs

Grand Rapids, Mich.—The ordinance governing the licensing of billboards has been passed by the Council. It provides that the owners of all billboards pay a license fee of \$100. The ordinance, it is thought, will do away with many alleged unsightly signs and billboards that appear on the sides of buildings. The city will also have the power to abate any billboard.

Park Commission Accepts Gift of Park

Louisville, Ky.—The Louisville Park Commission, in session at its headquarters on the sixth floor of the Columbia Building, accepted as a gift from the Ballard family fourteen acres of land on the Ashbottom road, just outside of the city limits. This land was recently purchased by Charles T. Ballard, S. Thruston Ballard and Roger Ballard Thruston, it has been stated, for the purpose of making a gift of it to the city for use as a public park. The Park Commission accepted it to-day with a vote of thanks to the Ballards. It will be known as Churchill Park, this being the name of the old cemetery, which is to be included within the limits of the new park. Gen. John B. Castleman, president of the Park Commission, stated to-day that there would be no action at the present time to improve the park. It is stated that it is the desire of the Ballards that the city may not feel under obligation to attempt to improve the tract until it is able to do so.

Expert Advises on City Improvement Plan

St. Paul, Minn.—John Nolen, the landscape architect, who is directing the preparation of the St. Paul city plan, under the joint auspices of the Council's City Plan Commission and the City Club, is in St. Paul for the purpose of going over the plans with his assistant, A. C. Comey. The draft of a city plan, covering a district from the new cathedral to the Union Station and from the Capitol to Irvine Park, is practically completed. There are some minor details to be worked out after the inspection to be made of this district by Mr. Nolen. The draft of the plan, however, will not be made public until some time in April.

Labor Unions Not Recognized by City

Spokane, Wash.—On a clean-cut issue involving the question of recognizing labor unions or not the city commissioners this morning indicated that the new administration's policy will be the "open shop." By a vote of two to two, Commissioner Fasset being absent, the commissioners killed a resolution by Coates, labor member, providing for the use of the union label on the City Official Gazette. The vote was: Nay—Hayden and Hindley; aye—Coates and Fairley. Commissioner Coates forced the question, his resolution being unexpected, and the matter not having been discussed by the commissioners in conference.

Good Building Clay Found at Corpus

Corpus Christi, Tex.—The test which has been made here of the clays in the vicinity of this city has turned out to be an unqualified success. It has been found that the clay will produce a building brick of the first quality. Preliminary steps have already been taken looking to the establishment of a brick making plant here. In view of the fact that between 5,000,000 and 10,000,000 brick will be required to carry out the building plans of the ensuing year in this city it is evident that a big saving will be effected by the establishment of a source of supply in the city.

Mayor to Run Official Pawnshop

Poughkeepsie, N. Y.—Poughkeepsie is soon to have an "official uncle." Mayor John K. Sague announced to-day that he is planning to open a municipal pawnshop for the convenience of the city's unfortunates in time of stress.

To Plant 100,000 Trees

Kansas City, Mo.—More than 100,000 trees will be planted in Kansas City April 7, Arbor Day. Every school pupil in the public and private schools will be expected to plant several trees, and for that purpose 100,000 catalpa trees will be distributed at the different schools. These trees are a gift. It is expected that other varieties also will be given.

Electrocution and Parole System Advised

Nashville, Tenn.—The joint committee of the Legislature on amendments to the criminal laws have adopted two bills. One of these provides for the electrocution instead of hanging of all condemned felons, the electrocution to take place at the main prison. The second bill provides for the parole system. The bill creates a parole board composed of the Governor, chairman of the prison commission and warden of the penitentiary. Paroles may be granted after the prisoner has served one-third of his sentence.

City Commissioners Plan Important Reforms

Spokane, Wash.—Indulging for the first time since the election in an open discussion of public matters on the floor of the Council chamber, the city commissioners this morning outlined their policy on two important matters. An attempt will be made to revolutionize the system of purchasing supplies and materials to economize, and each commissioner declared for a strict enforcement of penalties against contractors and bidders for failure to consummate agreements with the city. This latter is hardly short of an upheaval at the City Hall. For years a penalty has never been enforced against a contractor for delay in public improvements. The system of holding the certified checks and bonds of bidders on improvement work and supplies has become mere form and bidders have frequently withdrawn their proposals and refused to enter into contracts after bids and received their certified checks back. The matter came before the commissioners on a report of the purchasing agent, who had been placed in a tangle by the old board of public works over a contract for hydrants with the American Brass Company. The company had bid \$65 each on supplying the city with thirty fire hydrants, had been awarded the contract by the old board and after sixty days refused to sign the agreement, asking for the return of the certified check, amounting to \$500, which accompanied the bid. The purchasing agent wanted to know if the commissioner would return or forfeit the check. Each commissioner pressed himself in favor of forfeiting the check if it had been put to any loss. On the showing of John Gifford, however, that the Board of Public Works had forced to enter into the contract against his recommendation that the city had been put to no financial loss it was decided to return the check in this case. "I want it understood, however, that we are not establishing any precedent," Commissioner Hayden before the vote was taken. Commissioners Hayden, Hindley and Coates each declared from now on delays and loss to the city by reason of contractors failing to live up to agreements would have to be paid for by the contractors. On the matter of purchasing materials and supplies the commissioners and purchasing agent are to get together at once. Commissioners Coates and Hayden made it plain that in the future an attempt would be made to buy in much larger quantities in order to get a saving in price. To this end the several city departments are to combine their wants and hand their requirements to the purchasing agent as far in advance as possible.

Anti-Treating Law Is Adopted

Tacoma, Wash.—The anti-treating ordinance passed by the Municipal Commission in December and referred to voters of the city carried last week by a majority of over 2,700 votes. It was the first referendum election in Tacoma under the new city charter. A heavy vote was cast for the special election, about 66 per cent. of the total registration of 21,587 voters casting ballots. Women displayed an active interest in the election. Many said they had voted against the ordinance because they regarded it as a political scham rather than a sincere desire to better conditions. Some of them were much displeased to learn that it had carried the majority it received. Election officials also stated that a large number of those people active in the recall campaign against the present Municipal Commission had nevertheless voted in favor of the anti-treating ordinance, although not less determined to oust the commission.

May Utilize Sidewalks

Ogden, Utah.—As the result of a vigorous protest by numerous merchants of the city, the authorities have decided to allow two feet of space on the sidewalks to be used for display purposes. For a week or more the police have been enforcing the ordinance which states that the chief of police shall keep the sidewalks clear of all obstructions. Chief Police T. E. Browning has discovered, however, that there is another ordinance which deals with the matter in a different manner, merchants being allowed to utilize two feet of space in front of their places of business. The law department of the City Council has decided to allow the business houses the privileges mentioned in the ordinance with the understanding that displays will be kept well within the distance prescribed.

LEGAL NEWS

A Summary and Notes of Recent Decisions—Rulings of Interest to Municipalities

Public Water Supply—Private Consumers—Injunction

Childs vs. City of Columbia.—Under Constitution enabling cities to acquire and operate water works to supply individuals for reasonable compensation, and Civil Code 1902 providing that municipal water works shall be for the use of the city and its citizens, and the Act of February 25, 1907, allowing a municipality to supply non-residents upon such terms as may be fixed by contract between the city and the consumer, a city operating water works does not assume towards a non-resident the relation and duties of a public service corporation, but the city is only bound by the contracts made. Where a complaint seeking to enjoin a city from a violation of its contract to furnish water to complainant alleges a contract indefinite in its terms as to price and duration, and does not allege that complainant was bound to take or the city to furnish water for any specified time, the complainant is not entitled to an injunction against the city after notice by the city of its election to terminate the contract.—Supreme Court of South Carolina, 70 S. E. R., 297.

Municipal Corporation Defined

Ex parte Simmons.—A municipal corporation in its historical and proper sense is the incorporation by the authority of the government of the inhabitants of a particular place or district and authorizing them in their corporate capacity to exercise subordinate specified powers to legislation and regulation with respect to their local and internal concerns. This power of local government is the distinctive purpose and the distinguishing feature of a municipal corporation proper.—Criminal Court of Appeals of Oklahoma, 112 P. R., 951.

Assessment—Due Process of Law

City and County of Denver et al vs. State Inv. Co. et al.—Denver City Charter 1893, which expressly requires that landowners affected by a street improvement be given opportunity to complain of a proposed assessment, impliedly requires notice of the specific time of the hearing, and hence is not invalid as a deprivation of property without due process of law, as failing to make adequate provision for hearing objections. A taxpayer's offer, on suing to restrain an illegal street improvement assessment, to pay any part properly chargeable against him and to do equity, and subsequent payment into court of the full amount which could be justly established against him, were sufficient as a basis for equitable relief.—Supreme Court of Colorado, 112 P. R., 789.

Eminent Domain—Municipal Water Works.

Lavelle et al. vs. Town of Julesburg.—In a condemnation proceeding by a town under Revised Statutes, 1908, to condemn property for water works, a mere denial that the purpose for which the land was sought to be taken was public or that the town had power to condemn, did not raise a question of law or fact respecting a public use or the town's power in the premises.—Supreme Court of Colorado, 112 P. R., 774.

Pedlers—Power to Tax

Massey vs. City of Columbus.—The power to require truck farmers, selling their products at wholesale, to pay market fees during market hours is included in the powers conferred by the charter of the city of Columbus, and the same is true as to the right of the city to require market fees of retail dealers on such articles as are usually sold at a market house. The municipal ordinances providing for the exercise of these powers are reasonable regulations. It was clearly the intention of the Legislature in the charter granted the city of Columbus to allow that city to maintain a city market under such proper regulations as would make it a successful municipal enterprise, at once a source of public revenue and a means by which public inspection of such merchandise would be possible and a healthful competition promoted.—Court of Appeals of Georgia, 70 S. E. R., 263.

Civil Service Examinations—Veterans

People ex rel. Qua vs. Gaffney et al.—Where in a civil service examination to determine eligibles for appointment to the office of sewer, water and street commissioner and to the office of street superintendent of a village three persons were certified, one of whom was a veteran, the veteran was entitled to a preference of appointment under Constitution providing that appointments in the civil service shall be made according to merit, to be ascertained so far as practicable by examination, provided, however, that honorably discharged soldiers and sailors shall be entitled to preference without regard to standing.—New York Supreme Court, 126 N. Y. S., 1027.

Paving Assessment—Corner Lots

McDonnell et al vs. Improvement District No. 145 et al.—Where in levying assessments on property within an improvement district for the paving of a street the commissioners, in assessing certain corner lots, considered the fact that they fronted on another street already paved, and for that reason did not receive benefit in the same proportion as other lots fronting entirely on the streets improved, and therefore should not bear so great an assessment, that fact did not establish as a matter of law that the assessment was based on an erroneous theory, nor show that the commissioners were guilty of an abuse of discretion authorizing the vacation of the assessment in a court of chancery.—Supreme Court of Arkansas, 133 S. W. R., 1127.

Water Companies—Rates—Ordinances

Contra Costa Water Co. vs. City of Oakland et al.—The legislative body fixing rates for water furnished by a corporation supplying a city with water, on determining the present value of the property used in the public service, must fix such rates as will allow the corporation a fair return over and above its operating expenses, taxes and current repairs, and the annual depreciation in the property, and the questions of the value of the property and the amount of expenses, allowance for depreciation and fair compensation are for the legislative body, and the courts will not set aside its action on the ground that it deprives a corporation of its property without fair compensation unless that fact clearly appears. In the absence of a finding on the question of the value of the property of the corporation the court cannot determine that the compensation afforded by the ordinance is not reasonable, and, where reasonable, the corporation cannot complain in the courts because of the methods used by the City Council in arriving at the conclusion embodied in the ordinance.—Supreme Court of California, 113 P. R., 669.

Construction of Improvements—Negligence

Reynolds County Telephone Co. vs. City of Piedmont.—Where a telephone company laid its cable under a street without obtaining the city's consent, as required by statute, the city was not liable for damage to its cable by its being struck by a pick of one of the city employees attempting to loosen the rock and cement to remove the cable in repairing the sewer, where it appeared that the injury was caused either unintentionally or by the city employee's failure to carefully guard the point of his pick, the city not being liable unless it wilfully or recklessly injured the cable.—Springfield Court of Appeals, Missouri, 133 S. W. R., 141.

Pavement Maintenance—Construction of Contract

Mack Paving Co. of New York vs. City of New York.—A contract to repave the streets of a city and to maintain the same for a specified period after acceptance, which stipulates that the contractor agrees to make repairs, and during the period of maintenance to take up, lay and restore on notice the pavement over trenches for water and gas pipes and sewers or other purposes at a specified price, does not give the contractor an exclusive right to relay a pavement during the period of maintenance, and the act of the city in permitting a railway company, required by Railroad Law, as amended by Laws 1892, to keep in repair the part of the streets used by its tracks, to take up and repair a street at its own expense by employing another contractor, is not a violation of the contract, since the railroad company, not being a party to the contract, is not bound thereby, and since the city does not agree to pay for such work.—New York Supreme Court, 127 N. Y. S., 738.

Establishment of Sewer District—Validity

Mayer et al. vs. City of Shakopee et al.—Laws 1903, which delegates to cities of the fourth class the power to establish sewer districts, is not unconstitutional because it requires that each lot or tract of land within the district shall be assessed for the cost of the improvements, in the ratio of area in square feet to the total assessable area of the district. By the provisions of Chapter 312, Laws 1903, in establishing sewer districts and sewers therein, the Common Council is required to exercise its judgment so as to include within the district such real estate as will be benefited by the improvement, and to apportion the cost thereof on all of the property according to the benefits. In the establishment of a sewer district and sewers therein by the Common Council of the city of Shakopee the evidence is not sufficient to show that the Council proceeded upon an illegal principle, applied a wrong rule of law or acted upon a demonstrable mistake of fact.—Supreme Court of Minnesota, 130 N. W. R., 77.

Taxation—Underground Railroad

People ex rel. Hudson & Manhattan R. Co. vs. State Board of Tax Com'rs et al.—The mere fact that the value of special franchises to construct and operate an underground railroad under the streets of the city of New York cannot be ascertained with accuracy is not ground for annulling an assessment of the franchises, where the owner urged that the property was overvalued or valued at a higher proportionate value than that placed on other property on the same roll. Under Tax Law authorizing a petition complaining of an assessment by reason of overvaluation, and requiring the petition to state the extent of such overvaluation, and authorizing the court to order a reassessment to make it conform to the valuations of other property on the same roll, etc., a petition on certiorari to review an assessment of special franchises must state the valuation of the franchises and set forth the material facts to show a disproportionate valuation in order to enable the court to determine the questions of overvaluation and of higher proportionate valuation than that placed on other property. Where a corporation, on certiorari to review an assessment of its special franchises to operate an underground railroad under the streets of the city of New York, does not show the probable cost of equipment of its lines and the annual operating expenses, with a view to show that the net income, after allowance for depreciation and interest on the investment capitalized, will not equal the assessment, it is not shown that the assessment is unauthorized, either under the net earning rule or on the theory of the cost of reproduction of the tangible property in connection with the value of the intangible property, and the assessment must stand. Under Tax Law defining the terms "land," "real estate" and "real property" to include land, underground railroads, including the valuation of franchises to construct and operate the same, and defining a "special franchise" to include the value of the tangible property of a corporation situated in or under or above any street, a corporation owning special franchises to operate an underground railroad under city streets owns special franchises subject to taxation, though only so small a part of the railroad is constructed and in operation as is insufficient to meet operating expenses, taxes and interest, and the franchises, if possessing a value, are taxable, though they are not used. The State may tax a corporation on its special franchises, granted to it by the State, or by authority from the State wholly within its limits, though the corporation is engaged in interstate commerce, because the tax is not on the business of the corporation.—New York Supreme Court, Appellate Division, 127 N. Y. S., 918.

Land Condemnation—Compensation

In re Simmons et al., Board of Water Supply.—A municipality condemning land should be held to at least its lowest value.—Evidence held to show that wards for land taken by New York City for water supply purposes are too low. The value of rural church property condemned for municipal water supply purposes should be fixed at the value of the land as enhanced by the buildings thereon, taking the reasonable cost of replacing them and considering their state of repair and depreciation.—New York Supreme Court, 127 N. Y. S., 940.

Street Improvements—Special Funds

O'Neil vs. City of Portland.—Where the expense of improving a city street is to be paid from a special fund created by assessment on abutting property, a failure of the municipality to comply with any of the requirements in the charter, essential to supplying such fund or an unreasonable delay in enforcing such provision or collecting and paying over the money, gives the contractor a right of action ex delicto against the corporation for damages, notwithstanding a provision therein that he shall look for payment only to the special fund. A complaint of a plaintiff who had a contract with a city to improve certain streets, to be paid from assessments collected, alleging that owing to the negligence of the city in making an assessment, and its failure to exercise due diligence in prosecuting suits brought by property owners affected, whereby it has already failed to provide a special fund to pay for the improvement for nearly five years, whereby plaintiff has been damaged, states a cause of action.—Supreme Court of Oregon, 113 P. R., 653.

Pavement Maintenance—Construction of Contract

Asphalt Paving & Contracting Co. vs. City of New York.—Where a contract for an asphalt pavement over a stone block pavement bound the contractor to keep the pavement in repair for fifteen years, and with a sufficient foundation and an asphalt pavement would begin to need repairs in four or five years, the contract will be deemed to contemplate the necessity of repairs during at least ten of the fifteen years, and not to be a guarantee that the pavement, laid with the best material and workmanship, would not require repairs for fifteen years, and the contractor cannot avoid making repairs within the prescribed period on the ground that defects were not due to inferior workmanship or material but to defective plans of the pavement. If defects in the plan of a pavement or insufficiency of the pavement render the contract requiring the contractor to make repairs impossible of performance, both parties to the contract would be excused from further performance, and neither could recover damages for the part not performed. Where a paving contract provided that notice to make repairs should be served on the contractor either personally or by leaving it at its residence or on its agent in charge of the work, the service upon another company acting as agent of the contractor in making repairs under the contract was sufficient.—New York Supreme Court, 127 N. Y. S., 794.

Towns—Actions—Parties

Town of East Greenwich vs. Guenond; Guenond vs. Superior Court.—Under Gen. Laws 1909, declaring that the inhabitants of every town shall be a body corporate and may sue in their corporate name, and providing that every suit by a town shall be brought in the name of the town, and a chapter authorizing a warrant in forcible entry and detainer, where complaint under oath is made by complainant or some one in his behalf, etc., a town sergeant, though authorized by a vote of the town council of a town to take all steps necessary to eject any person occupying certain real estate, may not as sergeant make complaint on behalf of the town in forcible entry and detainer; but the action must be brought in the corporate name, even though chapter authorizing the town council to sue in the name of the town be applicable, since that requires the action to be brought in the name of the town by the town council.—Supreme Court of Rhode Island, 78 A. R., 1015.

Highways—Construction—Damages

Adkins vs. Crawford County.—The court below erred in sustaining a general demurrer to the petition in a suit brought against a county, wherein it was alleged by the plaintiff that she was the owner of certain lands lying within the county referred to and that the commissioner of roads and revenues of said county had cut a public road through her land and had taken her land for the public use without her consent, and by the manner of cutting said road had caused large quantities of rainwater to be diverted onto her cultivated land, resulting in damages to the land and rendering a large part of the same unfit for cultivation, to her injury and damage in a stated sum, and that she had demanded damages in writing from said commissioner who had refused compensation for the injury and damage done.—Supreme Court of Georgia, 70 S. E. R., 335.

MUNICIPAL APPLIANCES

Pick-up Street Sweeper Exhibited in New York

ONE of the most interesting of the devices for cleaning street pavements, which were recently exhibited in New York for the benefit of a committee of the Board of Estimate and Apportionment which had been appointed to make a general study of the subject, is the Emerson street sweeping machine. This machine is auto-propelled and operated. It loosens the scale of mud from the street, sprinkles lightly in front of a broom which picks up the sweepings and delivers them to a bin which is a part of the apparatus. At the same time a moderate draught of air produced by a fan sucks the dust into the machine so as to reduce the dust nuisance to a minimum. In addition to the committee, composed of Commissioner Thompson of the Department of Water Supply, Gas and Electricity and Borough President McAneny of Manhattan, the operation of the machine was observed by officials of the Street Cleaning Department, the Commissioner of Accounts and representatives of various civic societies. Whatever may be the opinion of these observers regarding the advisability of adopting the Emerson system—the question of costs was not taken up—the verdict was unanimous that the sweeper did good work and did not fail or break down at any time. Consulting Engineer Very of the Department of Street Cleaning calls it a practical working machine; the Commissioner of Accounts says it swept the street well, removing dirt from depressions of at least an inch in depth; Secretary Robert S. Binkerd of the Civic Club says it cleans the pavements as well as any street sweeper.

The general outline of the Emerson sweeper, as shown by the illustration, is that of a large covered van. The extension at the rear carrying the rotary

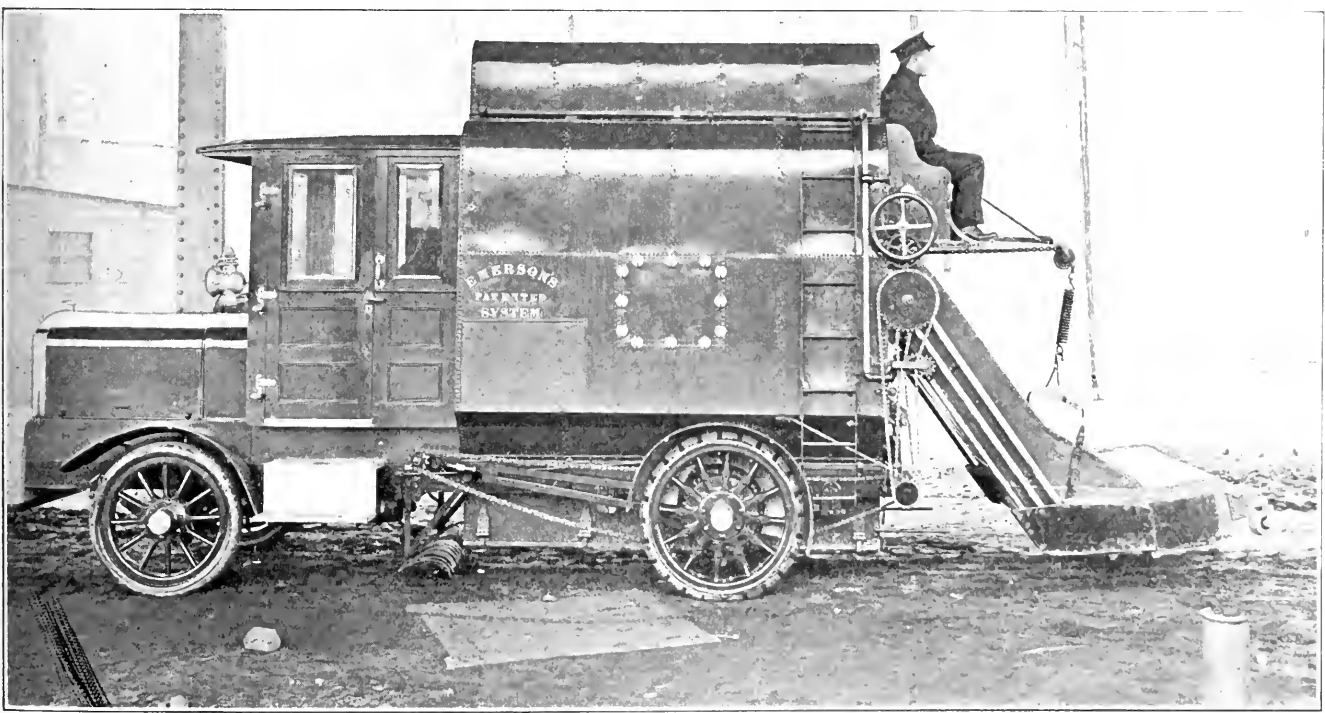
brush and conveyor is the only conspicuous feature which differentiates it from an ordinary commercial vehicle. The auto-apparatus occupies the usual position of such machinery. The covering of the van, carrying the dust bin, is made of aluminum to save weight. On top of the body proper is a tank which carries water for the sprinkling device which is located immediately in front of the brush so that the water is picked up before spreading. Under the machine, between the front and rear wheels, is a rake controlled by the operator, which loosens the scale of dirt from the pavement. The dust bin is emptied through bottom doors, the hinges of which show in the cut. The chains and sprockets that drive the broom and conveyor are plainly shown. The chauffeur is seated in a closed space in the usual position. A seat is provided at the rear near the top of the body, where an operator sits and controls the lifting and lowering of the broom and its casing as well as watching the quality of the work done. The company had two machines on exhibition. The smaller of these sweeps a width of 5 feet. It has an 11-foot wheel base, is 23½ feet long over all, weighs 3 tons empty and has a capacity of 5 cubic yards. This capacity is estimated to be sufficient to carry the collections of half a day's work. The dirt becomes compacted quite hard in the bin so that the quantity carried is greater than might be supposed. The larger machine sweeps a width of 9 feet, weighs 8 tons, has an 11-foot wheel base and measures 26 feet over all and has a storage capacity of 10 cubic yards. The water tank for the small machine carries 250 gallons and that on the larger machine 650. In the large machine the water is forced through the sprinkler by air supplied by a small compressor. The brooms are about 15 or 18 inches in diameter and revolve rapidly. They are made



SWEEPERS WORKING IN GANGS

of different materials—hickory, rattan, steel—to meet varying conditions. The speed of the machine may be anything up to 10 miles per hour. The speed during the tests, according to eyewitnesses, was about that of a horse walking, or three miles an hour. The amount of water used is about 40 gallons to each 1,000 square yards.

The lack of definite recommendations so far regarding the machines is due to the fact that it is realized that the adoption of the Emerson system is a big proposition. The machines are not for sale and the Emerson Contracting Company, inventors and owners, desire to take large contracts for street cleaning. Regarding the cost officials of the company state that it would not be any greater than by methods now employed, and in addition there is a sanitary advantage in the fact that the dirt is picked up immediately instead of being left in the gutters for a few hours, as is often done. Moreover the dust nuisance, it is claimed, is eliminated. The proper operation of the system requires the use of two or preferably more machines working in gangs. To clean a



AUTOMOBILE STREET SWEEPER, WHICH PICKS UP THE SWEEPINGS

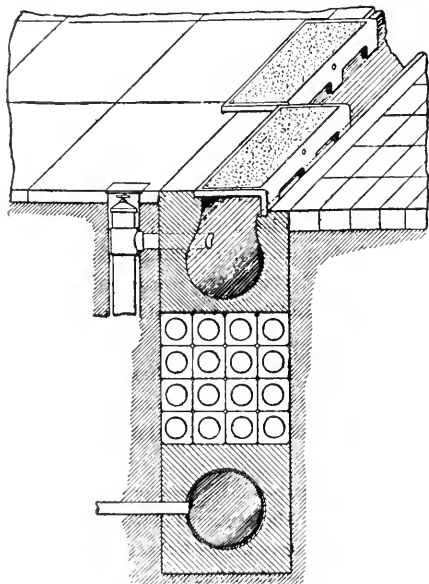
strip 5 feet wide and a mile or so long would not accomplish much good because by the time the machine returned to the starting point wagons would have tracked dirt over the first swath. Therefore the machines should be operated together, as shown in the illustration. To make the system complete a gutter sweeping machine, also owned by the company, should be used. This does not pick up dirt, but gets in close to the curbing and throws the dirt out where the large machine can pick it up. This plan does away with one of the greatest inconveniences and sources of expense in connection with ordinary machine street sweeping, since in this work it has never been possible to get rid of the services of the laborer and the cart.

Curb-Conduit System

The Marriott curb-conduit system, invented by James C. Marriott, Park Row Building, New York City, is designed to facilitate street cleaning, surface drainage and snow removal. The simplest form of the system consists in placing an open conduit at the curb line of a street and connecting it at intervals to a water pipe provided with a valve and a sewer system or body of water. To dispose of snow, where this system is installed, it is heaped by mechanical sweepers or other means near the curb-conduit. When this has been done in a certain section the valve in the supply pipe is opened and the snow is shoveled into it; the snow is partly melted by the latent heat in the water and the rest floated off to the sewer.

The advantage claimed for the operation of the system in ordinary surface drainage is that open gutter streams are abolished. The capacity of the conduit is intended to be such as to do away with the necessity of storm sewers. The use of a perforated plate over the gutter affords access of the storm water, and the plate makes the surface of the pavement substantially continuous.

The illustration shows how the simplest form of the system may be combined with equipment for public utilities. The arrangement shown obviates tearing up roadways to make connections with water, gas, telephone and electric service. At a short distance below the conduit it is proposed to



CURB CONDUIT SYSTEM



20TH CENTURY ROAD OILER AND PRESERVER

construct an electric conduit. If these should be owned by a municipality revenue from the leasing of ducts would be a possibility. Below the electric conduit water and gas mains or sewers might be installed. Regarding the water supply the inventor suggests the use of river or salt water; that is, a cheaper supply than that suitable for drinking purposes. This could be used in some instances for cleaning and sprinkling streets, flushing the lavatories of office buildings, manufacturing and miscellaneous purposes.

A diagram prepared by the inventor shows four types of construction in reference to the matter of covering. One design shows the cover, consisting of an open grating, carried out on the grade of the sidewalk, the vertical portion of the cover practically forming a curbing and provided with open inlets for water. Another style varies from this only in the absence of the grating. A third style has circular perforations in the plate which is laid continuously with the grade of the roadway. The curb conduit may also be left open without any plate.

Storage Battery Car

THE Edison-Beach storage battery car was recently given a successful official test on the York and Dauphin street lines, Philadelphia, Pa., in the presence of Mayor Reyburn and officials of the city and the Rapid Transit Company. The car weighs 13,100 pounds, has seating capacity for 26 and standing room for 20 more. The wheel base is 8½ feet. The power is supplied by a 100-cell Edison storage battery located beneath the seats, which run lengthwise of the car. These are claimed to be able to run the car 225 miles under favorable conditions.

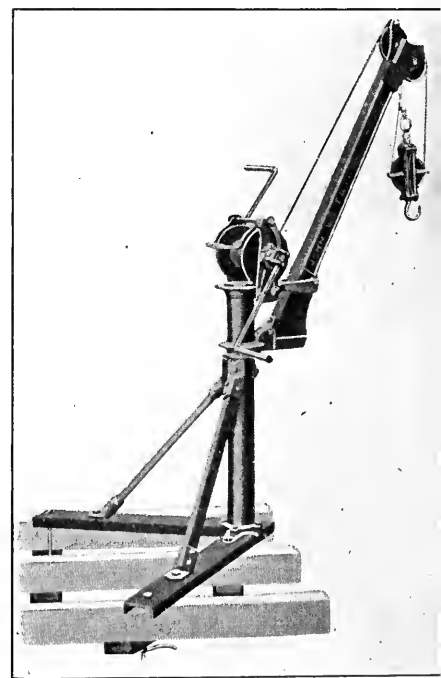
The 20th Century Road Oiler and Preserver

A road oiler in which the oil is sprayed over the road by means of a gasoline engine and pump has been placed on the market by Walter S. French & Co., Moorestown, N. J. The apparatus consists of a tank wagon of ordinary design, a gasoline engine and pump at the rear, a horizontal distributing pipe with a series of vertical nozzles directed downward from it. Two men are required to operate the machine, a driver and an attendant who is provided with a seat at the rear at one side where he can control the gasoline engine and the valves of the distributing apparatus as well as observe

the quality of the work done. In order to make the oil work easier and use no more than is necessary the oil in the tank is heated by water from the water jacket of the engine which is carried through radiators in the bottom of the tank by large pipes. The system of nozzles through which the oil is forced is controlled by a single lever acting instantaneously on the flow of oil, which is easily controlled by the operator. The manufacturer states that the control is so accurate that the oil can be shut off and on within a single inch of a given line, a feature of great advantage when passing over a cross-walk.

Portable Steel Derrick.

JOHN L. TAYLOR, 1034 West Lake street, Chicago, Ill., manufactures a portable steel derrick suitable for unloading curbstone and flagging from cars and for many other purposes. The derrick is constructed entirely of malleable iron and steel, has roller bearings and circle swing. The speed is adjustable. One man operates both cranks and can hoist 1,500 pounds.



A HANDY PORTABLE DERRICK

NEWS OF THE SOCIETIES

City Marshals and Police Chiefs' Association of Texas.—What it is hoped will be a big reunion of the peace officers of the Southwest will be held in Fort Worth, Tex., May 17 to 19, at the time of the seventeenth annual convention of the City Marshals and Police Chiefs' Association of Texas. Invitations have been sent out asking the attendance of the officers, and those in charge will be prepared to care for 1,000 peace officers and hope that many will attend. Secretary-Treasurer M. T. Forrest of Houston, of the Texas association, is the authority for the statement that extensive preparations are making for the reunion. At this meeting it is hoped there will be originated a widespread movement for the suppression of crime and the punishment of criminals in the Southwest. Recently a meeting of criminologists was held in Washington, D. C., whereat methods for the mutual aid and assistance of various police departments were formulated, and the proposed meeting here will endeavor to do similar work, but to evolve methods that will apply with more especial force to the Southwest and its needs as to police protection. Noted speakers familiar with the work of running down criminals, on methods of preventing crime and so on will be present to consider and discuss these questions. For the meeting all elective peace officers, members of the association, will be furnished free transportation and the committee on transportation is now trying to get specially low railway rates for the others who may attend the meeting. The transportation committee is J. H. Maddox, Commissioner of Streets in Fort Worth; Carroll Pates, City Marshal, San Angelo; T. J. Coggins, special agent of the Santa Fe at Temple; George Ellis, ex-Chief of Police, Houston, and John R. Snider, Chief of Police, Amarillo. In the circulars relating to the meeting peace officers are urged to lay aside other business and attend the meeting, for it will be well worth their while to do so. Mayor W. D. Davis, Chief of Police Polk, the City Commissioners, all of the city and county officials and the entire city police force will constitute the reception committee.

Architecture and Building Show, New York.—An architecture and building show is to be held at the New Grand Central Palace, New York City, May 6-13 inclusive. It is planned to make this the first annual exhibition and conference of American architectural building, contracting and engineering interests. Building materials and manufacturers' supplies will be placed on exhibition and a programme of lectures of interest to architects, engineers and contractors is being arranged. Further information regarding the show may be had from A. D. V. Storey, general manager, Architecture and Building Show Committee, No. 110 West Thirty-fourth street, New York City.

Grandville Avenue Improvement Association, Grand Rapids, Mich.—At a meeting March 23 City Engineer L. B. Cutcheon addressed the members on the subject of Grade Separation. He was introduced by President Brower of the association. Myron H. Walker explained the difficulties which confronted the charter commission.

International Municipal Congress.—The executive committee of the League of California Municipalities, of which Mayor Hodgehead of Berkeley is president, recently took steps to carry out the resolution adopted at San Diego last September regarding participation by the cities of California in the International Municipal Congress and Exposition to be held in Chicago this year. The plans under consideration by the league include the exhibition of stereopticon views showing not only municipal achievement and public buildings but also the principal private buildings of our cities and towns. These views will be made from photographs and will be in colors. They will be thrown on screens by automatic machinery and will enable each view to be exhibited at least fifty times a day. Besides this it is proposed to issue 50,000 illustrated booklets as souvenirs for free distribution at Chicago. These will be profusely illustrated with half-tone engravings. The expense is to be borne by the cities and public spirited citizens desiring to take advantage of the unusual opportunity thus afforded to show the world the municipal progress that has been made in San Francisco and the State. The League intends to make a strong effort to secure the next Municipal Congress and Exposition for San Francisco in 1915. Mayor P. H. McCarthy has addressed a letter to the delegates in this regard, and the Supervisors unanimously passed a resolution inviting the cities of the world to hold a Municipal Congress and Exposition in San Francisco in 1915 under the auspices of the League of California Municipalities. The delegates who will attend the International Municipal Congress and Exposition at Chicago in September of this year have been authorized to formally extend to the cities of the world, on behalf of the people of this city, an earnest invitation to attend and hold the next congress in San Francisco.

New England Water Works Association.—A special meeting of this association will be held at the Hotel Kimball, Springfield, Mass., Wednesday, April 12, 1911. Programme—12 o'clock m.—Meeting of the executive committee. 1 o'clock p. m.—Lunch will be served at the Hotel Kimball. 2 o'clock p. m.—Representatives of the city government will welcome the association. E. V. French, vice-president and engineer of the Arkright Mutual Fire Insurance Company of Boston, Mass., will present a paper on Desirable Pressure at Hydrants. The general subject of Fire Protection will be discussed by William H. Daggett, Chief of Fire Department, Springfield, Mass., and others.

Chicago Association of Commerce.—At a meeting at the Hotel La Salle J. P. Hovland spoke of the movement, to be aided by the association, of beautifying the downtown section. He said that the business men downtown were anxious that the central section should suggest to visitors some of the beauty of the outer city.

Youngstown Engineers' Club.—The members of the club met March 23 in their quarters in the Maloney Block. The meetings are rapidly growing in attendance and the club is one of the most flourishing in the Mahoning Valley. The principal topics of discussion at this meeting were the various bills regarding engineering matters pending in the Legislature.

Toledo Heights Citizens' League.—A new municipal improvement society with the above title was recently organized. The organization will act in conjunction with the South Side League, recently formed for a similar purpose. The following officers were elected: President, Dr. H. H. Havinghorst; vice-president, Dr. F. A. Cobb; second vice-president, E. D. Fearing; secretary, George Johnson; treasurer, Michael McDermott.

National Arts Club.—Efforts to make New York more attractive will be made manifest at a show soon to be held in the galleries of the National Arts Club, No. 119 East Nineteenth street, New York City. The Municipal Art Society will include exhibits by such city departments as the Park, Dock, Board of Water Supply, etc. The president of the Municipal Art Society is Bert Hanson, former Commissioner of Police; the secretary, Charles H. Israels, an architect.

Conference of New York Mayors.—William P. Capes, of Schenectady, secretary of the Advisory Committee on the Mayors' Conference to be held at Poughkeepsie, N. Y., May 25 and 26, has announced that the speakers who have already sent their acceptances are Governor John A. Dix; Mayor William J. Gaynor, of New York; E. A. Fisher, City Engineer of Rochester; A. Prescott Folwell, editor of the MUNICIPAL JOURNAL AND ENGINEER, New York; W. D. A. Ryan, of Schenectady, head of the illuminating engineering department of the General Electric Company and the greatest authority on street lighting, who is to give an illustrated lecture on street lighting; C. R. Hall, head of the Department of Examiners of Municipal Accounts in the State Comptroller's office; Hon. William Prendergast, Comptroller of New York City; Hon. Homer Folks, of New York, secretary of the State Charities Aid Association; Lawson K. Purdy, Tax Commissioner of New York, general land and tax agent of the Erie Railroad, and State Senator Harvey D. Hinman, of Binghamton. There are six speakers to whom invitations have been sent that are yet to be heard from.

Kay County (Okla.) Good Roads Association.—The association has adopted a new idea in the construction of culverts, suggested by Neal A. Pickett, Arkansas City. The idea is to build open concave cement gutters across the roads to carry off storm water. It is not intended to use the culverts when there are permanent streams. The gutters or culverts will be so shallow that they will not be an obstacle to vehicles.

Civic Club of Binghamton, N. Y.—At a regular meeting, March 22, Mrs. Frank D. Lyon gave a stereopticon lecture upon the subject River Banks. Views of cities, some of them larger, many of them smaller than Binghamton, which have beautified their river banks to a remarkable extent were shown in sharp contrast to the view of the banks of Binghamton's two rivers, strewn with garbage and ashes and surmounted with buildings of the most disreputable order, and used, to a large extent, as signboards for the advertisement of all sorts of commercial commodities. The speaker made a number of apt suggestions in regard to the ways in which the waterfront could be improved. Of special merit was that regarding the conversion of Chenango Point, the junction of the two rivers into a park.

National Electric Light Association.—Charles H. Hodskinson, master of transportation of the National Electric Light Association, is already taking active steps to organize his important work in advance of the convention to be held in New York, May 20 to June 2. At the time of the St. Louis convention last year, when the membership was 5,500, the registered attendance was 2,780. The membership has now crossed the 7,100 line and will not be less than 7,500 at the time of the annual convention, so that on the same basis there will be from 3,500 to 4,000 present in registered attendance. This implies heavy transportation and Mr. Hodskinson has therefore formed the following active committee, which is taking up its duties in co-operation with Mr. Hodskinson. By the middle of April practically all the details will have been arranged as to trips, rates, etc., and will then be announced. It is possible that other names may be added to the committee.

R. H. Ballard, Southern California Edison Company, Los Angeles, Cal.

W. J. Barker, Denver Gas & Electric Company, Denver, Col.

E. J. Bowers, Kansas City Electric Light Company, Kansas City, Mo.

J. A. Britton, Pacific Gas & Electric Company, San Francisco, Cal.

F. A. Coupal, Buffalo General Electric Company, Buffalo, N. Y.

E. Creed, Toronto Electric Light Company, Toronto, Canada.

J. E. Davidson, Pacific Power & Light Company, Portland, Ore.

P. Doty, St. Paul Gas Light Company, St. Paul, Minn.

J. B. Eaton, Rochester Railway & Light Company, Rochester, N. Y.

G. A. Freeman, Commonwealth Edison Company, Chicago, Ill.

F. H. Gale, General Electric Company, Schenectady, N. Y.

A. F. Giles, General Electric Company, Atlanta, Ga.

W. J. Grambs, Seattle Electric Company, Seattle, Wash.

M. S. Hart, Consumers' Electric Light & Power Company, New Orleans, La.

H. A. Holdredge, Omaha Electric Light & Power Company, Omaha, Neb.

H. M. Hope, Stone & Webster Corporation, Boston, Mass.

F. N. Jewett, Wagner Electric Manufacturing Company, St. Louis, Mo.

A. H. Manwaring, Philadelphia Electric Company, Philadelphia, Pa.

A. Maughan, Utah Light & Railway Company, Salt Lake City, Utah.

J. C. McQuiston, Westinghouse Bureau of Publicity, East Pittsburgh, Pa.

A. A. Serva, Fort Wayne Electric Works, Fort Wayne, Ind.

Chicago Electric Club.—Some interesting statistics relative to the operation, transportation facilities and engineering features of the Illinois tunnel system, which underlies the greater portion of the downtown business district of Chicago, were presented by W. E. Worth, superintendent of the company, in an address before the Chicago Electric Club on March 22.

The Illinois Tunnel Company's system comprises approximately sixty-two miles of track, which is all located in what is commonly termed the loop district of Chicago. Tracks are laid under practically every principal street in this district and the company has stations at many of the important buildings in the city.

One of the most important functions of the tunnel service is the re-

moval of excavations from buildings under construction. The speaker cited several instances in which all excavations for new caissons had been made under an old building before it had been torn down preparatory to rebuilding.

All excavated matter is transported to the company's disposal station alongside the Chicago River, where by means of electrically operated conveyors the earth is removed from the cars, raised to the water level and dumped into scows to be shipped and dumped into Lake Michigan.

Transportation of coal is another important feature of the company's service. The tunnel system is connected with a large number of power plants in its district to which it supplies coal and removes cinders. The cinders are disposed of in the same way as excavated material.

The transportation facilities as regards general freight were explained as being exceptionally good, the system being connected with every railroad entering Chicago, save one. There are four public receiving stations where freight is accepted for transportation to the railroad stations.

The tunnels are about 45 feet below the street level. The dimensions of the bore are 6 feet wide by 7 feet 6 inches high. The cars, which are made up into trains of ten cars, are 13 feet long by 4 feet wide. The motor cars now used for regular service are equipped with two twenty-five-horsepower motors. All current is purchased from the Commonwealth Edison Company and is supplied at 250 volts, direct current. The trolley system of operation is employed.

In reply to a question as to the ventilation Mr. Worth said that the system was equipped with eighty or ninety open-air shafts which furnish the requisite draft. The average temperature in the tunnels the year round is fifty-five degrees. Regarding switching Mr. Worth described the system employed, which is a combination automatic-electric method, invented by a member of the company.

Following the address brief remarks were made by W. N. Matthews, H. M. Wilson and V. Crawford.

National Conference on City Planning.—Plans have been completed for the national conference of the City Planning Association to be held in Philadelphia May 15, 16 and 17. President Taft and many widely known specialists in the line will attend. This will be the third meeting of the association. On Monday, the opening day of the convention, the delegates will be welcomed by Mayor Reyburn and the members of the local committee in charge. The first regular session will be called at 3 o'clock in the afternoon and the first paper will be read by Frederick C. Howe, embracing a discussion on German municipal real estate policies and the controversial topic of taxing the unearned increment of land. Mayor Reyburn's address of welcome will be replied to by Frederick Law Olmstead, president of the conference.

A number of interesting addresses are announced for the second session on Monday evening, when Ernest Flagg will talk on the "Proper Location of Public Buildings," and Frank Miles Day on the "Use of Parks for Buildings of Various Kinds." Mr. Day will tell of the attempts to erect buildings in Central Park, New York, and those in the parks of all cities in the

country for libraries, recreation buildings and bathhouses.

Among the speakers for other sessions are Lawrence Veiller, secretary of the National Housing Association; Lawson Purdy, president of the Department of Taxes and Assessments, New York; Professor Goodnow, of Columbia; Spencer Baldwin, of Boston University, and City Solicitor Alcorn. On Tuesday afternoon the delegates will be taken to the University of Pennsylvania on a tour of inspection, where a reception will be tendered by the trustees of the Archaeological Department.

One session will be devoted to a discussion of the link between water and rail transportation, and Wednesday morning's session will be presided over by Nelson P. Lewis, chief engineer of the Board of Estimate and Apportionment of New York City. Acting Director Haaskarl, of the Department of Wharves, Docks and Ferries, will read a paper. Equally interesting topics and speakers have been arranged for all the sessions, including John Nolen, of Cambridge, Mass.; George W. Tillson, chief engineer of the Borough of Manhattan; George S. Webster, chief engineer of the Philadelphia Bureau of Surveys; Walter L. Fisher, Secretary of the Interior; Assistant City Solicitor Andrew Wright Crawford, Ernest L. Heydecker, Frank B. Williams and Philip Kates.

American Society of Civil Engineers.

—At the next meeting to be held at the society house, on Wednesday, April 5, 1911, at 8.30 p. m., a paper entitled "The Going Value of Water Works," by Leonard Metcalf and John W. Alvord, member of the American Society of Civil Engineers, will be presented for discussion. This paper was printed in the "proceedings" for February, 1911. The usual collation, provided by subscription of resident members, will be served after the meeting. Chas. Warren Hunt, Secretary.

South Division Civic Association of Milwaukee.

—At a meeting March 23 the following officers were elected: First vice-president, Anton Lohr; second vice-president, A. P. Kunzelmann; third vice-president, Fred W. Reuter; fourth vice-president, W. J. Kroeger; secretary, George C. Nuesse. During the year the association has backed many improvements that have been put into effect. The following are claimed to be in whole or in part due to its activity: A high pressure water supply on the south side, creation of the office of tree warden, public comfort stations, agitation to clean up yards and houses, opening of the school halls to non-sectarian meetings, supplying of schools with trees and shrubs on Arbor Day, cross-town car line agitation, proposed Chicago & North-Western station, removal of poles and wires from National avenue, selection of the Fifth Ward Park after indecision for eight years, abatement of offensive Menomonee Valley smells, planning by the railroads for track elevation on the south side, rebuilding of Sixteenth street viaduct, greater privileges for children in Eighth Ward Park, bringing of track elevation experts to the city, abatement of the smoke nuisance in the Menomonee Valley.

Civic League, Petersburg, Va.—A committee has been appointed to look into the methods of garbage disposal in other cities.

Calendar of Meetings

- April 6-8.**
American Electrochemical Society.—Annual Meeting at New York City.—Secretary, Joseph W. Richards, Lehigh University, South Bethlehem, Pa.
- May.**
City Commission Congress.—Meeting. Galveston, Tex.—Mayor Lewis Fisher, Chairman of Committee, Galveston, Tex.
- May 11.**
Massachusetts Highway Association.—Quarterly Meeting in conjunction with the New England Conference on Street Cleaning, Springfield, Mass.
- May 15-17.**
National Conference on City Planning.—Philadelphia, Pa.—Flavel Shurtleff, Secretary, 19 Congress street, Boston, Mass.
- May 18-19.**
Ohio Society of Mechanical Steam and Electrical Engineers.—Annual Convention, Youngstown.—F. E. Sanborn, Secretary, Ohio State University, Columbus.
- May 23-25.**
National Fire Protection Association.—Annual Meeting, New York City.—F. H. Wentworth, Secretary, 87 Milk St., Boston.
- May 23-26.**
National Good Roads Association.—Fourth National Good Roads Congress, Birmingham, Ala.—J. A. Rountree, Secretary, Birmingham, Ala.
- May 29-June 2.**
National Electric Light Association.—New York City.—T. C. Martin, Secretary, 31 West 39th St.
- June 5-14.**
National Probation Officers' Association.—Boston, Mass.—Roger N. Baldwin, Secretary, 903 Security Building, St. Louis, Mo.
- June 6-10.**
American Water Works Association.—Thirty-first Annual Convention, Powers Hotel, Rochester, N. Y.—John M. Diven, Secretary, 14 George street, Charleston, S. C.
- June 7-14.**
National Conference of Charities and Correction.—Boston, Mass.—Alexander Johnson, Secretary, Ft. Wayne, Ind.
- June 7.**
National Association for the Study and Prevention of Tuberculosis.—Denver, Col.—Dr. Livingston Farrand, Executive Secretary, 105 East Twenty-second street, New York City.
- June.**
New England Conference on Street Cleaning.—Springfield, Mass.—Corresponding Officer, Carol Aronovici, 55 Eddy street, Providence, R. I.
- June 11-16.**
International Association of Chiefs of Police.—Eighteenth Annual Convention, Rochester, N. Y.—Major Richard Sylvester, Superintendent of Police, Washington, D. C., President.
- June 13-18.**
New York State Association of Chiefs of Police.—Annual Convention, Rochester, N. Y.
- June 13-16.**
American Society of Civil Engineers.—Annual Convention, Chattanooga, Tennessee.—Charles Warren Hunt, Secretary, 220 West 57th St., New York.
- June 21-22.**
National Conference of Poor Law Officials.—Boston, Mass.—Dr. Robert W. Hill, President State Board of Charities, 105 East Twenty-second street, New York City.
- August 15-18.**
Firemen's Association of the State of New York.—Watertown, N. Y.—A. H. Otto, Secretary.
- September 19-22.**
American Hospital Association.—New York City. J. N. E. Brown, M.D., Secretary, Toronto General Hospital, Can.
- September 24-30.**
International Congress on Tuberculosis.—Rome, Italy.—Professor Ascoli, Secretary-General, Via Lucina, Rome, Italy.
- September 26-29.**
American Society of Municipal Improvements.—Grand Rapids, Mich.—A. Prescott Folwell, Secretary, 239 West Thirty-ninth street, New York City.
- October 4-6.**
League of American Municipalities.—Annual Convention, Atlanta, Ga.—John MacVicar, Secretary, Des Moines, Ia.

PERSONALS

ARNOLD, W. C., Democratic candidate for Mayor of Weston, W. Va., was elected by a good majority.

COOMS, P. H., has been appointed City Engineer of Bangor, Me.

CREIGHTON, GEORGE, has been appointed Street Commissioner of Nyack, N. Y., succeeding Michael Crowley.

DEARBORN, G. W., has been elected Mayor of Amherst, Va., succeeding C. L. Scott, resigned.

GRAINGER, CHARLES F., of Louisville, who is president of the Board of Water Works, has been reappointed a member of the board by Mayor W. O. Head.

GREENE, L. O., Mayor of Albert Lea, Minn., was thrown from his automobile and sustained severe injuries. City Engineer Barneck was also thrown out and severely injured.

HALDEMAN, B. A., assistant engineer of the Comprehensive Plans Committee, read a paper before the Engineers' Club of Philadelphia on March 18 entitled "A Review of the Progress of City Planning."

HOLLIBAY, ALEX, Socialist candidate for Mayor of Two Harbors, Minn., was elected by an overwhelming majority.

HOPEMAN, A. M., has resigned as City Engineer of Fargo, N. D., to become President of the newly organized Hopeman Engineering & Construction Company.

HUGO, F. M., Mayor of Watertown, N. Y., gave a talk on Municipal Government before the Fortnightly Club of Oswego last week.

JONES, JOHN A., has been re-elected City Engineer of Lewiston, Me.

MACARTNEY, MORTON, has been reappointed City Engineer of Spokane, Wash.

MURPHY, M. D., has been appointed Street and Sewer Director of Wilmington, Del., succeeding John G. Gray, whose term expired.

NEWMAN, FRANK, has been appointed City Marshall of San Antonio, Tex., to succeed Charles T. Van Riper, deceased, who had been Chief of the Police Department for several years.

NISSLER, C. C., has been appointed City Engineer of Lewistown, Mont., succeeding O. F. Wasmansdorff, resigned.

RICKARDS, BURT R., formerly chief of Laboratories for the Ohio State Board of Health, has been appointed Associate Professor of Municipal and Sanitary Dairying at the Agricultural College of the University of Illinois.

SEESTED, HENRY M., has been appointed Inspector of Roads, Bridges and Culverts, Kansas City, Mo.

SHIELDS, BERNARD J., has been appointed Assistant Chief of the Fire Department of Albany, N. Y.

STANFORD, H. CLAY, has been elected Mayor of Kissimmee, Fla.

SWIFT, RODNEY, will serve again as engineer for Auburn, Me. At a recent meeting of the Water Commissioners Mr. F. E. Bisbee was elected Superintendent and Mr. L. L. Rand, Engineer.

TIMMONS, JOHN H., formerly of Niagara Falls, has been elected Mayor of the Village of Mayville, Chautauqua County, N. Y.

TURPIN, J. R. E., City Engineer of Rawlins, Wyo., and formerly Assistant Division Engineer of Utah division Union Pacific Railroad, and Lyman Eldridge, formerly Assistant Engineer with the N. Y. C. & H. R. R., have formed a partnership for the general practice of civil engineering, with offices in Hugus Building, Rawlins, Wyo.

TRADE NOTES

Cast Iron Pipe.—Chicago: Inquiries are quite numerous and prices remain firm. Quotations: 4-inch, \$25.50; 6 to 12-inch, \$24.50; 16-inch and up, \$24. Birmingham: The volume of small orders is quite satisfactory. Higher asking prices than those last quoted have been named for the small sizes of water pipe. Quotations: 4 to 6-inch, \$23; 8 to 12-inch, \$22; over 12-inch, average, \$21. New York: Rather more activity is reported in purchases by private companies. Quotations: 6-inch, carloads, \$21 to \$22.

Lead.—Outside sellers of lead are doing a good business, and the buying movement extends all over the East. Contractors who use a large quantity of lead in conduit work have been buying large quantities. Quotations: New York, 4.45c; St. Louis, 4.30c.

Where Guessing Stops.—Under this caption the Knickerbocker Company, Jackson, Mich., manufacturers of the Coltrin concrete mixer, is sending out an attractive folder calling attention to the fact that to-day concrete work is exacting and that specifications must be closely followed. The advantages of a concrete mixer which regulates the proportions accurately and automatically are accordingly obvious.

Factory Location.—A company which proposes to erect an auto-sweeper plant, reported to be the Emerson Contracting Company, No. 1 Madison avenue, New York, is seeking a location for a factory to employ about 50 men in New Castle, Pa. The Board of Trade is endeavoring to facilitate the negotiations which contemplate the use of river front privileges which belong to the city. In addition to the frontage the company will purchase land to the value of about \$15,000.

Indian Road Oil.—One of the hand-somest brochures that has been received at the office of the MUNICIPAL JOURNAL AND ENGINEER for many a day is the souvenir of the Grand Prize Race over the Savannah course, Savannah, Ga., November 11-12, 1910, published by the Indian Refining Company, First National Bank Building, Cincinnati, O. The illustrations are of various scenes during the race; the decorations, Florida moss, Spanish bayonet and the like, give a local coloring. A letter from David Bruce Brown, winner of the Grand Prize, says in part: "This course is the finest in the world. The perfect condition of the road is largely due to the treatment of asphalt oil as furnished and applied by the Indian Refining Company, of Cincinnati, O., rendering it free from dust or any tendency to skidding. I think when you stop to consider the short space of time which was given to prepare the road for the practice and race, and the fine condition of the course when the race was ended it leaves no doubt as to the superiority of the Indian Refining Company's asphalt oil as a road preserver."

Value of Water Company.—Officers of the People's Water Company, Millville, N. J., have offered to sell their plant to the city for \$180,000. Some time ago the Water Commissioner fixed the price of the plant at \$222,500, but Council refused to purchase it at that figure. The plant was assessed by the city assessors last year at \$140,000, and from this amount the company appealed to the County Tax Board.

Auto Combination Fire Wagon.—A realistic exhibition of an auto combination hose and chemical wagon made by the Kelley Motor Truck Company, Springfield, O., was given last week in Gloucester, Mass. The machine had been driven from Cambridge, and happened to have its chemical tank charged. While waiting outside of the Dale avenue engine house for the arrival of councilmen who were to inspect it an alarm was sounded. Several firemen jumped in and were taken by Agent Fred A. Howard to the fire, which was on a shingle roof, and was being held in check by a bucket brigade. The chemical stream soon extinguished the fire. The machine weighs 6,800 pounds. It has a capacity of about 1,200 feet of fire hose and 200 feet of 3/4-inch chemical hose. The tank has a capacity of 40 gallons. It also carries two three-gallon hand extinguishers, one 24-foot compound extension ladder, one 10-foot single fire ladder. The engine is of 35-horsepower and can make a speed of about 40 miles an hour.

Unusual Delivery of Concrete Mixer.—The Standard Scale and Supply Company, Chicago, Ill., recently made a quick delivery of a concrete mixer under unusual circumstances. A customer at Gary, Ind., had a breakdown on their mixer, which was of another make, and it was of the utmost importance to have another mixer on the job the next morning. The subject was taken up with the railroad company, and they could not guarantee delivery by freight, and the mixer, which was mounted on truck and equipped with gasoline engine, was too large to conveniently load in express cars, so an automobile moving van was secured and the completed mounted outfit loaded on this van at 6 o'clock in the evening and the next morning at 8 o'clock it was delivered at Gary, Ind., about 30 miles from Chicago, complete and ready for operation. The mixer referred to has a capacity of about 100 yards per day, and because of the Eclipse simple construction it was possible to load the complete outfit without taking it apart, and the machine being of moderate weight, enabled the automobile to handle it without any difficulty even on the country roads.

Informal Bid.—The absence of a single word was responsible for the lowest bidder losing a contract for the laying of over 25,000 lineal feet of cement curb in the borough of Haddon Heights, N. J. W. Penn Corson and Albert D. Pine, both of Camden, were the lowest bidders, with Corson having a trifle the best of it. But when one of the members found that Pine had bid on "screened" gravel while the Corson bid was just for plain "gravel" it was unanimously voted to award the contract to Pine.

Cement and Clay Sewer Pipe.—The Sewer Committee of the Portland Ore., Council has recommended that an ordinance be ordered placed on the ballot at the next election providing for open competition between clay and cement sewer pipe on all sewer work. At present the specifications call for either one kind or the other.

Contractors' Plows.—The Syracuse Chilled Plow Company, Syracuse, N. Y., will add a six-story and basement brick and steel warehouse, 41 x 92 x 213 feet to its plant on Marcellus street. It will be connected with the main factory by an overhead bridge.

Cement Manufacture.—Under the caption From the Raw to the Finished Product, the Chicago Portland Cement Co., Chicago, Ill., has published a 68-page booklet describing the manufacture of Chicago AA Portland Cement. The mills are located at Oglesby, Ill. The whole process is described in an interesting way and handsomely illustrated. The various stages are: Stripping the soil; drilling; excavating, mixing and crushing raw materials; conveying the raw mix to the mill; automatic unloading; drying; grinding; burning; cooling the clinker; grinding, preliminary and final of clinker; weighing and sacking. Altogether it sounds like a good many processes to put a material through which sells for about a dollar and a half a barrel. At the end of the book are separate articles on a new reinforced concrete plant built of the Chicago AA cement; the power house of the cement plant and the installation of a 210-ton McCully crusher.

Blaw Forms.—The Blaw Collapsible Steel Centering Company, Pittsburg, Pa., have published a 150-page book on the Catskill Mountain Water Works for the Extension of the Water Supply of New York City. While intended largely to explain the use of Blaw collapsible forms in connection with this work, the book contains much valuable information and is worthy of a place in a library. A sketch of the history of New York water projects, particularly the various Croton works, occupy the opening pages. An account of the preliminary investigations for a new supply follows. Then are described in succession: The Catskill supply; the Ashokan reservoir; Kensico reservoir; Hill View reservoir; Catskill aqueduct, the cut and cover construction, with description of forms used; grade tunnels; pressure tunnels; tunnel forms; steel pipe siphons; construction camps and sanitary precautions; a list of contractors. A copy of the specifications under which all contracts are done concludes the book. Reproductions of a large number of valuable photographs, perhaps 50 or 75, showing construction work of all sorts and in all stages of progress, are included in the pages.

Canadian Cement Project.—The Associated Portland Cement Company, London, England, is said to be contemplating the establishment of a number of plants in Canada at points scattered from the Atlantic to the Pacific. This would involve the expenditure of millions of dollars in construction.

Pipe Covering.—A company has been organized at Grand Rapids, Mich., to make an improved pipe covering. The principals are Glendon A. Richards and I. H. Wilson.

Pneumatic Service.—The Ohio Mail and Parcel Transportation Company, Cincinnati, O., operating under patents of the American Pneumatic Service Company, Boston, Mass., has applied to the City Council of Cincinnati for a right of way for a pneumatic tube through the streets of the city from the post office to the Grand Central depot. The tube is to be 30 inches in diameter, the largest hitherto ever used being only 8 inches.

Auto Fire Apparatus.—The Robinson Fire Apparatus Company has purchased the corner of Twentieth and Ferry streets for \$30,000. The company manufactures automobile fire engines, and it is understood will enlarge its present quarters on the site.

Concrete Company.—The Hopeman Engineering and Construction Company, Moorehead, Minn., has been organized to take over the business of the late J. V. Godfrey. A. M. Hopeman, formerly City Engineer, is president and manager.

Water Company's Report.—The forty-fifth annual report of the Annapolis Water Company was recently made by President Harry J. Hopkins. The receipts for the year were \$27,343.54 and the disbursements \$20,176.39. The year just closed was remarkable on account of the severe drought which exhausted the reserve in the storage reservoir of 16,000,000 gallons. With a view to averting a recurrence of this condition James H. Harlow, consulting engineer, has been engaged to make recommendations regarding the enlargement of the reservoir and the diversion into the reservoir of a nearby stream.

Crushing Plant.—The Michigan Limestone and Chemical Company, Calcite, Mich., will build a large stone crushing plant this spring. Work will commence this week on the excavations.

Contractors Ahead of Schedule.—The Guild Contracting Company, Chattanooga, Tenn., which is constructing an extensive sewerage system in Charleston, S. C., will complete the pipe laying and pavement repair in about three months, according to City Engineer J. H. Dingle. The company also has the contract for the pump wells and also an outfall sewer, so that they will be at work in Charleston for a much longer time.

Steam Roller.—The Iles Contracting Company, Louisville, Ky., has been incorporated with \$3,000 capital stock by Charles Stilger and others. A steam roller is about the most important item of equipment to be purchased.

Police Signal System.—A factory for the manufacture of a modern police signal system, including a semaphore and red light for the calling of policemen; also a checking system for policemen when they report at regular intervals, may be established in Salt Lake, Utah, in the near future. At police headquarters, Salt Lake, a demonstration was recently made of the new system before prominent members of the city government and police officials. The new system was recently perfected in Salt Lake by Earl J. Kingsley, the inventor.

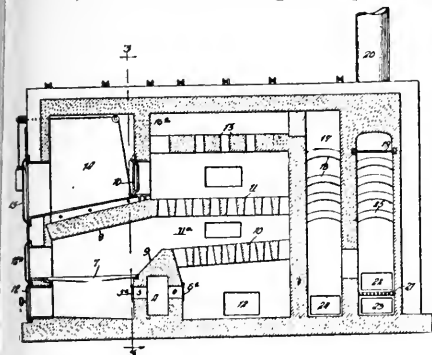
Enlarge Plant.—The pay roll of the James B. Clow & Sons plant at Coshocton, Ohio, shows an enrollment of 251 men, many of whom are high-salaried employees. For the month of January the company paid \$10,600 in wages, and for the month of February \$11,000. The hydroelectric power which will operate the plant was turned on last week. The plant will double its capacity, working a double shift, giving employment to twice the present number of men, making a total of 500. As fast as possible machinery will be added and other improvements made until the company employs the promised number 1,000 men. According to President Himebaugh this date is not in the remote future. Water pipe is one of the principal products of the concern.

Seagrave Auto Apparatus.—The following contracts have been recently received by the Seagrave Company for auto apparatus: Five pieces for Los Angeles, Cal.; 2 for Rockford, Ill.; 1 for Waukegan, Ill.; 1 for Shreveport, La.

PATENT CLAIMS

986,853. MANURE AND GARBAGE INCINERATOR. Gerhardt J. Patitz and Cornelius Sippel, Chicago, Ill., assignor to Kaestner & Co., a Corporation of Illinois. Serial No. 492,401.

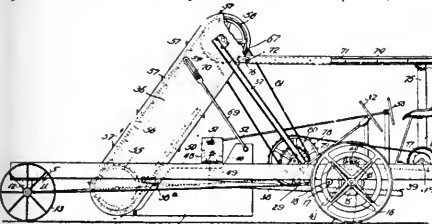
In an incinerator, the combination of a drying chamber and a combustion chamber, having a wall therebetween, a fire chamber below the drying chamber communicating with the combustion chamber, said combustion chamber having an auxiliary grate surface forming the bottom thereof, and an arch forming the top there-



of, said arch having restricted openings in the center thereof, and a relatively enlarged opening at the end thereof, adjacent the wall between the drying chamber and combustion chamber, whereby a ready outlet for the heated gases passing from the combustion chamber is provided adjacent the wall between the combustion chamber and drying chamber, substantially as described.

987,249. DITCHING-MACHINE. Henry Matthies, Chicago, Ill. Serial No. 571,271.

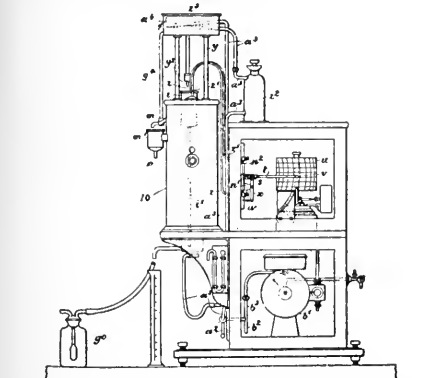
In a ditching machine, excavating elements comprising an endless chain, means for imparting travel thereto, a series of plates mounted upon said chain, shovels



pivotaly mounted at intervals upon said plates, said shovels each comprising a blade and a bifurcated base extending rearwardly from the blade, and a pair of opposed excavating knives mounted upon each side of the shovel.

987,537. RECORDING GAS-CALORIMETER. Clifford Howell Beasley and Fredric George Beasley, Smethwick, near Birmingham, and Richard Henry Bradbury, Oldbury, England, assignors of one-fourth to Parkinson and W. & B. Cowan, Limited, Birmingham, England. Serial No. 555,518.

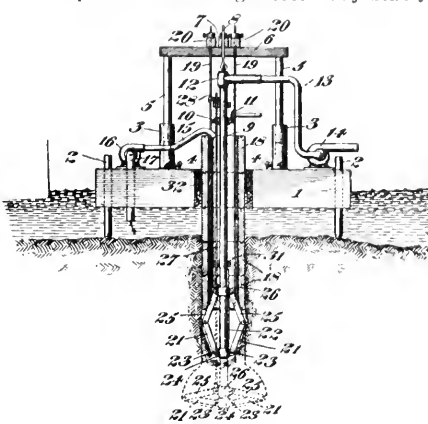
In a gas calorimeter, in combination, a burner, a closed shaft inclosing the burner, a burner connection which passes through the shaft, the latter having a combustion chamber in which the burner is arranged,



water heating tubes through which the products of combustion are forced upon said chamber, and means for supplying air and gas under pressure considerably greater than atmospheric pressure to the burner, the air and gas thus supplied serving to force the products of combustion through said tubes.

987,266. FOUNDATION APPARATUS. Stewart K. Smith, Vintondale, Pa. Serial No. 595,177.

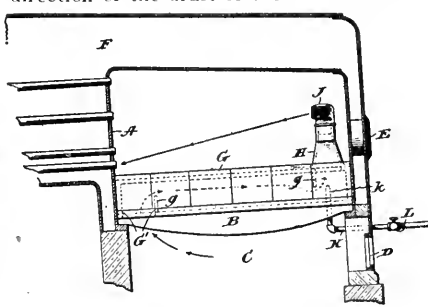
In apparatus of the character described, an expansible cutting tool adjustably



mounted on a hollow shaft, means for revolving the same, and suction or pumping devices connected with said hollow shaft for receiving the excavated material there-through.

987,316. METHOD OF PROMOTING COMBUSTION. John H. Parsons, Ridley Park, Pa., assignor to Parsons Engineering Company, Wilmington, Del., a Corporation of Delaware. Serial No. 556,426. Renewed Oct. 26, 1910. Serial No. 589,262.

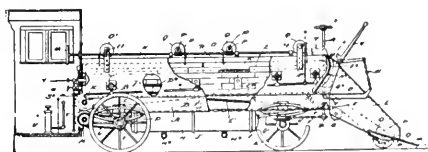
The art of promoting combustion in furnaces consisting in igniting a body of fuel supported on a grate, supplying air below the ignited body of fuel, introducing above said body of fuel heated air in the general direction of the draft of the furnace and in



such volume as to oxidize the combustible gases and consume the carbon particles arising from the body of fuel, the volume and velocity of the introduced air being such as to cause an entraining action on the air passing through the bed of fuel whereby the amount of air passing through the bed of fuel is regulated by the regulation of the volume and velocity of the air introduced above the fuel.

987,343. ROAD-MACHINE FOR MELTING SNOW. Clem M. Brooker, Lakewood, Ohio. Serial No. 563,684.

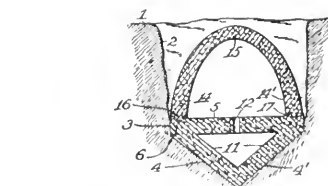
In a snow melting machine, the combination of a fire box, a conveyer traveling



within the fire box, and means to feed snow onto the conveyer by forward movement of the machine.

987,398. SEWER CONSTRUCTION. Joseph L. Potter, Indianapolis, Ind. Serial No. 587,525.

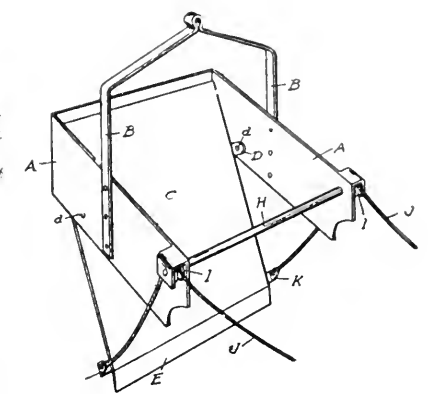
A sewer comprising base sections having each a triangular external contour in cross-section, the sections having flat tops and



joined together, and main sections upon the flat tops of the base sections and joined together, the main sections extending across the joints between the base sections.

987,352. APPARATUS FOR EXCAVATING AND TRANSPORTING SOIL AND SIMILAR SUBSTANCES. George E. Field, Comstock, N. Y., assignor of one-half to Atlantic, Gulf and Pacific Company, a Corporation of West Virginia. Serial No. 453,199.

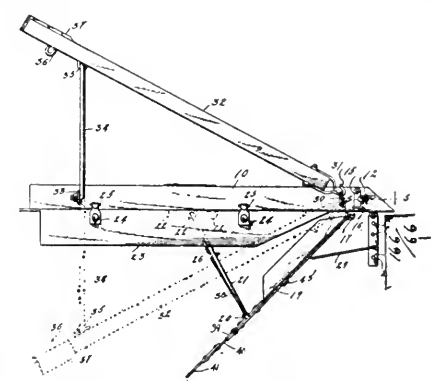
A bucket provided at its front end with a securing device, and at its rear end with



two pulleys arranged at an angle to the horizontal axis of the body-portion of the bucket, and separated sufficiently to permit a cable to pass between the same.

987,476. DITCHING AND GRADING MACHINE. John D. Martin, Owensboro, Ky. Serial No. 597,498.

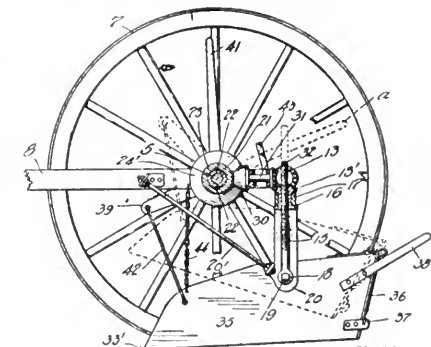
A machine of the class described, comprising a beam, a scraper blade hinged to the forward end of the beam, means for securing said scraper blade in different angular adjustments with respect to the



beam, an arm swingingly mounted on said beam for movement from one side thereof to the other, and an earth engaging blade carried by said arm adapted to be actively disposed when the arm is moved to a position on the opposite side of the beam from the scraper blade.

987,621. SELF-LOADING CART. Norman L. Goodwin, Tacoma, Wash. Serial No. 569,215.

In apparatus of the class described, the combination with an axle, a frame secured to the axle and wheels journaled upon the axle ends, vertically movable rods, a scraper tiltably connected to said rods, mechanical connections between one of said



wheels and said rods for effecting the raising and lowering of the rods with corresponding movements of the scraper, and means for tilting the forward end of the scraper downwardly for loading purposes and upwardly to enable the load to be discharged from the rear end of the scraper.

THE WEEK'S CONTRACT NEWS

Relating to Municipal and Public Work—Street Improvements—Paving, Road Making, Cleaning and Sprinkling—Sewer Water Supply and Public Lighting—Fire Equipment and Supplies—Bridges and Concrete Work—Sanitation, Garbage and Waste Disposal—Police, Parks and Miscellaneous—Proposals and Awards

To be of value this matter must be printed in the number immediately following its receipt, which makes it impossible for us to verify it all. Our sources of information are believed to be reliable, but we cannot guarantee the correctness of all items. Parties in charge of proposed work are requested to send us information concerning it as early as possible; also corrections of any errors discovered.

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREET IMPROVEMENTS				
Massachusetts	Lowell	Apr. 10 noon	Re-paving Clark Run Road	Fred. Drehs, Clk. Bd. Co. Contr.
Massachusetts	Lowell	Apr. 11 noon	Re-paving curb, ditch, cement, coal and trap rock	City Clerk
Massachusetts	Lowell	Apr. 11 noon	Constructing concrete walks	Constructing Quartermaster
Massachusetts	Lowell	Apr. 11 noon	Constructing 4 gravel roads in Ray, Birch and Springfield twps	C. A. Miller, County Auditor
Massachusetts	Lowell	Apr. 11 noon	Constructing 4 gravel roads in Chester Township	J. P. Nottger, County Auditor
Massachusetts	Lowell	Apr. 11 noon	Constructing concrete sidewalks	W. B. Neil, City Comm.
Massachusetts	Lowell	Apr. 11 noon	Constructing artificial stone sidewalks	John F. Boulton, City Clerk
Massachusetts	Lowell	Apr. 11 noon	Improving various streets and avenues	Roger G. McGrath, Secy Bd. Pub. Wk.
Massachusetts	Lowell	Apr. 11 noon	Having approximately five miles, ivex asphalt base, wearing surface, concrete curb and gutter	Z. M. Scifres, City Engr.
Massachusetts	Lowell	Apr. 11 noon	Constructing 8,500 ft. cement concrete curb and 11,500 sq. yds. cement concrete paving	John E. Peck, City Clerk
Massachusetts	Lowell	Apr. 11 noon	Doing construction work to cost \$100,000	J. N. Cox, Secy. Putnam Co. G. R.
Massachusetts	Lowell	Apr. 11 noon	Const. 28,800 sq. ft. macadam road and 800 sq. ft. concrete walk at Madison Barracks	Constructing Quartermaster
Massachusetts	Lowell	Apr. 11 noon	Constructing brick pavement on portion of W. River street	C. S. Butts, City Engineer
Massachusetts	Lowell	Apr. 11 noon	Doing and install. 100 lin. ft. of new granite heblers	Jos. Butts, Secy Bd. C. & Sup.
Massachusetts	Lowell	Apr. 11 noon	Having various streets in Districts 12 and 13	A. P. Bratton, City Clerk
Massachusetts	Lowell	Apr. 11 noon	Constructing concrete or artificial stone sidewalk in various streets	Wm. E. Williamson, Village Clk.
Massachusetts	Lowell	Apr. 11 noon	Finishing road with	John B. Ashe, County Auditor
Massachusetts	Lowell	Apr. 11 noon	Having various roads with gravel and shell	John B. Ashe, County Auditor
Massachusetts	Lowell	Apr. 11 noon	Constructing concrete steel curb on Fourth and Lumber sts.	W. B. Hays, City Clerk
Massachusetts	Lowell	Apr. 11 noon	Constructing road, catch basins, concrete sidewalks, grading and drains complete	F. W. Roswell, Constr. Q. M., U. S. A.
Massachusetts	Lowell	Apr. 11 noon	Paving various streets with sheet asphalt vitrified brick	C. M. Robertson, Clk Bd. Pub. Wk.
Massachusetts	Lowell	Apr. 11 noon	Installation of bituminous macadam	John McNeal, City Engr.
Massachusetts	Lowell	Apr. 11 noon	Paving with various materials from 0 to 2 1/2 city blocks, each block containing about 3,150 sq. yds. with 884 lin. ft. steel curb, concrete curb	M. C. Huddle, Twp. Clerk.
Massachusetts	Lowell	Apr. 11 noon	Gravel and brick with crushed stone two miles of road in Texas tp. including 5,000 tons of asphalt cement or material from which it can be manufactured	R. L. Gregory, Pres. Bd. Pub. Wk. Wilmer Egge, Mayor. County Commissioners.
Massachusetts	Lowell	Apr. 11 noon	Constructing Railroad Avenue	J. M. Stone, County Auditor.
Massachusetts	Lowell	Apr. 11 noon	Grading, draining and paving Webster Pike Road No. 3	W. M. Tredgold, Town Engineer
Massachusetts	Lowell	Apr. 11 noon	Constructing gravel and trap roads in various townships	Grover E. Yerdon, City Clerk. County Commissioners.
Massachusetts	Lowell	Apr. 11 noon	Constructing 8,000 sq. yds. pavement and 2,000 lin. ft. of concrete curb and gutter	A. P. Hilton, City Clk.
Massachusetts	Lowell	Apr. 11 noon	Paving East and West State sts. with bituminous macadam and constructing stone curbs	Edward F. Hennessey, Town Comm. Commissioners of Wood County.
Massachusetts	Lowell	Apr. 11 noon	Grading, curbing and curving Pechenlauben Road	S. Percy Hosker, Chm. St. Hwy. Com.
Massachusetts	Lowell	Apr. 11 noon	Having with vitrified brick about 200 sq. yds.	
Massachusetts	Lowell	Apr. 11 noon	Improving portions of two roads, 2 1/2 miles	
Massachusetts	Lowell	Apr. 11 noon	Grading and macadamizing various county roads	
Massachusetts	Lowell	Apr. 11 noon	Constructing various State highways	
SEWERAGE				
Massachusetts	Lowell	Apr. 11 noon	Doing engineering and construction of sewer laterals etc.	B. J. Gaffney, Clerk.
Massachusetts	Lowell	Apr. 11 noon	Doing engineering and construction of sewer	W. Barnesok, City Engr.
Massachusetts	Lowell	Apr. 11 noon	Doing engineering and laying about 30,000 ft. of 12 in. pipe sewer including manholes etc. separate lines. Also sewer dis. installation etc.	W. F. Heal, City Clerk.
Massachusetts	Lowell	Apr. 11 noon	Doing engineering and sewer, install sewer & sewer lift plant	S. K. Shrivley, Chm. Sewer Com.
Massachusetts	Lowell	Apr. 11 noon	Doing engineering and sewer, install sewer in Sewer Dist. No. 1	Jas. F. Stotler, Village Clerk.
Massachusetts	Lowell	Apr. 11 noon	Doing engineering and sewer, install sewer in various streets	John J. Wenner, Clk. Bd. Pub. Wk.
Massachusetts	Lowell	Apr. 11 noon	Doing engineering and sewer, install sewer in the Hillier district	Edward Arvularious, Twp. Clk.
Massachusetts	Lowell	Apr. 11 noon	Doing engineering and sewer, install sewer in various streets	L. L. McKay, Boro. Secy.
Massachusetts	Lowell	Apr. 11 noon	Doing engineering and sewer, install sewer in various streets	John Skam, Mayor.
Massachusetts	Lowell	Apr. 11 noon	Doing engineering and sewer, install sewer in various streets	F. M. Brewer, City Engineer.
Massachusetts	Lowell	Apr. 11 noon	Doing engineering and sewer, install sewer in various streets	M. M. Higgins, Pres. Sewer Com.
Massachusetts	Lowell	Apr. 11 noon	Doing engineering and sewer, install sewer in various streets	M. J. Scholey, Chm.
Massachusetts	Lowell	Apr. 11 noon	Doing engineering and sewer, install sewer in various streets	O. B. Leland, Asst. City Engr.
Massachusetts	Lowell	Apr. 11 noon	Doing engineering and sewer, install sewer in various streets	Calvin W. Hendrick, City Engr.
Massachusetts	Lowell	Apr. 11 noon	Doing engineering and sewer, install sewer in various streets	James H. Burdett, Secy S. P. C.
Massachusetts	Lowell	Apr. 11 noon	Doing engineering and sewer, install sewer in various streets	City Recorder
Massachusetts	Lowell	Apr. 11 noon	Doing engineering and sewer, install sewer in various streets	City Clerk
Massachusetts	Lowell	Apr. 11 noon	Doing engineering and sewer, install sewer in various streets	F. L. Barnes, Secy Sew. Com.
Massachusetts	Lowell	Apr. 11 noon	Doing engineering and sewer, install sewer in various streets	City Clerk
WATER SUPPLY				
Massachusetts	Lowell	Apr. 11 noon	Doing engineering and water, install water in various streets	C. O. Wood, Chm. Water Com.
Massachusetts	Lowell	Apr. 11 noon	Doing engineering and water, install water in various streets	Chas. A. V. Standish, Secy. B.
Massachusetts	Lowell	Apr. 11 noon	Doing engineering and water, install water in various streets	F. G. Ward, Comm. Pub. Wks.
Massachusetts	Lowell	Apr. 11 noon	Doing engineering and water, install water in various streets	G. B. Healy, Supt. Pks. & Pub. W.
Massachusetts	Lowell	Apr. 11 noon	Doing engineering and water, install water in various streets	W. F. Heal, City Clerk.
Massachusetts	Lowell	Apr. 11 noon	Doing engineering and water, install water in various streets	W. B. Jones, City Clerk.
Massachusetts	Lowell	Apr. 11 noon	Doing engineering and water, install water in various streets	W. M. Pike, Chm. Water Com.
Massachusetts	Lowell	Apr. 11 noon	Doing engineering and water, install water in various streets	L. O. Cowan, City Clerk.
Massachusetts	Lowell	Apr. 11 noon	Doing engineering and water, install water in various streets	Henry S. Thompson, Contr.
Massachusetts	Lowell	Apr. 11 noon	Doing engineering and water, install water in various streets	Capt. Jos. F. John, Com. Q. M. U.
Massachusetts	Lowell	Apr. 11 noon	Doing engineering and water, install water in various streets	J. W. Shumick, Clk. Bd. Contr.
Massachusetts	Lowell	Apr. 11 noon	Doing engineering and water, install water in various streets	J. A. Foster, Pres. Bd. Pub. Wk.
Massachusetts	Lowell	Apr. 11 noon	Doing engineering and water, install water in various streets	F. M. Brewer, City Engineer.
Massachusetts	Lowell	Apr. 11 noon	Doing engineering and water, install water in various streets	Michael Casey, Pres. Bd. Pub. Wk.
Massachusetts	Lowell	Apr. 11 noon	Doing engineering and water, install water in various streets	A. Mattison, City Clk.
Massachusetts	Lowell	Apr. 11 noon	Doing engineering and water, install water in various streets	G. D. Canfield, Chm. W. W. C.

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
BRIDGES				
Pennsylvania	Pittsburg	Apr. 7, 10 a.m.	Constructing reinforced concrete arch bridge	Jos. G. Armstrong, Dir. Pub. Wks.
Indiana	Fort Wayne	Apr. 8, 10 a.m.	Constructing a steel bridge over the Maumee river, also demolishing two old steel bridges and concrete abutments and one culvert, also forming the concrete bridge piers and one culvert, also forming the concrete bridge piers	Calvin H. Brown, County Auditor, John T. Scott, Asst. Knox Co.
Indiana	Vincennes	Apr. 8, 10 a.m.	Constructing 3 bridges in Knox County	Frederick W. Gereke, Chm. Bridge Com.
New Jersey	Camden	Apr. 10, 11 a.m.	Constructing culvert over Bates' Mill Stream, alternate build wooden bridge at same place	Frank M. Holcomb, County Clerk, Board of Co. Comrs.
Kansas	Kansas City	Apr. 10	Repairing 5th St. Bridge over Kansas river	Commissioners Licking County
Ohio	Nenia	Apr. 12, 11:30 a.m.	Con. superstructure & appurtenances of the Louis Hill Bridge	Board of Co. Comrs.
Ohio	Newark	Apr. 12	Constructing various bridges in Licking County	Commissioners Licking County
Pennsylvania	Chambersburg	Apr. 14, 11 a.m.	Erecting reinforced concrete bridge over Mill & Run	B. K. Radt, Chm. County Comrs.
Indiana	Decatur	Apr. 14	Constructing the Abe Reley bridge	Board of Co. Comrs.
Oregon	Portland	Apr. 14, 2 p.m.	Constructing West Portland Bridge	S. P. Fielis, County Clerk
Wisconsin	Kenosha	Apr. 15, 4 p.m.	Rebuilding and altering the St. Bridge	R. H. Mohr, City Engr.
Kansas	Lawrence	Apr. 15, noon	Constructing 2 stone abutments on 1st St. over river span	W. R. Green, County Clerk
Idaho	Moscow	Apr. 15, noon	Constructing bridge across Parula Creek	Homer E. Estes, Chm. Bz. Co. Comrs.
New Mexico	Las Vegas	Apr. 17	Constructing 3 bridges	Lorenzo Delaigo, Probate Clerk
Ohio	Warren	Apr. 17, 1 p.m.	Construct concrete bridge over Little Snyaw Creek, Liberty twp.	Frederick T. Stone, County Auditor
Kentucky	Paducah	Apr. 17	Constructing a reinforced concrete bridge over the Ohio river	L. A. Washington, City Engr.
Ohio	Niles	Apr. 17, 1 p.m.	Constructing concrete bridge over Little Snyaw Creek, Liberty twp.	Frederick T. Stone, County Auditor
Pennsylvania	Wilkes Barre	Apr. 18, 2 p.m.	Constructing sixty bridges	James M. Norris, County Comp.
Pennsylvania	Easton	Apr. 18	Constructing a reinforced concrete bridge	Comrs. Northampton County
Illinois	Aurora	Apr. 20, 2 p.m.	Constructing a new bridge	City Clerk
Illinois	E. St. Louis	Apr. 25	Constructing 3 iron bridges in Madison County	H. D. Sexton, Pres. Bd. Trustees.
LIGHTING AND POWER				
Omaha	Fort Nebraska	Apr. 10, 11 a.m.	Constructing an extension of the electric lighting system at Fort Omaha	Capt. W. L. Clarke, Com. Q. M. U. S. A.
Sask. Can.	Moose Jaw	Apr. 10, 8:30 p.m.	Furn. 2 electrically driven central pumps and auto starters	W. P. Heal, City Clerk
Nebraska	Omaha	Apr. 11, 8 p.m.	Lighting streets with incandescent street lamps, three years including extinguishing, cleaning, repairing and maintaining and painting posts once a year	Dan B. Butler, City Clerk, Robt. J. McQueen, Supt. Lamps & Lt.
Maryland	Baltimore	Apr. 12, 11 a.m.	Supplying ornamental lamp posts	A. B. Campbell, Supt. E. & W. Dept.
Alabama	Troy	Apr. 17	Furn. 1 stationary steam engine 400 H.P., 150 lbs. initial pressure; 1 electric generator, 250 kva., 60 cycles 3-phase, 2,300 volts; 1 pump, electrically driven capacity not less than 300 gals. per minute against 100 lbs. working pressure; 1 motor to drive pump; transmission line material for 3-phase line 3 1/2 miles long, size of wire No. 4 B&S.	Magnus Peterson, Secy. Civic B. Con.
Manitoba, Can.	Winnipeg	May 1, 11 a.m.	Furnishing ornamental lighting standards	A. B. Campbell, Supt. E. & W. Dept. Magnus Peterson, Secy. Civic B. Con.
FIRE EQUIPMENT				
Ohio	Cincinnati	Apr. 7, noon	Furnishing Fire Department during ensuing year with regulation single fire plugs with 2-in. outlets and 3-in. brass nozzles; regulation double cut-off fire plugs with 3-in. outlets and 3-in. brass nozzles; regulation three-way cut-off fire plugs 3-in. outlets and 3-in. nozzles.	Edw. P. Durr, Secy. D. Pub. Safety, Michael J. Pagels, City Clk.
New Jersey	Jersey City	Apr. 7	Furn. 1 first-class steam fire engine & 85-ft. aerial hook & ladder truck	W. D. Spence, City Clerk
Alberta, Can.	Calgary	Apr. 20, noon	Furnishing one combination motor fire engine and hose wagon; one motor hose wagon, one motor 85-ft. aerial truck	T. S. Standeven, City Clk.
New Jersey	Paterson	Apr. 21	Furn. automobile hook and ladder outfit and converting 2 first-class fire engines into gasoline-propelled vehicles	E. M. Updike, Chm. P. & W. Com.
New Jersey	Princeton	July 5	Furn. auto pumping engine	E. M. Updike, Chm. P. & W. Com.
MISCELLANEOUS				
Washington	Seattle	Apr. 7	Collecting garbage	Board Public Works
Kansas	Hutchinson	Apr. 7, 3 p.m.	Sprinkling various streets	Ed. Metz, City Clerk
Wisconsin	Fond du Lac	Apr. 7, 3 p.m.	Sprinkling various streets	J. S. McCullough, Chm. Bd. Pub. Wks.
Minnesota	Duluth	Apr. 7, 10 a.m.	Furnishing from time to time Season 1911, 25,000 ft. white or Norway pine, tamarack lumber or Washington fir, according to specifications.	Olof G. Olson, Pres. Bd. Pub. Wks.
Minnesota	Duluth	Apr. 8, 8 p.m.	Constructing piers of concrete, and moving buildings when piers are finished.	Olof G. Olson, Pres. Bd. Pub. Wks.
Pennsylvania	Bradford	Apr. 10, 5 p.m.	Furnishing automobile for Chm.	E. C. Charlton, City Clerk
Ohio	Ashland	Apr. 12	Erecting city hospital building	F. L. Packard, Architect
New York	Binghamton	Apr. 12	Furnishing 12,000 ft. oak lumber	City Clerk
Kansas	Hutchinson	Apr. 14, 3 p.m.	Sprinkling various streets	Ed. Metz, City Clerk
Ontario, Can.	Goderich	Apr. 15	Erect. municipal building Combined Town Hall and Fire Hall	L. L. Knox, Town Clerk
Wisconsin	Richland Center	Apr. 18, 7:30 p.m.	Erecting 110-ft. or 125-ft. brick or concrete chimney	City Clerk
West Virginia	Moorefield	Apr. 20, 11 a.m.	Constructing new county court house	C. B. Welton, Clk. County Court
Georgia	Waycross	Apr. 20, noon	Constructing jail and tailor's home	H. J. Berry, Clk. C. R. & Rev.
Montana	Glendive	Apr. 21	Constructing new concrete jail and construct steel cells	R. L. Wymann, Clk. Bd. Coun. Comrs.
Ohio	Cincinnati	May 10, noon	Constructing hospital buildings	Messrs. Hannaford & Sons, Arch.

STREET IMPROVEMENTS

Gadsden, Ala.—County Commissioners will consider improvement of road to Curtiston.

Williams, Cal.—Macadamizing of main streets is being considered; plans are being prepared by Engineer Hudson, of San Francisco; work will embrace about 100,000 sq. yds. and will cost \$17,000.

Derby, Conn.—Bids will soon be asked for constructing about one mile of road at cost of \$5,000.—James D. Donahue, City Clerk.

Naugatuck, Conn.—Specifications have been completed for macadamizing Maple st.—Wm. T. Neary, Warden.

Washington, D. C.—District Commissioners have ordered resurfacing of streets at cost of \$167,000.

Bradentown, Fla.—Citizens are urging bond issue for paving additional streets.

West Palm Beach, Fla.—Citizens will vote May 2, extension of time, on \$12,000 bonds for street improvements.

East St. Louis, Ill.—Board of Local Improvements is considering improvement of alley south of Missouri ave.; estimated cost \$1,418; also 38th st. at cost of \$16,590; vit. brick will be used.—Silas Cook, Mayor; W. J. Crocken, City Engineer.

Indianapolis, Ind.—Board of Works has adopted resolutions for improvement of portion of 36 streets and alleys; cost, \$140,540, according to estimate of City Engineer Klausmann.

Washington, Ia.—Citizens have voted in favor of paving streets.

Covington, Ky.—Council has adopted resolutions to extend Wallace ave. through to Rankliek st. and to repave Scott st. between Second and Park place.

Lewiston, Me.—City will lay about 20,000 sq. yd. of bituminous macadam; approximate cost, \$19,000.—John A. Jones, City Engineer.

Baltimore, Md.—City Engineer B. T. Fendall has submitted specifications to the Board of Awards for paving following streets: With vit. blocks, O'Donnell, Luzerne and Courtland sts. and Hargrove alley; with granite blocks, Fremont ave. Barre and Lombard sts. with sheet asphalt, asphalt blocks, bitulithic or vit. blocks, Edmonson, Fulton and Carrolton aves., Mulberry, Oliver, High, Alsqith and Hollins sts.

Snow Hill, Md.—State Roads Commission Trust Bldg., Baltimore, has authorized asking for bids for construction of road from Monrovia to Newmarket in Frederick County.

Everett, Mass.—City Engineer Chris Harrison has reported that \$66,000 will be required for edging stones and sidewalks on orders referred to him for estimates, proposed permanent paving of West St. \$36,000.

Haverhill, Mass.—Block paving of Hill st. at cost of \$18,500 is being considered.

Lansing, Mich.—Committee on Streets has recommended that petition for paving

Grand ave., Michigan ave to Saginaw st., be granted, with brick; also petition that 15th st., from St. Joseph to Isaac st., be paved with concrete.

Marquette, Minn.—Iron County will vote April 12 on \$150,000 bonds for good roads.

St. Paul, Minn.—Cost of improving proposed extension of West Side blvd. about \$15,000.

St. Louis, Mo.—Council has passed ordinances providing for paving of portions of 7th, 21st, 25th, 15th and Howard sts.

Kalispell, Mont.—Council is considering paving of the entire business area of city and has about concluded to use bitulithic paving.—W. H. Whipples, Mayor; A. L. Jaqueth, City Engineer.

Mt. Holly, N. J.—Road Commissioner Stevens has apportioned \$20,000 of State's automobile money to be spent in resurfacing Burlington County roads.

Perth Amboy, N. J.—Laying of bitulithic pavement on Park ave. is being considered.

Trenton, N. J.—Council has decided to pave portion of Highland ave. with fiber-tine on concrete base.—Harry B. Salter, City Clerk.

Ventnor, N. J.—Council is considering general scheme of improvement of the street beds, sidewalks, curbing lines and grades throughout city.

Westfield, N. J.—Road Committee of the Town Council has decided to ask Council to appropriate at least \$12,000 for street purposes.

Woodstown, N. J.—State Road Commissioner Stevenson has approved proposed extension of State Road from bridge over Salem Creek, through West and East ayes to the railroad station, and survey will be made at once.

Batavia, N. Y.—Preliminary plans have been prepared for improving two county highways, as follows: Indian Falls road, part two, from the Batavia-Pembroke highway south to Corfu village line, 1.85 miles, estimated cost \$18,600; the Pavilion-Batavia road, from Wyoming County line north-easterly through town of Pavilion toward Batavia, 4.7 miles, estimated cost \$48,600.

Binghamton, N. Y.—Council has directed the City Engineer to file estimate of cost of resurfacing and macadamizing Chenango st. from brick pav. next to Linden st.

Binghamton, N. Y.—Council is considering calling election May 2 on \$25,000 paving bonds.

Mohawk, N. Y.—Board of Village Trustees has decided to pave Main st.

Niagara Falls, N. Y.—Board of Public Works has decided to improve portion of Sugar st.

Pelham Manor, N. Y.—Bids will be received April 17 for \$13,000 bonds for sidewalk improvements.

Plattsburg, N. Y.—Bids will be received in April for asphalt, brick and concrete paving; cost, \$6,000 to \$8,000.—R. H. Rogers, City Engineer.

Rome, N. Y.—Board of Public Works has decided to order two combination road levellers and scrapers.

Schenectady, N. Y.—Council has adopted ordinances for grading, paving and curbing Hattie st., Ave. A to Mott st., and paving Christer ave.

Syracuse, N. Y.—Plans for new Skaneateles-Camillus County highway have been approved and appropriation for construction authorized by the Board of Supervisors.

Utica, N. Y.—No bids were received by Board of Contract and Supply for paving portion of eight streets.

Valley Cottage, N. Y.—Town Superintendent of Highways Smith is making plans for improving the roads in Clarkstown.

Murphy, N. C.—Murphy Township Highway Commission will issue \$150,000 of bonds for building and macadamizing roads; \$50,000 to be expended at once.—W. H. Woodbury, President.

Akron, O.—City is planning to improve portions of 20 streets.

Barberton, O.—City Engineer Harry Alwin has estimated the cost of improving 3d st., Baird ave. to the Erie Railroad, at \$19,280.

Cincinnati, O.—Improving Young st., Crawling to Dorchester st., with macadam, to the Kircher Construction Co., \$3,548.70.

Cincinnati, O.—All bids for paving of Ludlow ave., Clifton to Brookline ave., with wood block have been rejected by Service Director Sundmaker; work will be re-advertised under new paving specifications.

Coshocton, O.—City has sold \$12,400 paving and sewer bonds to H. D. Beach & Co.

Girard, O.—Street Committee has been authorized to procure machine and "drag" on approval.

Girard, O.—Council will soon ask bids for proposed sidewalk improvements.

Russell, O.—Council has decided to pave number of streets this summer.

Youngstown, O.—Poland Township has voted to permit Township Trustees to continue work of making good roads.

Oklahoma City, Okla.—Council has decided to pave portions of ten streets with Cuban asphalt.

McMinnville, Ore.—Citizens have voted bonds for improvement of streets.

Erie, Pa.—Immediate repair of upper State st. is being considered.

Franklin, Pa.—Council has decided to curb and repave Liberty st.

New Castle, Pa.—Council is considering resolution for issuance of \$47,000 bonds for street and sewer improvements.

Norristown, Pa.—Election will be held in Upper Dublin Township, Montgomery County, May 2, on \$35,000 bonds to provide funds to complete macadamizing and improvement of highways.

Pittsburg, Pa.—Council is considering improvement of South 22d st. bridge at cost of about \$12,000.

Sharon, Pa.—Paving of North Irving ave. is being considered.

Westerly, R. I.—Town has voted \$1,500 for improvement of Shore road, \$5,000 for Beach st. and \$3,800 for improvements at Watch Hill.

Columbia, S. C.—Council is now ready to expend \$100,000 on improvement of streets.

Memphis, Tenn.—Precinct No. 1, which includes Memphis, has voted to issue \$25,000 road bonds.

Morristown, Tenn.—Hamblen County Pike Commission is considering election in April on \$25,000 bond issue for construction of culverts, etc., in connection with resurfac-

ing 25 miles of macadam road.—J. N. Fisher, Chairman.

Crockett, Tex.—Houston County has voted \$150,000 bonds for road construction.

Dallas, Tex.—Municipal Commissioners have decided to ask for bids for grading Bennett Ave.

Goldthwaite, Tex.—Precinct No. 1, Wells County, will vote April 25 on \$25,000 bonds for road building.

Houston, Tex.—Bids will be opened about April 10 by County Commissioners for construction of macadam road from Houston to San Jacinto battlegrounds.

McGregor, Tex.—McGregor Precinct will consider bond issue for building gravel roads.

Paris, Tex.—Lamar County will soon vote on \$300,000 bonds for construction of good roads.

Seguin, Tex.—City has sold \$25,000 street improvement bonds; work is to begin at once.—H. H. Weinert, Mayor.

Marion, Va.—Smyth County will vote May 2 on \$250,000 bonds for road improvements.

South Hill, Va.—Petition is being prepared asking for \$60,000 bond issue for road improvements.—Mack Pritchett, City Clerk.

Port Angeles, Wash.—Grading of Oak and 1st sts. is being considered.

Walla Walla, Wash.—County is considering petitions for five roads.

Platteville, Wis.—Contract will soon be let for about 9,000 sq. yds. of paving on concrete foundation.—W. G. Kirchoffer, Madison, Engineer.

Coquitlam, B. C., Can.—By-law to raise \$150,000 for road purposes is being considered. J. R. Grant, New Westminster, is interested.

CONTRACTS AWARDED

Demopolis, Ala.—To E. B. Barnes, city, for constructing 10 blocks, each 300 ft., of cement sidewalks in residence section.—Jesse G. Whitfield, Engineer in Charge.

Fairfield, Cal.—By Board of Trustees, to W. B. Connelly to macadamize street from Union ave. westward to city limits, about \$10,000.

Redondo, Cal.—To Venable & Morrell, city, for improving Emerald st. with petroliothic paving, cement curbs and gutters, \$19,600; to W. C. Henderson, 3030 North Main st., Los Angeles, for improving Guadalupe st. with petroliothic paving, cement curbs and gutters, \$26,100.

Adel, Ga.—Building graded highway from Adel south to Lowndes County line, to H. E. Warwick, city.

Orleans, Ind.—Construction of gravel road in Paoli Township, to Edward Johnson, Orleans, \$6,350.

Paoli, Ind.—Constructing gravel road in Paoli Township, to Elwood Johnson, Orleans.

Muscataine, Ia.—Paving Districts Nos. 28 and 29, to Wm. Horrabin, Iowa City, as follows: 21,284 sq. yds. 1½-in. bitulithic pavement, \$1,803; 12,679 lin. ft. 24-in. concrete curb and gutter, 56c; 624 cu yds. ballast under street railway, \$1,40; 301 lin. ft. 18-in. concrete curb and gutter, 56c; 301 lin. ft. 18-in. curb and gutter to old curb, 28c; 7,600 cu yds. grading, 35c; 4,894.5 lin. ft. street railway, brick 7 ft. wide, \$1.24; reset old curb, per lin. ft., 25c; overhaul, per cu yd., 1½c; new 24-in. gutter to old curb, per lin. ft., 30c; 4-in. tile drain, per lin. ft., 25c; broken stone drain, per lin. ft., 25c; total, \$54,340; totals of other bidders: Warren Bros. Co., New York, N. Y., \$57,105; Burlington Construction Co., Burlington, \$57,823; Independent Construction Co., Davenport, \$56,910; D. F. Keeler & Co., Davenport, \$62,585.

Red Oak, Ia.—Laying 25,411 sq. yds. brick block paving, 3,312 yds. concrete pavement, 9,368 ft. curb and gutter and 600 ft. straight curb, to Hamilton & Schwartz, Shenandoah, \$1.83 per sq. yd. for brick.

Sault Ste. Marie, Mich.—Construction of sidewalks during year, to Curran & Clement, \$27,995; other bidders: W. F. Grant, \$33,320; H. A. Weston, of the Maple Leaf Paving Co., \$31,461; David Jannison, \$31,500.

Kansas City, Mo.—To J. C. Nichols, to construct two miles of tarvia macadam pavement between 55th and 59th sts., Wornall road and Summit st.

Newark, N. J.—Paving Gouverneur st., to J. F. Shanley Co., \$6,656; South 18th st., to Standard Bitulithic Co., \$67,671; Renner ave., to Standard Bitulithic Co., \$22,689.

Perth Amboy, N. J.—To Hastings Pavement Co., 25 Broad st., New York, for improving Fayette and other streets, \$36,632.

Albany, N. Y.—Building State roads: Road No. 639, Ontario County, to James Stewart & Co., New York, \$88,900; Road No. 5081, Ontario County, to John E. Johnston, Buffalo, \$73,155; Road No. 833, Otsego County, to Thomas Meehan & Sons, Philadelphia, \$45,593.39; Road No. 875, St. Lawrence County, to James Stewart & Co.,

\$57,950; Road No. 876, St. Lawrence County, to James Stewart & Co., \$34,350; Road No. 878, St. Lawrence County, to A. J. Roodwood, Rochester, \$69,800; Road No. 7, Saratoga County, Herlihy Contracting Co., Glens Falls, \$38,896; Road No. 815, Saratoga County to Herlihy Contracting Co., \$70,000; Road No. 793, Schenectady County, Schenectady, Vischers Ferry route, to Thomas P. Shaughnessy Co., Albany, \$22,300; Road No. 888, Schenectady, Duaneburg route, to Thomas P. Shaughnessy Co., \$24,400; Road No. 5086, Schoharie County, to Catskill Construction Co., \$63,000; Road No. 3, Seneca County, to Schroeder-Hicks Construction Co., Rochester, \$33,700; Road No. 5088, Warren County, to Santononi Construction Co., Newcomb, \$22,490; Road No. 802, Washington County, to Theodore Hailes, Jr., Albany, \$50,480; Road No. 508 to Thomas Grady & Co., Rochester, \$59,880; Road No. 882, Cortlandt County, to John J. Weidman, Syracuse, \$24,748; Road No. 507, Cortlandt County, to S. P. Hull, Cortlandt, \$7,503.

New York, N. Y.—Regulating, repaving, grading, etc., various streets, to L. Moran, \$17,632; to Londino & Gallo, \$4,500; and to Anita Construction Co., \$4,064.

New York, N. Y.—Furnishing 10,000 cu yds. of Hudson River road gravel, by Pa. Board, to Henry Steers, 17 Battery pl., \$2. per cu. yd.; other bidders: Robert T. Boy, 515 Eastern Parkway, Brooklyn, \$2.24 per cu. yd.; John J. Fleming, 38 Park Rd., \$2.65 per cu. yd.; paving, regulating, widening, etc., several streets in Borough Manhattan, to Jacob E. Conklin, 299 Broadway, contract No. 1, \$28,200; to Hastings Pavement Co., 25 Broad st., contract No. 12,468; to Asphalt Construction Co., Madison ave. and 137th st., contract No. 3, \$11,731; contract No. 4, \$5,620; to Edward Handy, 2342 Morris ave., contract No. 14,061; to D. W. Moran, 562 Burnside av., contract No. 6, \$14,780.

Rochester, N. Y.—Paving Liberty st. with Medina block, to Brooks & Julian, \$1,463.80. St. Paul st., Lowell st. to Driving Park av. to Whitmore, Rauber & Vicinus, \$83,397.70.

Utica, N. Y.—Paving North Genesee st. to John R. Baxter, Jr., \$21,318.80; Shawmut vit. brick will be used.

Hamilton, O.—Building Columbia bridge, road, to Graver Contracting & Transfer Company, city, \$15,085.84, using Covington or Piqua stone in the lower course and New Paris stone in upper course with Tarvia binder; same company bid \$14,835.98 for bound macadam; \$15,135.75 on Standard macadam "C," and \$15,685.68 on Carbo-Via. Other bidders: Horace Shields, city, water bound macadam, \$15,999; Carbo-Via, \$16,550.65; Standard binder "C," \$16,300; Wilson Engineering & Contracting Co., Xenia, water bound macadam, \$14,200; Carbo-Via, \$18,400; Standard binder "C," \$18,350; Tarvia "X," \$18,300. A. W. Transfer Co. & J. H. Trunk, city, water bound macadam, \$15,632.58; Burmudas asphalt, \$17,500; American asphaltum, \$19,950; standard asphalt, \$16,980.—Jas. Wonders, State Highway Commissioner.

Ravenna, O.—To E. E. Morgan and H. Green, city, \$75,971.83 for building portion of Kent-Ravenna road.—Jas. C. Wonders, State Highway Commissioner.

Delaware Water Gap, Pa.—Constructing 2½ miles of macadam road in the borough of E. P. Arbogast, Stroudsburg.

Hazleton, Pa.—Building street crossing, etc., to Frank DeLuca, street crossing, \$9c; cross gutters, 68c; side gutters, 30c.

Providence, R. I.—Furnishing 275,000 granite paving blocks, to Booth Brothers of the Hurricane Island Granite Company, \$60 per 1000 on one lot of 100,000 blocks, \$61 per 1,000 on a second lot of 100,000 blocks, and \$62 per 1,000 for 75,000 blocks.

Memphis, Tenn.—Street paving aggregating a cost of \$170,516: McNeil st., Jeffers to Union ave., tar macadam, to R. Houston, \$6,690; Walker ave., College st. to Mississippi bldg., tar macadam, to R. Houston, \$13,780; College st., Parkway Kerr ave., tar macadam, to R. C. Houston, \$2,086; Dunlap st., Poplar to Jackson av., tar macadam, to H. P. Streicher & Co., \$22,148; Oliver ave., Rembert to Cooper st., tar macadam, to S. W. Johnson, \$6,830; Darksdale st., Union ave. to Nashville Chattanooga and St. Louis Railroad, bituminous macadam, to F. D. Harvey Co., \$18,642; Bellevue Blvd., Autumn Jackson ave., tar macadam, to F. D. Harvey & Co., \$10,887; Cox st., Central to Madison ave., tar macadam, to F. D. Harvey Co., \$18,222; South Cooper st., Central av. to Parkway, tar macadam, to S. W. Johnson, \$30,477; Jefferson ave., Main to Laderdale st., creosoted wood blocks, to J. Wetterstrom, \$20,227; Mississippi bldg. to Trigg to Kerr ave., brick, to Roach & Mangan, \$11,537; Florida st., Trigg ave., Parkway, brick, to Roach & Mangan, \$7,873.

Sweetwater, Tex.—Laying 11 blocks macadam asphalt pavement, to A. J. Ray.

Bellingham, Wash.—Paving Forest st., to G. Barnett, \$11,726.80; cement walk, to H. Lich, James st. \$1,173, and Young, \$3,900.
Everett, Wash.—Improvement of Summit vye., to E. Kerr Ffolliott, \$9,650; other bidders: J. E. Snyder & Co., \$10,788.40; Atlas Construction Co., \$10,615; Hans T. Ellenon, \$10,140; Cleveland ave., to F. Kerr folliott, \$1,520; other bidders: J. B. Snyder & Co., \$5,531.65; Atlas Construction Co., \$3,24; Hans T. Ellenon, \$5,150.

Victoria, B. C., Can.—Paving View and Fort sts. with asphalt, to Worskick Paving Co.

BIDS RECEIVED

Lynn, Mass.—Building 10,000 ft. curbing: straight curb, per lin. ft., Hooper, Harvey & Co., 67 $\frac{1}{2}$ ¢; David J. Sheehan, 66¢; Hildreth Granite Co., 74¢; Lynn Marble & Granite Works, 71¢; American Granite & Marble Co., 80¢; G. F. Ames & Co., 80¢; Charles E. Mudge, 76¢. Curb circle—Hooper, Harvey & Co., 86¢; David J. Sheehan, 83¢; Hildreth Granite Co., 93¢; Lynn Marble & Granite Works, 91¢; American Granite & Marble Co., 95¢; G. F. Ames & Co., 92¢; Charles E. Mudge, 95¢. Driveways—Hooper, Harvey & Co., 77¢; David J. Sheehan, 75¢; Hildreth Granite Co., 80¢; Lynn Marble & Granite Works, 75¢; American Granite & Marble Co., \$1.10; G. F. Ames & Co., 75¢; Charles E. Mudge, 90¢. Cornerstones—Hooper, Harvey & Co., \$2.75; David J. Sheehan, \$3; Hildreth Granite Co., \$3.50; Lynn Marble & Granite Works, \$4.65; American Granite & Marble Co., \$3.50; G. F. Ames & Co., \$5; Charles E. Mudge, \$5.50. Catch basins—Hooper, Harvey & Co., \$6.20; David J. Sheehan, \$6.50; Hildreth Granite Co., \$7.50; Lynn Marble & Granite Works, \$7.50; American Granite Co., \$9; G. F. Ames & Co., \$8; Charles E. Mudge, \$9.12.

Perth Amboy, N. J.—Paving Lewis, Hobart, King and Fayette sts. with asphalt block: Lewis st., the Barber Asphalt Paving Co., excavation per cu. yd. 95¢., concrete in place per cu. yd. \$6.25, asphalt block per sq. yd. \$1.32; the Hastings Pavement Co., excavation per cu. yd. 1c., concrete \$5.92, asphalt block \$1.56; King st., the Barber Asphalt Paving Co., excavation per cu. yd. 85¢., concrete per cu. yd. \$5.75, old curb reset per lin. ft. 45¢., new curb per lin. ft. 90¢., asphalt block per sq. yd. \$1.37; the Hastings Pavement Co., excavation per cu. yd. 1c., concrete \$5.92, old curb 50¢., new curb 80¢., asphalt block \$1.56; Hobart st., the Barber Asphalt Paving Co., excavation 85¢., concrete \$5.50, old curb 45¢., new curb 90¢., asphalt block \$1.38; the Hastings Pavement Co., excavation 1c., concrete \$5.92, old curb 50¢., new curb 80¢., asphalt block \$1.56; Fayette st., the Barber Asphalt Paving Co., excavation \$1.25, concrete \$6.25, old curb 45¢., new curb 90¢., asphalt block \$1.83; the Hastings Pavement Co., excavation 80¢., concrete \$6, old curb 50¢., new curb 80¢., asphalt block \$1.85.

New York, N. Y.—Paving with asphalt blocks on a concrete foundation Longfellow ave. from Freeman st. to E. 172d st., Hastings Pavement Co., lowest bidder, 4,320 sq. yds. completed asphalt block pavement and keep same in repair for 5 years from date of acceptance, \$1.66; 690 cu. yds. concrete, including mortar bed, \$5.92; 600 lin. ft. new curb, set in concrete, 98¢.; 1,890 lin. ft. old curb, reset in concrete, 33¢.; total, \$12,468; with sheet asphalt on concrete foundation Park ave. West between Morris ave., near 156th st. and 162d st., Asphalt Construction Co., lowest bidder, 2,530 sq. yds. completed sheet asphalt, including binder course and keep in repair for 5 years, \$1.22; 910 cu. yds. concrete, \$4.90;

2,000 lin. ft. new curb, 80¢.; 625 lin. ft. old curb reset, 33¢.; total, \$12,731; with sheet asphalt on a concrete foundation Fox st. from Intervale ave. to Barretto st., Asphalt Construction Co., lowest bidder, 2,530 sq. yds. sheet asphalt pavement, including binder course and keep in repair for 5 years, \$1.04; 445 cu. yds. concrete, \$1.90; 150 lin. ft. new curb, 75¢.; 970 lin. ft. old curb reset, 30¢.; 690 sq. ft. new flag, 26¢.; total, \$5,620; regulating, grading, setting curb, flagging sidewalks, laying crosswalks, building approaches and erecting fences where necessary in the unnamed street connecting Tiebout ave. at intersection of 181st st. with Webster ave. at the intersection of 182d st., E. V. Handy, lowest bidder, 7,450 cu. yds. earth excavation, 80¢.; 5,000 cu. yds. rock excavation, \$1.10; 1,500 lin. ft. new curb, 68¢.; 5,950 sq. ft. new flag, 23¢.; 112 sq. ft. new bridgestone for crosswalks, 45¢.; 150 cu. yds. dry rubble masonry in retaining walls, culverts and gutters, \$1; 120 lin. ft. new guard rail, 10¢.; total, \$14,061; regulating, grading, setting curb, flagging sidewalks, laying crosswalks, building approaches and erecting fences where necessary in Rochambeau ave. from 212th st. to 210 ft. south of Van Cortlandt ave., L. J. Moran, lowest bidder, \$14,780.

New York, N. Y.—Widening 23d st. from 2d ave. to 8th ave., for repaving roadway as widened, as well as the present roadway between 8th ave. and 10th ave., all with wood block pavement: (a) Republic Contracting Co., 18 Broadway, (b) U. S. Wood Preserving Co., 165 Broadway: 23,460 sq. yds. wood block pavement, including sand cushion, except the railroad area. (a) \$3.87, (b) \$2.73; 3,030 sq. yds. wood block pavement, including sand cushion in the railroad area, no guarantee. (a) \$3.87, (b) \$2.73; 100 sq. yds. sheet asphalt pavement, including binder course, (a) \$2.50, (b) \$1.90; 5,100 cu. yds. Portland cement concrete. (a) 1c., (b) \$5.85; 11,120 lin. ft. new blue-stone curbs, (a) 80¢., (b) \$1; 2,000 lin. ft. old blue-stone curbs, reset, (a) 80¢., (b) 40¢.; 300 lin. ft. platform flags, to be cut to line, (a) \$1, (b) \$1.25; 660 lin. ft. new header stone, (a) 35¢., (b) 45¢.; 400 cu. yds. fill, (a) 1c., (b) 5c.; 40 noiseless heads and covers, complete, for sewer manholes, furnished and set, (a) \$15, (b) \$15.50; 10 new corner catch basins, (a) \$250, (b) \$250; 3 corner catch basins, (a) \$250, (b) \$200; 3 side catch basins, (a) \$250, (b) \$200; totals, (a) \$118,448, (b) \$119,275; regulating and repaving with wood block pavement on concrete foundation 2d ave. from 74th st. to 83d st., Republic Contracting Co., 18 Broadway, 11,350 sq. yds. wood block pavement, including sand cushion, except the railroad, \$3.45; 1,060 sq. yds. wood block pavement, including sand cushion in the railroad area, no guarantee, \$3.45; 2,200 cu. yds. Portland cement concrete, 1c.; 2,300 lin. ft. new blue-stone curb, 85¢.; 2,000 lin. ft. old blue-stone curb, reset, 35¢.; 13 noiseless heads and covers, complete, for sewer manholes, furnished and set, \$15; 470 lin. ft. of header stone, 35¢.; total, \$45,851.90; regulating, grading, curbing, flagging, etc., Bennett ave., extending from W. 181st st. to Broadway, opposite Nagle ave., Marrone Contracting Co., 357 E. 116th st., 9,400 cu. yds. earth excavation, \$2.40; 7,500 cu. yds. solid rock excavation, \$1.45; 1,700 cu. yds. loose rock excavation, 1c.; 6,000 cu. yds. filling, to furnish, exclusive of that secured from excavation, \$1.35; 1,800 cu. yds. dry rubble wall, to take down, 50¢.; 1,000 cu. yds. dry rubble masonry for retaining wall and culverts, \$1; 50 cu. yds. concrete for foundations, \$1; 3,300 lin. ft. of guard rail, 15¢.; 7,500 lin. ft. new curb, 50¢.; 28,600 sq. ft. new flagging, \$2; 2,600 sq. ft. new bridgestone, 72¢.; 35 sq. yds. granite pavement, 24¢.; total, \$32,971.

Utica, N. Y.—Paving: Canal st., Breese

st., to Schuyler st., Barber Asphalt Paving Co., with asphalt, \$8,741.12; H. P. Burgard Co., Buffalo, asphalt, \$9,754.75; Fay st., Lafayette st., to Columbia st., Barber Asphalt Paving Co., asphalt with artificial curb, \$2,616.30; with natural curb, \$2,763.80; H. P. Burgard Co., asphalt with artificial curb, \$2,833.25; with natural curb, \$3,066.35; Barber Asphalt Paving Co., railroad strip with brick \$944.20; Hammond sandstone, \$1,212; H. P. Burgard Co., railroad strip with brick, \$910, Hammond sandstone, \$1,170; Root st., Catherine st. to Erie Canal, Barber Asphalt Paving Co., asphalt, \$1,320.30; H. P. Burgard Co., asphalt, \$1,463.15; John R. Baxter, Jr., with Shawmut brick, \$1,518.35; J. W. Johnston, Shawmut, Mack or Corning brick, \$1,440.10; Metropolitan block, \$1,484.10; N. D. Peters, Shawmut or Corning bricks, \$1,469.50, Hammond sandstone blocks, \$1,887.50; Wurz ave., Miller road to North Genesee st., Barber Asphalt Paving Co., asphalt, with artificial curb, \$15,216.10, with natural curb, \$16,298.60; H. P. Burgard Co., asphalt with artificial curb, \$17,105.30, natural curb, \$18,271.40; John R. Baxter, Jr., Shawmut brick and artificial curb, \$17,007.80; natural curb, \$17,787.20, Hammond sandstone and natural curb, \$22,749.40; J. W. Johnston, Shawmut, Mack or Corning brick and artificial curb, \$16,774.-0, with natural curb, \$17,770, Metropolitan block and artificial curb, \$17,351.10; natural curb, \$18,347.10; N. D. Peters, Shawmut or Corning brick and artificial curb, \$17,048, natural curb, \$18,130.50; Hammond sandstone and natural curb, \$23,612.

Youngstown, O.—Bettie ave. grading, J. McGraw, \$943.30; J. Cumisky, \$1,018; E. J. Kane, \$1,032; Miller Bros., \$1,075.50; J. McCarron, \$1,160.50; Kennedy Bros., \$1,124.50; S. H. DeGroodt, \$1,249.50; Anthony O'Haro, \$1,139; M. P. Connelly, \$1,481; J. P. Morrison, \$1,640; William Hynes, \$2,035.

Youngstown, O.—Paving streets: Oak St., Watt St. and Truesdale Ave., Anthony O'Horo, \$27,441.50; H. P. Connelly, \$28,200; Turner & Olson, \$28,439; J. McGraw, \$28,667.30; Kennedy Bros., \$29,060.60; William Hynes, \$29,170; Mullin & Quinn, \$29,284.60; W. E. Gartland, \$29,298; James McCarron, \$29,352.40; P. F. Farragher, \$29,395.30; A. Colucci, \$29,401.80; H. A. Miller, \$29,429.90; Chambers & Heasley, \$29,755.50; E. J. Kane, \$29,777.50; Miller Bros., \$29,987.90; J. P. Morrison, \$29,918.80; J. Comiskey, \$30,149; Youngstown Construction Co., \$30,653.20; Logan Ave., Broadway and city limits, S. H. DeGroodt, \$35,766.30; M. P. Connelly, \$35,901; W. E. Gartland, \$35,995.50; A. Colucci, \$36,230.20; Chambers & Heasley, \$36,419.50; Kennedy Bros., \$36,420.50; Turner & Olson, \$36,467; Youngstown Construction Co., \$36,651.50; James McCarron, \$36,701.50; Miller Bros., \$37,048; J. Comiskey, \$37,423; P. F. Farragher, \$37,491; H. A. Miller, \$37,632.50; William Hynes, \$37,818; Mullin & Quinn, \$37,917.50; J. McGraw, \$37,954.40; J. P. Morrison, \$38,810; Duquesne St., Edwards St. and Greenwood Ave., P. F. Farragher, \$6,872.40; Kennedy Bros., \$6,783.50; J. P. Morrison, \$7,064.50; M. P. Connelly, \$6,837.50; Turner & Olson, \$6,752.70; S. H. DeGroodt, \$6,682.20; J. McGraw, \$7,152.20; James McCarron, \$6,819.50; Chambers & Heasley, \$6,897.80; William Hynes, \$6,900.50; Youngstown Construction Co., \$6,626.10; J. Comiskey, \$6,946; H. A. Miller, \$7,007.70; Mullin & Quinn, \$5,637.50; W. E. Gartland, \$7,157; J. Colucci, \$6,568; Miller Bros., \$6,595.30; Bread-street, Market and Hillman, Mullin & Quinn, \$10,522.75; W. E. Gartland, \$11,177.90; A. Colucci, \$10,936.15; Youngstown Construction Co., \$10,610.50; J. Comiskey, \$11,235.50; E. J. Kane, \$10,752; H. A. Miller, \$11,510.50; J. McGraw, \$10,922; James McCarron, \$10,871.75; Chambers & Heasley, \$11,165.95; William Hynes, \$11,281.50; M. P. Connelly, \$11,274.80; Miller Bros., \$10,494.15; S. H. DeGroodt, \$10,481; J. P. Morrison, \$11,186; Kennedy Bros., \$10,825.80; P. F. Farragher, \$11,009.71; Superior St., Federal and Delaware, S. H. DeGroodt, \$12,574; J. P. Morrison, \$13,236.50; Kennedy Bros., \$13,690.30; P. F. Farragher, \$13,674.70; J. McGraw, \$13,647.70; James McCarron, \$13,036.90; Chambers & Heasley, \$14,074.50; William Hynes, \$12,771.20; M. P. Connelly, \$13,364.20; Turner & Olson, \$13,635.50; Youngstown Construction Co., \$13,911.30; A. Colucci, \$12,658; E. J. Kane, \$13,637.50; H. A. Miller, \$13,071.10; Mullin & Quinn, \$13,072; W. E. Gartland, \$14,528.50; J. Comiskey, \$13,470; Miller Bros., \$13,747.90.

Beaumont, Tex.—Paving Pearl, Main, Milam and other streets: Davis Bros. of Houston, \$2.77 per sq. yd. for wood blocks; James Wellman, bitulithic, \$2; brick, \$2.80; wooden blocks, \$2.88; the Eureka Construction Co., of Tulsa, Okla., bitulithic, \$2; brick, \$2.59; asphalt, \$2.12 wooden blocks, \$2.83; Creosote Wood Block Construction Co., Gulfport, Miss., \$2.70 for creosoted wooden blocks.

Galveston, Tex.—Grading and shelling Lamarque-Texas City road, 1-1.3 miles, W. D. Haden, excavating 17c., embankment 17c., creosoted lumber \$65, pine lumber \$27,

Burlington, Wis.—Bids received Mar. 24 for brick and cement paving, cement curb and gutter; 5,460 cu. yds. of excavation is included in price bid for paving; sand-gravel-crushed stone cost 75c. per su. yd. delivered on streets; contract awarded to Fred Eul, Menasha, \$21,922.15; bid included \$118.10 for retaining curb.

Contractor.	12,645 square yards of cement pavement, 5-inch concrete base.	2,240 square yards of brick pavement, 6-inch concrete base.	5,875 lineal feet of com. curb and gutter 2-ft. gutter.	5,970 lineal feet of cement curb.
1 R. R. Birdsall, Racine, Wis.	\$1.12	\$1.70	\$0.60	\$0.40
2 Jno. Brogan, Green Bay, Wis.	1.23	2.02	.48	.33
3 J. Rasmussen & Sons, Oshkosh, Wis.	1.23 1/2	1.87	.48	.37
4 Western Improvement Co., Racine, Wis.	1.34	1.99	.58	.44
5 N. F. Reichert, Racine, Wis.	1.17	1.66	.53	.40
6 Fred Eul, Menasha, Wis.	1.06	1.85	.45	.27
7 Jas. Cape & Sons, Racine, Wis.	1.22	1.69	.60	.40
8 Chris. Petersen, Kenosha, Wis.	1.09	1.78	.53	.34
9 Thos. Nelson, Racine, Wis.	1.32	1.80	.58	.58
10 Thos. Woolley, LaCrosse, Wis.	1.19	1.71	.49	.29
11 McGrath Construction Co., Green Bay, Wis.	1.26	1.83	.49	.29

Building retaining wall, to Fred Eul, \$1,710; other bidders: Jno. Brogan, \$2,600; Chris. Peterson, \$1,710, and G. M. Agner, Burlington, \$2,280.—P. J. Hurltgen, City Engineer.

excavating culverts 35c., mudshell \$1.98; F. Freund, excavating 15c., embankment 16c., creosote lumber \$65, pine lumber \$35, excavating culverts 17½c., shell \$1.87½c.; Han-son & Sons, excavating 16c., embankment 17½c., creosote lumber \$67, pine lumber \$38, excavating culverts 18½c., shell \$1.89½c.; Suderman & Dolson, excavating 15c., embankment 15c., creosote lumber \$60, pine lumber \$50; excavating culverts 25c., shell \$1.61; J. C. Kelso, excavating 16c., embankment 16c., creosote lumber \$60, pine lumber \$30, shell \$1.94.

Everett, Wash.—Construction of three and a half miles of road between Gold Bar and Index, two sections: For both sections lowest bid was submitted by Ferch & Goss, \$23,168.46; firm will get the work. The bids submitted are as follows: Section D, two miles, A. C. Goerig, \$13,186; Cross, Chadbourne & Rollens, \$12,857; Charles Daley & Co., \$13,607.80; Yost & Waddle, \$22,643.82; American Pile Driving Co., \$15,722; A. R. Swanson, \$17,691.10; Section E, one and one-half miles, A. C. Goerig, \$14,313; Cross, Chadbourne & Rollens, \$12,606; Ferch & Goss, \$12,800.42; Yost & Waddle, \$16,710.76; American Pile Driving Co., \$13,151.

Fort Monroe, Va.—Constructing concrete walks, macadam roads, etc.: R. H. Richardson, Hampton, Va., concrete walks, 13c. per sq. ft.; macadam roads, 98½c. per sq. yd.; catch basins, \$14.39 each; tile drains, 6-in. laid, 22c. per lin. ft.; J. H. Brinson, Hampton, on same items, 12½c., 90c., \$10, 18c.

Fond du Lac, Wis.—Total bid of the John Rasmussen & Sons Co., Oshkosh, for paving 6th st., Main to Fond du Lac ave., with reinforced cement amounts to \$17,792.50; G. H. Stanchfield, city, bid \$17,884.95; John Brogan, Green Bay, \$18,167; McCugo-Bullock Co., city, \$18,272.30, and Christ. Johnson, Oshkosh, \$20,042.10.

Wausau, Wis.—Paving 3d st., (a) with creosote blocks, (b) with vit. brick, price given per sq. yd.: C. Johnson, (a) \$2.53, (b) \$2.36; Advance Construction Co., (a) \$2.71, (b) \$2.42; McGrath Construction Co., (a) \$2.75, (b) \$2.45.

SEWERAGE

Denver, Col.—City proposes to construct lateral sewer in a portion of Sub-District No. 3 at a cost of \$122,319.—J. B. Hunter, City Engineer.

Bradentown, Fla.—Citizens are urging bond issue for extending sewer and water system.

West Palm Beach, Fla.—Citizens will vote May 2, extension of time, on \$16,000 bonds for extension of sewer system.

Barnesville, Ga.—Citizens will vote April 18 on \$50,000 bonds for extension of sewer system, etc.

East St. Louis, Ill.—Board of Local Improvements has passed resolution for formation of sewer drainage district and construction of system of sewers at total cost of \$280,000.—Silas Cook, Mayor; W. J. Crocken, City Engineer.

Anderson, Ind.—Plans are being prepared for 8-ft. sewer from center of city, 1¼ miles south, including dredging of Green Branch Creek; estimated cost, \$100,000.

Indianapolis, Ind.—Board of Public Works has confirmed resolution for sewer system in Jackson Park; cost \$81,600.

Clinton, Ia.—Council intends to repeal all former resolutions and notices in regard to construction of completion of sewer in Sewer District No. 46 and will not take bids on April 4 as contemplated; new bids will be taken about May 2.—K. C. Hart, City Engineer.

Humboldt, Kan.—Council has passed ordinance creating sewer district and calling for construction of such improvements costing about \$20,000.

Jonesville, Mich.—Council has passed resolution to construct sewer along the principal business portion of Chicago st.; total cost not to exceed \$1,540.

Gilbert, Minn.—Village Board is planning to install sewers at cost of over \$30,000.

Chatham, N. J.—Councils of Madison and Chatham have received report from the engineers in charge of joint sewer construction favoring the building of a siphon through Chatham rather than a gravity conduit, portions of which would have to be elevated; additional cost, which will be borne entirely by Madison, will be in neighborhood of \$12,120; report is binding upon towns.

Monmouth Beach, N. J.—Council has decided to install modern sewerage system in near future.—J. P. Manahan, Mayor.

Ocean City, N. J.—Committee from the Board of Trade has reported in favor of \$75,000 bond issue for an adequate and permanent system of surface drainage.

Sparks, Nev.—Council is considering calling election on \$25,000 bonds to construct sewers.

Dunn, N. C.—City has selected White & Piatt, Durham, to prepare plans for sewerage.

Red Springs, N. C.—City has selected White & Piatt, Durham, as engineers in charge of construction of sewer system; surveys are completed.

Coshocton, O.—City has sold \$12,400 sewer and paving bonds to H. D. Beach & Co.

Glaro, O.—Engineer Wilson has estimated cost of storm sewer on State st. at \$6,000 and on Liberty st., \$4,000.

Marysville, O.—J. A. Kimmier, Columbus, will prepare plans for installation of proposed sewerage system.

Niles, O.—Council has authorized Board of Control to ask for bids for construction of sewage disposal plant to cost \$75,000.

Stuebenville, O.—Bids will be received about May 1 for constructing sewers in Stony Hollow road; cost \$14,000.—J. N. Fuch, Engineer.

Lebanon, Pa.—Bids will be received about May 1 for building sewage disposal plant to cost about \$120,000.—W. Crowell, City Engineer.

New Castle, Pa.—Council is considering issuance of \$47,000 bonds for sewer and street improvements.

Blacksburg, Va.—City is considering laying out about 3.5 miles 6-in. and 8-in. sewer pipe.—F. W. Eheart, Mayor.

Lusk, Wyo.—Bids will be received April 17 for \$14,000 sewer bonds.

Regina, Sask., Can.—Citizens have passed \$18,000 by-law for sewerage.

CONTRACTS AWARDED

Ft. Logan, Col.—To National Construction Co., Denver, by the Quartermaster's Department, for construction of a sewage disposal system, \$29,030.

West Dundee, Ill.—Construction of sewer system from plans of J. W. Miller, Elgin, to E. Schefflow, Gary, Ind.

Bridgeton, N. J.—Completion of sewage disposal plant, to T. J. McGovern, Trenton, N. J., \$20,770; other bidders: Hard & Worm, \$22,364.50; Bond & McAlley, \$22,826; Barber & Perrin, \$23,443.20; J. W. Heller, \$23,489; B. F. Sweeten & Son, \$25,682.25.—Clyde Potts, New York City, Engineer in Charge; J. B. Jones, City Clerk.

Lestershire, N. Y.—Building East Main st. sewer extension, to Contractor Serafina, Binghamton, \$1,099.

Niagara Falls, N. Y.—Building tunnel trunk sewer in Lafayette ave., to Read-Coddington, \$45,000.

Rochester, N. Y.—Building sewer on Frank st., to Hagaman, Miller & Hagaman, \$5,787.25.

Cincinnati, O.—By Service Director Sundmaker, sewer Rittenhouse st., to M. F. Quill, \$999.80; Potomac ave. and adjacent streets, to Charles L. Wright, \$8,543.80; West 8th st., to Connelly Construction Co., \$7,353.50.

Dayton, O.—Construction of number of sewer extensions: Edmund st. sewer, to Hecker & Kirchner; Johnson and Morton sts., to John F. Cook; Hart st., to Hecker & Kirchner; Phillips ave., to Shafer & Dill; Orchard ave., to A. J. Kammer; Bickham st., to Shafer & Dill.

Grandview Heights, O.—Furnishing labor and materials necessary to construct sewer with outlet outside of the corporate limits: John C. Beasley, Columbus, \$18,797; Joseph Westwater Co., Columbus, \$23,252; C. I. McCrocken & Co., Columbus, \$19,507.

Newberg, Ore.—To T. S. Shepperd, Portland, for constructing sewer system, \$75,940.

Chester, Pa.—Furnishing 35 No. 1 inlets, to Edmund Butler, as follows: Open mouth, \$87; grate top inlets, \$87.

Rochester, Pa.—Sewering part of Jefferson and Enon sts., to Contractor J. L. Conner, Freedom.

Burlington, Wis.—Building sewers, to C. E. Reed, city, 1,258 ft. 15-in. vit. pipe, 45c.; 938 ft. 12-in. 34c.; 518 ft. 10-in. 28c.; 290 ft. 8-in. 25c.; 7 manholes, \$23 each; 18 10-in. ¼-bent, \$3 each; total bid, \$1,109.96; totals of other bidders: Fred Eul, Manasha, \$1,308.18; Johnson & Thompson, Racine, \$1,213.48; N. F. Reichert, Racine, \$1,335.10; Jas. McCabe, Fond du Lac, \$1,151.45; J. Rasmussen & Sons, Oshkosh, \$1,757.20; McGrath Construction Co., Green Bay, \$1,908.20; John Brogan, Green Bay, \$1,547.32; the Swanson Co., Chicago, \$1,710.60.—F. J. Hurtigan, City Engineer.

BIDS RECEIVED

Wheaton, Ill.—Bids received March 23 for sewer extension: (a) Radcliffe Plumbing & Heating Co., city, (b) the Swanson Co., 834 N. Clark st., Chicago, (c) Chas. M. Porter Co., 702 S. La Salle st., Chicago, (d) G. Maffioli & Son, Rockford, (e) John Hayes Son's Co., Naperville, (f) H. C. Goeltz, Oak Park, (g) Illinois Engineering and Construction Co., 2017 Ogden ave., Chicago; furnishing pipe, 1,764 ft. vit. pipe per foot, (a) 11c., (b) 14c., (c) 13c., (d)

13., (e) 15c., (g) 12c.; 50 "Y" connections, (a) 50c., (b) 30c., (c) 50c., (d) 30c., (e) 50c., (g) 23c.; trenching, laying pipe and back-filling per ft., (f) 5c.; 221 ft. of 5-6 ft. cut, (a) 25c., (b) 35c., (c) 35c., (d) 40c., (e) 40c., (g) 48c.; 1,255 ft. of 6-7 ft. cut, (a) 30c., (b) 40c., (c) 47c., (d) 50c., (e) 50c., (g) 56c.; 400 ft. average 8-ft. cut, (a) 35c., (b) 55c., (c) 58c., (d) 60c., (e) 65c., (g) 32c.; 25 manholes, each, (a) \$17, (b) \$25, (c) \$25, (d) \$25, (e) \$25, (f) \$30, (g) \$20; two lampholes, each, (a) \$5, (b) \$3.50, (c) \$4.50, (d) \$5, (e) \$5, (f) \$6, (g) \$7; one flush tank, (a) \$46.10, (b) \$60, (c) \$60, (d) \$60, (e) \$50, (f) \$60, (g) \$55; hauling and breakage, (a) \$98; extra for cutting and replacing 33 ft. of macadam paving, (a) \$20, (b) \$10, (c) \$10, (d) \$10, (e) \$10, (f) \$6.50, (g) \$10; totals, (a) \$1,032.89, (b) \$1,301.06, (c) \$1,332.52, (d) \$1,380.22, (e) \$1,430.50, (f) \$1,503.96, (g) \$1,570.56.

Baltimore, Md.—Construction of storm water drains, Storm Water Contract No. 12: C. B. Clark & Co., Huntington Ave. and 31st St., city, \$83,246; McCauley-Manton Co., Ave. M and Ocean Parkway, Brooklyn, N. Y., \$88,439; The David M. Andrew Co., \$98,859; The Whiting-Middleton Construction Co., Sexton Bldg., \$99,981; Ryan & Reilly, Coleman Bldg., Philadelphia, Pa., \$99,705; B. F. Sweeten & Son, \$100,646; David Peoples, 60 Knickerbocker Bldg., \$100,415; W. H. & C. F. Thompson, 627 Law Bldg., \$112,228; Wm. McCarthy & Co., \$113,039; James Ferry & Sons, Inc., Grafton Sta., Pittsburg, Pa., \$143,333.—Calvin W. Hendrick, Chief Engineer, Sewerage Company.

Hamilton, O.—Building storm sewer on Hanover st.: Wirtz & Trunk, \$1,090.21; Garver Construction Co., \$1,070.01; W. H. Louthan, \$1,054.02; Frank P. Davis, \$977.50.

North Vancouver, B. C., Can.—Laying storm sewers on Mahon, Chesterfield, St. Georges', St. Andrew's and St. Patrick's aves., from the water front to 3d st.: M. P. Cotton & Co., \$36,972; Palmer Bros., \$40,080.83; Mathew and James McDougall, \$37,146.25; Romino Pinto, \$35,958.25; L. P. Laplacca, \$43,451.62; McAlpine-Robertson Construction Co., \$41,200; R. McLean & Co., \$28,620; W. Allan Kennedy, \$40,449.

WATER SUPPLY

Greenville, Ala.—Citizens have voted \$15-000 bonds for duplicates for water system and to pay off interest on bonded indebtedness.

Gurdon, Ark.—Council has granted 30-year franchise to J. B. and J. G. Gresham to construct water works and electric light plant.

Mena, Ark.—City will expend about \$60,000 on water works improvements.—John Thompson, Chairman Board of Improvements.

Corning, Cal.—Bids will be received about April 20 for construction of water works and sewer system; plans by W. F. Lunning, Red Bluff; cost about \$68,000.

Ontario, Cal.—Bids will soon be asked for construction of three reinforced concrete reservoirs, with capacities of 400,000, 1,000,000 and 2,000,000 gals. each.—F. E. Trask, Homer Laughlin Bldg., Los Angeles, Consulting Engineer.

Santa Ana, Cal.—S. S. Forney, Los Angeles, has petitioned County Board of Supervisors, Orange County, for franchise for 5 years, to lay water pipes in roads.

Alamosa, Col.—Citizens have voted to construct system of water works.

Colorado Springs, Col.—Engineer Hiram Phillips, St. Louis, Mo., has recommended increasing of capacity of water works plant by increasing 16-in. main at cost of \$130,000.

Washington, D. C.—Plans for including cost of high pressure fire service in the appropriation estimates for 1912 are being prepared by District Commissioners and will be forwarded to Congress; cost of the service will amount to about \$750,000, according to the estimates of Water Department.

Bradentown, Fla.—Citizens are urging bond issue for extending water and sewer system.

Ocala, Fla.—Council is considering election on \$100,000 bond issue to either build water works or purchase and improve those now in use.

Barnesville, Ga.—Citizens will vote April 18 on \$50,000 of bonds for extension of water, sewer, light systems, etc.

Fairburn, Ga.—J. B. McCrary & Co., Atlanta, are preparing plans for proposed water works; cost \$30,000.

Macon, Ga.—Water Committee will recommend laying of water mains on river bed in order to furnish water to North Highlands; cost about \$8,000.

Sparta, Ga.—Walton & Wagner, Atlanta, are preparing plans for water works and sewer system; cost about \$35,000.—John D. Walker, Mayor.

Burley, Ida.—Louis C. Kelsey, civil and hydraulic engineer, 402 Dooly Bldg., Salt Lake City, has submitted report and recom-

mendation to Council for construction of water works system; proposed to obtain water supply from wells and pump into a steel tower tank; estimated cost \$45,810.55.

Rockford, Ill.—Citizens will soon vote on \$200,000 bonds for the construction of water works.

Columbus, Ind.—Council has selected engineer to prepare plans for filtration plant.

Montpelier, Ind.—John P. Boyd, receiver for the Light and Water Co., has been given power to expend sum not to exceed \$1,500 for purpose of drilling two or more large water wells.

Anita, Ia.—Town has secured the services of the W. K. Palmer Co., Engineers, 717 Dwight Bldg., Kansas City, Mo., in connection with the remodeling of water works plant and the installation of municipal electric lighting plant and system; total appropriation will be approximately \$30,000; further particulars and information can be obtained from the office of the Engineers.

Brockton, Mass.—City proposes to expend \$125,000 to improve water service.

Longmeadow, Mass.—Board of Water Commissioners has recommended construction of reservoir capable of storing 350,000 gals. of water; also a pump house engine and pump.

Uxbridge, Mass.—Bids will be received about April 15 for laying water mains at estimated cost of \$8,000.—W. E. Rawson, Superintendent.

Grand Rapids, Mich.—Engineers Riggs & Sherman, Toledo, will at once prepare plans for 60-in. intake pipe.

Port Huron, Mich.—Commissioners have completed plans for replacing damaged and broken water mains at north end of city; estimated cost \$8,000.

Pacific, Mo.—Fuller-Coult Co., St. Louis, has been selected to prepare plans and estimates for water works.

Princeton, Mo.—Plans are being prepared by Rollins & Westover, Consulting Engineers, Beals Bldg., Kansas City, Mo., for construction of system of water works.

Jersey City, N. J.—Legislature has passed bill to allow Street and Water Board to spend \$500,000 for renewal of worn-out water pipes.

Woodbury, N. J.—Citizens are urging election of \$75,000 bonds to enlarge water mains.

Holland Patent, N. Y.—Village will build and maintain dam across Beaver Brook to store water.

Red Springs, N. C.—City has selected White & Platt, Durham, as engineers in charge of constructing water works and sewerage system; cost \$35,000; surveys completed.

Fargo, N. D.—Plans and specifications for filtration plant has been approved by Council; plans will contain a provision for municipal electric light plant; bids will be asked; City Auditor was also instructed to advertise for bids for boilers and pumping engines for filtration plant and power house.

East Liverpool, O.—Citizens have defeated proposition to issue \$175,000 bonds to build well water system.

Springfield, O.—Director Klein and Superintendent Cotter, of Water Works Department, will advertise for bids for force main from new to old pumping station in about two weeks.

McAlester, Okla.—Citizens will vote on bonds for building additional dam and construction of pipe line to Gaines Creek for purpose of pumping water distance of 8 miles to present water works; cost \$150,000.

Tulsa, Okla.—Superintendent Sands has recommended purchase of two 150-h.p. horizontal engines with tubular boilers, purchase of one 4,000,000-gal. high pressure pump, one 4,000,000-gal. low pressure pump, 2,000 ft. of 20-in. c.-i. pipe, 3,800 ft. of 14-in. pipe, 11 tons of 14 and 20-in. special pipe, 26,000 ft. of 6-in. and 16 tons of 6-in. special pipe, enlarging and rebuilding of pumping station and additional concrete sedimentation basin to cost \$30,000.

McMinnville, Ore.—City will remove wooden water mains on streets to be paved and replace same with cast-iron mains.

Bradford, Pa.—City proposes to lay 2,490 ft. 6-in. and 260 ft. 4-in. water mains on portions of Clarence pl., Charlotte, Euclid, Palmer and B aves.—B. A. Wise, City Engineer.

Morristown, S. D.—Cost of constructing water works has been estimated at \$10,000.—J. P. Healey, Town Clerk.

Vermillion, S. D.—W. K. Palmer Co., Engineers, 717 Dwight Bldg., Kansas City, Mo., has been engaged as engineers in connection with remodeling of water works system which is soon to be taken over by the city, and also in connection with design and construction of modern electric lighting plant and system; particulars can be had from the office of the Engineers.

Clarksville, Tex.—Citizens will vote April 25 on \$10,000 bonds to make repairs and extensions to municipal water works system.

Kirkland, Wash.—City is considering construction of water system, including drilling of well, erection of standpipe and installation of gasoline pumps.

Regina, Sask., Can.—Citizens have passed \$15,000 by-law for water works.

CONTRACTS AWARDED

San Luis Obispo, Cal.—Furnishing water pipe and connections necessary for a water pipe line from dam to the new reservoir, to H. Reed & Co., city, Conysee lock joint c.-i. pipe and fittings, \$11,146; company bid \$12,669 on steel riveted pipe; to Crane Co., San Francisco, for lock joint pipe, \$11,314; Baker Iron Works, Los Angeles, steel riveted pipe, \$11,734.

Wheaton, Ill.—To John Hayes Son's Co., Naperville, for water extension, 235 ft. of 6-in. pipe, 1 hydrant, etc., \$258.

Boone, Ia.—Constructing water mains from Des Moines River pumping station to the Boone city water works pumping station, together with suction mains at river station, to Des Moines Bridge and Iron Co., Des Moines, \$6,240.

South Bend, Ind.—Board of Public Works has decided to buy 6,800 ft. of pipe from Glamorgan Pipe and Foundry Co., Lynchburg, Va.

Fort Madison, Ia.—To Hagarty & Serog, Keokuk, for the digging of four deep city wells, from which water will be pumped for use in city instead of from Mississippi river.

Boston, Mass.—To Gibby Foundry Co. for furnishing 500,000 lbs., more or less, of iron castings, 2 1/2/1000, per lb.; to Essex Brass Foundry Co. for furnishing composition castings required by the water service, 8,000 lbs. No. 1 composition castings 20 3/4 c., 30,000 lbs. No. 2 composition castings 18 3/4 c.; 8,500 lbs. No. 3 composition castings 14 c.; to United States Cast Iron Pipe and Foundry Co. for furnishing 2,880 tons of class B iron pipe, 6, 8, 10, 12, 16 and 36-in., \$20.70, and 25 tons of special castings for the water service, \$47.

Lynn, Mass.—Furnishing 20 tons of soft pig lead, to C. F. Buckby, Peabody, 4 1/2 c. per lb.

Pittsfield, Mass.—Supplying city with 3,800 tons of water pipe, to Charles Miller & Sons, Utica, \$82,926; other bidders: United States Cast Iron Pipe and Foundry Co., New York, \$83,344; Warren Foundry Machine Co., New York, \$89,024; R. D. Wood & Co., Philadelphia, \$83,252.60; Standard Cast Iron Pipe and Foundry Co., Bristol, Pa., \$86,806.

Lansing, Mich.—Furnishing 3,000-gal. centrifugal pump with 200-h.p. motor, to Allis-Chalmers Co., Milwaukee, \$2,700.

Mount Clement, Mich.—To the Fairbanks-Morse Manufacturing Co., Beloit, to build and install big pumping engine for Municipal Water Works plant; \$5,606 net.

Geneva, N. Y.—Pump to be installed at pumping station, to Snow Pump Works, Buffalo, \$15,000.

New Lexington, O.—Constructing water works, to National Co., South Bend, Ind.

Altus, Okla.—To the Terry Construction Co., Poteau, for completing ditching, about four miles, for water and sewer systems.

Fairfax, Okla.—To J. B. Davidson, 435 Lee Bldg., Oklahoma City, Okla., for construction of water works system.—E. T. Archer & Co., Beals Bldg., Kansas City, Mo., Engineers.

Altoona, Pa.—By Board of Water Commissioners for various supplies for the department: Pipe and special castings, to United States Pipe and Foundry Co., Scottsdale; gate valves, to Daring Pump and Manufacturing Co., Williamsport; fire hydrants, to R. D. Wood & Co., Philadelphia; extension valve boxes, to Bigham & Taylor Co., Buffalo, N. Y.; manhole valve boxes, to J. W. Bain, Altoona; jute packing, to Thos. Jackson & Son, Reading; lead, to Latham Bros. & Co., Philadelphia; brass corporation goods, to Hayes Manufacturing Co., Erie; hauling, to Wilkinson & Co., Altoona; trenching, to Isaac Bender, Altoona.

Wheeling, W. Va.—Building small pump house on hilltop, to U. C. Hamilton & Sons, \$2,090.

Aberdeen, Wyo.—To James Kennedy, Fargo, N. D., for construction of 8,694 ft. of 10-in. and 6,550 ft. of 14-in. water main, \$24,850.

Brandon, Man., Can.—Water works supplies, to James Robertson & Co., Winnipeg, for headpipe, \$1.86 per 100 lbs.; pig lead, \$1.03 per 100 lbs.; to Johnson & Co., Brandon, for brass goods, "Mueller" manufacture

BIDS RECEIVED

Kingsbury, Cal.—Construction of municipal water system, George A. Rogers, \$25,971; Braun, Russell & Williams, \$23,759; F. C. Roberts, \$25,770; Western Engineering & Water Supply Co., \$25,917; P. S. Austin, \$26,310; Pacific Fire Extinguisher Co., \$25,731.

Fort Wayne, Ind.—Furnishing Board of Works 400 tons of 16, 12, 6 and 4-in. water pipe to be purchased for extension and perfecting department's circulating system: United States Cast Iron Pipe Co., \$23.85 straight; Lynchburg Foundry Co., \$23.85 for three sizes and \$24.85 for 4-in. pipe; Glamorgan Pipe and Foundry Co., \$23 for 16-in., \$23.50 for 12-in., \$24 for 6-in. and \$25 for 4-in.; the James B. Clow & Sons Co., \$23.85 for three sizes and \$24.85 for 4-in. pipe.

Bozeman, Mont.—Lining Bozeman Water Works Reservoir with concrete: S. Birch & Sons' Construction Co., Fargo, N. D., \$13,819; Fred M. Brown, city, \$14,510; J. M. Penson, Williston, N. D., \$16,118.80. Bid of the S. Birch & Sons' Construction Co. was as follows: Extra excavation, 85c. per cu. yd.; gravel fill, \$2; concrete footings, \$9.75; waterproofing, 35c. per sq. yd.; reinforced concrete, \$2.—Will S. Hartman, City Engineer.

Norwood, O.—Furnishing 2.75 miles 8 to 12-in. standard t.-c. pipe, Wm. P. Mahoney, lowest bidder, \$16,456.

Grandview Heights.—Furnishing and laying water pipes: James Westmaster Co., Columbus, Ohio, \$31,727; C. T. McCracken & Co., Columbus, \$32,475; T. C. Brooks & Son, Jackson, Mich., \$30,530; Harry T. Shaw, Columbus, \$28,407; William M. Graham, Columbus, \$2,579.

Pittsburg, Pa.—Constructing Mission St. Pumping Station building and appurtenances, Golden & Crick, 3512 Fifth St., lowest bidder, \$94,707.

LIGHTING AND POWER

Cummins, Ark.—Board of Penitentiary Commissioners is considering installation of electric light plant of 200 lights capacity, erection of 15,000-gal. cypress tank, drilling deep well and installation of water and sewerage system at State convict farm.—J. H. Page, Little Rock, Secretary.

Gurdon, Ark.—Council has granted 30-year franchise to J. B. and J. G. Gresham to construct electric light plant and water works.

Boulder, Col.—Highland Power Co. is preparing to construct high-head hydroelectric power plant.—H. von Schon, Wayne County Savings Bank Bldg., Detroit, Mich., Consulting Engineer.

Fort Lauderdale, Fla.—Fort Lauderdale Ice and Light Co. will construct electric light plant.—Henry R. Brown, President.

Barnesville, Ga.—Citizens will vote April 18 on \$50,000 bonds for extension of electric light plant, etc.

Farmington, Ill.—Farmington Light and Power Co. has been incorporated to operate heat, light and power plant; capital, \$30,000.—T. Bass, W. M. Anderson and H. E. Worden, Incorporators.

Elwood, Ind.—Council has granted franchise to manufacture and furnish artificial gas to Elwood consumers to the "home company" consisting of W. H. Hoppenrath and his successors assigned.

Farmland, Ind.—Council has accepted electric light ordinance offered by Ed Goodrich and "Jet" Moorman, Winchester, to light town for \$1,400 a year, plant to be in operation by August 1.

Kendallville, Ind.—Fred Iess, Chairman Light Committee, is interested in proposed installation of boulevard lighting system.

Shoals, Ind.—Southern Indiana Power Co. is preparing to erect power plant and dam.

Anita, Ia.—W. K. Palmer Co., Engineers, 717 Dwight Bldg., Kansas City, Mo., have been secured in connection with installation of municipal electric lighting plant and system and remodeling of water works plant; cost \$30,000.

Fraser, Ia.—The Ft. Dodge, Des Moines and Southern Railroad Co. will construct power plant to cost \$18,500.

Chesterfield, Mass.—E. E. Davis, Engineer, Northampton, is planning to build a dam and power plant along Westfield River.

Danvers, Mass.—Electric Light Commissioners will purchase site for power station and supply current to Middleton Electric Light Co.

Holyoke, Mass.—Plans have been devised for putting wires underground in Holyoke in Main st. from Sargeant to Lyman st., Dwight st., High st. from Prospect to Cabot and between Maple and Railroad and Bond sts.; estimated cost \$100,000.

Buffalo, Minn.—Franchise has been granted to J. A. Bonner to construct and operate electric light plant for 20 years.

Luverne, Minn.—Clausen Engineering Co., St. Paul, has estimated cost of electric light and water plant at \$35,000 to \$41,000.

Tower, Minn.—Citizens have voted \$16,000 bonds to develop power at Park Falls for furnishing light and power to city.

Columbia, Mo.—Water and Light Commissioners have been authorized to advertise for bids for new power house and equipments to cost about \$69,600.—J. S. Bicknell, City Clerk.

Bridgeport, N. J.—Gas plant, destroyed by explosion, will be rebuilt at once.

Elizabeth, N. J.—Estimates on cost of installing and maintaining extra gas lights on Broad st. and Morris ave., as suggested by Mayor Stem, have been submitted by the Elizabethtown Gas Co.

Classboro, N. J.—Bids for installation of an electric light plant at the Gloucester County Almshouse are asked by Board of Freeholders.

Newburgh, N. Y.—Newburgh Light, Heat and Power Co. will erect power station at Balmville; Frank E. Estabrook has submitted plans.

New Castle, Pa.—Council is considering resolution for issuance of \$100,000 bonds for installation of municipal electric light plant.

Oreland, Pa.—The Philadelphia Suburban and Electric Co. has purchased site for erecting gas and electric light plant.

Philadelphia, Pa.—Finance Committee has approved ordinance appropriating \$60,000 for improved lighting of Independence Square and for restoration of Congress Hall.

Summeytown, Pa.—Electric light plant will be built by James S. Miller to furnish light to the surrounding villages.

Lexington, S. C.—Citizens have voted to grant Lexington Electric Light and Power Co. exclusive franchise to furnish lights for town at \$1,200 per year; plant will be installed at once.—W. W. Barr, President of company.

Vermillion, S. D.—W. K. Palmer Co., Engineers, 717 Dwight Bldg., Kansas City, Mo., have been selected as engineers in connection with design and construction of modern electric lighting plant and system and remodeling of water works system.

Memphis, Tenn.—City Commission has passed resolutions asking Legislature to authorize city to issue bonds covering cost of constructing city lighting plant; the result is to be left to popular vote.

Brenham, Tex.—Council is considering installation of gas plant and distributing system; cost of plant will be about \$40,800.

Sunset, Tex.—Lone Star Gas Co. will light Main st. with gas for two years.

Portsmouth, Va.—Council will consider ordinance to compel placing underground of all wires.

Hamilton, Ont., Can.—Board of Control has recommended Council to engage E. J. Sifton, Vancouver, electrical expert, to report on cost of a municipal lighting, power and street lighting system.

Thessalon, Ont., Can.—City is considering installation of electric light plant of power house and installing another boiler, engine and generator.

CONTRACTS AWARDED

Monticello, Ark.—Installation of electric light plant to contain two 72-in. x 16-ft. return tubular boilers, 75 and 100-kw, direct-connected, alternating generators, with switchboards, wiring, piping, fittings, boiler feed pumps, feed water heater and all appurtenances, to the Ball Engine Co., Erie, Pa., for machinery, \$11,725; to Oglesby Bros., Monticello, for concrete building.

Tremont, Ill.—Constructing two reinforced concrete bridges in Elm Grove Township, to Porter-McCulla Contracting Co., Mackinaw.

Columbia City, Ind.—To Fort Wayne Electric Works, for installing electric power system for the village.

Webster City, Ia.—Electric light improvements, to C. E. Atkinson, city, \$9,897; other bidders: W. J. Zitterell, Webster City, \$9,935; Stepson & Peterson, Webster City, \$11,796; Cook Construction Co., Des Moines, \$11,548.

Webster City, Ia.—Erection of municipal electric light and power plant, to C. Atkinson, city, bid covered only the building and was \$9,897.

Franklin, Pa.—Lighting city for nine years, to Franklin Electric Co.

Fairmount, W. Va.—Furnishing two 250-h.p. boilers, to E. Keller Co., Williamsport, Pa., \$6,136.

Strathcona, Alta., Can.—Machinery for the municipal electric plant: One 600-kw generator, to Chapman & Walker Co., Toronto, Ont., \$10,160; to German, Clancey & Gridley, Edmonton, Alta., for Burham regulator, \$750; for engine, to Goldie & McCulloch Co., Galt, Ont., \$12,900; for boilers, to the Canada Foundry Co., Toronto, Ont., \$12,700; for smoke stacks, fans, \$7,304, and two feed pumps, \$1,167.

BIDS RECEIVED

Vineland, N. J.—Engine and generator for power house; For generator, Westinghouse Electric Co., \$2,103; General Electric Co., \$1,850; Rumsey Electric Co., \$1,920; Fort Wayne Electric Co., \$1,600; Triumph Electric Co., \$1,881; for engine, Hoovens, Devens, Rentschler Co., \$2,550; Ball Engine Co., \$3,317; Erie City Iron Works, \$2,710.

FIRE EQUIPMENT

Helena, Ark.—City is planning to build \$5,000 fire house.

Oakland, Cal.—Architect F. D. Voorhees has been selected to prepare plans for erection of \$13,000 fire house on Montgomery st.

Pasadena, Cal.—Citizens will vote April 21 on \$18,000 bonds for auto fire engine, hose cart and hose for Menton st. fire company.

Edison, Ga.—Fire department has been organized with Chas. E. Jennessy as Chief; equipment will be purchased.

Murphysboro, Ill.—Council has decided to purchase 40-gal. chemical engine.—J. L. Schmidgall, Mayor.

Newport, Ky.—Council is considering erection of fire house and improvement of fire alarm system.

Thibodaux, La.—City is considering installation of auto fire apparatus.

Beverly, Mass.—Town has voted \$650 for hose wagon.

Chicopee, Mass.—Residents of Aldenville have asked city for auto truck.

Holyoke, Mass.—Citizens of Aldenville are urging purchase of fire truck.

Monson, Mass.—Engineers have asked town to purchase auto truck.

Pittsfield, Mass.—Finance Commission has recommended \$5,000 appropriation for auto truck.

Southbridge, Mass.—Firemen favor 50-h.p. auto truck with two chemical tanks.

Springfield, Mass.—Council is considering plans for addition to Pine st. fire station and station and tower at North and Patton sts.

Iron River, Mich.—Village will consider purchase of combination hose and chemical wagon, drop harness, etc., on April 6.—Chas. McFarland, Chief; J. B. Henley, Secretary Fire Department.

Reno, Nev.—Council is considering purchase of auto fire engine.

Hollis, N. H.—Purchase of chemical engine is being considered.

Kearny, N. J.—Council is planning to purchase auto chemical wagon.

Perth Amboy, N. J.—Committee on Fire will secure estimates for combination fire wagon for McClellan Engine Co.

Owego, N. Y.—Village is issuing \$15,000 bonds for erection of fire house.

Rensselaer, N. Y.—Ring Fire Company is considering replacing by auto truck of horse and apparatus now used.

Devil's Lake, N. D.—Council will issue \$10,000 bonds for erection of fire station.

Cincinnati, O.—Fire Chief Archibald has submitted to Safety Director Small recommendations for additional fire protection; for California, one combination auto hose and chemical wagon, with the erection of a new fire house; estimate of cost, including the first year's pay to the men, \$23,776; same equipment for Delhi and Sayer, the estimated cost being \$17,776; College Hill and Mount Airy, automobile hose and chemical engine with full complement of men and a new engine house at cost of \$27,075.

Beggs, Okla.—Council will purchase gasoline engine and 500 ft. of hose.

Matamoras, Pa.—Town will organize fire department; 1000 ft. of hose will be purchased.

Port Kennedy, Pa.—Fire company has been organized.—H. S. Hittell, President.

Egerton, Wis.—Council has empowered Committee to purchase and install a fire alarm system; bell tower will also be erected and all yard hydrants will be ordered out.

Worland, Wyo.—Volunteer fire department has been organized.—F. Kent, Chief.

CONTRACTS AWARDED

Lexington, Ky.—By City Council Committee, to Miles Automobile Co., Louisville, lowest of six bidders, for one Knox triple combination engine and hose wagon, \$8,600; one Knox combination chemical engine and hose wagon, \$5,600; 2,500 ft. of hose, one deluge set with patent platform; two perfection holders with patent reducers.

Long Branch, N. J.—Furnishing engine, to American-La France Fire Engine Co., Elmira, N. Y., \$4,700.

Utica, N. Y.—Constructing central fire station on corner of Elizabeth and Burnet sts., to R. Richards & Son, \$50,822; contract for plumbing and gas fitting in building, to the McKeough-Danquer Plumbing Co., \$2,528.

BIDS RECEIVED

Washington, D. C.—Erecting fire house at Rock Creek road and Georgia Ave., N. W.; W. E. Mooney, \$21,175; Arthur L. Smith, \$22,755; Burgess & Parsons, \$23,500; Hoge & Luehert Co., Inc., \$22,432; Allan T. Howison, \$21,965; Skinner & Garrett, \$22,640; Randolph L. Jennings, \$22,780, and W. H. McCray, \$24,943.

BRIDGES

Marysville, Cal.—Supervisors are discussing proposition of building two new bridges in districts of Supervisors Mellon and Casy.

Washington, D. C.—Bridge spanning Rock Creek Park at Colvert st. will be reconstructed at once at cost of about \$12,000; plans by District Engineer Bailey.

Doctortown, Ga.—Wayne County Commissioners, Jessup, and Liberty County Commissioners, Hinesville, are considering construction of bridge over Altamaha River at Doctortown.

Muncie, Ind.—The Delaware County Commissioners are asking for bids for construction of four bridges.

Leavenworth, Kan.—Engineer John O'Neill has estimated cost of erecting bridge across Three Mile Creek on South 3d st. at \$21,319.

St. Paul, Minn.—Plans are being prepared for construction of proposed Great Western bridge over Mississippi River.

St. Louis, Mo.—Mayor Kreismann will recommend election on bonds for proposed municipal bridge.

West Seneca, N. Y.—Town Board has been empowered to build iron bridge across Cazenovia Creek at Lein's Park at cost of \$12,000.

Valley City, N. D.—City will soon ask for bonds for 75-ft. span steel foot bridge, width 6 ft., to be erected at entrance to City Park.—C. A. Mahre, City Engineer.

Hamilton, O.—County Commissioners are considering erection of bridge over Four Mile Creek.

Marion, O.—County Surveyor Edward S. Ault is preparing plans and specifications for abutments of five bridges to be built by County over the Little Scioto River.

Toledo, O.—Arnold W. Brunner, New York, will be employed to prepare the plans for beautification of Cherry St. Bridge, if the recommendation of Service Director Cowell, seconded by Mayor Whitlock, is approved by Council.

Natrona, Pa.—Allegheny and Westmoreland Counties Commissioners are considering erection of bridge between Natrona and Braeburn; cost about \$225,000.

Pittsburg, Pa.—County Commissioners are planning to erect 16 bridges this year at cost of \$281,150.

Pawtucket, R. I.—Council has passed ordinance providing for appropriation of \$20,000 for construction of bridge at North Main st.

Columbia, S. C.—W. G. Childs, J. Pope Matthews, Clarence L. Kibler, Julian B. Friday and G. C. Taylor will constitute Bridge Commission to be named by the Governor to have charge of bond issue of \$75,000 to be used in purchasing or erecting new bridges across Congaree and Broad Rivers.

Galveston, Tex.—Bids will be asked by County Commissioners for erection of bridge at head of Dickinson Bayou.

Lampasas, Tex.—County has voted bonds for erection of bridge across the Lampasas.

Wichita Falls, Tex.—Citizens have voted \$151,000 bonds to build wagon bridge across Wichita River.

CONTRACTS AWARDED

Mount Holly, N. J.—By Burlington County Board of Freeholders, to the Ferro Concrete Co., Harrisburg, to construct bridge at Wallace's Mill.

Petersburgh, N. Y.—Constructing reinforced concrete arch bridge of 85-ft. span over Hoosick River, to Cole-Mortland Co., Bennington, Vt., \$2,700.

Chambersburg, Pa.—Building concrete bridge at Spring st. to Nelson-Merydith Co., \$649; other bidders: Aug. Wolf, \$717.40; A. Buchanan, \$819; Kriechbaum & Son, \$664; Hood st. concrete bridge, to Kriechbaum & Son, \$1,075; other bidders: Nelson-Merydith Co., \$1,648; Aug. Wolf, \$1,379.30; A. Buchanan, \$1,579.

Fredericksburg, Va.—By Spotsylvania Road Board, to I. D. Ireland, Richmond, for building concrete girder bridge over Hazel Run on improved Spotsylvania road, \$1,843.

BIDS RECEIVED

Pittsburg, Pa.—Constructing piers of the new bridge to be erected between the Point and the Northside: Dravo Contracting Co. lowest bidder, \$182,750; other bidders: Crawford Construction Co., \$196,836; C. M. Driven, \$198,737; Charles McDermitt, \$206,000; John Monks & Sons, \$196,950; Missouri Valley Bridge and Iron Co., \$194,500; Drake & Stratton, \$209,500; Friday Contracting Co., \$207,789.

MISCELLANEOUS

Gadsden, Ala.—Comissioner's Court is considering purchase of dump cart for convict gangs to use on road.

Los Angeles, Cal.—C. D. Cox, Detroit, Mich., has been appointed as landscape engineer by Park Commissioners; will map out improvements for various parks of city.

Pasadena, Cal.—Citizens will vote April 21 on bonds for playgrounds.

St. Augustine, Fla.—Mayor Eugene Masters has recommended that asphalt road oil be applied upon all shell streets.

West Palm Beach, Fla.—Citizens will vote May 2, extension of time, on \$32,000 bonds for city dock and sea wall.

Liberal, Kan.—County Commissioners are considering plans for erection of \$10,000 jail.

Henderson, Ky.—Mayor W. I. Thompson will recommend to Council to set aside \$2,000 for purpose of oiling 2d st, Hlinois Central Railroad to Main, and Main for its full length.

Rockville, Md.—Board of County Commissioners are considering erection of jail.

Fitchburg, Mass.—Finance Committee will recommend purchase of auto patrol and ambulance.

Lawrence, Mass.—Special Committee has recommended purchase of auto combination patrol and ambulance.

Somerville, Mass.—Municipal incinerator plant has been destroyed by fire.

Hoboken, N. J.—Council is considering erection of \$100,000 addition to city hall.

Paterson, N. J.—Board of Works has decided in favor of destructor system of garbage disposal.

Ridgefield Park, N. J.—Plans and specifications by C. B. Deer, Preston st., for municipal building to be erected on corner of Hackensack road and Park st., have been adopted by Board of Trustees; bids will be advertised for.

Akron, O.—Board of Control has rejected all bids for erection of public comfort station at Main and Market sts.

Columbus, O.—Ordinance has been approved by Council Streets Committee directing Service Director to purchase 30 horses or mules and 15 sets of double harness for street cleaning department at a total cost of \$7,000.

Columbus, O.—Finance Committee has approved \$43,000 bond issue for municipal removal of rubbish, ashes and manure; money is to provide for purchase of horses and wagons enough to operate system until July 1.

Bend, Ore.—Council has decided to erect \$10,000 city hall.

Prineville, Ore.—Citizens will vote May 1 on erection of \$10,000 city hall; plans prepared.

Woodburn, Ore.—Erection of city hall is being considered.

Fort Worth, Tex.—City is preparing to install police and fire alarm underground

system in business district; cable will be laid in conduits; cost \$30,000.

Bennington, Vt.—Citizens will vote on \$2,000 bonds for erection of city hall.

Olympia, Wash.—City hall to cost \$150,000 will be erected at 3d ave. and Main st.

Milwaukee, Wis.—Committee on Public Buildings has decided to report favorably on resolution to have plans drawn for public bathhouse on the shore of Lake Michigan in South Shore Park.

Milwaukee, Wis.—Council has agreed to issue \$100,000 bonds for contagious disease hospital on south side.

Regina, Sask., Can.—Citizens have passed \$22,000 by-law for street cleaning.

CONTRACTS AWARDED

Middletown, Conn.—Sprinkling streets for coming year, to A. Brazos & Sons, \$2,375.

Boston, Mass.—To J. P. O'Riorden for furnishing teams for watering and oiling streets in the East Boston district, \$5.40 for two-horse hitches; other bidders: Chelis Rossetti, \$5.35; A. De Stefano, \$5.48; Hugh Nawn Contracting Co., \$5.75 for two-horse and \$8 for three-horse hitches.

Boston, Mass.—Watering and oiling streets in various city districts, as follows: South Boston and Dorchester North, to Frank E. Wilson, \$4.88 for 2-horse hitch; other bidders, Thomas F. Lynch, \$5; John H. Winsloe Contracting Co., \$4.94 on 2-horse and \$6.49 on 3-horse hitches; Hugh Nawn Contracting Co., \$5.15 and \$8 on 2 and 3-horse hitches, respectively; Charlestown, to J. P. O'Riorden, for 2-horse hitch, \$5.40; other bidder, Hugh Nawn Contracting Co., \$5.75 for 2-horse and \$8 for 3-horse hitches; Brighton, to Joseph McGreevey, \$5.35 for 2-horse and \$6.50 for 3-horse hitches; other bidders, Hugh Nawn Contracting Co., \$5.75 for 2-horse and \$8 for 3-horse hitches; John Kelley, 2-horse, \$5.45; Joseph Sprissler, \$5.50; West Roxbury, to M. McGinnis & Co., \$5; other bidders, Joseph Sprissler, \$5.50; John Kelley, \$5.45, on 2-horse hitch; Hugh Nawn Contracting Co., \$5.15 on 2-horse and \$8 on 3-horse; Dorchester and Ashmont, to John H. Winsloe Contracting Co., \$4.84 on 2 and \$6.49 on 3-horse hitches; other bidders, John J.

Loonie, \$5.30; Joseph Sprissler, \$5.50; Hugh Nawn Contracting Co., \$5.15 on 2 and \$8 on 3-horse hitches; Roxbury South and Jamaica Plain, to James E. Noble, \$5; other bidders, John Kelley, \$5.25; Joseph Sprissler, \$5.25 on 2-horse hitch; Hugh Nawn Contracting Co., \$5.25 on 2 and \$8 on 3-horse; J. McGreevey, \$5 on 2-horse and \$6.50 on 3-horse hitches; South End and Roxbury North, to Joseph Sprissler, \$4.85; other bidders, N. McCabe & Son, \$4.98; John Kelley, \$5.45 on 2-horse hitch; Hugh Nawn Contracting Co., \$5.25 on 2 and \$8 on 3-horse; James E. Noble, \$5.10 on 2 and \$6.50 on 3-horse; Joseph McGreevey, \$4.95 on 2 and \$6.50 on 3-horse hitches; North and West Ends and Back Bay, to William Gilligan Co., \$5 on 2 and 3-horse hitches; other bidders, John T. Keough & Bro., \$4.85 on 2 and \$6.75 on 3-horse; Hugh Nawn Contracting Co., \$5.25 on 2 and \$8 on 3-horse; Joseph McGreevey, \$5.25 on 2 and \$6.50 on 3-horse hitches.

Boston, Mass.—Additions and alterations to L st. bathhouse, to Christopher F. Brown, \$27,936; other bidders, Rendle & Stoddard, \$29,936; A. Varnerin Co., \$31,844; John J. Flynn, \$32,400; William H. Keyes & Co., \$37,221.

Buffalo, N. Y.—To Velie Motor Vehicle Co., Moline, Ill., to furnish two auto ambulances, \$7,300.

Little Falls, N. Y.—Sprinkling streets, to Owen Rogers, \$680.

Cincinnati, O.—Building Celestial st. steps, to Ross Bros., \$6,892.80; building comfort station and bandstand in Burnet Woods, to Wm. Miller & Sons, \$6,258.

Hazleton, Pa.—Furnishing of metal signs warning autoists to run slow, to T. C. Bright & Co., two lines, \$87. Collecting and removing garbage to Louis Meiss, \$1,500. Cleaning sewer inlets to N. Eposito, \$1,349.

York, Pa.—By Highway Committee of Council for city carting during ensuing fiscal year, to the General Supply and Construction Co., to furnish six one-horse carts and drivers at 23.8c an hour, and John W. Stahle, double teams, when required, at 38c an hour.

Spokane, Wash.—Furnishing police emergency auto, to Metropolitan Motor Car Co., 1318 Second ave., for \$3,500 locomobile.

A product of which pure "Gilsonite" Asphalt is the base—manufactured under processes which make it the most durable, uniform and efficient material known for

Paving, Roofing, Waterproofing, Under-ground Pipe Dips and Coatings, Mastic Flooring, Paving Filler, Wire Insulation

See our advertisement in last issue of this paper or ask us for literature describing its use for any of the purposes named.

STANDARD ASPHALT AND RUBBER CO.
205 La Salle Street, Chicago



Hand-Wiped
Joint

or lead flange, in from one
to eight branch.

Gooseneck Headquarters

ALL SIZES—ANY STYLE—FOR ANY MACHINE
GET OUR PRICES BEFORE PLACING ORDERS

Glauber Brass Mfg. Co. Cleveland

SAVE YOUR TREES

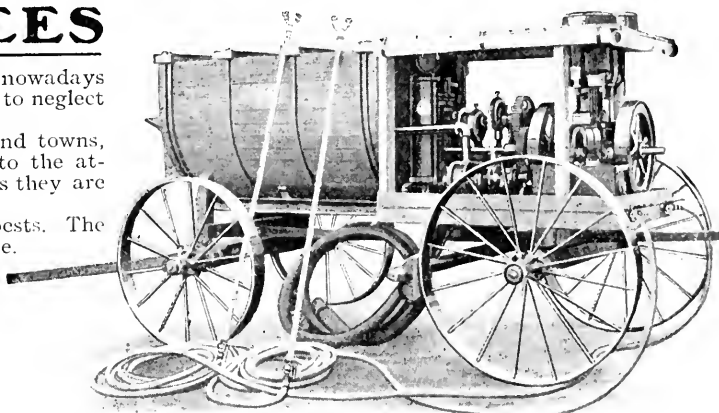
The private citizen who owns a fruit orchard nowadays knows that he might as well cut down his trees as to neglect to spray them.

The large and beautiful shade trees of cities and towns, which by the way add more than anything else to the attractiveness of a place, will surely disappear unless they are sprayed.

It is easy to keep the upper hand of the insect pests. The orchardist does it and takes it as a matter of course.

The cost of a **Spraying Outfit** to "Save the trees" is insignificant as compared with the value of the trees. Drop us a line and we will send you our catalogue, also give you full information on the subject if desired.

THE BEAN SPRAY PUMP CO.
Cleveland, Ohio



TOO LATE FOR CLASSIFICATION

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREET IMPROVEMENTS				
Pennsylvania	Dormont	Apr. 7, 8 p.m.	Grading, curbing and paving portion of Greenmount ave.	H. M. Stille, Chm. Street Com.
Pennsylvania	Edgeworth	Apr. 10, 7:30 p.m.	Grad. and improve. Woodland Rd. with Kentucky Rock Asp.	R. W. Dixon, Chm. Street Com.
Texas	Galveston	Apr. 10, 11 a.m.	Paving with mudshell, clam shell, gravel or other material about 3,500 cu. yds.	John M. Murch, County Auditor.
Pennsylvania	Philadelphia	Apr. 10	Resurfacing and repairing various streets and avenues.	Geo. R. Starns, Dir. Pub. Wks.
Ohio	Cincinnati	Apr. 12, noon	Grading, setting granite curbs and paving with brick portions of Bardes and Benton alleys.	John J. Wenner, Clk. Bd. Pub. Serv.
Ohio	Akron	Apr. 12, noon	Laying sidewalks.	John W. Gauthier Dir. Pub. Serv.
Ohio	Cincinnati	Apr. 12, noon	Grading, setting granite curb and paving with brick portion of Ahler alley.	John J. Wenner, Clk. Bd. Pub. Serv.
Illinois	E. St. Louis	Apr. 14	Improving 38th street and an alley.	Jas. F. Parr, Asst. City Engr.
Ohio	Columbus	Apr. 14, noon	Paving Summit street with asphalt or brick.	City Clerk.
Ohio	Cincinnati	Apr. 14, noon	Grading, setting granite curb and paving with brick portion of Ross Alley.	John J. Wenner, Clk. Bd. Pub. Serv.
Indiana	Rushville	Apr. 15	Constructing macadam road in Anderson twp.; 2 gravel roads in Ripley and Posey townships.	J. M. Stone, County Auditor.
New York	Johnstown	Apr. 17	Paving portion of West and East State streets, about 11,815 sq. yds. bituminous macadam and 3,000 stone curbing and 1,885 sq. yds. cobble gutter.	Grover E. Yardon, City Clerk.
North Dakota	Grand Forks	Apr. 17	Paving various streets.	City Clerk.
New Jersey	Washington	Apr. 17	Macadamizing 6.04 miles of road.	Jos. R. Thatcher, Director.
Ohio	Dayton	Apr. 18, noon	Grading and paving with macadam, brick, sheet asphalt, creosoted wooden blocks or other material various streets and avenues.	J. C. Ely, Dir. Pub. Serv.
New York	N. Tarrytown	Apr. 18	Improvement to highways in the town of Mt. Pleasant.	Edw. F. Hennessey, Town Clerk.
Michigan	Morenci	Apr. 21, 1 p.m.	Paving various streets with brick.	C. R. Kellogg, Village Clerk.
New Jersey	Moorestown	Apr. 24	Constructing macadam road on Central ave. & No. Church rd.	Wm. B. Lippincott, Chm. Twp. Com.
Ohio	Ashland	Apr. 24	Grading and paving with brick Diamond Alley.	Edgar Koehl, City Clerk.
Florida	Jacksonville	Apr. 28, 10 a.m.	Resurfacing St. Johns ave. about 27,000 sq. yds. with as. mac.	Gail L. Barnard, County Engr.
Ohio	Cincinnati	Apr. 28, noon	Improving the Eight Mile road in Anderson township.	Stanley Struble, Pres. Bd. Co. Comrs
SEWERAGE				
Minnesota	Duluth	Apr. 7, 10 a.m.	Extending sanitary sewer in various streets.	Olof G. Olson, Pres. Bd. Pub. Wks.
Ont., Can.	Walkerville	Apr. 11, noon	Constructing brick sewer in portion of Victoria road.	Cecil H. Robinson, Town Clerk.
New York	Binghamton	Apr. 12, 4 p.m.	Constructing sewer in Charles street; furn. vitrified pipe and appur; furn. sewer cleaning machine.	S. W. Murray, Clk. Bd. C. & Sup.
Ohio	Toledo	Apr. 13, noon	Constructing sanitary sewer in various streets.	Fred Shane, Secy. Bd. Pub. Serv.
New York	Buffalo	Apr. 15, 11 a.m.	Constructing 18, 15, 12 and 10-in. sewers in various streets.	Francis G. Ward, Comr.
Iowa	Burlington	Apr. 15	Furnishing a direct connected centrifugal pump and steam turbine; w. w. surface condenser and air pump, etc., etc.	Frank Lawler, Supt. Citizen W. Co.
New York	Fulton	Apr. 17	Furnishing c.i. water pipe and standard castings.	J. A. Foster, Pres. Bd. Pub. Wks.
Ohio	Niles	Apr. 18	Constructing a 3,000,000-gal. water filtration plant.	Board of Control.
New York	East Aurora	Apr. 18	Constructing sewer system including disposal plant, value of work about \$110,000.	Alfred Brotherhood, Pres. Bd. V. T.
Manitoba, Can.	Winnipeg	Apr. 19	Constructing a wooden stave conduit pipe line.	H. N. Ruttan, City Engr.
Ohio	Toledo	Apr. 27, noon	Installing complete high pressure fire system.	John M. Babcock, Clk. of Council.
Florida	Pensacola	May 2	Constructing 15,060 lin. ft. storm water drains from 10 to 66-in. in dia.; and 23,880 lin. ft. of san. sewers from 6 to 24-in.	John A. Merritt, Chm. Bd Bond Tr.
WATER SUPPLY				
Ontario, Can.	Berlin	Apr. 13	Furn. c. i. pipe, hydrants, valves, lead, water tower.	Bowman & Connor, Con. Engr.
North Dakota	Fargo	Apr. 27	Furnishing a high duty crank and fly wheel pumping engine with a capacity of 4,000,000 gals. each 24 hours; constructing a water purification plant complete 4,000,000 gals daily.	E. R. Orchard, City Auditor.
BRIDGES				
Texas	Galveston	Apr. 10, 11 a.m.	Constructing wooden bridge over Todds Bayou.	John M. Murch, County Auditor.
Texas	Galveston	Apr. 17, 11 a.m.	Constructing reinforced concrete bridge.	John M. Murch, County Auditor.
LIGHTING AND POWER				
Ohio	Hamilton	Apr. 13, noon	Furnishing 30 or more ornamental cast iron lamp posts.	C. M. Robertson, Clk. Dept. P. Serv.
MISCELLANEOUS				
Minnesota	Minneapolis	Apr. 11, noon	Furnishing one electric hospital ambulance.	Richard Tattersfield, Secy. B. C. & C.
New York	Schenectady	Apr. 12, 2:30 p.m.	Constructing a cottage at the pumping station.	Harry F. Miller, Secy. Bd. C. & Sup.
New Jersey	S. Orange	Apr. 18	Oiling about 8 miles of street during coming season.	William H. Kemp, Chm. Twn. Com.

STREET IMPROVEMENTS

Washington, D. C.—American Minister Fred W. Carpenter, of Tangier, has forwarded copies of specifications for construction of road from Martil River to Tetuan, and one plan, drawn to scale, in profile of the road; award, which is estimated to cost about \$40,000, will be made publicly at Tangier on May 30. Address No. 6489, Bureau of Manufactures.

Orient, Me.—Town has appropriated \$1,000 for highways.—I. D. Robbins, Town Clerk.

Orange, N. J.—Mayor Julian A. Gregory has recommended paving of Main st.

Columbia, S. C.—Cost of paving Gervais st., Sumter to Pulaski, has been estimated at \$8,089.29 per block.—John McNeal, City Engineer.

Granger, Tex.—Citizens have voted \$100,000 bonds to build good roads in Justice Precinct No. 2, Williamson County.

Lockhart, Tex.—Citizens have voted \$50,000 bonds to build good roads in this Precinct.

Dayton, Wash.—City is considering several blocks of paving.—Geo. Jackson, Mayor.

CONTRACTS AWARDED

Colfax, Ia.—Paving to cost \$50,000, to Turner Improvement Co., Des Moines.

Findlay, O.—To Taylor & Biggs, city, for construction of nine miles of pike in Huron County, \$42,000.

Seattle, Wash.—Building Chas. Davie's road, to W. N. Lord, \$6,449.

SEWERAGE

Washington, D. C.—Report from American consul in a European country states that local publication has recently announced that bids will be received for construction of sewer system; Consul writes that time for submitting bids is short, but he believes that he can secure an extension in case any American firms are unable to present their bids within the time limit already fixed; if American contractors decide to present tenders they should cable consulate, stating definitely how long time is needed, with the assurance that bids will be forwarded if extension of time is granted. Address No. 6485, Bureau of Manufactures.

Leighton, Pa.—Citizens are urging installation of sewers.

Madison, S. D.—Citizens will vote Apr. 18 on \$65,000 bonds for sewer purposes.

WATER SUPPLY

Susanville, Cal.—Susanville Water Co. is planning to lay larger water mains.

Baxter, Ia.—Citizens will vote on \$14,000 bonds for installation of water works plant.

Kenton, O.—Citizens will vote Apr. 11 on \$40,000 bonds to rebuild water works.

Rawlins, Wyo.—City Board of Trustees has ordered surveys made and plans drawn for extensions and improvements to present water supply system as follows: Construction of one rein. concrete reservoir of 500,000 gals. capacity, one reinforced concrete reservoir of 100,000 gal. capacity, laying of 8,000 ft. of 6 and 8" c.-i. water mains, installation of one motor-driven air com-

pressor plant to raise 400 gal. per min from well 130 ft. deep, one motor-driven direct-connected 4" centrifugal pump to pump against a head of 120 ft. and deliver 400 gal. per min. Plans will be completed financial arrangements made and bid asked for in this work about June 1st. Turpin & Eldridge, Civil Engineers, Hugu Block, are making the plans and will supervise the construction when built.

CONTRACTS AWARDED

Dallas, Tex.—Furnishing 500 water cut off boxes, to Dallas Foundry Co., 60c. per box.

Ogden, Utah.—To Moran Contracting Co. for concreting city reservoir No. 1, \$14,597.85; other bidders: McKay & Reed, \$15,797.85; J. P. O'Neill Construction Co., \$17,270.60; Gilles Construction Co., \$17,689.29; Lynch-Cannon Engineering Co., \$17,746.31; Wheelwright Construction Co., \$18,763; Wm Doyle, \$19,679.20.

LIGHTING AND POWER

Los Angeles, Cal.—Franchise for building electric lighting system in Eagle Rock district has been sold by Board of Supervisors to Eagle Rock Water Company.

Eldora, Ia.—Park Dam Power Co. has been granted franchise for installation of light and power plant.

Roland, Ia.—Citizens will vote Apr. 18 on \$8,000 bonds for installation of electric light plant.

Langford, S. D.—Franchise has been granted to C. B. Hersey Co. to install electric light plant.

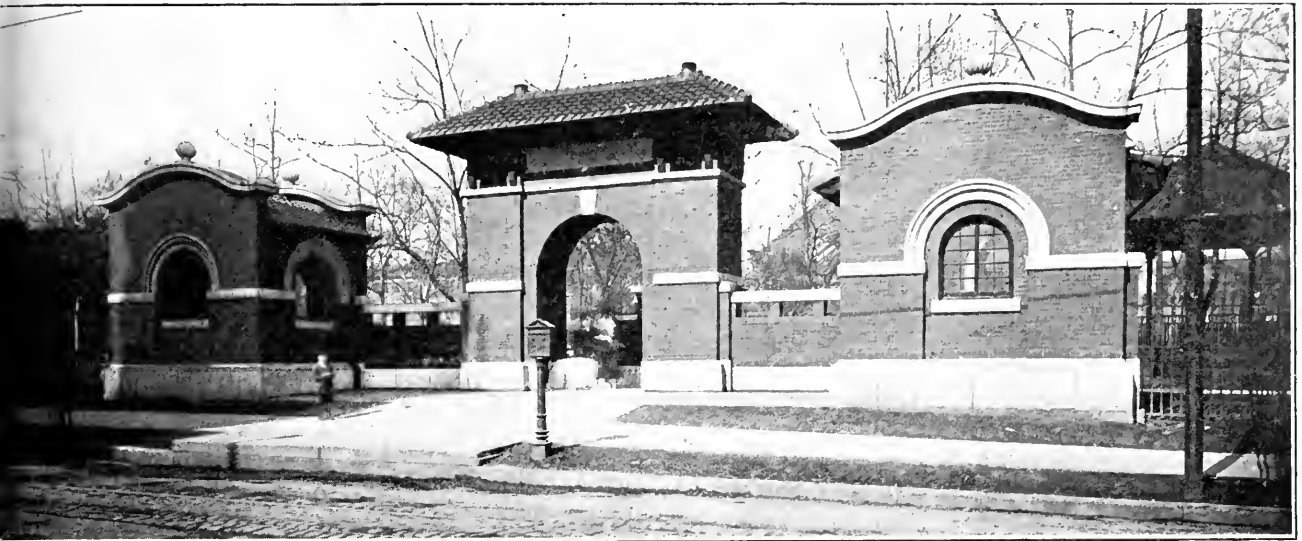
Municipal Journal

And Engineer

VOLUME XXX.

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No. 15



FRONT VIEW OF CARR SQUARE ENTRANCE AND COMFORT STATION

PARK ENTRANCE AND PUBLIC COMFORT STATION

Ornamental Brick and Stone Structure, Under Which are Shower Baths and Toilet Rooms—Used by Half a Million People in a Year—Details of Arrangement and Construction

By CHAS. CLAUDE CASEY

THE Park Department of St. Louis has given the patrons of Carr Park, one of the congested district breathing places, what seems to be an unusual building. It is an ornamental park entrance built over an underground bath house and comfort station.

As will be seen from the photographs, the structure has the appearance of a park entrance and would hardly impress anyone passing the street in front of the park as anything else. From the inside of the park it looks different only in that the two small buildings at each side of the entrance proper have pillars, one marked "men" and the other "women."

Immediately in front of the entrance on the inside is another pillar, or wide post, of brick and masonry, and just beyond this is a stairway leading down in front of which is a heavy stone-capped railing and gate.

Another feature that makes the entrance unusual is that the

paving, both inside and outside of the structure, is of glass—the ordinary vault lights so common in business districts but not often found in such locations. This makes a smoother walk, or pavement, than granitoid, the glass squares being set in an iron frame and cement. It also delivers sufficient light to the rooms below, which otherwise would be little less than dungeons.

The idea of the building originated in the park department of which Phillip C. Scanlan is the head, and the plans were drawn under the direction of C. M. Talbert, assistant to Andrew J. O'Reilly, then president of the Board of Public Improvements. Mr. Talbert is now first assistant to Maxime Reber, present head of the board, and supervised the construction.

The cost of the building was \$16,500. It is a permanent structure of concrete, brick, stone and tile, the last being used for the roof covering and part of the floors. Marble slabs

separate the water closets in the comfort station, on both the men's and women's sides. The stairways are of steel and concrete, with iron railings.

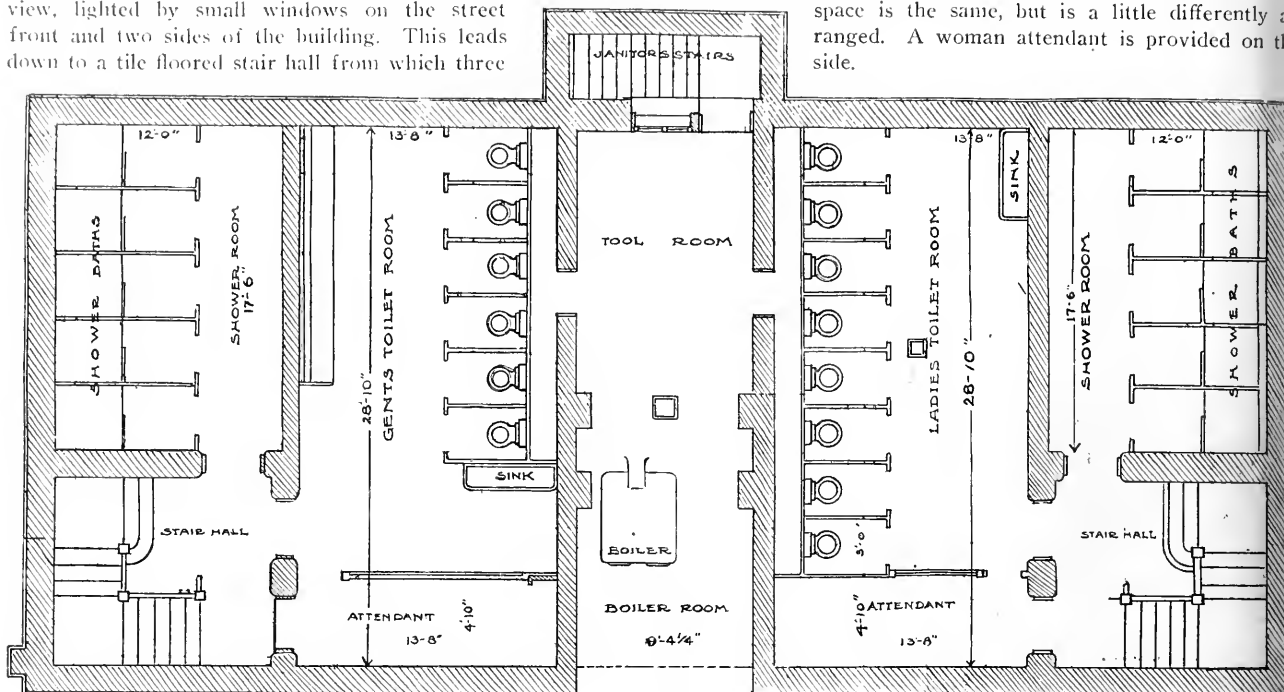
Though the widest part of the structure above ground, from front to back, is 12 feet, exterior measurement, the underground area is nearly 2500 square feet, or 31 feet 10 inches by 67 feet 8 inches, with a room 17 feet x 18 feet projecting from the main underground buildings under the sidewalk at the front of the entrance.

Entering the strong heavy door in the rear of the little buildings at either side, a stairway of ample size comes into view, lighted by small windows on the street front and two sides of the building. This leads down to a tile floored stair hall from which three

length. This slab is 21 inches wide and 14 feet long. Along the wall to the right are six water closets, divided by marble slabs, each space being 3 feet by 4 feet 6 inches.

The third door opening from the stair hall opens into shower bathroom. This is provided with five shower baths. This was originally intended to divide these with marble slabs in spaces 3½ feet square, with a tiny dressing room, 3½ x 4 feet adjoining, provided with doors, but this idea was abandoned and the showers are all open.

The women's side is the same as the men's reversed, except that two additional closets take the place of the urinal. This space is the same, but is a little differently arranged. A woman attendant is provided on this side.

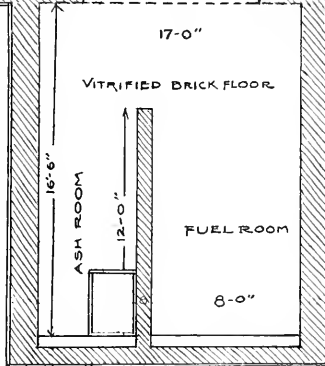


ENTRANCE AND PUBLIC COMFORT

STATION. PLAN OF BASEMENT

doors open. One of these doors leads directly into the railed-off office, and is usually open from the middle up, a cut or "dutch" door being provided. The other opens into a little waiting space in front of the attendant's office, which is 4.5 x 13.6 feet. This office has a maple floor, big lockers, desk, etc. The space between the attendant's room and the toilet room is the same length and a foot wider than the attendant's room.

The men's toilet room is 13 feet 8 inches by 19 feet 10 inches, with a concrete floor, draining to the center. Along the wall to the left is a marble slab urinal, in the floor, draining to a sewer opening at its mid-



Between the two separate parts of the station is a space, 9 feet 4 inches by 31 feet 10 inches, used as a tool room and boiler room for heating the underground apartments and water for the shower baths. The entrance to this is entirely separate from that to the other apartments, a stairway being provided behind the ornamental stop, back of the entrance proper referred to above.

The masonry pillar which stands back of the entrance, and which serves as a stairway, built along strong heavy lines, the same as the balance of the building, and is further made useful and ornamental by utilizing it as a drinking fountain. An iron



INTERIOR OF MEN'S TOILET ROOM



ONE CORNER OF SHOWER BATH ROOM

argyle projects from the center in front, delivering a small stream of water to the wide concrete basin below.

An ash room, 5 1/3 x 16 1/2 feet, and a fuel room, 8 x 16 1/2 feet, with vitrified brick floors, project under the sidewalk toward the street, with openings in the walk for dumping coal and removing ashes.

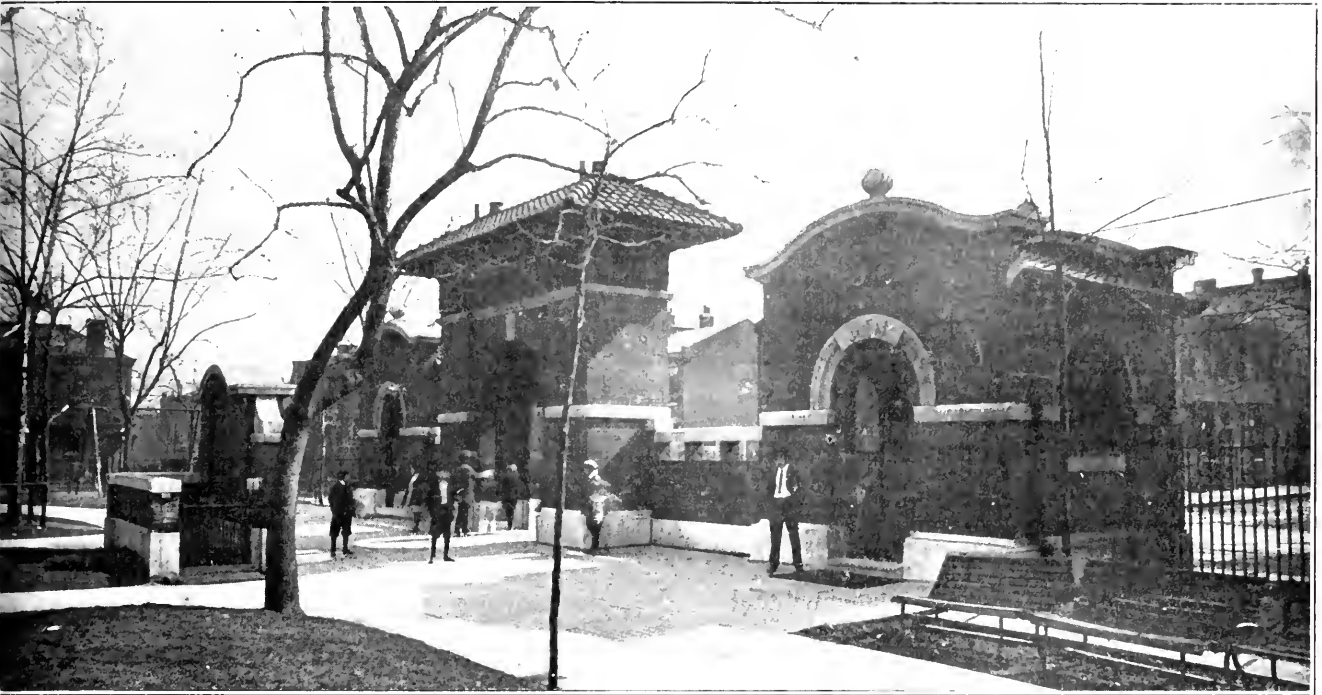
To render the underground rooms dry, a coating of coal tar pitch 1 inch thick was applied to the outside of the concrete walls. This makes the rooms as dry as they would be if above ground.

ACID MINE DRAINAGE AND POLLUTION

(From Annual Report of Board of Health of Altoona for 1910.)

It has long been the opinion of those who have studied the health conditions of Altoona that the city water was comparatively free from bacterial life, and that the acid condition due to mine drainage from the Baker and Glen White mines was an important factor in maintaining that condition.

The results of a series of experiments made by the Pennsylvania Department of Health indicate that this opinion has a solid foundation. The conclusions arrived at in the laboratories



ENTRANCE AND COMFORT STATION VIEWED FROM INSIDE PARK

The comfort station is used by thousands of people in the summer months when the park becomes the front yard of the people living in the tenements of the congested district. It has been estimated by the park department that fully 1,000 people live in each of the blocks that bound Carr park. Benches are placed close together in the one-block breathing space, but in good weather during the summer it is difficult to find an empty space on a bench at night. Occasional public band concerts add greatly to the attendance at the park.

Figures kept by the park department show that 338,162 men, women and children used the comfort station privileges of the building in the nine and a half months between April 6, 1910, when it was opened, and January 29 last, the latest figures available.

It was intended originally to make the little shower bath rooms of service to the general public, but another and larger bath house has been built eight or ten blocks away, and the general purpose of the new place was abandoned. It is used daily by several thousand children, however, during the playground season. Boys and girls by the dozen run into the apartments assigned to their use and after stripping to the skin stand under the cool showers to wash off the dirt and perspiration after their healthful play.

Two sinks, with towels, are provided also, one on each side, for the use of the public. On the men's side the sink is in the little waiting space just outside the attendant's railing; but in the women's side it is set back against the wall in the end of the toilet room.

Two attendants are employed all the year around, one for the men's side and one for the women's. These employees also serve as janitors and keep the places clean. The park keeper is in charge.

of the Health Department are as follows: "Mine drainage will prevent the growth of typhoid bacilli after the lapse of one hour. Mine water will markedly limit the growth of colon bacilli so that they die off progressively and cannot be cultivated after a lapse of twenty-four hours. The organisms lived for three days, but could not be found on the fourth day in one experiment in which the dilution was high." "The only inference that can be drawn from the experiments is that, so far as the risk of the most serious of all water pollutions is concerned, that by the typhoid bacillus and its companion and index, the colon bacillus, and inferentially the cholera bacillus, which is known to succumb readily to sulphuric acid, the attempt to exclude mine water from streams which may eventually become sources of drinking water would be a mistake. Evidently neither of these organisms can live for any considerable time in water containing these wastes in any appreciable quantity. Especially is this true of that most dangerous and elusive bacillus, that of typhoid fever. Data are not yet available to indicate to what distance from the mine the protective influence of these wastes will extend." Since the only sewage that finds its way into our water supply is at the head of the streams, and for the most part above the mines, the distance from the mines to which the protective influence of the drainage would extend is not of much importance to us.

In the same report attention is called to the fact that during high water in the streams, when the water is coming down in torrents, the volumes of fresh water overcome the acidity of the mine waters and, the dilution being sufficient, preclude any germicidal effect of the acid mine water. In the Altoona water supply, however, this danger is reduced to the minimum by the flood channel, which, running parallel with the reservoirs, carries away all the water during heavy rains.

SEWAGE DISPOSAL EXPERIMENTS

Conducted in Philadelphia During Past Two Years — Screening and Sedimentation — Contact, Sprinkling and Intermittent Filters — Sludge Disposal

In 1905 the Pennsylvania State Legislature passed an act authorizing the Commissioner of Health, the Governor and Attorney-General to prevent the discharge of sewage into any of the waters of the State, and in exercising this authority they directed the city of Philadelphia to submit to the Department of Health, on or before the year 1912, a comprehensive plan for the collection and disposal of the sewage of the city. In order to carry out this order the City Council directed the Department of Public Works to establish an experimental station for studying the methods of sewage disposal available for treating the sewage of the city. In 1908 there was organized a division of the Bureau of Surveys of this department known as the sewage disposal division, which was placed under the direction of principal assistant engineer Geo. E. Datesman. The assistant engineer in charge from Sept. 21, 1908, has been W. L. Stevenson. There have also been engaged in this work a chemist, an assistant chemist and a bacteriologist. This operating force began experimental work on March 23, 1909, and continued the same until May 15, 1910. A description of the experimental station and of the experiments then being conducted was published in MUNICIPAL JOURNAL AND ENGINEER for October 27 and November 3, 1909.

The Bureau of Surveys has just published a report of the experiments conducted and the results and conclusions derived therefrom, this giving a full and complete description of all apparatus and methods, with tables and diagrams and also photographs of the apparatus, the whole forming a very complete statement of the experiments conducted and containing a great deal of valuable information concerning practically all methods of sewage disposal which have come into general use. We hope in future issues to abstract a number of the more interesting and important descriptions of the results from these experiments, but for the present will give merely a summary of the conclusions as found in the report. These, it will be seen, cover screening and sedimentation, slate and ordinary contact beds, sprinkling filters, sand filters, disinfection and dilution; also a special consideration of sludge and the methods of disposing of it. This summary is of considerable interest, but it fails to give any indication of the many small points in connection with the construction and maintenance of sewage disposal plants which were studied and elucidated by this investigation.

SUMMARY OF CONCLUSIONS.

Fine Mesh Screening

The 35 mesh per inch screen removed one-third of the suspended matter in the crude sewage as applied; prevented the formation of scum in subsequent sedimentation tanks, and prevented the clogging of nozzle orifices on the sprinkling filters.

Sedimentation

For the purpose of comparison, the results of sedimentation are given in percentage removal, although it is recognized that effluents which are produced with equal percentage removal are not comparable on the basis of solids content.

Horizontal Flow

Three and one-half hours nominal flow through a baffled sedimentation tank removed two-thirds of the suspended solids in the crude sewage; an increased storage did not produce a proportionate improvement in the efficiency of the tank. Baffling by equalizing velocity through the cross-section prevented dead spots in the tank and restrained sludge and scum at the inlet end.

Between periods of three and a half to six hours' flow the influent was not deoxidized nor rendered offensive when sprayed upon sprinkling filters. To prevent septic action the tanks required sludging and washing out every six weeks.

Vertical Flow

The Emscher or Imhoff tank studied illustrated the principle involved, inasmuch as the substantial separation of the sewage flow from the digesting sludge keeps the sewage fresh and eliminates offensive odors either in the effluent, the sludge or in the gas developed.

The removal of suspended solids from the crude sewage was but little more than one-half due to the shallowness of the tank; the efficiency may be increased in tanks of working size.

Slate Contact Beds

The best results were accomplished when this bed was filled twice a day or at a rate of two million gallons per acre per day. Crude sewage applied deposited three-fourths of the suspended solids; the effluent was slightly nitrified and rendered partially stable.

The deposit on the slates was inodorous, resembling earth and could be removed by flushing in the small size bed experimented with.

Where slates are not a waste product the construction of the bed would be costly.

Contact System

The primary and secondary beds treating settled sewage did not mature sufficiently to yield a stable effluent, although it was very low in suspended matter. The highest rate obtained was 1,350,000 gallons per acre per day. With sewage containing less trade waste better results might have been obtained.

Sprinkling Filters

Distribution.

Best results were obtained with fixed sprinkler nozzles where the film of sewage was made to constantly travel back and forth over the media, without a resting period; this caused a uniform rate of flow from the underdrains.

Rate of Operation

A regular uniform rate of operation produced better results than the same net rate obtained irregularly. With filters exposed to the weather and receiving sewage partially settled the maximum rate obtained was two and a half million gallons per acre per day, but in the winter the stability of the effluent deteriorated.

With a filter protected from the weather, having fine screened and settled sewage uniformly distributed over its surface, and having a ventilating system, the maximum rate used was three and one-tenth million gallons per acre per day. The effluent was practically always stable. How far this would have been affected by exposure to the weather was not determined.

Kind of Media

Trap and gravel maintained their initial size. Limestone and slag disintegrated to a slight extent.

The smooth surface of the gravel stones was not as well adapted to the formation of a bacterial jelly as rougher media and the extreme roughness of slag caused it to retain the deposited solids.

The rough, irregular cinders removed all the suspended matter from coarsely screened sewage, so that clogging soon ruined the bed.

Size of Media

The completeness of preliminary treatment partially controlled the size of media in subsequent filtration.

In filters exposed to the weather and receiving sewage partially settled, operating at two and a half million gallons per acre per day, best results were obtained from trap media one inch to three inches in size. Under the more favorable conditions of fine screened and settled sewage as an influent uniformly distributed, at a rate of three and one-tenth million gallons per acre per day, media three-quarters inch to one and a half inches produced an excellent effluent.

Depth of Bed

Filters of less depth than six feet were not satisfactory, but from filters six feet or more in depth effluents could be obtained at rates between two and a half and three million gallons per acre per day of satisfactory quality. The additional depth over six and one-half feet did not seem to be economical.

Maturing

Filters exposed to the weather, receiving sewage partially settled, and put in operation in March, yielded a satisfactory effluent in three weeks, and after three months the effluent was perfectly stable.

A filter protected from the weather, having fine screened and settled sewage uniformly distributed over its surface, and put in operation in July, yielded a perfectly stable effluent after one week of service.

Unloading

In filters operated at rates between two and one-half and three million gallons per acre per day media composed of stones approximately uniform in size completely unloaded the solids stored up in the interstices, whereas media composed of stones of great diversity in size became badly clogged but did not unload.

Effect of Freezing Temperature

No trouble was experienced from the formation of ice upon the surface of the filters; biological activity was decreased by

low temperature to such an extent, however, that at a rate of two and one-half million gallons per acre per day the fine rain and graded mixture beds pooled and the effluents of all exposed filters were of lower stability than in summer.

Elimination of Surface Growth

Fungus growths on the surface were completely removed by an application of calcium hypochlorite dissolved in water.

The continual disinfection with calcium hypochlorite of the influent to a filter maintained its surface in perfect condition and did not interfere with the biological action of the bed.

Bacterial Efficiency

The average number of bacteria in the effluent of a mature sprinkling filter operated at rates between two and one-half and three million gallons per acre per day was 400,000 per c.c., which represented a removal of 86 per cent from the crude sewage.

Bacterial efficiency within a limited range of small size tone was proportionate to depth of bed.

Settlement of the Effluent

When the effluent was passed through a settling basin in two hours much improvement was obtained by the removal of the suspended matter.

Hamburg and Intermittent Sand Filter

A filter modeled after the so-called Hamburg type, in which distribution is effected by a layer of fine coke; also a shallow, coarse size sand filter both operated at too low a rate to be economical for the conditions in Philadelphia.

Disinfection

Fresh sewage from which suspended matter larger than $1/25$ inch had been removed was disinfected to a practical degree with calcium hypochlorite; the amount of disinfectant required depended upon the amount and condition of the organic matter in the sewage.

Economy of design and operation can be attained by short storage and mechanical agitation to insure contact of the disinfectant and the sewage.

Dilution

Crude sewage when passed through a fine-mesh screen or satisfactorily settled to remove the solids larger than $1/25$ inch, and disinfected with calcium hypochlorite to yield six parts per million available chlorine, was added to river water in proportions up to one to ten, and its purification accomplished without offense to sight or smell nor the depletion of the dissolved oxygen of the river water below 50 per cent saturation.

Sludge

Amount

Horizontal flow in sedimentation tanks produced sludge 88 per cent moisture at an average rate of five cubic yards per million gallons sewage.

An Emscher tank with $4\frac{1}{2}$ feet vertical flow produced sludge 2.6 per cent moisture at an average rate of $9/10$ cubic yard per million gallons sewage.

Condition

Cleaning plain sedimentation tanks caused considerable offense, but the sludge withdrawn from the Emscher tank had tarry odor and was not offensive.

Scum formed on sedimentation tanks except when the influent was screened.

Digestion

The placing of sludge from a sedimentation tank in a water-tight, uncovered tank for digestion did not prove successful.

agooning

Wet sludge from plain sedimentation tanks placed in earth lagoons to a depth of 12 inches in moderate weather dried to a consistency fit to remove within the six weeks elapsing between cleaning tanks, and its volume was $4/10$ of that pooled.

Sludge Bed

Fine sand or sawdust over a coarse stone drainage floor was more efficient for reducing moisture in sludge than a plain earth lagoon.

Wet sludge from a sedimentation tank, applied six inches deep in winter weather, under cover, dried to a consistency fit to remove in six days, and under the same conditions but not under cover in twelve days.

Based upon small size tests in winter weather, Emscher sludge 12 inches deep upon a sand bed dried to a consistency fit to remove in 12 days during freezing weather. In Germany the time is given as from four to five days, but sludge is not withdrawn in freezing weather, which accounts for the difference.

When equal weights of rice coal and wet sludge were mixed and placed on sludge beds, the mixture was fit to remove in one day, and was successfully burnt.

STANDARD PAVING SPECIFICATIONS

Adopted This Year by Association for Standardizing Paving Specifications—Concrete Pavements, Foundations and Sidewalks—Wood Block

THE standard specifications adopted by the Association for Standardizing Paving Specifications at its February meeting have finally been published in the *Proceedings* of the society. These *Proceedings* and the specifications therein have been copyrighted, "Not for the purpose of limiting the use of the matter herein to members of the association only. On the contrary, the legitimate use of the same will be granted gratis to those who make written application to the Executive Committee, stating exactly what part or parts of the *Proceedings* it is the desire to use and for what purpose."

In general most of the new specifications follow very closely those adopted last year and published by us at that time, although certain of them are practically new throughout. In view of the fact that last year's specifications were published by us complete it does not seem worth while to repeat the unchanged portions, but we will indicate where changes have been made, referring to the pages in Volume XXVIII (January to June, 1910) of MUNICIPAL JOURNAL AND ENGINEER. Secretary Hittell has granted permission to make such extracts on condition that we make the following statement in connection therewith: "By permission of the association these extracts are reprinted from the copyrighted *Proceedings* of the Association for Standardizing Paving Specifications. John B. Hittell, secretary-treasurer, 5917 Winthrop Avenue, Chicago."

CONCRETE PAVEMENTS AND FOUNDATIONS

On pages 362 to 364 of MUNICIPAL JOURNAL AND ENGINEER were published standard specifications for cement, concrete sidewalks, curb and combined curb and gutter, concrete pavement foundations and concrete pavements. The specifications this year follow these exactly so far as the cement is concerned. In the specifications for concrete sidewalks the only change is the addition of a paragraph as follows:

"The base shall be — inches in thickness, with its upper surface finished parallel to and — inches below the grade of the finished sidewalk. The minimum thickness for base shall be 3 inches."

Under the head of Forms, the new specifications read, "The forms shall be well staked and thoroughly braced and set to the established lines," the words "thoroughly braced" being new.

Under the head of Top or Wearing Surface appears the new paragraph, "This wearing surface shall be — inches in thickness. The minimum thickness for wearing surface shall be $\frac{1}{2}$ inch."

Also the following has been added: "No concrete shall be mixed while the air temperature is below 32 deg. Fahr., and if this temperature is reached at any time before the wearing surface is laid, the foundation or other concrete shall be immediately provided with such covering as will protect it from all damage. In no event shall concrete walks be laid on a frozen foundation."

The specifications for concrete curb and combined curb and gutter have been changed by the addition of the same paragraphs as to thickness and laying in freezing temperature as were just quoted. Also the second paragraph of article 11 is changed and added to to read as follows:

"The mortar for the facing shall be mixed in a mortar box and spread in place immediately after mixing. The facing or wearing surface of the curb shall be placed on the inside of the forms as the body of the curb is being built up. In no case shall the facing be placed after the base has set."

The specifications for concrete pavement foundations are similar to the old except for the addition of a paragraph on thickness similar to that for the thickness of concrete sidewalk foundations (with a minimum thickness of 4 inches instead of 3) and the paragraph concerning laying in freezing

temperature already given; and with article 9 changed to read as follows: "When completed, the foundation shall be kept moist for not less than two days and it shall be protected from traffic until the concrete has thoroughly set."

The specifications for concrete pavements are unchanged except for the addition of the paragraph concerning laying in freezing temperature, and another on thickness similar to that for the thickness for concrete sidewalk foundations, with a minimum of 5½ inches. There was also suggested by the committee a paragraph on guarantee, but the committee was unable to agree upon the time, some favoring no guarantee beyond one year, and others favoring a five-year period. This was discussed by the convention, which voted to recommend a two-year guarantee, the vote being two to one.

The Committee on Cement and Concrete Pavements was composed of the following: N. E. Murray, chairman, superintendent of sidewalks, Board of Local Improvements, Chicago, Ill.; James E. Faris, member Board of Public Works, Kansas City, Mo.; L. J. Myers, city engineer, Ardmore, Okla.; J. E. Ramsey, consulting engineer, Salisbury, N. C.; A. F. Damon, Jr., consulting engineer, Chester, Pa.; W. H. Broadhurst, chemist, Borough of Brooklyn, New York City.

WOOD BLOCK PAVEMENT

The specifications for wood block pavement adopted last year were published on pages 320 to 321 of MUNICIPAL JOURNAL AND ENGINEER. In these the following changes are made this year. Instead of specifying that the wood to be treated shall consist of "long leaf yellow pine," "Southern yellow pine" is substituted. Similarly in the second paragraph, which began "Yellow pine blocks shall be cut from what is known as prime timber, namely, all timber must be sound, commercial long leaf yellow pine," the new specifications state "Yellow pine blocks shall be made from what is known as Southern yellow pine." The third paragraph is changed to read, "In yellow pine timber the annual rings shall average not less than eight to the inch and shall in no case be less than four to the inch, measured radially."

In the description of the oil to be used there are several changes. Article 1 is changed to read "The specific gravity shall not be less than 1.10 nor more than 1.14 at a temperature of 38 deg. C." In the second paragraph 3 per cent is changed to 3½ per cent. In the third paragraph for the words "35 per cent up to 315 deg. C." are substituted "and shall be not less than 30 or more than 40 per cent up to 315 deg. C." The words "the mean of three determinations to be taken" are omitted.

The paragraph on Filler is changed to read "The joints between the blocks shall be filled with pitch, asphalt residuum or dry, fine sand. (The committee recommends sand for heavy traffic streets.)"

Under the head of Expansion Joints it is specified that these shall be one inch in width and placed every 100 feet, instead of ½ inch in width and placed every 50 feet, as last year.

To these specifications is added an appendix giving a description of the method of analyzing coal tar creosote, which is referred to in article 3 of the specifications for oil, being an extract from Bulletin No. 65 of the American Railway Engineering and Maintenance of Way Association. This appendix is reprinted on page 520 of this issue.

The committee stated that it had considered the matter of the preservative very carefully and "found that the oil specified may not only be produced in the open market at reasonable cost, but also may be manufactured by any one competent and willing to erect the necessary plant, and this plant, moreover, would not be prohibitive from a financial standpoint. The committee is satisfied, from the testimony of the different parties examined and from the experience of its own members, that the oil with a specific gravity of 1.10 is best suited for treating wood blocks, when it is considered that a waterproofing as well as a preservative compound is desired." The committee recognized that this oil "is not a direct product of distillation, but is formed by the addition of a coal tar pitch. It

has accordingly changed the positive amount of 35 per cent heretofore specified as the maximum to be distilled up to a temperature of 315 deg. C. to the variable amount of not less than 30 nor more than 40 per cent."

The Wood Block Committee was composed as follows: George W. Tillson, chief engineer, Bureau of Highway Borough of Manhattan, New York City; Andrew Rinke, city engineer, Minneapolis, Minn.; N. S. Sprague, superintendent Bureau of Construction, Department of Public Works, Pittsburg, Pa.; James C. Travilla, member Board of Public Improvements and street commissioner, St. Louis, Mo.; M. McKenna, city engineer, Bridgeport, Conn.; Felix A. Norden, member Board of Local Improvements, Chicago, Ill.; W. P. Taylor, engineer of tests, Philadelphia, Pa.; Walter M. Cross, city chemist, Kansas City, Mo., and Cassius V. Kelly, city engineer, New Haven, Conn.

The new specifications for the other kinds of paving will be given next week.

FUEL BRIQUETS FROM STREET RUBBISH

THE following statement by U. S. Consul Frank W. Mahin of Amsterdam, Holland, is published in the Consular and Trade Reports.

Hitherto rubbish collected by street cleaners in Amsterdam has been assorted; paper, rags, metals, and glass have been sold to dealers therein, the residue as manure.

The city authorities are now considering converting the street rubbish as a mass into combustible briquets for heating boilers. They have found that at Southwark, London, and St. Ouen, France, street rubbish is transformed into a marketable product. At Southwark all the refuse is crushed to powder, which is sold as a manure. At St. Ouen the powder thus made, with the addition of combustible substances, is formed into a cheap fuel. The Amsterdam authorities experimented at both those places, combining powder made with coal tar from the Amsterdam gas works and pressing the substance into briquets. The experiment was successful and disposed the Amsterdam authorities toward establishing a plant for producing briquets from street rubbish.

The quantity of material which can be worked in this city is about 140,000 tons a year. It is estimated that an establishment to work this will cost about \$200,000; that the annual expense thereof will be about \$98,000; that the product will be about 85,000 tons, costing \$1.15 a ton. It is believed that the briquets can be sold for a net price of \$1.40 a ton, which would yield a profit of over \$20,000 a year. At present the street refuse of Amsterdam is disposed of at a loss of \$18,000 a year. Besides the anticipated financial profit, it is reasoned that the danger in times of epidemic will be much reduced by this transformation of street refuse, which amounts to destruction.

WALLINGFORD MUNICIPAL ELECTRIC PLANT

IN the report of the municipal electric plant of Wallingford, Conn., for the year ending 1910, the finances of the plant are set forth in great detail, the accounts including insurance on boilers and building, office rent, interest, depreciation, legal expenses and apparently all other legitimate expenses which should be charged against it. After deducting these from the income there is left a balance of \$5,663.77. There probably should be a deduction from this for interest, since the amount of interest paid was but \$1,925, whereas the value of the plant is about \$120,000. This, however, would still leave a balance of about \$2,800.

The average watts developed by the steam plant per pound of coal consumed was 151, or the average pounds of coal per kw. of output was \$6.64. The coal cost \$4.08 per ton delivered at the plant and the average cost per kw. for fuel was 1.62 cents. The average total cost per kw. at the steam plant was 5.4 cents. About 36 per cent of the output was developed by a water plant, and the cost per kw. here, including 5 per cent interest and 5 per cent depreciation, was 1.62 cents. The total output for the entire year was 549,365 kw. The total income averaged 6 cents per kw. generated.

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A. PRESCOTT FOLWELL, Editor
F. E. PUFFER, Assistant Editor

Business Department

S. W. HUME, President

T. MORRIS, Manager. A. PRESCOTT FOLWELL, Secretary

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APRIL 12, 1911.

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Philadelphia Sewage Disposal Experiments

THE city of Philadelphia has conducted for a little over a year a series of experiments on sewage disposal which are of great interest and value to engineers and others engaged in the study and practical adaptation of sewage disposal methods. The experiments of the Massachusetts State Board of Health and the reports upon the same, which are unsurpassed for completeness and scientific thoroughness, are recognized in Europe as well as in this country as being of the greatest importance and reliability, although their value has been somewhat restricted during the past few years by a conservatism in the adoption of new ideas which seems to us unnecessary and unfortunate. The tests conducted by the cities of New Orleans and Columbus added greatly to our information concerning some of the later methods of sewage treatment and probably had considerable effect upon the general adoption of certain of them, although neither introduced any new methods.

The Philadelphia experiments in turn have supplied us with data concerning some still more recent ideas, especially screening and sedimentation tanks, including the Enscher tank; with certain conclusions as to details of sprinkling filter construction and as to results which can be obtained with the use of hypo-

chlorite in adapting more or less crude sewage to disposal by dilution. Especial attention was paid to the subject of the disposal of sludge, which still remains one of the most serious and least satisfactorily solved problems of sewage disposal.

While much of the report published by the Philadelphia investigators consists of tables and data which are too voluminous for publication in a periodical, and which would be of value chiefly to experts, there were a great many deductions drawn from these bearing upon minor points of construction and operation which are not given in the general summary of conclusions published this week, and these we are expecting to give abstracts and synopses of from time to time during the next few weeks.

Paving Specifications

ANOTHER publication of more than ordinary interest which has just reached us is the *Proceedings* of the Association for Standardizing Paving Specifications, containing the specifications revised and adopted by that association in February of this year. Considering the short time which has elapsed since the convention for the publication of the *Proceedings* these have been gotten out in very good shape and with comparatively few typographical errors. Our chief criticism is that they do not contain the specifications as finally decided upon in those cases where they were amended or added to by the convention as a body, but give the specifications as reported from the committees, any modifications made by the convention as a whole being given elsewhere as a part of the proceedings. It seems to us that it would have been better to have interpolated such changes and additions at the proper places in the specifications as reported, noting, if it seemed desirable, that these were variations from the original report.

Except for two or three points concerning which satisfactory conclusions were not reached we believe that these specifications are considered by the association as being final so far as it is concerned, and recommended to all cities for adoption. While the association has copyrighted these in order that they may not be used commercially, it is their desire that they be adopted generally by all cities; and in furthering this we are expecting to publish all of them where they are entirely or largely new, or to note the changes made from those of last year where these are few in number. This week we take up the specifications for concrete pavements, pavement foundations and sidewalk work and those for wood block pavements. These will be followed during the next two or three weeks with a presentation of the remaining specifications adopted by the association.

Material for Water Conduits

IN a report upon a new water supply for Cumberland, Md., by Mr. James H. Fuertes, a brief discussion is given of the material available for constructing a conduit several miles in length. Concerning this the report says:

The estimates of cost of the conduits for bringing the water from distant sources are based upon the use of wood stave pipe for pressures up to about 90 pounds per square inch. Where the pipe lines cross deep ravines and the pressures on the pipes would be in excess of 90 pounds per square inch, riveted steel pipe or cast iron pipes have been provided for, depending upon the pressures and on the location. As a rule, it is proposed to use cast iron pipes under all important stream crossings.

Wood stave pipe is an approved and well tried form of construction for pipe lines operating under moderate heads, and when properly built of suitable materials and when the alignment is laid out with due regard to the hydraulic questions involved, is a durable, substantial and useful form of construction. Its cost is only about one-half that of steel pipe of equivalent carrying capacity and about one-third that of cast iron, while its life, when intelligently designed and constructed, should be as great as that of either cast iron or steel.

Another very important advantage is that their cost is so low that they could be replaced at least three times for the cost of one cast iron pipe line, and this low cost of construction frequently makes it possible to bring the total investment necessary within the limit of expenditure possible to a city when the cost of a long cast iron pipe line might be prohibitive.

The statements as to cost are probably for that locality only, and the relations between the costs of the several kinds of pipe might be constantly different in other sections of the country. Engineers should, however, bear in mind the practicability of using not only the materials herein referred to, but even certain additional ones, such as vitrified clay with water-tight joints where the head is very light. There is too often a tendency to confine oneself to materials which have been used in former work, forgetting to consider the possibilities of others which may be not only cheaper but better adapted to meet the requirements of the case.

Analyzing Coal Tar Creosote

Extract from Bulletin No. 65 of the American Railway Engineering and Maintenance of Way Association. See page 518 of this issue.

SAMPLE

In view of the fact that everything depends upon the samples taken for analysis, too much care cannot be used to make sure that such samples are strictly average ones of the whole bulk of the oil.

To this end the oil should be completely liquefied and well mixed before any samples are taken. Wherever possible, a drip sample of not less than 2 gallons should be taken, commencing after the oil has started to run freely. Where this cannot be done, as, for instance, in large storage tanks, samples should be taken from various depths in the tank, by means of a tube or bottle, the number of samples depending on local conditions.

For taking samples during the process of treatment, it is desirable to take a sample of oil from the storage tank about one foot from the bottom of the tank before the cylinder is filled, and, where possible, a sample directly from the cylinder during the process of treatment. For this purpose a thermometer well, as shown in attached figure, is recommended.

The sample to be analyzed should be thoroughly liquefied by heating until no crystals adhere to a glass stirring rod, and also well shaken, after which one-half shall be taken for analysis and the balance reserved as a check test.

APPARATUS

The apparatus for distilling the tar oil or creosote must consist of a stoppered glass retort similar to that shown in the diagram, having a capacity as nearly as can be obtained of 8 ounces up to the bend of the neck when the bottom of the retort and the mouth of the offtake are in the same plane. A nitrogen-filled mercury thermometer of good standard make, divided into full degrees centigrade, must be used in connection therewith. The bulb of the retort and at least 2 inches of the neck must be and remain covered with a shield of heavy asbestos paper, shaped as shown in diagram, during the entire process of distillation, so as to prevent heat radiation, and

between the bottom of the retort and the flame of the lamp burner two sheets of wire gauze, each 20-mesh fine, and at least 6 inches square must be placed.

It is also recommended that the flame be protected against air currents. An ordinary tin can from which a portion of the bottom and all of the top have been removed, placed on support attached to the burner, as shown on the diagram, has been found to answer the purpose.

DISTILLATION

Before beginning the distillation the retort should be carefully weighed and exactly 100 grammes of the oil placed therein, the same being placed in the retort. The thermometer should be inserted in the retort with the lower end of the bulb $\frac{1}{2}$ inch from the surface of the oil, and the condensing tube attached to the retort by a tight cork joint. The distance between the bulb of the thermometer and the end of the condensing tube should not be less than 20 nor more than 24 inches and during the progress of the distillation the thermometer must remain in the position originally placed.

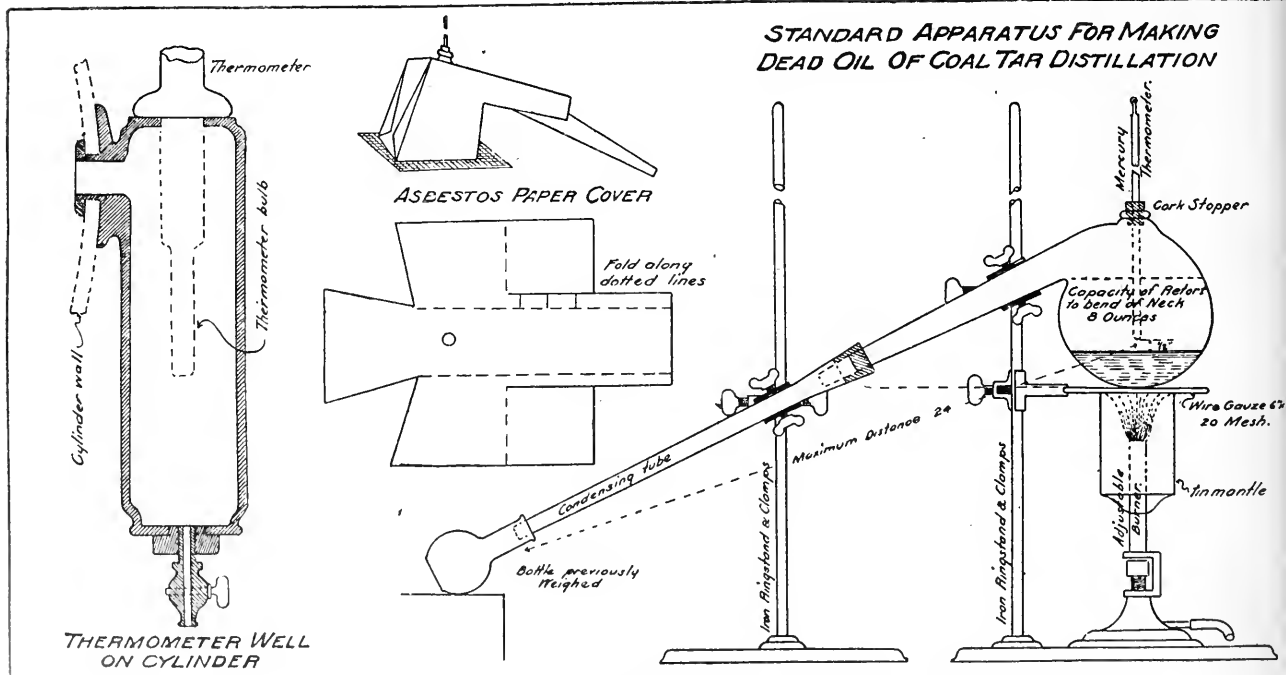
The distillates should be collected in weighed bottles and fractions determined by weight. Reports are to be made of the following fractions:

- 0 to 170 degrees Centigrade.
- 170 to 200 degrees Centigrade.
- 200 to 210 degrees Centigrade.
- 210 to 235 degrees Centigrade.
- 235 to 270 degrees Centigrade.
- 270 to 315 degrees Centigrade.
- 315 degrees Centigrade and above.

For practical purposes there will be no need of reporting all of these fractions. It will be sufficient to report on the following fractions as follows:

- Below 200 degrees Centigrade.
- 200 to 210 degrees Centigrade.
- 210 to 235 degrees Centigrade.
- 235 to 315 degrees Centigrade.
- Above 315 degrees Centigrade.

Reports are to be made on individual fractions. In making such reports it is to be distinctly understood that these fractions do not necessarily refer to individual compounds. In other words, the fractions between 210 and 235 deg. will not necessarily be all naphthalene, but will probably contain a number of other compounds. The distillation should be a continuous one, and should take about 45 minutes. When a measurable quantity of water is present in the oil, the distillation should be stopped, the oil separated from the water and returned to the retort, when the distillation should recommenced and the previous readings discarded. In obtaining water-free oil it will be desirable to free about 300 to 600 c.c. of the oil by using a large retort and using 100 grammes of water-free oil for the final distillation. In the final report as to fractions a correction must be made of the amount of water remaining, so that the report may be made on the basis of a dry oil.



APPARATUS FOR TAKING SAMPLE OF AND DISTILLING CREOSOTE

NEWS OF THE MUNICIPALITIES

Current Subjects of General Interest, Under Consideration by City Councils and Department Heads—Streets
Water Works, Lighting and Sanitary Matters—Fire and Police Items—Government and Finance

ROADS AND PAVEMENTS

Buy New Roller

Burlington, Ia.—The city has purchased an eight-ton tandem roller for use in repairing and improving streets. This new roller is a small brother of the huge steam roller which the city now owns, and is also propelled by steam. It is easier to handle and gets over the ground quicker and may be used in many places and at times when it is not possible to move the big roller. The list price of the new machine is \$2,500, the city getting a good reduction. It is the intention of keeping the larger roller for heavy work and for spiking macadam. By inserting spikes in the wheels this heavy contrivance can tear up a macadam street just as easily as it can pack the stone.

Want Park Board to Have Charge of Street Opening

Bloomfield, N. J.—To avoid litigation in the proposed opening of a new Mechanic street in Bloomfield to take the place of the one vacated by the Town Council of Bloomfield for the Lackawanna Railroad improvements, forty residents of the First district of the Third Ward at a meeting held at the home of Assistant Postmaster John R. Conlan last week voted to appeal to the Legislature for relief. To this end a committee was appointed to endeavor to get a bill through the Legislature to bring the property southwest of the present Mechanic street into the care of the Essex Park Commissioners. The object of getting the proposed bill through is to have a boulevard as an approach to the new depot from East Orange, extending to Glen Ridge on the north and eventually to the park system in Montclair. Such a bill, if passed, will eliminate the assessment and litigation that may arise for damage suits in the opening of the new street.

Demand Sewers Be Laid Before Paving

Springfield, Ohio—Threatened with an injunction suit unless time was first given in which a sewer can be put down on East High street from Limestone to Spring, Service Director Klein will not allow this section of East High street to be finished until some sewer connections are established. Frank Mills, president of the Pythian Castle Company, called upon Mr. Klein yesterday afternoon and told him that an injunction suit would be filed should the contractors attempt to tear up the southern half of the street before a sewer is installed. "We cannot build unless we have sewers," said Mr. Mills, "and we will have to have them put in first." Mr. Klein said it would be several weeks before the work was finished, and the sewer could be put in in the meantime, and that he expected no trouble. Work of tearing up the old pavement started yesterday.

Laid a Million Yards of Paving in Six Years

New Orleans, La.—City Engineer W. J. Hardee has sent the following letter to Mayor Martin Behrman, giving the amount of pavement laid during the years of his administration:

Hon. Martin Behrman:

Dear Sir: Believing that you would like to know what the records of this department show. I have had the following tabulation of street pavements made, according to which you will observe that in the six years that you have been mayor, 274,368 more square yards of such pavements were laid than in the entire history of the city of New Orleans up to and before the time you became mayor.

Kind of Pavement.	Previous to Jan. 1, 1905. Since Jan. 1, 1905.	
	Sq. Yd.	Sq. Yd.
Asphalt	576,475	625,582
Vitrified brick.....	138,300	10,201
Small granite.....	10,166	30,919
Bitulithic .....	.....	155,663
Granitoid .....	.....	138,808
Mineral rubber.....	.....	38,136
Total	724,941	999,309

W. J. HARDEE, City Engineer.

SEWERAGE AND SANITATION

Decisions in the Bronx Sewer Cases

White Plains—Supreme Court Justice Mills has handed down two decisions affecting the appraisal of damages of land taken for the Bronx Valley sewer, within the borders of the City of Yonkers. In the case of the land of William E. Hauptauf, which runs south on Bronx River road from Yonkers avenue, the justice sends the matter back to the commission for re-appraisal and rehearing. The plot was considered as one parcel, and \$16,718 was awarded to the owner. The latter claim that it should have been considered in plots and lots, as laid out, containing 58 separate parcels and the court upholds him in his contention. Parcel 73-A ran through the center of Bronx place, a private thoroughfare when the proceedings were started, but later it was decided to and was accepted by the city, making it a public thoroughfare. The owners of the abutting property claimed damages through an alleged ownership to the center of the street in front of their lands. Deeds of original ownership in the street rather complicated matters. The present proceeding was to set aside the order confirming the report and to have the commissioners appraise the damage to their property. Justice Mills decides that there was a technical wrong committed when the commissioners failed to notify the abutting property owners of the intention to file the report and to make the motion to confirm the report, and for that reason he would vacate the order confirming the report. In any event, the justice says, the owners would be entitled only to nominal damages, and on that account it would be useless to send it back to the commissioners for correction in that respect. Therefore he vacated the other order, and confirmed the report as of the present date, the owners having now received notice.

Civic Club Plans War on House Fly

Philadelphia, Pa.—Prof. F. D. Weidman, assistant professor of pathology at the University of Pennsylvania, delivered a lecture before the Civic Club last week on the disease-breeding house-fly. The Public Health Committee of the Civic Club has arranged to have the lecture given in some 30 different places in and about Philadelphia.

New Pumps Installed at Sewage Plant

Providence, R. I.—The sewage pumping plant is completed except for some minor touches, the installation of the last of the centrifugal pumps being finished last week. The plant is now ready for any emergency. The work of changing over the old system to the new centrifugal pumps was accomplished in the face of much difficulty, as it was possible to discontinue but one of the old pumps at a time in effecting the change, the others being required for service in taking care of the sewage of the city. They were so worn that it required extraordinary work to cope with the volume that came down the big trunk sewers in time of storm and at times exceeded their capacity and flooded the plant. With the installation of the first series of the six centrifugal pumps, however, the demand on the old pumps was not so severe, as the new system proved itself beyond its rated capacity and amply able to handle the large volume of sewerage easily. Thus, when the work on the second installation was begun, the first centrifugal and the third old pump were able to care for the sewage. The third centrifugal was installed and placed in operation last week, the rope drive being completed and tested successfully. The rebuilt plant now comprises the three engines which were retained from the old system, each of which drives two new centrifugal pumps. As for the efficiency of the new plant, the City Engineer, Otis F. Clapp, states that about two days ago during the severe storm, two of the engines were set at work for an hour and had no difficulty in handling the rush of water through the storm sewers, attaining in that time the notable rate of 87,000,000 gallons per day.

Davenport Plans to Buy Water Works

Davenport, Ia.—One of the preliminary steps in the negotiation for the proposed sale of the Davenport Water Company plant was taken when F. E. Tearneure, dean of the engineering college of the University of Wisconsin, arrived to make appraisalment of the value of the plant.

Filtration Plant to Be Installed

Ogdensburg, N. Y.—Following the inspection of the Albany filtration plant by George E. Van Kennan and other officials of Ogdensburg, Common Council has awarded contracts aggregating \$175,000 for the installation of a system of slow sand filtration. Besides supplying the city with water the new plant will pump 500,000 gallons of water daily for the St. Lawrence State Hospital.

Muskegon in Grip of Water Famine

Muskegon, Mich.—A water famine has assumed alarming proportions in Muskegon. The intake pipe leading into the lake is clogged with sand and it is possible to get scarcely any water in the mains, and in the lower levels of the city there is a pressure of only six pounds. On the high lands and in outlying parts of the city there is none at all. The normal pressure maintained is 40 pounds, the fire pressure being much higher. The city has borrowed another engine for an emergency and an effort will be made to obtain another one. Engineers say it will be impossible to clean out the mouth of the intake pipe until Lake Michigan is calm. The lake is rarely in this condition at this time of the year and there is no prospect of relief. It is feared that insurance companies will declare thousands of dollars worth of policies void if something is not done. The authorities are afraid to turn water from Muskegon Lake into the mains because of the impurity of the lake water, but this will be done in case a serious fire breaks out.

New Filtration Plant Near Completion

Norwich, Conn.—Last week the filters arrived here from Darby, Pa., where they are manufactured by the Roberts Filter Company. Arrangements have been made by the company with a local truckman to cart them to the pumping station, where they will be set up as soon as possible. Each filter is 8x20 feet and will be filled with the material required in filtration after they are in place. The foundations are ready and the filters ready to be moved as soon as the workmen are ready for them. Their arrival was as early as they had been expected, having been nine days on the way. The company has full charge of them until they are set up and ready for use, which will take from one to two weeks.

May Abandon Reservoir Because of Crawfish

Frederick, Md.—The presence of crawfish in the Frederick reservoir will probably cost the city \$22,000 to repair leaks made by their boring, and the abandonment of the reservoir may follow. The great leakage of water from the reservoir has been assigned to the presence of crawfish by engineers, and it is thought that about 100,000 gallons of water are daily going to waste.

Work to Be Resumed on Lake Altoona

Altoona, Pa.—R. J. Carothers, head of the Carothers Contracting Company, which is constructing Lake Altoona, has arrived at the scene of operations, and work will be started as soon as the weather permits. Mr. Carothers will give the work his personal attention during the ensuing summer and every effort will be made to complete the contract before fall. The present contract chiefly involves the core wall and the embankment. The reservoir will not be completed by the contract with the Carothers Company, but it will be so far completed that it can be put in service, and half a billion gallons of water can be stored in it. This it is expected will place the city beyond danger of water famine after this year, and the officials of the water department do not anticipate the trouble this year the city experienced during 1909 and 1910, as there has been a much larger precipitation throughout the winter and the flow of the streams is unusually heavy. Both reservoirs are constantly overflowing from four to six inches.

City Endeavors to Buy Water Plant

Covington, Ky.—At a meeting of the Covington Board of Water Works Commissioners last week the director of the Kenton Water Company reported that the offer of \$26,331.45 made to them by Council for their entire plant which is now supplying water to former Latonia, was not enough, and they ask \$36,673. The offer was made by the city after experts had reported that the plant as it stood was worth that amount. It is not believed that Council will increase their offer, but will order the commissioner to proceed to lay water mains in Latonia.

Meter at Filtration Plant.

Providence, R. I.—The City Engineer's department will install an eight-inch Venturi meter in the main pipe leading from the Pettaconsett pumping station to the filter bed for the purpose of measuring the amount of water sent through the filters daily. Up to the present time the city has estimated the amount, but it is now believed desirable to keep an accurate series of figures. Two small meters will also be installed at the pumping plant, one in the laboratory and the other in the screen chamber of the engine room. In this way an accurate measurement of the water for all purposes can be secured and filed for compilation in the reports of the department.

STREET LIGHTING AND POWER

Lighting Experts Examine Property

Los Angeles, Cal.—Work preliminary to fixing the lighting rates to be charged by the different electrical corporations has been begun in earnest by the experts engaged by the Board of Public Utilities, who are at present going over the plant of the Southern California Edison Company. The board is going into the rate-fixing question in a thorough manner, and instead of accepting the figures of the corporations will be furnished with first-hand information gathered by its own engineers.

Gas Company Asks City's Help in Adjusting Differences

Spokane, Wash.—Asking the City to take a hand in adjusting the differences between the company and its gas consumers, the Spokane Falls Gaslight Company has recommended to the city commissioners that a complete meter proving apparatus be installed at the city hall. To make this apparatus the last "resort" of consumers who kick to the company that their meters register more gas than they use, is the plan of the company.

Cuts City's Light Price

Cincinnati, Ohio—Cincinnati will be given its electric lighting contract by the Union Gas & Electric Co. several dollars per lamp per year cheaper than the price in Cleveland. The bid, which has just been opened, states that the company will give the city its lighting in the "overhead" district for \$50 per lamp per year and in the "underground" district for \$55 a year. Cleveland pays \$53.75 for its "overhead" lighting. No figures are obtainable here as to the "underground" cost. The taxpayers of Cincinnati will save \$66,000 a year for each of the ten years this contract is to run, or \$660,000 in all.

For Municipal Gas

Portland, Me.—The socialists of this city are agitating for municipal ownership of the gas works and will make it a part of their educational campaign until the next municipal election and one of their local issues.

Accident to Light and Power in City Hall

Chicago, Ill.—The new City Hall had its first dark experience last week. For half an hour before 10 a. m. the building was in gloom, the elevators were stuck between floors and the main corridor filled with excited persons who groped about in the dim light furnished by two gasoline lamps. All the trouble was caused by the burning out of the main feed cable of the Commonwealth Edison Company leading into the building. This furnished the electric power for lighting the building and running the elevators. It was repaired in comparatively quick time, a large force of electricians being put at the work, but for a time it was feared that the cable was broken and that the damage could not be fixed up during the day.

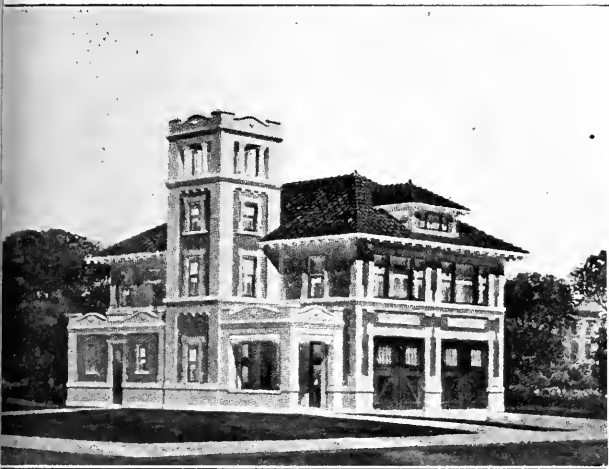
FIRE AND POLICE

Will Pay Fire Department

Anderson, S. C.—City Council adopted an ordinance looking to the reorganization of the fire department. The old system of a volunteer department was abolished. W. L. Jackson, fire driver, was elected chief to give his full time to his duties. The department will consist of 18 men, exclusive of the chief and the three drivers. These men will be paid stated annual salaries, which will be supplemented by extra pay for each fire call. The 18 men will not give up any of their time to the department but will answer the fire calls from their respective jobs. The effect of the ordinance is that Council will take over and completely control the fire department.

Fire House with Police Station as Annex

Hamilton, O.—The illustration shows the new Linden-wood hose house and is duplicated in the East Hamilton hose house, both nearly finished. Each house will be equipped with a hose wagon, two horses and four men. The houses will be the best equipped in the department and will carry 100 feet of hose with chemical extinguishers, ladders, etc. There will be hose racks in the basement for drying. The



Courtesy Hamilton News.

NEW FIRE STATION, HAMILTON, O.

ground floor will be cemented and will be occupied by horses and apparatus. There is space for a new truck in each, to be purchased later, possibly an auto truck. There will also be an office, toilet rooms, lockers and a place of detention for police prisoners. This will contain two steel cells. On the second floor is the dormitory, lounging room, baths, etc. The houses cost with land \$40,000 each. Safety Director A. W. Marged will select men for the new houses.

Auto Ambulance Placed in Commission

Dayton, Ohio—With the delivery last week of the new ambulance to city officials the emergency equipment of the police department was brought up to the efficiency of any city in the country of its size, and surpassing many larger. The receiving party was composed of Mayor Burkhart, Director of Safety Lienesch and Chief Allaback. The ambulance was taken to headquarters and officially turned over to the city. A test ride was taken over the hills south of the city, and perfect satisfaction was the verdict. The machine is equipped with the most modern devices, including electric light, hot and cold water, and emergency electric lamps to be used at accidents where no other lights are available. The cost of the ambulance was \$4,050.

City Makes Splendid Fire Record

Topeka, Kan.—The fire loss in the city of Topeka for the last 20 years, ending December 31, 1910, amounts to \$1,429,162. The value of the property under risk in these fires has been placed at \$16,636,162. The insurance involved reaches near the ten-million mark. In these 20 years 3,495 fire alarms were turned in to the stations in Topeka.

Buy Police Dogs

Houston, Tex.—Chief Ray of the Houston Police Department has purchased eleven trained dogs, which will be kept at the police station. The main purpose of the dogs is to trail the burglars that have been operating frequently in this city, providing their work is not stopped. A try-out in three runs proved the efficiency of the dogs.

Entire Fire Department Resigns

Bloomington, Ind.—The resignations of all the members of the city fire department were accepted last week at an adjourned meeting of the City Council and the organization of a new department started. William Shinn, an ex-policeman and former fireman, is to take Chief Frank Todd's place and Perwic Deckard is to replace Assistant Chief James Durnall. The present fire department tendered their resignation when the Council refused to increase their pay.

Trial of Fire Apparatus Satisfactory

Lansing, Mich.—A new motor fire engine has stood several preliminary tests and has been accepted by the city.

GOVERNMENT AND FINANCE

Tarrytown Election Carried by Women

Tarrytown, N. Y.—Tarrytown will have \$70,000 to enlarge its water supply and lay new mains for fire protection, and Washington Engine Company will have a new \$5,550 auto combination fire apparatus, thanks to the women voters. Never before in the history of the village have women taken such an active part in a campaign. They were only enlisted in the fight six days. On March 15 the Women's Civic League held a meeting at which they asked D. S. Merritt, engineer for the Water Board, to deliver an address on Tarrytown's water supply and its needs. Mr. Merritt told of the need of a better water supply so well that after he finished the women crowded around him and pledged their support for his plans. The next day women were being buttonholed on the street by enthusiastic workers. Nearly every woman in Tarrytown was visited, and a notice was published calling on the women to get out on election day and do their duty. They heeded the call enthusiastically and out of a total of 309 votes, the women cast more than a third of them.

Bill Will Protect City Bond Buyers

Lebanon, Pa.—To doubly validate the \$110,000 worth of bonds issued by the City of Lebanon to pay for sewer improvements, Representative Wm. C. Freeman, of Cornwall, last week introduced in the House at Harrisburg a bill making them absolutely legal. There is no doubt whatever of the passage of the bill. This precaution—which, by the way, was taken at the instance of none of the three banking institutions in this city which bought blocks of the bonds—makes assurance doubly sure that the bonds are good. It makes the legality of the bonds absolutely sure, double riveted and ironclad. The bill was introduced at the instance of private buyers of the bonds, it was stated.

Draw Lots for Office

Newburg, N. Y.—After a bitter contest in Highland Falls for Village President between George W. Flood and J. S. Likely, a tie vote resulted. To avoid the expense of another election the two candidates agreed to draw lots for the office. Slips of paper were put in a hat and Flood drew the winning ticket.

City Wins Franchise Suit

Denison, Tex.—In the case of the City of Denison vs. The Postal Telegraph and Cable Company of Texas, wherein the City of Denison sued for a franchise tax for the year 1910, Justice of the Peace I. N. Layne last week rendered a decision in favor of the City of Denison. This is one of the four suits which were filed several weeks ago by City Attorney N. H. L. Decker for the collection of the franchise tax of \$74,288, penalties, interest and fees and cost of suit. D. A. Frank of the Postal Telegraph Company legal department represented the company, and Mr. Decker the City of Denison. The evidence in the case was heard Saturday and Justice Layne rendered his decision Monday afternoon.

STREET CLEANING AND REFUSE DISPOSAL

New Flushing Machine

Schenectady, N. Y.—The new street flushing machine for the city has arrived. It is of iron, with a capacity of 653 gallons, three more than called for in the specifications. As soon as the weather permits it will be put to work, together with the old one, flushing the streets. The new street sprinkler has not yet arrived, but the old ones are in commission, and with the rotary broom wagons received their new numbers from the hand of a painter in the city hall lot.

Garbage Crematory Closed

Waterbury, Conn.—H. M. Rigney's contract with the city for the disposal of the garbage at the crematory on Sheffield street has expired. Consequently there will be no more garbage disposed of in Waterville. The garbage will be disposed of by Hans Rasmussen and sub-contractors for the next year. Mr. Rigney, who has been a resident of Waterville for many years, has had the contract for over twenty years. Those employed at the crematory by Mr. Rigney have been thrown out of employment by the shifting of the contract.

Flushing Machine for City Arrives

Poughkeepsie, N. Y.—The clean streets of Poughkeepsie will be cleaner still and that state next to godliness will be secured with a deal less effort than has been expended before this time. A new flushing machine, weighing 4,000 pounds, which is said to fairly eat up the dirt, arrived in Poughkeepsie last week. It is white, with "Department of Public Works" in black, red-lined letters. The machine has been taken on trial and will not be finally accepted until its worth has been proved. A demonstration will be given by men from the Tiffin Wagon Company, of Tiffin, Ohio.

Cheaper Flushing Asked for Streets

Spokane, Wash.—Commissioner of Public Works Coates states that he will ask the commissioners to send him to Seattle to investigate a new system of street flushing. The system, if adopted, will supplant the present pressure flushing wagons used downtown and on paved streets elsewhere in the city. If found efficient, it will save considerable expense. The system is to flush the streets from the hydrants instead of from the carts, using length of 2-inch steel pipe mounted at each end on 4-inch swiveled wheels, the lengths of pipe to be connected together by pieces of heavy, steel-ribbed fire hose. Mr. Coates says two men can flush a block with this outfit in 10 minutes at much less cost than under the present system. A horse is used to drag the outfit from block to block.

Must Carry Refuse Far Out Into Ocean

Sacramento, Cal.—Harland's bill prohibiting the deposition of garbage and refuse in navigable waters was passed by the Senate and goes to the Governor. Senator Martindale said that the object of the bill was to relieve residents of Marin county from the nuisance caused by the dumping off the Heads of all sorts of trash, rubbish and offensive matter. The bill provides that the scows and other craft carrying garbage out on the Pacific Ocean must go not less than twenty miles off shore before unloading. Inspectors appointed by the State Board of Health or the municipality at the point of departure must go along to see that this is done.

Garbage Plant Ready for Opening

Bridgeport, Conn.—Delay in the arrival of machinery for the garbage plant is responsible for its not being able to open for receiving the city garbage until April 15. Commissioner Frank Bogart of the Health Board was informed by Contractor C. C. Fischer that he expected the plant will be ready at that time. It is expected that the contractor will have a model plant when everything is ready for the opening and no expense is being spared. His contract which calls for payment of \$1 per ton for the reduction process is considered to be an excellent one for the contractor and, provided he can keep his contract by having an odorless plant, it is expected that he will be able to make his venture a profitable one.

Plan for Cleaner Streets

Elizabeth, N. J.—The problem of keeping clean ninety-seven miles of paved and unpaved streets in Elizabeth is the puzzle facing the Committee on Streets Highways of City Council. The Committee, composed of Councilman McGurn, chairman, and Councilmen Maughan and Wagner, has been giving the subject the utmost consideration for weeks and has gone over many plans that have been suggested to the committee, by Mayor Stein and others. No plan has been adopted as yet, but Chairman McGurn is of the opinion that a satisfactory method will be discovered and that the streets will be kept clean watered at a minimum cost.

The plan of street cleaning as suggested by Mayor Stein is: That the work be divided into districts, with a competent foreman at the head of each district, said foreman being held accountable for his district work; that the principal business streets be swept at night; that the sprinkling wagons be assigned to each district and be kept busy during the dry season of the year; that the employes be paid in uniform, as are the police and firemen; that a certain sum be set aside annually to be used exclusively for the repair of paved streets, so that minor repairs can be made as soon as their needs are discovered, without causing a general fund for street cleaning to suffer; that the ordinance providing for the removal of snow from sidewalks and the throwing of paper, etc., into the streets should be more rigidly enforced, and that the necessary appropriation for oiling the streets be made early so that the streets can be oiled in the early summer months as soon as the roads become dusty.

To Investigate City Garbage Methods

Niagara Falls, N. Y.—City Engineer F. S. Parkhurst, has been authorized by the Board of Public Works to visit other cities using sanitary methods for the disposal of garbage and make a report to the Board at the earliest possible date. It is the intention of the city to stop the pollution of the Niagara River by discontinuing the dumping of refuse into the water. By this means it is believed that the city will be taking the first step in stopping the pollution of the Niagara and that the State Board of Health will take steps to prevent Buffalo and the Tonawandas from dumping its sewage into the river above the falls. The disposal of garbage by incineration is said to be the best method, and the taxpayers may be called upon in a short time to vote on the purchase of such disposal plant. The cost of a disposal plant sufficient to take care of the city refuse is estimated at about \$75,000.

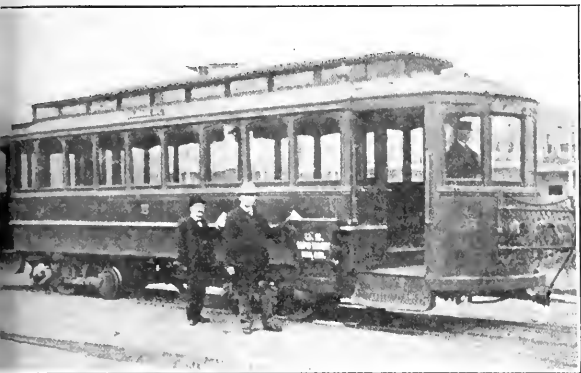
Spring Cleaning a Step in City Beautiful Plan

Toledo, O.—There will be a monster housecleaning May day for which everybody in Toledo will want to get called early in the morning if the plans of the proposed Civic Federation, already numbering 2,500 members, go into effect as suggested at the meeting of many of the committees of the city at the Business Men's Club last week. It is confidently expected that the federation will embrace 5,000 members when organized. With the idea of the City Beautiful in mind, Colonel J. C. Bonner, acting as chairman of the meeting, spoke of the necessity of rendering the city and the hygienic aspects of the city attractive to prospective settlers. On May day every storekeeper, policeman and manufacturing concern in the city will be asked to put its house in order, and explore garret, cellar, lumber shed and yard for the things which are unnecessarily cluttering the earth. These will be deposited in front of the premises and collected and taken to a scow, which will be far out upon the lake, where the rubbish will be deposited. The sign of the citizens desirous of perfecting the City Beautiful will be a pile of debris on May the first. It will be a badge of honor on that day. The day set by the federation as that on which the City Beautiful idea should be completed is that of the Perry Centennial celebration, September, 1913. The grocers, the butchers, the bakers, the candlestick makers of Toledo will all be invited to load their wagons for the removal of the proceeds of the sale after forgotten and unsightly things on May day. Among the measures advocated for the promotion of the City Beautiful will be the paving of all streets, the growth of more shade trees and the education of citizens as to the things they ought and ought not to do.

RAPID TRANSIT

Satisfactory System of Street Car Mail Boxes

Washington, D. C.—If negotiations now pending between the Post Office Department and the street railway companies are successful, letters may be mailed in boxes attached to the sides of the street cars and their outward reach greatly facilitated. Various plans have been tried in the department to perfect a system of rapid mail collection. In some cities where postal cars are operated on the street railways letter boxes have been provided on the mail cars and the mail dropped in them has had the immediate attention of the postal clerks. Such a plan was tried in this



Courtesy Washington Star

NEW PLAN OF ATTACHING MAIL BOX TO CAR

for a while. The new plan, however, is said to be much more effective and satisfactory. It contemplates the attachment to the side of the street car of a mail box with a large funnel-shaped mouth, into which letters may be easily deposited when the car stops at the corners or the motor-slackens speed as it passes. The box is so constructed that neither snow nor rain can damage the letters deposited in it, and yet its mouth is always wide open. Provision is made whereby letters gathered on lines that do not connect with the postoffice may be transferred at junctions with other lines and without delaying the rapid transit of the cars or interfering with their schedule. The plan is said to have been tried in Wilmington, Del., for several months and to have been so successful and satisfactory in every respect that the Mayor and Common Council ordered the postmaster in extolling it to the department and urged for its continuance.

Improvements to Street Cars

Louisville, Ky.—Street cars on Louisville city lines may be timed hereafter by clocks instead of inspectors. Three such clocks are already in use and President Minors says that they have proven so uniformly satisfactory that they will be used on the entire system in a short time. Clocks now in use are located at Fourth avenue and Oak street and at Second street and Broadway. The clocks are connected with the trolley wire by a small electric wire and when the car on any line reaches a given point the trolley wheel coming in contact with the small wire puts in action an electric current that causes a needle to register on the face of the clock the exact second the car reaches that point. It is stated that it will be only about ten days before motormen on every car line in the city will be equipped with stools. They have already been introduced on the Second street line. This innovation is introduced on the suggestion of Mayor W. O. Head. The commissioner has found some difficulty in finding stools small enough to keep from obstructing the small spaces in the vestibules.

Fender Ordinance Goes into Effect

South Bend, Ind.—Safety appliances, similar to those in use in the large cities, have been placed on city cars of the Northern Indiana Railway in South Bend, and will serve as a protection against fatal accidents. An ordinance passed by the Common Council providing for the equipment of cars with proper safety appliances became effective last week.

To Limit Street Car Loads

St. Paul, Minn.—Without a dissenting vote the Aldermanic Committee on Streets last week recommended Alderman Corning's "strap-hanger" ordinance for passage. The ordinance provided the maximum carrying capacity of any car shall be the number of passengers the car may seat, plus one-half that number, who will be permitted to stand. When the maximum carrying capacity has been reached there must be displayed in a conspicuous place at the rear of the car the sign "Filled," and no more passengers may be permitted on the car until other passengers leave the car. A penal clause is attached. It is further provided the company must furnish enough cars so no patron will be required to wait more than three minutes for a car on the lines of heaviest traffic and not more than ten minutes for a car on all other lines in the city. A penalty attaches to violation of this provision. It is likely, however, this provision will be amended, making the waiting time uniform.

Improvements Must Be Made in Street Car System

Seattle, Wash.—The radical actions of the newly elected reform City Councilmen have caused a sensation here. The Council has gone on record to investigate immediately how many miles of tracks the Seattle Electric Company is operating over without franchise, and if such are asked for and now granted they must be paid for. The Council will put an end to strap-hanging by making new schedules and forcing the purchase of new equipment. Its most radical action was the setting of the date of April 25, when the Seattle Electric Company must show cause why its Ranier avenue franchise, a line that will tap the populous Ranier Valley, should not be repealed. The voters at the same election in which they elected the reform candidates having voted a bond issue of \$800,000 to build a line along Ranier avenue, leads shrewd financiers to believe the franchise will be repealed.

MISCELLANEOUS

Voters Reject Library

Wellsville, N. Y.—By a majority of 74 votes, at the village election, last week, the town of Wellsville, N. Y., voted down the proposition to accept the "David A. Howe Public Library." It is understood that the vote was the result of a misunderstanding, the people believing that conditions were attached to the gift.

Dog Ordinance Passed by City Council

Jacksonville, Fla.—As the result of several cases of hydrophobia in the city a bill has been passed stipulating that every person owning a dog must register the animal with the City Recorder and shall be subjected to a tax of \$1 for each dog. The bill also provides that metal tags shall be attached to a collar, denoting the number of the license. Owners allowing their dogs to run at large are required to have them muzzled and when a dog accompanies a person on the streets of the city he must either be muzzled or must be led by a chain or leash. The appointment of dog catchers to impound animals not muzzled or failing to comply with provisions of the ordinance is vested in and the period of their service is discretionary with the Mayor. The ordinance further stipulates that all dogs taken up shall be held for five days. Owners of dogs which are tagged shall be notified of their being impounded and every opportunity given them to claim the animals. After being held five days unclaimed dogs will be killed.

Trimming of Trees Ordered in Garwood

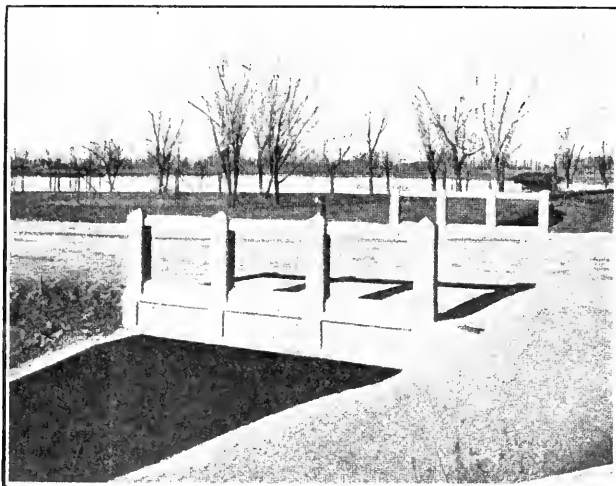
Garwood, N. J.—Councilmen J. L. Hildner, H. M. Bull and H. M. Wyckoff, constituting the street committee of the council, have sent out notices to all property owners to trim trees in compliance with the borough ordinance. The notice informs property owners that the committee takes the opportunity of notifying each owner to trim trees so that the same will not interfere with the free passage of pedestrians or the obstruction of electric lights in accordance with Section 7 of ordinance No. 1. The committee gives the owners ten days' time to comply with the terms of the ordinance.

Plans Launched to Free Bridges

Columbus, S. C.—Plans for "freeing" the bridges across the Congaree and Broad Rivers were discussed at the organization meeting of the commission named by Governor Blease to have charge of the work. The members of the commission were commissioned following a report to Governor Blease by the election commissioners that the election held in Columbia township for the issue of \$75,000 in bonds, was provided for by an act passed in 1908. At the meeting it was decided to confer with the owners of the present bridges across the Congaree and Broad Rivers. The bridges will be bought if a reasonable price is fixed. Before making a purchase an expert will examine the bridges for the commission to determine the safety of the structures.

Concrete Bridges in Denver Parks

Denver, Col.—The Park Board is completing the construction of four concrete bridges, spanning the City Ditch which borders the Marion street driveway through Wash-



SHORT SPAN CONCRETE PARK BRIDGE

ington Park. The work is being done under the supervision of Frederick C. Steinbauer, superintendent of parks. The bridges are of ornamental design and will add considerably to the beauty of the park.

Municipal Ownership Makes Good Showing

Calgary, Alberta.—The City of Calgary, Alberta, owns and operates the street railway, water works and electric light plants, which are operated by a commission of three. During the five years that the electric plant has been under municipal control the rates have been reduced 45 per cent. The street railway has been operating about eighteen months, and contracts have been let for 22 miles of new track this year. The water works plant was purchased from a private company several years ago in a very dilapidated condition, since when it has been largely reconstructed; 19½ miles of mains having been laid in 1910. This plant has cost about \$1,400,000. The electric plant has cost about \$500,000, and the street railway about \$530,000. During 1910 the net surplus was \$3,335 for the water works, \$22,407 for the lighting and power plant, and \$33,315 for the street railway. In figuring these profits allowance was made for interest, sinking fund and depreciation, except that apparently no depreciation is charged off for the water works. The interest rates are from 3 to 4½ per cent., and the sinking fund about 1.6 per cent. for the water works and 1.8 per cent. for the other two.

City After Record for Improvements

Richmond, Ind.—The city is going after a record this year for public improvements in contrast to last year's inactivity. So far this year, according to Everett Davis, Chief Clerk of the Engineering Department, contracts for \$83,000 of public improvements have been let. Mr. Davis says there is about \$30,000 worth of contracts for improvements to be let.

City Planners Organize to Beautify City

St. Paul, Minn.—St. Paul's city planners believe the public will support their projects for civic improvements, and the City Club last week launched a campaign for the organization of a gigantic "civic trust," the object of which will be to obtain the consummation of the projects now planned. Every civic organization in St. Paul will be invited to become a member of the City Club. Such membership will entitle the organization to five delegates, president, secretary and three other members in the club's civic council. The civic council will be an executive committee of the "civic trust," which will comprise the total membership of all civic organizations when it comes creating sentiment for civic improvements. This is a most important step as it assures uniformity of plans.

Law Prohibiting Sidewalk Obstructions Will Be Enforced

Port Arthur, Tex.—Removal of board signs and merchandise displayed on the sidewalks will be strictly insisted upon, and those who fail to take heed and obey the edict will be prosecuted. The city authorities have determined to strictly enforce the law prohibiting the placing of the board signs on the sidewalks, likewise the obstruction of the walks in other ways. Chief of Police Taylor, acting under instructions of the Mayor and Council, is making a canvass of the town and notifying the merchants and others of this fact, giving them due warning that unless the law is obeyed arrests will follow.

Dynamiting Municipal Building Does Little Damage

Springfield, Mass.—An attempt to blow up the tower of the new municipal group of buildings with dynamite resulted in slight damage. The contractor said when asked that 100 bricks and a few hours' work would put it in good shape as ever. Five hundred dollars reward is offered by the city for the arrest and conviction of the person responsible for the explosion.

Will Plant 60,000 Trees

Washington, D. C.—The school children of Washington will contribute their efforts toward making Washington "City Beautiful" on Arbor Day by planting about 50,000 catalpa trees. These trees are to be given to the public and private school pupils by Woodward & Lothrop, the only stipulation being that the planter must take care of the tree. Not only will 50,000 be distributed in Washington, but about 10,000 more will be distributed in the vicinity. The catalpa, or "Indian cigar," reaches maturity within a few years, and because of its rapid growth a very durable wood, which has been described as being "lighter than pine, stronger than oak, and tougher than hickory," is recommended by the United States for service for general planting. Besides its rapid growth, the catalpa is valuable for city use because it is a flowering tree, bearing beautiful white blossoms, spotted and lined with brown and purple.

Money Is Divided Among City Parks

Richmond, Va.—After two hours of cutting and pruning a subcommittee of the Council Committee on Grounds and Buildings last week distributed between the various parks of the city the general appropriation of \$25,000. The report will be made to the Grounds and Buildings Committee next week. The slate as adopted is as follows: Chamberlayne Park, \$2,950; Marshall Park, \$2,000; Jefferson Park, \$1,000; Taylor's Hill, \$1,000; Steps, Twenty-sixth street, \$20; Gamble's Hill, \$900; Monroe Park, \$1,200; Nurse Park, \$1,200; Riverside, \$1,000; William Byrd, \$8,900; Monument Avenue, \$900; Washington square, \$700; Contingent fund, \$100; Water and Light, \$700; Joseph Bryan Park, \$2,400. These funds are for improvements, and are aside from the pay of keepers and laborers.

Only Bonded Persons May Do Pipe Fitting

Spokane, Wash.—An ordinance prohibiting any plumbing and gas fitting in the city except by persons and firms filing a \$5,000 surety bond was one of the last passed by the City Council. It was framed by the master plumbers of the city and passed, according to Plumbing Inspector E. R. Rife, without his recommendation and even without his having time to go over it. Permits will be required for all work except removal of stoppages or repairing leaks and a few other minor jobs of repairing.

LEGAL NEWS

Summary and Notes of Recent Decisions—Rulings of Interest to Municipalities

Patented Paving Materials—Statutes

Tousey v. City of Indianapolis et al.—Burns' Ann. St. 1908, relating to towns and cities, provides that a board of public works shall let a contract to the lowest and best bidder; section 8710 relates to the determination by voters by the Council of the kind of material to be used in a street improvement. A corporation having patent rights in a paving material called bitulithic proposed to grant to the city, or to any accepted bidder for paving work, the right to use it for a specified royalty, conceded to be reasonable, the city to have the use of such right for repair of improvements for which the contracts were let during 1908. The city accepted the proposition and after a petition under section 8710, requiring the use of bitulithic, prepared specifications calling for bitulithic paving, specifying that the rights conferred by the company were granted to any contractor at the same rate. Held, in an action by a taxpayer to enjoin the letting of the contract, that the use of the patent rights provided in the specification was not an interference with the competition contemplated by the statute. Supreme Court of Indiana, 94 N. E. R., 225.

Improvements—Description—Sufficiency

City of Hillsboro v. Grassel.—Where blue prints of the plans of a local improvement were before the Council, and considered as part of the ordinance at the time of its passage, temporary detachment from the ordinance did not invalidate the ordinance. Under Local Improvement Act, requiring an ordinance for a local improvement to describe the improvement, etc., plans, profiles and specifications attached to the ordinance made a part thereof by reference as much part of the ordinance as if bodily incorporated therein.—Supreme Court of Illinois, 94 N. E. R., 48.

Park Commissioners—Power to Make Improvements

South Park Commissioners v. Pearce et al.—Under the Revised Statutes, 1909, authorizing park commissioners to improve streets under their control by special assessment, an improvement is not precluded merely because the street has been improved by the city, but good pavement, sidewalks, curbs and gutters recently put down at the abutter's expense cannot be replaced at the abutter's expense, with substantially similar improvements, slightly changing the details to better adapt the street as a pleasure driveway.—Supreme Court of Illinois, 94 N. E. R., 33.

Public Officers—Compensation

Amerige v. Town of Saugus.—There is no such relation between a public officer and a municipality in and for which he is elected or appointed as to entitle him, merely by reason thereof, to compensation.—Supreme Judicial Court of Massachusetts, 95 N. E. R., 297.

Highway Construction—Landslide Damages

Giaconi v. City of Astoria.—In an action against a municipality for damages to land caused by a slide of earth in opening a road where defendant had the services of a competent engineer, and, in running the cross-section lines to determine the amount of cut and fill, he examined the ground where the improvement was to be made, and prepared specifications based thereon, and no slide had ever been known in that vicinity, and he was never informed of the existence of a fissure therein, his judgment respecting the plan was all that reasonably could have been required from an inspection of the conditions, and the city was not liable.—Supreme Court of Oregon, 113 P. R., 855.

Defective Sidewalk—Negligence

Preiss vs. City of New York.—In an action to recover for injuries sustained by one who stumbled over the end of an iron pipe projecting about 2½ inches above a cement sidewalk it is a question for the jury whether the accident was reasonably to be apprehended.—New York Supreme Court, New York, 127 N. Y. S., 498.

Commission Government—Statutory Provisions

Walker v. City of Spokane et al.—The city of Spokane, a city of the first class, having the right, under Constitution, to frame its own charter subject to control by general laws, prepared and proposed a charter abolishing the offices of Mayor and the Council and substituting five Commissioners, who were to exercise all municipal powers, both executive and legislative, and to be subject to the order and direction of the people by the initiative, referendum and recall provisions. Held, that the provisions of the proposed charter were "within the realm of local affairs or municipal business," within Laws 1903, providing that charter amendments as to any matter within such realm might be submitted to the voters for adoption as part of the charter.—Supreme Court of Washington, 113 P. R., 775.

Defective Street—Injury—Notice

Anthony v. City of St. Joseph.—Where the notice, required by Rev. St. 1899, to be given to the city in case of injury to a person by a defect in the street, stated that the accident occurred on the 14th of August, when the petition and evidence showed that it happened on the 13th, the variance was fatal.—Kansas City Court of Appeals, Missouri, 133 S. W. R., 371.

Grading Streets—Action on Bond

Kansas City v. Davidson et al.—In an action on the bond of a contractor for grading a city street by owners of two tracts of land for breach of the contractor's agreement to grade lots in consideration of the right to remove dirt from such tracts for filling purposes, there could be no recovery where it does not appear what was the quantum of damages suffered by each plaintiff on account of the breach.—Kansas City Court of Appeals, Missouri, 133 S. W. R., 366.

Defective Streets—Injuries to Children

Townley vs. City of Huntington.—A space within the bounds of a city street, set apart between the sidewalk and the roadway for a grass plot, is a part of the street, for the neglect of the safe condition of which the city may be held liable. A street or sidewalk is not in good repair when one without fault may fall from it into a dangerous hole, or an irresponsible child may venture to an unguarded pitfall within its bounds or immediately at its side. A city owes substantially the same duties to children, properly on the streets, although engaged in play, as it does to travelers on business.—Supreme Court of Appeals of West Virginia, 70 S. E. R., 368.

City Advertising—Incidental Expenses

Mitchell vs. City of St. Paul et al.—The term "current and incidental expenses," as used in St. Paul Charter, 1905, means the usual and reasonably necessary expenses, not otherwise provided for, of carrying into effect the powers and discharging the duties given and imposed by the charter. Advertising the city is not a current and incidental expense, but one which is payable only out of the contingent fund of \$10,000 for promoting the welfare of the city.—Supreme Court of Minnesota, 130 N. W. R., 66.

Telephones—Permits—Franchises

East Tennessee Telephone Co. v. Board of Councilmen of City of Frankfort.—A permit to a telephone company to use the streets of a city given by resolution is not a franchise. It is only a license, and may be withdrawn; but, where extensive improvements are made upon the strength of it, it can only be revoked upon reasonable notice to remove the property or to acquire a new franchise.—Court of Appeals of Kentucky, 133 S. W. R., 564.

Defective Sidewalk—New Trial—Diligence

City of Ft. Worth v. Lopp.—Where diligence exercised by attorneys for a city to discover evidence before trial which was subsequently found and urged as a ground for a new trial had been begun and prosecuted but a short time before the trial, which was some six years after the accident, and there was no legal showing as to what effort, if any, former city attorneys and other city officers had made to secure the testimony, the diligence was insufficient.—Court of Civil Appeals of Texas, 134 S. W. R., 824.

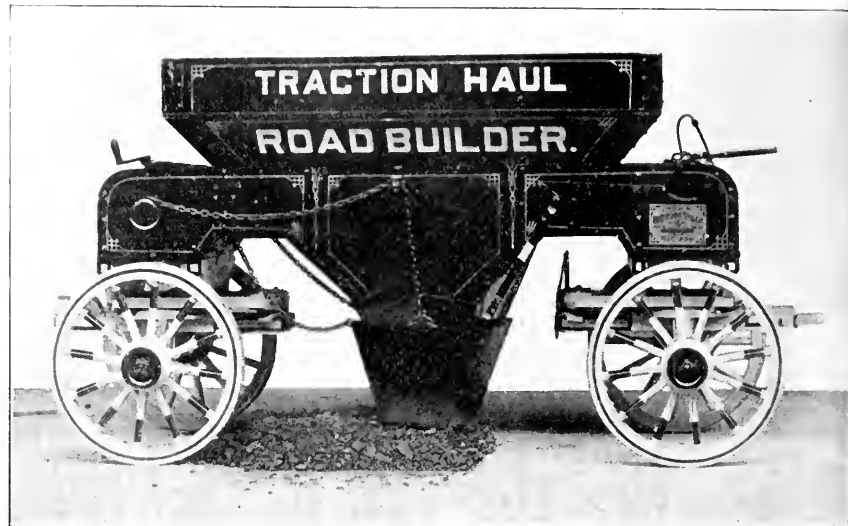
MUNICIPAL APPLIANCES

Street Flushers

AN exhibition of street cleaning machinery was given in New York City, at Eighth avenue and Forty-second street, March 20, in the presence of Commissioner Edwards of the Department of Street Cleaning and other city officials. Machines made by seven manufacturers were shown, among them being the Emerson street sweeper described in these columns, April 5th issue of the MUNICIPAL JOURNAL AND ENGINEER. The street washing machine, perhaps better known as the "squeegee cleaner," made by the Kindling Machinery Company, Milwaukee, Wis., was also there. Street flushing machines, operated by air pressure, created by drawing water from the hydrant into a closed tank until the pressure in the tank is equal to that of the water at the hydrant, were exhibited by the following manufacturers: Sanitary Street Flushing Machine Company, St. Louis, Mo.; St. Louis Flushing Machine Company; D. Conolly Boiler Works, Cleveland, O.; Charles B. Hyass, 509 East Eighteenth street, New York. These machines have been described in the MUNICIPAL JOURNAL AND ENGINEER at various times. They all operate on the same general principle and vary from each other in the details of the flushing nozzle, air arrangements and methods of control. Although the water pressure in the hydrants at this point in New York is only 25 pounds, and 40 or 50 pounds is considered as a desirable working pressure, the machines made a favorable impression.

The most novel machine in the exhibit was the new Studebaker Uniform Pressure Street Flusher, made by the Studebaker Corporation, South Bend, Ind. Although a machine of this general description was placed on the market last year by this company, the

machine exhibited is practically a new design on account of the substitution of a positive pressure for a centrifugal pump. In this machine the flushing is accomplished by the pump driven by a gasoline engine, there being no pressure in the tank.



HAYWOOD 3-YARD WAGON WITH SPREADING ATTACHMENT

In general outlines the machine can hardly be distinguished from the other flushing machines, except by a view of the rear, which shows the housing for the machinery. The flusher exhibited was handsomely painted in green with ornamental stripes and lettering. The tank, which is of steel, holds 750 gallons. This is mounted on a substantial running gear with Sarven wheels and Timken roller bearing axles. The weight of the wagon is

4,500 pounds. The wheels are provided with double roller brakes. The roller bearing makes the apparatus, even when filled with some 5,000 pounds of water, easy to draw when once started. The gasoline engine is a Fairbanks-Morse two-cycle engine of 12 horsepower, such as is used for marine purposes. It is recommended for simplicity and economy. There are no valves, the piston acting as a valve as it passes the ports of a tri-pass valve. The system of ignition is the Atwater-Kent, recommended for reliability and economy. The pump is a positive pressure pump, the pressure being created by two impellers, which operate together without friction. The flushing nozzle is a Studebaker patent fan-shaped nozzle. It is adjustable in any direction by means of clamp

rings and elbows working in combination.

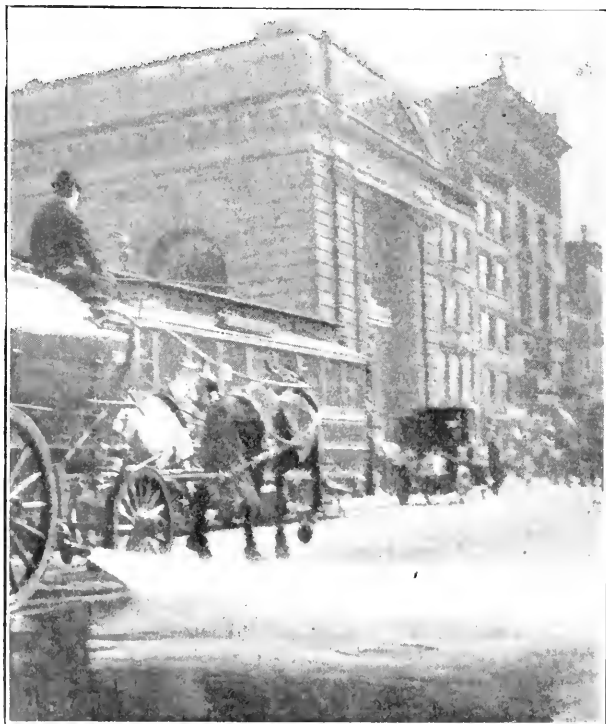
The engine and valve leading to the nozzle is under the control of the driver by means of levers situated by his side. The engine at 725 revolutions creates a pressure of 45 pounds and it can be run at a speed of 900. The valve leading to the nozzle is also controlled by the driver by means of a lever. There is a by-pass from the pump to the wagon so that if the water should be

shut off from the nozzle without stopping the engine the overflow goes back into the tank. The engine runs on the throttle, as the engineers say, so that the pressure can be varied from 5 to 40 pounds.

One tank of water will clean about 1,200 square yards of pavement, more or less, according to the condition of the pavement. If only 20 pounds pressure is needed that is all that has to be used. Five gallons of gasoline is sufficient for eight hours' work. The piping can be so arranged that the tank can be filled from a river or other body of water and the expense of using city water thus avoided.

Three Yard Road Building Wagon with Spreading Attachment

The Haywood Wagon Co., Newark, N. Y., have placed on the market a stone spreading wagon of three yards capacity, which they call a Traction Haul Road Builder. As shown by the illustration the wagon is substantial in construction. Both front and rear wheels turn on fifth wheels so that the wagon may be hauled either way. The construction is intended to be strong enough so that the wagon may be hauled by a traction engine. For this purpose it is made with a traction hitch. The automatic spreading attachment is a steel hopper, the raising and lowering of which is under the control of the driver through levers and chains. A gate at the bottom may be opened as wide as is desirable. The manufacturers claim that the wagon will spread stone or other road material to a depth varying from one inch to two feet and that it will spread its load evenly no matter how rough the road. When the wagon stops the discharge is also stopped. The possibility of saving one or two cents a square yard, the usual cost of hand spreading, makes this proposition an interesting one.



POWERFUL STREAM FROM STUDEBAKER FLUSHING MACHINE

NEWS OF THE SOCIETIES

National Conference on City Planning.—The following program of the third national conference, Philadelphia, May 15-17, has been issued by Flavel Shurtleff, secretary, 19 Congress street, Boston, Mass.:

Monday, May 15—A city planning automobile tour of the city for members of the conference and specially invited guests. Is Honor Mayor John E. Reburn will give a luncheon to members of the conference. First conference session from 9 to 5 p. m. Address of Welcome by Mayor John E. Reburn. Reply by the chairman of the executive committee, Frederick Law Olmsted. Paper, Municipal Real Estate Policies, Frederic C. Howe, New York City. Discussion. It is hoped that experts from England, France and Germany will present the municipal real estate policy of their respective countries. Second conference session from 8 to 10 p. m., under the direction of the Committee on Public Buildings, Open Spaces and Waterways. Chairman, Frank Miles Day, F. A. I. A., Philadelphia. Papers: The Proper Distribution of Public Buildings, Mr. Ernest Flagg, F. A. I. A., New York City; The Location of Public Buildings in Parks and Other Public Open Spaces, Frank Miles Day, F. A. I. A., Philadelphia.

Tuesday, May 16—Third conference session from 10 to 12 a. m., under the direction of the Committee on Buildings in Relation to Street and Site. Chairman, Lawrence Veiller, Secretary and Director, National Housing Association, New York City. Paper, Buildings in Relation to Street and Site, Lawrence Veiller. Fourth conference session from 2:30 to 4 p. m., under the direction of the Committee on Taxation. Chairman, Hon. Lawson Purdy, LL.D., President Department of Taxes and Assessments, New York City. Paper, Taxes, Assessments and Condemnation, on Lawson Purdy, LL.D. Discussion: Prof. Frank J. Goodnow, Columbia University; Hon. James Alcorn, City Solicitor, Philadelphia; Prof. F. Spencer Baldwin, Boston University; Prof. Charles E. Merriam, University of Chicago. The University of Pennsylvania will give a tea to the members of the conference from 4 to 6 o'clock. Fifth conference session from 10 to 12 p. m., under the direction of the Committee on Traction Lines, Railroads and Docks. Chairman, George E. Hooker, Secretary, Chicago City Club. General topic, The Dock Problem. Papers: Hon. Alvin Tompkins, Dock Commissioner, New York City; Hon. Joseph Hasskarl, Director Department of Docks and Ferries, Philadelphia; Hon. T. E. Gibbon, President of Dock Commission, Los Angeles. Cal.; George C. Sykes, formerly Secretary Chicago Harbor Commission.

Wednesday, May 17—Sixth conference session from 10 to 12 a. m., under the direction of the Committee on Street Planning. Chairman, Nelson P. Lewis, Chief Engineer, Board of Estimate and Apportionment, New York City. General topic, Street Widths and Their Subdivision. Papers: Charles Mulford Robinson, Civic Adviser, Rochester, N. Y.; John Nolen, Fellow American Society Landscape Architects, Cambridge, Mass.. Discussion: Chief Street Surface, George W. Tillson, Chief Engineer, Bureau of Highways, Borough of Manhattan, New York; The Subsurface, George S. Webster, Chief Engineer, Philadelphia. Seventh conference session from 3:30 to 5 p. m., under the direction of the Committee on Legal and Administrative Methods. Chairman, Andrew Wright Crawford, Esq., Assistant City Solicitor, Philadelphia. Paper: The Principles of a Uniform City Planning Code, A. W. Crawford. At 8 o'clock the City Club of Philadelphia will give a subscription dinner, at which the members of the conference will be guests.

National Civic Federation.—At a meeting of the Public Welfare Committee, New York, April 7, to discuss the Triangle Waist Company Fire, Fire Chief Croker was invited to speak. After describing the hazardous conditions existing in the building, he concluded in part as follows: "I should recommend outside fire escapes on all buildings, fireproof or not. I would have standpipes with outlets at every floor and buckets for water and fire drills on weekly fire drills. In addition, there ought to be, whenever possible, outside fire escapes—tower escapes, enclosed in iron. They are the only means for getting out of a fire. The trouble is, as the law stands, re-

sponsibility is all divided up between three or four departments and bureaus—the factory inspectors, the Labor Bureau, the tenement house inspectors, the Building Department and I don't know what all. Responsibility ought to be invested in one department, say the Fire Department, and that department ought to have the legal authority to make good. I think it would make good.

This department ought to have authority to inspect factories, and if it found them unsafe to serve a written notice on the occupants (not the owners of the building). After a reasonable time, if the notice remained unheeded, the factory should be closed and a notice left on the door to the effect that it had been closed because the people refused to make the place safe to work in. And it ought to be kept closed.

National Highway.—The National Highways Club, New York and Washington, has been organized to promote the construction of a highway of special design between New York and Washington. The designing engineer is H. Douglass Layman, president of the National Road and Realty Company, 115 Broadway, New York, and Washington Loan and Trust Building, Washington, D. C. The extreme width of the road, according to the plan, will be 144 feet and will include six separate roadbeds and two sidewalks. Trolley cars, automobiles and horse-drawn vehicles will be given a roadway for each direction traveled. The cost of the highway is figured at \$90,000 a mile. The scheme is expected to be self-sustaining, the cost of building and maintaining the road being paid from the increase in real estate values participated in by the company along the route and from the tolls charged for the use of the auto roads, the fares charged on the trolley system and rights granted for privileges of running wires, pipes, etc.

Good Roads Association of Florida.—President J. G. Dampier and Secretary C. L. Bittering have issued an announcement of the annual meeting, to be held at Tallahassee April 27 and 28. They state that the proceedings of the convention will include addresses and discussions upon the scientific, ethic and economic phases of the subject and its relation to industrial progress and development. Legislation pertaining to State co-operation and supervision, financial ways and means, the use of convicts and other details of the subject will receive practical consideration. State and county officials, Mayors of cities, officers of commercial, agricultural, industrial, transportation, development, civic improvement and all good roads advocates are earnestly requested to be present.

Municipal Art Society of New York.—Mayor Gaynor, who is an honorary director, has sent a letter to the heads of all city departments asking them to co-operate with the society in the coming exhibition, which will be held at the National Arts Club, 119 East Nineteenth street, from April 10 to April 23. They have been asked to send in maps, photographs and such other data as will show what is being done to improve the appearance of the city.

International Association of Fire Engineers.—At a meeting of the directors of the association, Milwaukee, March 29, arrangements were made for holding the annual convention at Racine, Wis., September 19-22. A large exhibit hall has been arranged for. Suitable hotel accommodations can be secured in Milwaukee, which is 24 miles away, as well as at Racine. The sessions of the convention will be held in the Racine City Hall. Eleven topics for discussion were selected and invitations sent out to members who are invited to speak.

Calendar of Meetings

- April 10-23.**
Municipal Art Society of New York.—Exhibition, National Arts Club, 119 East Nineteenth street, New York City.
- April 27-28.**
Good Roads Association of Florida.—Annual Meeting, Tallahassee. C. L. Bittering, Secretary, Ocala, Fla.
- May 11.**
Massachusetts Highway Association.—Quarterly Meeting in conjunction with the New England Conference on Street Cleaning, Springfield, Mass.
- May 15-17.**
National Conference on City Planning.—Philadelphia, Pa.—Flavel Shurtleff, Secretary, 19 Congress street, Boston, Mass.
- May 18-19.**
Ohio Society of Mechanical Steam and Electrical Engineers.—Annual Convention, Youngstown.—F. E. Sanborn, Secretary, Ohio State University, Columbus.
- May 23-25.**
National Fire Protection Association.—Annual Meeting, New York City.—F. H. Wentworth, Secretary, 87 Milk St., Boston.
- May 23-26.**
National Good Roads Association.—Fourth National Good Roads Congress, Birmingham, Ala.—J. A. Rountree, Secretary, Birmingham, Ala.
- May 25-26.**
League of Second and Third Class Cities of New York.—Poughkeepsie, N. Y.
- May 29-June 2.**
National Electric Light Association.—New York City.—T. C. Martin, Secretary, 31 West 39th St.
- June 5-14.**
National Probation Officers' Association.—Boston, Mass.—Roger N. Baldwin, Secretary, 903 Security Building, St. Louis, Mo.
- June 6-10.**
American Water Works Association.—Thirty-first Annual Convention, Powers Hotel, Rochester, N. Y.—John M. Diven, Secretary, 14 George street, Charleston, S. C.
- June 7-14.**
National Conference of Charities and Correction.—Boston, Mass.—Alexander Johnson, Secretary, Ft. Wayne, Ind.
- June 7.**
National Association for the Study and Prevention of Tuberculosis.—Denver, Col.—Dr. Livingston Farrand, Executive Secretary, 105 East Twenty-second street, New York City.
- June.**
New England Conference on Street Cleaning.—Springfield, Mass.—Corresponding Officer, Carol Aronovici, 55 Eddy street, Providence, R. I.
- June 11-16.**
International Association of Chiefs of Police.—Eighteenth Annual Convention, Rochester, N. Y.—Major Richard Sylvester, Superintendent of Police, Washington, D. C., President.
- June 13-18.**
New York State Association of Chiefs of Police.—Annual Convention, Rochester, N. Y.
- June 13-16.**
American Society of Civil Engineers.—Annual Convention, Chattanooga, Tennessee.—Charles Warren Hunt, Secretary, 220 West 57th St., New York.
- June 21-22.**
National Conference of Poor Law Officials.—Boston, Mass.—Dr. Robert W. Hill, President State Board of Charities, 105 East Twenty-second street, New York City.
- August 15-18.**
Firemen's Association of the State of New York.—Watertown, N. Y.—A. H. Otto, Secretary.
- September 19-22.**
International Association of Fire Engineers.—Annual Convention, Racine, Wis.
- September 19-22.**
American Hospital Association.—New York City. J. N. E. Brown, M.D., Secretary, Toronto General Hospital, Can.
- September 24-30.**
International Congress on Tuberculosis.—Rome, Italy.—Professor Ascoli, Secretary-General, Via Lucina, Rome, Italy.
- September 26-29.**
American Society of Municipal Improvements.—Grand Rapids, Mich.—A. Prescott Folwell, Secretary, 239 West Thirty-ninth street, New York City.

PERSONALS

ARCALL, JOHN C., former secretary of the Board of Public Works under Mayor Pratt, was unanimously elected to the position of purchasing agent by the City Commissioners of Spokane, Wash., to succeed John Gifford.

BOUSLOG, JAMES, has been appointed Chief of Police of New Castle, Ind., succeeding Chief Burr, resigned.

CARR, HENRY F., of Lawrence, Mass., has been appointed a member of the Park Commission for a term of five years to succeed Colonel Percy Parker.

LYOYD, CHARLES B., has been appointed by the Governor of Maryland a member of the State Roads Commission.

MCCLEUNG, BENJAMIN, Mayor of Newburgh, N. Y., has been appointed counsel to the Forest, Fish and Game Department, to succeed Ellis J. Stanley, who was recently appointed County Attorney for Albany County.

POOLE, C. ARTHUR, has been appointed Assistant City Engineer of Rochester, N. Y., to have charge of the construction of the new \$1,000,000 sewage disposal plant to be built by that city.

REYNOLDS, S. V., mayoralty candidate on the Citizens' Non-Partisan Ticket, was elected by an overwhelming majority.

STEELE, DR. R. L., has been elected president of the Board of Health of McKeesport, Pa.

TARVER, T. C., Jr., City Engineer of Houston, Texas, has resigned to go with the Houston Land Corporation as consulting engineer.

THOMPSON, THOMAS C., has been elected Mayor of Columbia, S. C.

WILSON, J. STITT, has been elected Mayor of Berkeley, Cal. Mr. Wilson, who was formerly a minister, is a Socialist, and was Socialist candidate for Governor last November. This is the first time in the history of California a Socialist has been elected Mayor of a city.

MAYORALTY ELECTIONS

MICHIGAN.

Adrian—F. M. Joslin.
 Bay City—R. O. Woodruff.
 St. Clair—Frank Moore, Jr.
 Lapeer—Dr. F. A. Tinker.
 Flint—John A. C. Menton.
 Ann Arbor—William Waltz, re-elected.
 Pontiac—Robert J. Lounsbury.
 Port Huron—Frank Moore.
 Owosso—Otto L. Sprague.
 Corunna—A. E. Richards.
 Sturgis—Homer L. Allard.
 Marine City—R. B. Baird.
 South Haven—Charles Funk.
 Monroe—H. C. Ovis.
 Cheboygan—Frank Brackett.
 Gladwin—Frank Leonard.
 Big Rapids—Harry I. Dreshon.
 Bessemer—Dr. Pinkerton.
 Charlotte—E. G. David.
 Boyne City—W. W. Bailey.
 Petoskey—W. L. McManus.
 Ludington—Joseph Zeiff.
 Coldwater—Charles A. Conover.
 Battle Creek—Dr. Thomas Zelinsky.
 Allegan—Clarence W. Young.
 Tawas City—Callie Johnson.
 Hillsdale—A. L. Lincoln.

OKLAHOMA.

Guthrie—Frank Olsmith.
 Shawnee—A. D. Martin.
 Lawton—George H. Block.

ARKANSAS.

Little Rock—Charles E. Taylor.
 Pine Bluff—Dr. A. C. Jordan.
 Texarkana—John P. Kline.
 Hot Springs—W. W. Walters.

TRADE NOTES

Cast Iron Pipe.—Chicago: With the business already closed and numerous inquiries on their books, the leading pipe people seem justified in their opinion that this year's business will total above normal. Prices are firm. Quotations: 4-inch, \$25.50; 6 to 12-inch, \$24.50; 16-inch and up, \$24. Birmingham: No reports are made of any lettings of consequence. Production is still less than for the same period last year. Quotations: 4 to 6-inch, \$23; 8 to 12-inch, \$22; over 12-inch, average \$21. San Francisco: The demand continues active in all the Coast States. New York: Competition continues keen for all orders coming up. Quotations: 6-inch, carloads, \$21 to \$22.

Lead.—The market continues strong. Quotations: New York, 4.55c; St. Louis, 4.30c.

Large Motor Centrifugal Pumps.—The borough of South River, N. J., has placed an order for pumps for its new water works with the Buffalo Steam Pump Company, Buffalo, N. Y. This equipment consists of two 5-inch two-stage centrifugal pumps, each having a capacity of 800,000 gallons of water per day against a total head of 135 pounds. The pumps will be driven by 75-horsepower, 1,700-revolutions-per-minute, Fort Wayne motors.

Sewer Cleaning.—The Sieben System of Sanitation Company has recently received the following record of cost of cleaning sewers. N. M. Clancy, Superintendent of Sewer Cleaning and Repairs, says:

On Ashland avenue sewer we operated the machine, cleaning a distance of 380 feet after the machine was set in the sewer in twenty-four (24) minutes. This sewer was about one-third full, a 15-inch pipe sewer. The test given the machine on Second street, in an 18-inch pipe sewer, was full within 6 inches of the top. We cleaned 280 feet in forty-four (44) minutes. On Second street, in a 15-inch pipe sewer, we cleaned 300 feet in thirty-six (36) minutes. This sewer was very badly congested, only about 4 inches of an opening in the top of the sewer.

J. E. Porter, Mayor of Kansas City, Kan., says:

I wish to compliment you upon the efficiency of your sewer cleaning system, which I saw in operation upon a 10-inch sewer in the alley south of Minnesota avenue, between Ninth and Tenth streets. This sewer has given our Sewer Department much trouble, costing us hundreds of dollars a year keeping it in good condition. After getting your rods through the sewer, which I understand took about seven hours' work, this including time spent in taking out about 200 feet of our cleaning rods which were stuck in the sewer, it took just 47 minutes to run your cleaning apparatus the full 400 feet length of the sewer at a total cost of \$9. This cost included time for three laborers and one man with a wagon, making the cost about .02½ cents per lineal foot.

Road Machinery.—Six years ago the J. I. Case Threshing Machine Company put on the market its power-steered, 10-ton steam road roller, which was then the only power-steered roller on the market. This year the company decided to put forth a complete line for road building. In addition to the road roller and road sprinkling wagons the company has been selling, it has added recently the perfection graders and drags, rock crushers, rotary stone screens, rooters, road scrapers, railroad and township plows, the Troy line of bottom dump wagons, boxes, reversible bottom dump wagons, Case municipal tractors, especially constructed for use on any kind of paved streets, and Case contractors' hauling engines.

Tarvia.—The Barrett Manufacturing Company has issued a 1911 edition of its book on Tarvia. As formerly the three grades of Tarvia are: X, for use hot as a binding material; A, the next heaviest grade, also used hot, and B, which is light enough to be used cold. A modification of the methods of construction hitherto generally used is called Tarvia Modern Pavement, which is described as follows: The foundation is prepared as for ordinary macadam, but care should be taken to see that this foundation is properly drained and properly consolidated, for the best of surfaces can be destroyed by softness and movement below. Upon the foundation the base course is laid, using stone 3 inches to 1 inch in size. Usually a thickness of 4 inches, measured after rolling, will be sufficient. This course is filled, rolled as for ordinary macadam and then has spread upon it ½ inch of clean, sharp sand or good gravel. Over this, without further rolling, is sprayed "Tarvia-A" to the amount of one gallon to a square yard. Another layer of stone (3 inches to 1 inch) is then spread to such a depth that when rolled this course will be 2½ inches thick. It is then rolled thoroughly with a steam roller, until the Tarvia and sand are drawn up between the stone and until this layer of stone is bedded firmly into the stone below. The layer of Tarvia and sand holds this course firmly in place and cements the top course of the road thoroughly to the bottom course. A spraying of "Tarvia-X" is then given the road, using 1¼ gallons to a square yard, and a thin layer of ¾-inch stone is spread over the surface. Enough stone must be used to fill in all the chinks of the surface, making it smooth but not enough should be used to leave any loose material on the top. The road is rolled again until perfectly smooth and a final coat of "Tarvia-A," amounting to one-half gallon to the square yard, is sprayed on and the road finished by adding pea stone or screenings and given a final rolling. The booklet is gotten up in the usual good style displayed by the Barrett company, and is handsomely illustrated.

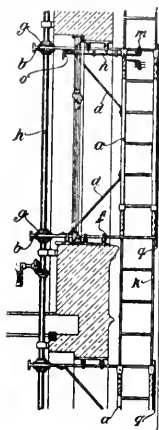
Corcoran Coupling.—The Allyn Brass Foundry Company, Detroit, Mich., has issued a folder explaining the Corcoran joints for lead pipe, made without wiping. The folder states that an exceptionally good man and helper can wipe six joints in ten hours and that an inexperienced man can make six joints with the Corcoran coupling in one hour and the joints will be better. The company manufactures corporation cocks and inverted curb cocks.

Prevailing Rate of Wages.—An important decision regarding the subletting of a contract outside of a State where a different rate of wages prevail has been made by Justice Crane of the New York Supreme Court. The Thompson-Starrett Company had a contract for building the new municipal building in Manhattan. The company sublet the granite work to the Mount Waldo Granite Works, of Maine, which had the granite cut and trimmed by workmen at a daily wage of \$3. For the same work \$4.50 is paid in New York State. Justice Crane declared that there was nothing in the contract or in the labor law requiring the contractors to pay workmen of another State the wages prevailing in this State.

PATENT CLAIMS

987,494. APPARATUS FOR LIFE-SAVING IN CASE OF FIRE. Franz Scherrer, Berlin, Germany. Serial No. 559,810.

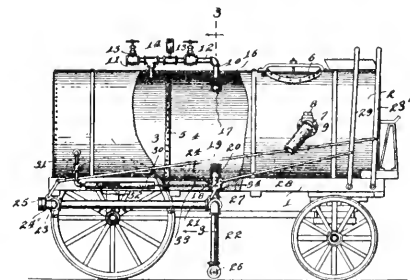
In combination in a device for life-saving from fire, a series of vertical ladders retractable within the window embrasures and normally concealed therein, side plates fixed to said embrasures and adapted to conceal one side of said ladders, covering plates fixed to the outer rail of said ladders



and adapted to close the space between each side plate and the corresponding window jamb, a pair of horizontal bars attached to the top and bottom respectively of each ladder section, means for supporting said bars and ladder sections, a vertical rotatable shaft entirely located within the building, and mechanism whereby the rotation of the shaft projects the entire set of ladders beyond the window embrasures and at a right angle thereto.

987,545. STREET-FLUSHING MACHINE. Jacob I. Brorby, Shenandoah, Iowa. Serial No. 576,453.

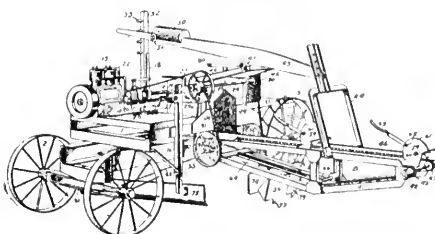
A sprinkling device comprising a tank, a partition dividing the tank into water and air compartments, means connecting the water and air compartments having a



valve therein to control the supply from one to the other, a valved discharge pipe connected with the water compartment, and means communicating with the air compartment and connected to the valve in the discharge pipe for controlling the flow through the discharge nozzle.

987,937. DITCHING APPARATUS. Joseph E. Wyckoff, Los Angeles, Cal. Serial No. 563,219.

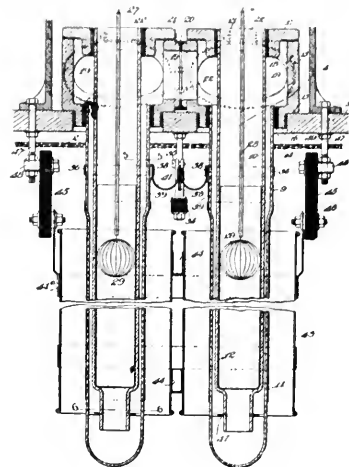
In ditching apparatus, in combination, a frame, mechanism hingedly connected at one end thereof with the frame, said mechanism including a frame and earth removing members mounted thereon, counterbal-



ancing means connected with said mechanism for raising and lowering the same, means coacting with the first means to hold the mechanism in adjusted position and permitting yielding thereof when the members meet with obstructions, and operative connections for the mechanism.

987,902. APPARATUS FOR PRODUCING OZONE. Clifford D. Meeker, East Orange, N. J., assignor to Gerard Ozone Process Company, New York, N. Y., a Corporation of New Jersey. Serial No. 575,393.

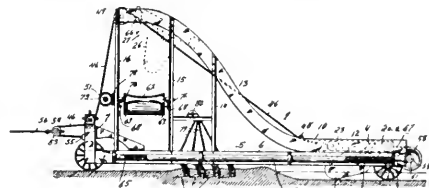
An ozone apparatus which comprises a tank, a cover therefor, ozonizing elements supported by the cover, a casing inclosing



the upper ends of the elements, a fluid passage communicating with the interior of the casing, a separate conduit box for each element, said boxes being connected in series, and a fluid passage from the boxes through a wall of the casing.

987,660. EXCAVATING-MACHINE. Leonard C. Wood, Denver, Colo. Serial No. 555,817.

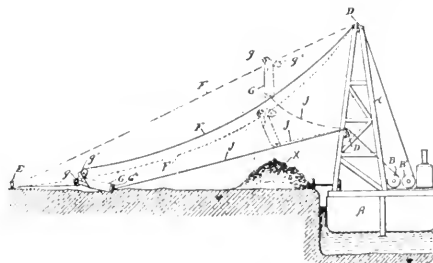
The combination with a vehicle, of a bucket normally locked against movement in relation to the vehicle when at its rear-



ward limit of movement, means connected with the bucket and vehicle for imparting forward travel to the latter, and means for releasing the bucket to allow it to travel independently of the vehicle.

987,612. EXCAVATOR-SHOVEL. Henry G. Butler, Kenosha, Wis. Serial No. 534,068.

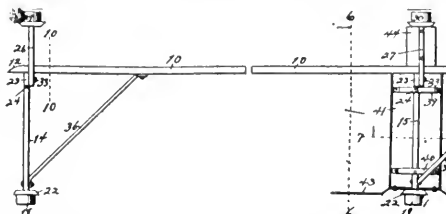
In an excavator shovel of the type described a body portion with a bottom hinged



thereto and means in connection with a drag line for controlling said bottom, substantially as set forth and shown.

987,879. COMBINED CURB AND GUTTER FINISHER. Alfred Horrabin, Iowa City, Ia. Serial No. 575,580.

A combined curb and gutter finisher, comprising a longitudinal face plate, trow-



els on opposite sides of and rigidly connected to and arranged transversely of said face plate, and supporting and guiding wheels at opposite ends of said trowels.

Smoke Prevention Compound.—Smoke Inspector Nelson and Superintendent Jerome of the Smoke Abatement League are conducting tests of a patent smoke prevention compound invented by William H. Murray, Norwalk, O.

Pyrene.—Six pieces of the Paterson (N. J.) fire apparatus have been equipped with Pyrene fire extinguishers, which have been given to the Fire Department by the Pyrene Manufacturing Company, 410 East Thirty-second street, New York, N. Y. One extinguisher will be placed on each chief's wagon and each of the three trucks. Fire Chief Stagg will have the extinguishers used on gasoline fires and fires from electric wiring.

Lighting Company Consolidation.—The Board of Public Utilities, Trenton, N. J., has decided to approve the proposed merger of the Shore Electric Company, the Seabright Electric Company and the Citizens' Light and Fuel Company of South Amboy into the Shore Lighting Company. The new company will be authorized by the board to issue \$400,000 of 5 per cent mortgage bonds.

Incinerator Incinerated.—The Somerville, Mass., incineration plant was practically destroyed by fire last week, causing a loss of about \$3,000. The blaze is supposed to have started by paper that littered the floor becoming ignited from the furnace.

Testing for Water Waste.—The Pitometer Company, 220 Broadway, New York, has resumed its series of tests for water waste at Yonkers, N. Y. Superintendent of Water Peene issued orders last week for the digging of holes, in which the company is to install the instruments used to measure and record the flow in the mains.

Garbage Plant.—C. C. Fisher, York, Pa., who has the contract for disposing of garbage at Bridgeport, Conn., has nearly completed the rebuilding of the works formerly belonging to the Bridgeport By-Products Company. The last pieces of machinery installed were a press and a dryer.

Sulphate Alumina.—Mechanical filtration plants to the number of 66 located throughout Pennsylvania and representing an investment of about \$20,000,000 will be forced out of existence if a bill introduced in the Legislature by E. H. Fahey, Philadelphia, should pass. The bill aims to prohibit the use of alum and alum compounds in the filtration of water furnished to the public for drinking purposes. There are three manufacturing companies in Pennsylvania manufacturing the material; they are the Pennsylvania Salt Manufacturing Company, Charles Leunig & Co. and Harrison Brothers & Co.

Gas Engines.—The Bruce-Macbeth Engine Company, Cleveland, O., has published a new catalogue describing and illustrating its gas engines. At the front of the booklet a tabular statement of comparative costs of fuel for different kinds of power is given. A simple non-condensing engine is estimated to require 8 pounds of coal per horsepower, a compound condensing steam engine 3 pounds and a gas engine using producer gas about 1 1/4 pounds. An illustration of a 300-horsepower, four-cylinder gas engine installed at the city lighting plant, Canal Dover, O., serves to point out the fact that gas engines are a municipal proposition.

THE MUNICIPAL INDEX

In Which Are Listed and Classified by Subjects All Articles Treating of Municipal Topics Which Have Appeared During the Past Month in the Leading Periodicals

It is our purpose to give in the second issue of each month a list of all articles of any length or importance which have appeared in all the American periodicals and the leading English, French and German ones, dealing more or less directly with municipal matters. The index is kept up to date, and the month of literature covered each time will be brought up to within two or three days of publication. Our chief object in this is to keep our readers in touch with all the current literature on municipal matters. In furtherance of this we will furnish any of the articles listed in the index for the price named after each article, except that where an article is continued in two or three issues of the paper, the price given is for each of said issues. In addition to the titles, where these are not sufficiently descriptive or where the article is of sufficient importance, a brief statement of its contents is added. The length also is given, and the name of the author when it is a contributed article.

ROADS AND PAVEMENTS

Highways in Indiana. Address before National Good Roads Congress. By W. P. Blair. 1 p., Clay-Worker, March. 25 cts.

Roads and Pavements. Digest of remarks by Frank J. Spruce, Pres. New Jersey State Association of County Engineers, before Convention. 3 pp., The Public Officials Magazine, February. 10 cts.

The Highway, the Farmer and the Automobile. Illustrated. 2 pp., The Canadian Engineer, Mar. 2. 10 cts.

The Inter-Relation of Good Roads and Good Schools. Address before Southern Educational Association. By Chas. H. Hoyt. Illustrated. 2 1-2 pp., Good Roads, March. 10 cts.

The Economics of Modern Highway Engineering. Paper before American Society of Municipal Improvements. By Arthur H. Blanchard. 2 pp., Good Roads, March. 10 cts.

Road Construction, Some Ideas in Modern. By John McNeal. 1 p., Southern Good Roads, March. 10 cts.

The Art of Roadmaking. By Harwood Frost. 2 1-2 pp., The Surveyor and Municipal and County Engineer, Mar. 17. 25 cts.

The Effective Cheap Drag. Illustrated. 1 p., The Canadian Engineer, Mar. 2. 10 cts.

Systems of Road Building. By W. A. McLean. Paper before Good Roads Association of Ontario. 3 pp., Canadian Municipal Journal, April. 15 cts.

Method and Cost of Constructing a Macadam Road in Fine Grained Loose Soil Subject to Erratic Drainage Conditions. Illustrated. 3 pp., Engineering-Contracting, Feb. 15. 10 cts.

Meadow Roads as Constructed in Southern New Jersey Counties. Paper before New Jersey State Association of County Engineers. By E. D. Rightmire. 1 1-2 pp., Good Roads, March. 10 cts.

Construction and Care of Earth Roads. By G. W. Cooley, State Engineer of Minnesota. Illustrated. 3 pp., Good Roads, March. 10 cts.

Gravel and Earth Object Lesson Roads Constructed by the United States Government. 1 1-2 pp., Good Roads, March. 10 cts.

Gravel Road Building in Michigan. By Frank F. Rogers. Illustrated. 3 1-3 pp., Engineering-Contracting, Mar. 15. 10 cts.

Roads for Heavy Traffic. Illustrated. 3 pp., The Municipal World, March. 10 cts.

Niagara River Boulevard. Paper before Ontario Good Roads Association. By J. H. Jackson. 1 1-2 pp., Contract Record, Mar. 29. 15 cts. 2 pp., The Canadian Engineer, March 9. 10 cts.

Bituminous Road Binders. 1 p., The Canadian Engineer, Mar. 2. 10 cts.

Ten Years' Experience of Tar-Grouted Granite Macadam in a Lancashire Urban District. By Geo. H. Ashworth and Vincent W. Laithwaite. 2 pp., The Surveyor and Municipal and County Engineer, Mar. 3. 20 cts.

Bituminous Materials in Road Construction and Maintenance. Paper before American Association for the Advancement of Science. By A. H. Blanchard. 4 pp., Municipal Engineering, April. 25 cts. 1 1-2 pp., Engineering-Contracting, Mar. 29. 10 cts. 1 1-3 pp., Engineering Record, Mar. 18. 10 cts.

The "Rocmac" Method of Road Construction. Illustrated. 1 1-2 pp., The Canadian Engineer, Mar. 2. 10 cts.

Method and Cost of Constructing Tar Grouted Macadam. 1 p., Engineering-Contracting, Mar. 29. 10 cts.

Arguments for Bituminous-Bound Macadam Built by the Penetration Method. By T. Warren Allen, Engineer Member N. Y. State Highway Commission. 2-3 pp., Engineering Record, Mar. 4. 10 cts.

Asphalt Macadam Roadways. By Thomas M. Roche. 1 1-2 pp., Good Roads, March. 10 cts.

Oil Macadam in California. 1-2 pp., Municipal Journal and Engineer, Mar. 15. 25 cts.

Methods of Constructing and Experience

of California Cities with Oil Macadam. 1 1-3 pp., Engineering-Contracting, Mar. 8. 10 cts.

Bitumens and Their Essential Constituents for Road Construction and Maintenance. By Prevost Hubbard. 4 1-2 pp., Good Roads, March. 10 cts.

Terms Used in Bituminous Road Work. Definitions Adopted by the U. S. Office of Public Roads. 4 pp., Municipal Journal and Engineer, Mar. 15. 25 cts.

Dust Layers, The Use of Artificial. Illustrated. 6 pp., Good Roads, March. 10 cts.

Maintenance of Earth and Gravel Roads in New York State by Road Honing. Illustrated. 1 p., Engineering-Contracting, Mar. 15. 10 cts.

The Development of a Road Maintenance System for Menominee County, Michigan. By K. I. Sawyer, County Road Engineer. 1 p., Engineering-Contracting, Mar. 8. 10 cts.

Macadam Roads and Their Preservation. By L. W. Page. Illustrated. 3 pp., Southern Good Roads, March. 10 cts.

Traffic Records for Purposes of Comparison, Simplification of. By Maj. W. W. Crosby. 3 2-3 pp., Municipal Engineering, March. 50 cts.

Relation Between Modern Traffic and the Alignment and Profile of Highway Design. Paper before American Association for the Advancement of Science. By H. B. Drowne. 1 1-2 pp., Canadian Engineer, Mar. 30. 15 cts. 1 1-4 pp., Good Roads, March. 10 cts.

Street Traffic Data. Tabular Statement. 3 pp., Municipal Journal and Engineer, Mar. 22. 10 cts.

Laws of Ohio, Present Highway, and the Proposed New Law. Paper before American Road Builders' Association. By James C. Wonders. 2 pp., Good Roads, March. 10 cts.

Men in Highway Work, Trained. By A. N. Johnson, State Highway Engineer, Illinois. 5 pp., The Public Officials Magazine, February. 10 cts. 2 pp., The Canadian Engineer, Mar. 2. 10 cts.

Paving in 1910 and '11. Data collected in March from 460 cities. 15 pp., Municipal Journal and Engineer, Mar. 15. 25 cts.

Modern Pavement Construction. Illustrated. 2 1-2 pp., The Canadian Engineer, Mar. 2. 10 cts.

Toronto Street Paving. 1-3 pp., Municipal Journal and Engineer, April 5. 10 cts.

Committees on Pavement Specifications. 1-2 pp., Municipal Journal and Engineer, Mar. 15. 25 cts.

London Paving Materials. Metropolitan Committee's Annual Report. 4 pp., Surveyor, Mar. 24. 25 cts.

Pavements in Grass Forks. Untreated and Treated Wood Blocks. Blome and Bitulithic Pavements. By H. G. Lykken, City Engineer. 1 p., Municipal Journal and Engineer, Mar. 15. 25 cts.

Best Pavements in Demand. 1-4 p., Municipal Journal and Engineer, Mar. 15. 25 cts.

Methods of Road and Sidewalk Building. By F. L. Fellows. 1 1-2 pp., Contract Record, Mar. 29. 15 cts.

Cost of Pavements. 1-2 pp., Municipal Journal and Engineer, Mar. 15. 25 cts.

Crown, Street Paving. By J. T. Powell. Illustrated. 3 pp., Proceedings of American Society of Civil Engineers, March. \$1.00.

Brick Pavements, Cracking of Cement Grouted, Causes and Remedies. Paper before the Michigan Engineering Society. By Earle R. Whitmore. 1 1-2 pp., Engineering-Contracting, Feb. 15. 10 cts.

New Standard Brick Rattler. Recommended by National Paving Brick Manufacturers' Association. Instructions for construction and use. 1 1-2 pp., Municipal Journal and Engineer, Mar. 15. 25 cts.

Concrete Street Paving in Mason City, Ia. Paper before Iowa Engineering Society. By F. P. Wilson. Illustrated. 1 1-2 pp., Cement Era, April. 40 cts.

Cement Concrete Paving. Paper before Middle West Cement Exhibition. By C. P. Chase. 7 pp., Midland Municipalities, April. 10 cts.

Cement Concrete Street Paving in

Mason City, Iowa. By F. P. Wilson, City Engineer. 2 2-3 pp., Municipal Engineering, March. 50 cts.

Asphalt Pavements, New York's. By D. T. Pierce. 2-3 pp., Municipal Journal and Engineer, Mar. 29. 10 cts.

New York Pavements. 1-2 p., Municipal Journal and Engineer, Mar. 29. 10 cts.

Methods and Costs of Constructing an Asphalt Street with Concrete Walks, Curb and Lamp Posts. Illustrated. 1 1-2 pp., Engineering-Contracting, Mar. 15. 10 cts.

The Municipal Asphalt Paving Plant at Detroit, Mich. By Len G. Shaw. 3 1-3 pp., Municipal Engineering, March. 50 cts.

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SEWERAGE AND SANITATION

Sewer at Syracuse, The Main Intercepting. Illustrated. 2 1-3 pp., Engineering Record, Mar. 4. 10 cts.

The Main Drainage Works at Toronto. Illustrated. 4 pp., Engineering Record, Mar. 18. 10 cts.

Concrete Outlet Sewer at Fort Smith, Ark. By Matt and Bemis, contractors. Illustrated. 1 1-2 pp., Municipal Engineering, April. 25 cts.

Pipe, Vitrified Sewer and Culvert. Portion of official report of the 25th annual convention of National Brick Manufacturers' Association. By George H. Tefft. Illustrated. 6 3-4 pp., The Clay Worker, February. 25 cts.

Yearly Variation in Cost of Pipe Sewers. By E. S. Rankin. Illustrated. 1-2 p., Municipal Journal and Engineer, Mar. 29. 10 cts.

Cost of Constructing Reinforced Concrete Pipe Sewers at Mishawaka, Ind. Paper before the Indiana Engineering Society. By Wm. P. Moore, City Engineer. 1 1-2 pp., Engineering-Contracting, Feb. 15. 10 cts.

Manholes in Winnipeg. 1-4 p., Municipal Journal and Engineer, Mar. 29. 10 cts.

Tests of Drain Tile and Sewer Pipe, Standard. Paper before Iowa Engineering Society. By A. Marston. Illustrated. 2 pp., Engineering-Contracting, Mar. 15. 10 cts.

Proposed Standard Method of Testing Drain Tile. Paper before Interstate Tile Manufacturers' Association. By C. M. Powell. Illustrated, 3 pp., Canadian Engineer, Mar. 30, 15 cts.

Concrete, The Action of Sewage on. 3 pp., Cement Age, March, 15 cts.

Disintegration of Concrete in Sewage Disposal Plant. 1 p., Canadian Engineer, Mar. 30, 15 cts.

Stream Pollution, Legislation on. Paper before Illinois Sanitary and Water Supply Association. By H. M. Ely, 1½ pp., Municipal Engineering, April, 25 cts.

Observation upon the Law Relating to the Pollution of Rivers by Sewage. By A. C. Farquharson. 9 pp., Journal, Royal Institute of Public Health, March, 60 cts.

A Plea for a Clean River. By Albert W. Cobb. Illustrated, 4 1-3 pp., Western New England, February, 15 cts.

Sewage Disposal in California. 1-4 p., Municipal Journal and Engineer, Mar. 29, 10 cts.

Sewage Disposal Works at Bordentown. Screen chambers, Emscher tanks, contact beds, settling basins, sand filters and sludge pit. By E. J. Kastenhuber, Jr. Illustrated, 3½ pp., Municipal Journal and Engineer, Mar. 29, 10 cts.

Chatham-Madison Joint Sewage Disposal Works. Construction of Emscher sedimentation tanks, double contact beds, sand filter and sludge bed. Cost of construction and operation. Illustrated, 4½ pp., Municipal Journal and Engineer, Mar. 8, 10 cts.

Modern Sewage Disposal. By F. W. Kerns. 2-2-3 pp., Municipal Engineering, March, 50 cts.

Sewage Disposal in England. By H. N. Ogden. 4 pp., The Cornell Civil Engineer, March, 20 cts.

Market Harborough Sewage Disposal Works. By H. W. Coales. Illustrated, 6 pp., Surveying and the Civil Engineer, Mar. 3, 15 cts.

German System of Sewage Purification. 1-3 pp., Municipal Journal and Engineer, Mar. 22, 10 cts.

Natural Purification of Sewage in Practice at Hyde. Abstract of paper before Association of Managers of Sewage Disposal Works. By Thomas Horrocks. Illustrated, 2 pp., The Contract Journal, Mar. 1, 20 cts.

Aerobic Methods of Sewage Disposal. 1½ pp., Contract Journal, Mar. 22, 20 cts.

Grit Chamber Sand, Washing. 1-3 p., Municipal Journal and Engineer, April 5, 10 cts.

Sedimentation Tank Experiments. 1-4 p., Municipal Journal and Engineer, April 5, 10 cts.

Sewage Precipitation Patents. 1-4 p., Municipal Journal and Engineer, Mar. 8, 10 cts.

The Imhoff Patents. Communication from W. S. Shields. Illustrated, 1 p., Municipal Journal and Engineer, Mar. 8, 10 cts.

Analysis. A Method for Determining the Parts per Million of Dissolved Oxygen Consumed by Sewage and Sewage Effluents; Columbus Sewage Works. By C. B. Hoover, Chemist-in-charge. 1 p., Engineering News, Mar. 16, 15 cts.

Public Health Movement on the Pacific Coast. By Sarah Shuey, M.D., 8 p., Annals, American Academy Political and Social Science, March, \$1.

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New York Health Bulletin. 1-4 p., Municipal Journal and Engineer, Mar. 22, 10 cts.

The Census and the Public Health Movement. By Cressy L. Wilbur, Chief Statistician Bureau of Census, Washington. 19 pp., Annals, American Academy Political and Social Science, March, \$1.

Health Needs and Civic Action. By William H. Allen, Director Bureau Municipal Research, New York, 10 pp., Annals, American Academy Political and Social Science, March, \$1.

Municipal Authorities and Public Health. Paper before Union of Nova Scotia Municipalities. By A. P. Reid, Provincial health officer. 2 pp., Canadian Municipal Journal, April, 15 cts.

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Work of the Committee of One Hundred on National Health. By Wm. Jay Scheffelin, Chairman of the Committee. 19 pp., Annals, American Academy Political and Social Science, March, \$1.

Modern Municipal Sanitation in Cuba. Paper before American Society of Municipal Improvements. By R. Winthrop Pratt. 2½ pp., Municipal Engineering, April, 25 cts.

Ordinances, New Municipal, Relating to Public Hygiene. 3 pp., Public Health Report, Mar. 31, 3 pp., Mar. 24.

School Children, What American Cities are Doing for the Health of. By Leonard P. Ayres, Russell Sage Foundation. 11 pp., Annals, American Academy Political and Social Science, March, \$1.

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Bakeshops, Unsanitary. By T. P. Kearns. 11 pp., Bulletin, Ohio State Board of Health, February.

Ice. Investigation at Cayuga Lake and Sodus Bay. 2 pp., Monthly Bulletin, New York State Department of Health, February.

Typhoid Bacillus Carrier. By R. M. Grimm. 15 pp., Public Health Reports, Mar. 17.

The Typhoid Epidemic in Ottawa, Canada. By P. H. Brice, M.D. Illustrated. 1 p., Engineering News, Mar. 23, 15 cts.

Fighting American Typhoid. By John Bessner Huber, M.D., 6 pp., The American Review of Reviews, March, 25 cts.

Investigation of Recent Outbreaks of Typhoid Fever in an Adirondack Camp and the Discovery of a Typhoid Carrier. Paper before New York Academy of Medicine. By C. E. North. Illustrated, 5 pp., Medical Record, Mar. 25, 15 cts.

Negroes, Health Problems of the. By John A. Kenny, M.D., Tuskegee Institute. 13 pp., Annals, American Academy Political and Social Science, March, \$1.

Rural Communities, Sanitation in. By Chas. E. North. 23 pp., Annals, American Academy Political and Social Science, March, \$1.

Death Rates, Diminishing. 1-4 p., Municipal Journal and Engineer, Mar. 29, 10 cts.

New York's Health Record. 1-3 p., Municipal Journal and Engineer, Mar. 20, 10 cts.

Disinfection, Report on an Original Form of Sulphur Burner for. By N. Roberts. Illustrated, 8 pp., Public Health Report, Mar. 31.

WATER SUPPLY

Waterworks, Notes on the Design of. By J. N. Nicholson. 2½ pp., Surveying and the Civil Engineer, Mar. 3, 15 cts.

1½ pp., Surveying and the Civil Engineer, Mar. 10, 15 cts.

Investigation of Water Works Service in Wisconsin. 1 p., Engineering Record, Mar. 25, 10 cts.

Water Works at Point Gray, D. C. Illustrated, 1 p., Canadian Municipal Journal, April, 15 cts.

Texas Water Works Details. Gathered from nine cities. Per capita consumption, cost of pumping, recording of data. 2½ pp., Municipal Journal and Engineer, April 5, 10 cts.

Water Supply, Public. By Edmond Bongan. 9 pp., La Technique Sanitaire, March, 50 cts.

Water Supply. Paper before Royal Institution. By J. H. B. Brown. 5 pp., Surveying, Mar. 21, 15 cts.

New Water Supply for Cebu. Illustrated, 5 pp., The Far Eastern Review, January, 25 cts.

Developing a Mexican Water Supply. Illustrated, 4 pp., Contractor, April 1, 20 cts.

Surface Water Supplies for Small Communities. Paper before Royal Sanitary Institute. By Albert P. I. Cotterell. 5 pp., Water and Water Engineering, Mar. 15, 25 cts.

Discussion of Mr. Cotterell's paper. 2 pp., The Surveyor and Municipal and County Engineer, Mar. 3, 20 cts.

Underground Water, Judicial and Parliamentary Decisions with Regard to Rights in, since 1907. Paper before the Surveyors' Institution. By W. Vaux Gra-

ham and Harold F. Bidder. 3 pp., Surveying and the Civil Engineer, Mar. 17, 15 cts.

Pure Water and the Pollution of Waterways. Condensed from address before the Dominion Public Health Conference. By Chas. A. Hodgetts, 1½ pp., The Canadian Municipal Journal, March, 10 cts.

The Obligations of Water Works Superintendents with Respect to the Sanitary Quality of Public Water Supplies. Address before Central States Water Works Association. By Paul Hansen. 3 pp., The American City, March, 15 cts.

Relation of Intakes to Pure Water from the Great Lakes. Paper before Illinois Water Supply Association. By Charles B. Burdick. Illustrated, 12-3 pp., Engineering Record, Mar. 4, 10 cts. 1 p., Engineering News, Mar. 30, 15 cts. Illustrated, 11-3 pp., Fire and Water Engineering, Mar. 15, 10 cts.

Conservation of our National Water Resources. 1½ pp., Water and Water Engineering, Mar. 15, 25 cts.

New Jersey Municipal Waters for Sale. Illustrated, 1 p., Fire and Water Engineering, Mar. 15, 10 cts.

Flow of Water over Dams. By Gardner S. Williams, Prof. of Civil, Hydraulic and Sanitary Engineering in University of Michigan. 1-3-4 pp., The Canadian Engineer, Mar. 9, 10 cts.

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The Hudson Tunnel of the Catskill Aqueduct for the Water Supply of New York City. By Alfred S. Flinn, Dept. Engineer, Board of Water Supply, New York City. Illustrated, 3 pp., Engineering News, Mar. 23, 15 cts.

A Cave at the Hunter's Brook Tunnel on the Catskill Aqueduct of the New Water-Works for New York. By Arnold Becker. Illustrated, 11-3 pp., Engineering Record, Mar. 18, 10 cts.

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Elizabeth Tunnel, Los Angeles Aqueduct. By B. A. Heiny. Illustrated, 3-4 pp., Municipal Journal and Engineer, Mar. 22, 10 cts.

Longest American Aqueduct. By E. P. Bailey. Illustrated, 6 pp., Cement World, March, 15 cts.

Leakage of Cabin John Bridge. Illustrated, 1 p., Engineering Record, April 1, 10 cts.

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Reservoir Site, Grubbing Stumps on. By Victor F. Hammel. Illustrated, 3 1-4 pp., The Contractor, Mar. 1, 20 cts.

A Concrete Reservoir Built on Soft Ground. Illustrated, ½ p., Engineering Record, Mar. 4, 10 cts.

Dam, Extension of the Sweetwater. By J. D. Schuyler. Illustrated, 3½ pp., Engineering News, Mar. 30, 15 cts.

Cost Data on the New Croton Dam. Portion of a paper by Edward Wegmann and J. B. Goldsborough, read at Annual Convention of the American Society of Engineering Contractors. Illustrated, 3 pp., The Contractor, Mar. 15, 20 cts.

The Morris Dam of the Waterbury, Conn., Water Supply Extension. Illustrated, 2 pp., Engineering News, Mar. 23, 15 cts.

Contractors' Camps at the Ashokan Reservoir. Illustrated, 2 pp., Engineering Record, Mar. 25, 10 cts.

Steel Pipe, Repairing a. Illustrated, 1-4 p., Municipal Journal and Engineer, April 5, 10 cts.

The Durability of Welded Steel Pipe. Paper before Annual Meeting of American Society of Heating and Ventilating Engineers. By F. N. Speler. 1 p., Engineering News, Mar. 23, 15 cts.

Dimensions of Riveted Steel Pipe. By N. A. Carle. Illustrated, 3 pp., Power, Mar. 7, 5 cts.

Pumping Station, The Evolution of a. By Theodore A. Leisen. 4 pp., Municipal Engineering, March, 50 cts.

A Municipal Pumping Plant Using Producer Gas. By Raymond C. Allen, C.E. 4 pp., Municipal Engineering, March, 50 cts.

Turbine Pumping Units in the Indianapolis Water Works. Illustrated, 6 pp., Municipal Engineering, April, 25 cts.

Present Day Pumping Engine for Water Works. By C. A. Hague. Illustrated, 17 pp., Proceedings of American Society of Civil Engineers, March, \$1.

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Devices in Water Works Plants, Labor Saving. By Frank C. Jordan, Secretary Indianapolis Water Co. 2 pp., Municipal Engineering, March. 50 cts.

Methods Used in Obtaining Concrete of Maximum Density for the Westerly, R. I., Standpipe. Remarks before Boston Society of Civil Engineers. By Angus B. MacMillan. Illustrated. 1 p., Engineering-Contracting, Feb. 15. 10 cts. Illustrated, 2 pp., Concrete, March. 15 cts.

Purification, Water. By J. C. Mahr, State Commissioner of Health. Illustrated, 2 pp., The Canadian Engineer, Mar. 16. 10 cts.

Modern Methods of Purification of Public Water Supply. Discussion before Royal Sanitary Institute. 3 pp., Surveyor, Mar. 24. 25 cts.

Operating Results, Cincinnati Water Purification Works. 12-3 pp., Engineering Record, Mar. 18. 10 cts.

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Water Sedimentation in Poughkeepsie. 1-3 p., Municipal Journal and Engineer, Mar. 8. 10 cts.

Water Filtration for Industrial Purposes. By Churchill Hungerford. 15½ pp., The Journal of the Franklin Institute, March. 50 cts.

Fort Collins Filtration Plant. By W. D. Vosburg. Illustrated, 1 p., Engineering Record, April 1. 10 cts.

Construction of Springfield Filters. Paper before Boston Society of Civil Engineers. By Chas. R. Gow. Illustrated, 5½ pp., The Contractor, Mar. 1. 20 cts.

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Water Meters, Ownership, Care, Repair and Reading of. By E. W. Bemis. 2 pp., Engineering Record, Mar. 25. 10 cts.

The Purchase, Setting and Testing of Water Meters. By Edward W. Bemis. 2 pp., Engineering Record, Mar. 4. 10 cts.

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Meter Installation and Maintenance. ½ p., Municipal Journal and Engineer, Mar. 22. 10 cts.

Value of Water Meters. Paper before Convention, League of Nebraska Municipalities. By H. D. Mead, Water Commissioner, Chadron, Neb. 3 pp., Midland Municipalities, March. 10 cts.

Water Surveys of the City of Chicago. Paper before Illinois Water Supply Association. By T. C. Phillips. Illustrated, 12-3 pp., Engineering Record, Mar. 4. 10 cts.

Rate Making, Water. Items included in income which must be raised; apportioning rates among consumers; ready to serve charge. Abstract of paper by F. C. Jordan before Illinois Water Supply Association. 1 p., Municipal Journal and Engineer, Mar. 8. 10 cts. 3 pp., Municipal Engineering, April. 25 cts. 1 p., Fire and Water, April 5. 10 cts.

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Method of Determining the Going Value of Water Works. From paper before American Society of Civil Engineers. By Leonard Metcalf and J. W. Alford. 6 pp., Engineering-Contracting, Mar. 29. 10 cts.

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Street Lighting at Cincinnati, Ohio, Ornamental. Illustrated, 5 pp., Municipal Engineering, March. 50 cts.

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Electric Street Lighting. By Albert Schible. 3 pp., Electrical Review, April 1. 10 cts.

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Arc Light in Illumination, The Place of the. By R. E. Pierce. 3½ pp., The Illuminating Engineer, March. 20 cts.

Illumination. Paper before National Commercial Gas Association. By Norman McBeth. Illustrated, 7 pp., American Gas Light Journal, April 3. 10 cts.

A Year's Progress in Illuminating Engineering. By E. Leavenworth Elliott. 9 pp., The Illuminating Engineer, March. 20 cts.

Conduit Construction in Downtown New York, Underground. By S. D. Levings. Illustrated, 41-3 pp., Electrical Review and Western Electrician, Mar. 11. 10 cts.

Manufacture of Illuminating Gas, Recent Municipal Improvements in the. By Jacques Boyer. Illustrated, 18 pp., The Engineering Magazine, March. 25 cts.

Holder Construction, Recent Improvements in. By J. Alex. Mayers. Illustrated, 11-2 pp., American Gas Light Journal, Mar. 6. 10 cts.

Gas Main under Harlem River, Laying a 48-in. By C. C. Simpson. Illustrated. 3 pp., The Canadian Engineer, Mar. 9. 10 cts.

Pneumatic Caulking with Lead Wool of 30, 36 and 48-in. Mains. Illustrated, 3½ pp., American Gas Light Journal, Feb. 20. 10 cts.

Rates, Gas, and Politics in Chicago. By Glenn Marston. 21-4 pp., Public Service, March. 20 cts.

The Real Theory of Real Electric Rates. By R. S. Hale. 13 pp., General Electric Review, April. 20 cts.

Faulty Data and Misleading Analysis of Data. Paper before American Gas Institute. By Dr. A. C. Humphreys. 3 pp., Progressive Age, April 1. 20 cts.

The Decision of the Railroad Commission of Racine in the Racine Case. Illustrated, 41-4 pp., American Gas Light Journal, Mar. 20. 10 cts.

Lamps, New Metallic Filament. By G. S. Merrill. Illustrated, 23 pp., Journal of the Franklin Institute, April. 50 cts.

Electric Plant, South Norwalk Municipal. 1-4 p., Municipal Journal and Engineer, Mar. 22. 10 cts.

Hydro-Electric Practice. By H. A. von Schon, Consulting Engineer, Detroit. Illustrated, 4 pp., Municipal Engineering, March. 50 cts.

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Fire Protection in Small Towns and Villages. By J. E. Buchanan, Chief, Winnipeg Fire Dept. 11-4 pp., The Western Municipal News, March. 10 cts.

New York and Its Fire Protection. Illustrated. 11-3 pp., Fireman's Herald, Mar. 11. 5 cts.

Window Protection. Boston and Cincinnati Fires. Illustrated, 4 pp., Insurance Engineering, February. 25 cts.

Good Fire Protection at Terra Haute. From Report of National Board of Fire Underwriters. 11-3 pp., Fire and Water, April 5. 10 cts.

Fireproof Construction. By Philip H. Bevier. Illustrated, 7 pp., Insurance Engineering, February. 25 cts.

Fire Hazard Standpoint, Modern Garage from a. By N. B. Pope, 1½ pp., Fire and Water, April 5. 10 cts.

Fire Analyzed. From an address by W. H. Merrill. 3 pp., Insurance Engineering, February. 25 cts.

Fires, Warehouse. Illustrated, 8 pp., Insurance Engineering, February. 25 cts.

New York City Factory Holocaust. Illustrated, 3 pp., Fireman's Herald, April 1. 5 cts. Illustrated, 1 p., Fire and Water, Mar. 29. 10 cts.

Fire Drills to be Compulsory in New Jersey. 1 p., Fire and Water, Mar. 29. 10 cts.

Department, Mobile's Efficient Fire. Illustrated, 1 p., Fireman's Herald, Mar. 4. 5 cts.

Methods, Prussian Fire. By Alcide Chausse. 8 pp., Insurance Engineering, February. 25 cts.

Association, The National Fire Protection, and its Work. Abstract of address before National Association of Cement Users. By W. H. Merrill. 2 pp., Cement, February. 20 cts.

Purpose and Work of the Underwriters' Laboratory. Paper before International Association of Fire Engineers. By W. H.

Merrill. ½ p., Engineering News, Mar. 30. 15 cts.

Police Dog, The German, and What He Does. Illustrated, 1½ pp., American Review of Reviews, April. 25 cts.

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Commission Government in the Far West. ½ p., Municipal Journal and Engineer, Mar. 22. 10 cts.

Commission Plan of City Government Propaganda in New York and New Jersey. 2-3 p., Engineering News, Mar. 16. 15 cts.

Initiative and Referendum Defects. Illustrated, 2 pp., Public Service, March. 20 cts.

Charter, The Indianapolis. By Augustus Lynch Mason. 6 pp., The Public Officials Magazine, February. 10 cts.

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Efficiency Records in the Civil Service of the City of New York. By Leonhard Felix Fuld, Examiner, New York Municipal Civil Service Commission. 3½ pp., The American City, March. 15 cts.

Milwaukee Bureau of Economy and Efficiency. By P. H. Myers. 1 p., Engineering News, Mar. 30. 15 cts.

Accounting, Municipal. By Charles F. Gettemy, Director of Massachusetts Bureau of Statistics. 6 pp., The Journal of Accounting, March. 25 cts.

REFUSE DISPOSAL

Refuse Disposal. Annual review of progress in. 4 pp., Surveyor, Jan. 27. 20 cts.

Garbage, Disposal of, at Newport. 1-p., Municipal Journal and Engineer, Mar. 29. 10 cts.

Incinerator, Milwaukee. An explanation. 1-4 p., Municipal Journal and Engineer, Feb. 8. ½ p., Mar. 29. 10 cts.

Installation of an Incinerator. By J. A. Stewart, manager, Edmuntion incinerator. 2 pp., Canadian Engineer, Feb. 2. 15 cts.

Incinerator Construction. By George I. Bliven, M.E. Illustrated, 33-4 pp., Pacific Builder & Engineer, Feb. 4. 15 cts.

The Technique of Combustion and Production of Energy from Municipal Wastes. By Frederick Meyer. Illustrated, 6 pp., La Technique Sanitaire, March. 50 cts.

The Garbage Crematory at Houston, Texas. Paper before a convention of Health Officers of Texas. By David M. Duller, City Engineer. Illustrated, 4 pp., Municipal Engineering, March. 50 cts. Illustrated, 2½ pp., Canadian Engineer, Mar. 30. 15 cts.

Gas Fired Animal Crematory at Boston. By Huntington Smith. Illustrated, 1 p., Progressive Age, Jan. 16. 20 cts.

Reduction Plant, Municipal Garbage, at Columbus, O. Illustrated, 4 pp., Municipal Engineering, April. 25 cts.

BRIDGES AND MATERIALS

Highway Bridges from the Investment Point of View. Address before Ontario Good Roads Association. By C. R. Young. 2 pp., Engineering Record, Mar. 18. 10 cts.

3 pp., The Canadian Engineer, Mar. 16. 10 cts. 2 pp., Engineering-Contracting, Mar. 15. 10 cts.

Municipalities and Highway Bridges. By C. R. Young. 3 pp., Contract Record, Mar. 29. 15 cts.

The Bridges of Nova Scotia. Illustrated. 2 pp., The Canadian Engineer, Mar. 16. 10 cts.

Highway Bridge Built of Separately Molded Members. Illustrated, 2 pp., Engineering Record, Mar. 25. 10 cts.

Concrete Abutments for Highway Bridges. Diagrams for determining quantities and cost. Paper before Illinois Society of Engineers and Surveyors. By H. E. Bilger. Illustrated, 3 pp., Engineering-Contracting, Feb. 15. 10 cts. Illustrated, 2 pp., Engineering Record, Mar. 18. 10 cts.

Substructure of the Municipal Bridge over the Mississippi River at St. Louis, Mo. By S. W. Bowen. Illustrated, 32-4 pp., Engineering News, Mar. 16. 15 cts.

Illustrated, 8 pp., Engineering-Contracting, Mar. 8. 10 cts.

Concrete-Filled Steel Arches; Steel is Reinforced with Concrete. Paper before N. A. C. U. Convention. By Henry H. Quimby. Illustrated, 3 pp., Concrete, March. 15 cts. Illustrated, 23-4 pp., Good Roads, March. 10 cts.

Specifications, Relation of Bridge, to Highway Improvements. Paper before Indiana Engineering Society. By Albert Smith. 3 pp., Municipal Engineering, April. 25 cts.

Viaduct, Dallas, Oak Cliff. By V. H. Cochrane. Illustrated, 3 pp., Engineering Record, Apr. 1. 10 cts.

(Continued next week.)

THE WEEK'S CONTRACT NEWS

relating to Municipal and Public Work—Street Improvements—Paving, Road Making, Cleaning and Sprinkling—Sewerage, Water Supply and Public Lighting—Fire Equipment and Supplies—Bridges and Concrete Work—Sanitation, Garbage and Waste Disposal—Police, Parks and Miscellaneous—Proposals and Awards

To be of value this matter must be printed in the number immediately following its receipt, which makes it impossible for us to verify it all. Our sources of information are believed to be reliable, but we cannot guarantee the correctness of all items. Parties in charge of proposed work are requested to send us information concerning it as early as possible; also corrections of any errors discovered.

BIDS ASKED FOR

Table with columns: STATE, CITY, RECEIVED UNTIL, NATURE OF WORK, ADDRESS INQUIRIES TO. Includes sub-sections for STREET IMPROVEMENTS and SEWERAGE.

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
WATER SUPPLY				
Illinois	Aurora	Apr. 11	Furnishing and installing boilers; separate bids for one and two boilers respectively to be safety water tube type of about 230 h.p. each, and for working pressure of 150 lbs.	T. D. Stimson, Supt. Water Dep.
Maine	Ft. McKinley	Apr. 15	Constructing chemical water softening plant.	Capt. Jos. F. Gohn, Con. Q.M.U.S.
Ohio	Cleveland	Apr. 15, noon	Constructing water main in Kinsman road, Newburg.	J. W. Shimek, Clk. Bd. Control.
New York	Pulton	Apr. 17, 8 p.m.	Furn. 740,000 lbs. pipe and 5,000 lbs. standard castings.	J. A. Foster, Pres. Bd. Pub. Wks.
Ohio	Niles	Apr. 18, noon	Constructing 3,000,000 gal. filtration plant.	F. M. Brewer, City Engineer.
California	San Francisco	Apr. 20	Constructing dam 200 ft. high.	Michael Casey, Pres. Bd. Pub. W.
Montana	Helena	Apr. 20, 8 p.m.	Con. water works system, reservoir, pipe line & distri. system.	J. A. Mattson, City Clk.
North Carolina	Morehead	Apr. 20	Installing water works.	G. D. Canfield, Chm. W. W. Con.
Dist. of Col.	Washington	Apr. 21, 2 p.m.	Furn. 2,411 tons 16 and 20-in. cast iron water pipe; and 90 tons cast iron water pipe specials.	Cuno H. Rudolph, Comr.
North Dakota	Fargo	Apr. 27	Furnishing a high duty crank and fly wheel pumping engine with a capacity of 4,000,000 gals. each 24 hours; constructing a water purification plant complete 4,000,000 gals daily.	E. R. Orchard, City Auditor.
Ohio	Toledo	Apr. 27	Installing complete high pressure fire system including c. i. pipe, hydrant etc., except the pumping station, machinery, etc.	F. Shane, Secy. Bd. Pub. Service.
Pennsylvania	Somerset	Apr. 27	Constructing a reservoir.	Chas. I. Shaver, Secy. Boro. Cou.
Florida	Fort Dale	Apr. 29, 10 a.m.	Constructing extension of water system.	Construct. Quartermaster, U.S.N.
New Jersey	Skillman	May 1, 10:15 a.m.	Extending water system, together with necessary hydrants, gates, valves, etc., at Village for Epileptics.	Jonas A. Fuld, Secy. Bd. Manager.
BRIDGES				
Pennsylvania	Chambersburg	Apr. 14, 11 a.m.	Erecting reinforced concrete bridge over Muddy Run.	E. K. Raff, Clk. County Comrs.
Indiana	Decatur	Apr. 14	Constructing the Abe Egley bridge.	Board of Co. Comrns.
Oregon	Portland	Apr. 14, 2 p.m.	Constructing the West Portland Bridge.	F. S. Shields, County Clerk.
Wisconsin	Kenosha	Apr. 15, 4 p.m.	Rebuilding and altering Middle St. Bridge.	R. H. Moth, City Engr.
Kansas	Lawrence	Apr. 15, noon	Constructing 2 stone abutments and 32-ft. girder span.	W. R. Green, County Clerk.
Idaho	Moscow	Apr. 15, noon	Constructing bridge across Paradise Creek.	Homer E. Estes, Clk. Bd. Co. Com.
New Mexico	Las Vegas	Apr. 17	Constructing 3 bridges.	Lorenzo Delgado, Probate Clerk.
Ohio	Warren	Apr. 17, 1 p.m.	Construct concrete bridge over Little Squaw Creek, Liberty twp.	Fred T. Stone, County Auditor.
Kentucky	Paducah	Apr. 17	Constructing a rein. conc. bridge 43 ft. wide and 295 ft. long.	L. A. Washington, City Engr.
Ohio	Niles	Apr. 17, 1 p.m.	Constructing concrete bridge over Little Squaw Creek.	Fred T. Stone, County Au. Itor.
Texas	Galveston	Apr. 17, 11 a.m.	Constructing reinforced concrete bridge.	John M. Murch, County Auditor.
Pennsylvania	Wilkes Barre	Apr. 18, 2 p.m.	Constructing sixty bridges.	James M. Norris, County Com.
Pennsylvania	Easton	Apr. 18	Constructing a reinforced concrete bridge.	Comrs. Northampton County.
Illinois	Aurora	Apr. 20, 2 p.m.	Constructing a new bridge.	City Clerk.
Ohio	New Lexington	Apr. 24	Constructing bridge over Rush creek.	Auditor Perry County.
Illinois	E. St. Louis	Apr. 25	Constructing 5 railroad bridges in Madison County.	H. D. Sexton, Pres. Bd. Trustees.
LIGHTING AND POWER				
Alabama	Troy	Apr. 17	Furn. 1 stationary steam engine, 400 H P., 150 lbs. initial pressure; 1 electric generator, 250 kva., 60 cycles 3-phase, 2,300 volts; 1 pump, electrically driven capacity not less than 500 gals. per minute against 200 lbs. working pressure; 1 motor to drive pump; transmission line material for 3-phase line 3 1/2 miles long, size of wire No. 4 B&S.	A. B. Campbell, Supt. E. & W. D.
Ohio	Dayton	Apr. 20, noon	Ornamental lighting with electricity portions of various streets	J. C. Ely, Dir. Pub. Service.
Manitoba, Can.	Winnipeg	May 1, 11 a.m.	Furnishing ornamental lighting standards.	Magnus Peterson Secy. Civic B. C.
California	Benicia	May 1	Furn. elec. supplies for year ending June 30.	Lieut.-Col. J. W. Benet, Com. Off.
FIRE EQUIPMENT				
Sask., Can.	Regina	Apr. 17	Furn. combination hose and chemical wagon; 1,700 feet double jacket rubber lined fire hose; 2 hydrant gate valves; two plays pipes and other apparatus.	A. J. McPherson, City Comr.
Alberta, Can.	Calgary	Apr. 20, noon	Furnishing one combination motor fire engine and hose wagon; one motor hose wagon, one motor 85-ft. aerial truck.	W. D. Spence, City Clerk.
New Jersey	Paterson	Apr. 21	Furn. automobile hook and ladder outfit and converting 2 first-class fire engines into gasoline-propelled vehicles.	T. S. Standeven, City Clk.
New Jersey	Princeton	July 5	Furn. auto pumping engine.	E. M. Updike, Chm. F. & W. Con.
MISCELLANEOUS				
Utah	Eureka City	Apr. 14	Constructing a jail.	E. W. Redmond, City Recorder.
Kansas	Hutchinson	Apr. 14, 3 p.m.	Sprinkling various streets.	Ed Metz, City Clerk.
Ontario, Can.	Goderich	Apr. 15	Erect. municipal building Combined Town Hall and Fire Hall.	L. L. Knox, Town Clerk.
Wisconsin	Richland Center	Apr. 18, 7:30 p.m.	Erecting 110-ft. or 125-ft. brick or concrete chimney.	City Clerk.
New Jersey	S. Orange	Apr. 18	Oiling about 8 miles of street during coming season.	William H. Kemp, Chm. Twn. C.
Washington	Pasco	Apr. 18	Constructing reinforced concrete city hall; also furn. two street sprinklers, and one flusher.	L. H. Koontz, City Clk.
Indiana	Indianapolis	Apr. 20, 10 a.m.	Repairing Guardians' Home; and Marion County Asylum for Poor; also furnishing 1 road scraper with scarifier attach.	Albert Sahn, County Auditor.
West Virginia	Moorefield	Apr. 20, 11 a.m.	Constructing new county court house.	C. B. Welton, Clk. County Court.
Georgia	Waycross	Apr. 20, noon	Constructing jail and jailer's home.	H. J. Berry, Clk. C. R. D. & Rev.
Montana	Glendive	Apr. 21	Constructing new concrete jail, and construct. steel cells.	R. L. Wyman, Clk. Bd. Coun. Cor.
South Africa	Johannesburg	Apr. 21, noon	Furn. 2 patrol motor fire engines.	Town Clerk.
Pennsylvania	Reading	Apr. 24, noon	Constructing new library buildings.	Chas. H. Hunter, Secy. B-1. Trus.
Massachusetts	Boston	Apr. 24	Disposal of the refuse of the city collected by the Public Works Department, except W. Roxbury and E. Boston Dists. for a term of ten years.	Louis K. Rourke, Comr. Pub. W.
Michigan	Grand Rapids	Apr. 29, 3 p.m.	Repairing and construct. piers at various harbors in Michigan.	C. S. Riche, Lieut. Col. Engrs.
Ohio	Cincinnati	May 10, noon	Constructing hospital buil. lings.	Messrs. Harzaforl & Sons, A.
California	Oakland	May 11	Constructing city hall, value of contract \$1,000,000.	Frank R. Thompson, City Clerk.

STREET IMPROVEMENTS

Clarksville, Ark.—Johnson County Commissioners have selected Civil Engineer W. A. Reams, Fort Smith, Ark., to make survey for proposed roads improvement.

Little Rock, Ark.—Bids will soon be asked for twelve blocks of wood block paving, at an approximate cost of \$45,000, in West 23d st. Improvement Dist.—W. F. Reichard, 204 Riegler Bldg., Engineer.

Los Angeles, Cal.—Improvement of Wilshire Boulevard with bitulithic pavement is being considered.

Stockton, Cal.—San Joaquin Highway Commission is planning oiling of three roads; plans and specifications will be prepared for oiled macadam on four roads; bids will soon be asked for asphalt macadam work on North Stockton road, Copperopolis and French Camp roads.

Washington, D. C.—District Commissioners have decided to expend \$167,000 on resurfacing Corcoran, Hh, O, M, 15th, 19th and numerous other streets.

New Castle, Del.—Council received no bids April 3 for \$30,000 street paving bonds.

Wilmington, Del.—Bids will be received April 18, noon, for \$80,000 highway improvement bonds. Daniel Thompson, Chairman, Finance Committee.

Brooksville, Fla.—Town will vote April 25 on \$2,000 bond issue for constructing sidewalks and \$7,000 for paving streets.—W. A. Thaxton, Town Clerk.

Summerville, Ga.—Citizens have voted \$75,000 bonds for street, sewer and water improvements.

Nezperce, Ida.—Town Trustees have decided to macadamize number of streets at once; bids asked.

Harrisburg, Ill.—Township has voted \$35,000 bonds to build rock roads.

Peoria, Ill.—Contracts will soon be let for paving with brick portions of 6th ave., South and Sanford sts.

Bluffton, Ind.—Petition has been filed in Wells Commissioners' Court asking for stone road about 1 1/4 miles long on Wells-Adams county line, south of Vera Cruz.

Evansville, Ind.—Bids will be received

by Board of Public Works on improvement of four alleys.

Evansville, Ind.—Paving of Blackk ave., between Garvin and Kentucky av. has been ordered.

Greensburg, Ind.—Council will soon for bids for paving with brick Main st.

Michigan City, Ind.—Plans and specifications are being prepared for paving Bmore st., Wabash st. and Willard ave.—R. Miles, City Engineer.

Richmond, Ind.—Wayne County Commissioners will soon ask for bids for improvement of National road west of city to the center township line.

Mount Sterling, Ky.—Council has ordinances providing for construction 11,250 sq. yd. of brick streets in busi section of the city; cost, \$1.75 per sq. yard.

Winfield, La.—Road Commission of W Parish has planned about 635 miles of improvement to cost \$50,000.

Oakfield, Me.—Town has appropriated \$1,500 for highways.—H. P. Sprague, T. Clerk.

Perham, Me.—Town has appropriated \$1,600 for highways.—A. A. Spaulding, Town Clerk.

Baltimore, Md.—Council has passed ordinance providing for harbor front boulevard or South Baltimore; plans by Harbor Engineer Lackey call for street 106 ft. wide throughout length; also for construction of pier at Hughes and Covington sts.

Cambridge, Mass.—Mayor J. Edward Barry has recommended replacing of gravel sidewalks with brick or granolithic.

Marblehead, Mass.—Town has appropriated \$50,000 for macadamizing 10 miles of town roads; \$3,500 for granolithic sidewalk t causeway and \$2,000 to make repairs on train at Clifton. John G. Stevens, Chairman Selectmen.

Whitinsville, Mass.—Town has appropriated \$5,500 for highways and small bridges.

Detroit, Mich.—Estimates for street work have been prepared by Board of Public Works for repairing, patching and resurfacing with asphalt, \$457,558; resurfacing with brick, \$205,704; repaving with sheet asphalt, \$175,610; repaving with brick, \$316,391; repaving with creosoted block, \$22,984. J. J. Hoarer, Commissioner.

Escanaba, Mich.—Township of Bark River has voted \$6,000 bonds for highway purposes and Township of Wells \$1,000 bonds for same purpose.

Grand Haven, Mich.—Ottawa County has voted bond issue for good roads.

Ludington, Mich.—Citizens have defeated proposition to expend \$150,000 on good roads.

Zeeland, Mich.—Zeeland Township has voted bonds for good roads.

Akeley, Minn.—Township of White Oak has voted \$5,000 bonds for improvement of roads.

Grenada, Miss.—City has asked bids on construction of 75,000 to 150,000 ft. granolithic sidewalks according to specifications L. B. James, City Recorder.

Omaha, Neb.—City is figuring on ten miles of new paving to begin season.

Long Branch, N. J.—Council has decided to resurface portion of five streets.—B. B. Newcomb, City Clerk.

Long Branch, N. J.—Citizens will vote May 9 on \$65,000 bonds for resurfacing asphalt streets.—E. W. Packer, Mayor.

New Brunswick, N. J.—Plans for top dressing pavement on Livingstone ave. with asphalt are being considered by County Board of Freeholders.

Paterson, N. J.—County Engineer Ferguson has prepared plans for improvement of five roads.

Woodbury, N. J.—Street Committee is considering advisability of using oil on highways.

Binghamton, N. Y.—Commissioner of Public Works Chas. S. Darling has planned number of street improvements in the Eleventh Ward.

Cortland, N. Y.—Board of Public Works has passed resolutions that Grant st., Stevenson st. and Harrington ave. shall be paved with slag.

Fulton, N. Y.—Board of Public Works has received petition from residents of Cayuga st., between Fourth and Fifth sts., asking that this part of the street be paved.

Long Island City, L. I., N. Y.—Queensboro Council is considering paving with asphalt block on concrete foundation of 5th st. ave. from Paynter to Washington st.; cost, \$18,900.

Niagara Falls, N. Y.—Board of Works has ordered estimates prepared for pavement of Portage rd. Buffalo ave. to Main st.

Rockville Centre, L. I., N. Y.—Village has voted \$7,500 for improvement of roads and water system.

Whitesboro, N. Y.—Village has voted \$19,000 for paving streets.

Andrews, N. C.—City is considering \$20,000 bond issue for street improvement, electric lights and water works.

Murphy, N. C.—Murphy Township Highway Commission is considering construction of about 30 miles macadam road, and will award contracts as rapidly as possible. W. I. Woodbury, Chairman.

Salisbury, N. C.—Boone Township has petitioned Rowan County Commissioners to order election to vote on bonds for macadamizing roads.

Salisbury, N. C.—Davidson County Commissioners are considering election on bonds for macadamizing public roads in Boone Township.

Bellaire, O.—Council has decided to pave out Belmont st. at cost of about \$18,000.

Cincinnati, O.—Council has passed ordinance for issuance of \$10,000 bonds for Hickory and Jay sts. and \$2,000 for improvement of Alice st.

Findlay, O.—Henry County Commissioners are advertising for bids for construction of about 30 miles of new stone roads, varying in length from 3 to eight miles; another petition is now on file with Commissioners asking for a joint pike between counties of Hancock, Henry and

Putnam; average cost of stone roads per mile in Henry County is about \$5,000.

Marion, O.—Bids will be received about April 24 for constructing 7 miles macadam road. C. L. Allen, County Auditor.

Nottingham, O.—Bids will be received by J. S. Steinhack, Village Clerk, April 29, for \$14,594 street improvement and water main bonds.

Toledo, O.—County Commissioners have directed County Surveyor to prepare plans and specifications for macadamizing seven stretches of country roads.

Toledo, O.—Council is considering repaving of Jefferson ave.

Wyoming, O.—Bids will be received April 24 by W. A. Clark, Village Clerk, for \$8,500 street repair bonds.

Ashland, Ore.—Citizens have voted \$35,000 bonds for paving street intersections.

Forest Grove, Ore.—Council has decided to pave 19 blocks of city streets with bitulithic hard surface pavement.

Carbondale, Pa.—Mayor A. L. Sahn has recommended number of street improvements.

Washington, Pa.—Bids have now been advertised for the construction of one mile of brick road leading from McDonald borough line toward Venice, three miles of brick road leading from Colvin farm near Charleroi to Bentleyville borough line, and for two miles of macadamized road on what is known as the Prosperity-Dunns Station road, from village of Prosperity toward Dunns Station.

Maryville, Tenn.—Citizens have voted \$300,000 bonds to build pike roads.

Crockett, Tex.—Citizens have voted \$150,000 bonds to build new roads.

Dallas, Tex.—City Commissioners have ordered grading and excavating of Grant ave., preparatory to paving, and paving of Cole ave., Lemmon to Knox sts.

Dallas, Tex.—Bids will be asked for grading and filling Bishop ave.; work includes roadway, 8,910 cu. yds. of cut and 2,054 yds. of fill; for sidewalks, 6,129 yds. of cut and 3,761 yds. of fill.

Galveston, Tex.—Bids will be asked by County Commissioners for sloping, bulkheading and surfacing county highway from city limits to causeway.

Groesbeck, Tex.—Citizens have voted \$12,000 bonds to build sidewalks.

Houston, Tex.—Paving of Chartres st. has been ordered and work will soon be started.

Smithville, Tex.—Smithville district of Bastrop County will vote on \$100,000 of road bonds.

Logan, Utah.—County will vote May 6 on \$150,000 bonds for building roads and bridges.

Everett, Wash.—Paving of South Colby ave. with asphalt is being considered.

Spokane, Wash.—Board of Public Works is considering improvement of parking strip along the center line of Riverside ave., cost, \$4,700.

Vancouver, Wash.—Council has adopted resolutions providing for paving of portion of East South st.; estimated cost, \$11,089.

Barboursville, W. Va.—Town Council is considering paving of streets.

La Crosse, Wis.—County will improve highways.—John Hintgen, Supervisor.

Madison, Wis.—Street improvements of aggregate cost of \$278,726 will be made by the city this season. According to the report of Board of Public Works, three streets will be improved with asphalt.

Chilliwack, B. C., Can.—City Road Superintendent J. B. Croly has estimated cost of proposed macadamizing at \$66,000.

CONTRACTS AWARDED

Covina, Cal.—To L. H. McGowan, Higgins Blvd., Los Angeles, Cal., for improving one mile of Citrus ave., \$37,693; the work includes asphalt paving, macadamizing and constructing cement curbs and gutters; other bidders: B. T. Ford, Los Angeles, \$41,846; Johnson-Shea Co., Los Angeles, \$42,918.—Dessery & West, Union Trust Building, Los Angeles, Engineers.

Fairfield, Cal.—To W. B. Connelly, for grading and macadamizing eight blocks of Texas st.

Denver, Col.—Paving in North Side Improvement Dist. No. 14 to Municipal Constr. Co., \$15,723.

Canton, Ill.—Paving around South Park, to Roller & Saville, Canton, \$14,201.

Chicago, Ill.—Building sidewalks to following contractors: H. P. Larsen, 1542 N. Rockwell st.; Siewert & Callen Co., 386 Milwaukee ave.; Chas. Chambers & Son, 5256 S. Wood st.; Jas. Porter, 1557 E. 94th st.; Hanson-Undine Co., 2858 E. 93d st., and A. L. Strachan, 5737 E. May st.

Murphysboro, Ill.—Paving to cost \$21,000, to the Meyer-Thomson Co., East St. Louis.

Paris, Ill.—Paving East Crawford st. to Allan J. Parrish, \$8,574.—Baum Construction Co. bid \$8,743 on this work.

Hartford City, Ind.—Construction of the Burns gravel road to John F. Buckley,

Harrison Township, \$9,291; estimated cost of the road as determined by the viewer was \$12,985.25; thoroughfare will be 2½ miles long and will be built of macadam.

Marion, Ind.—To Ryan & Carroll, Jonesboro, for the construction of Earl 1'ough stone road, \$3,100.

Marion, Ind.—To Ryan & Carroll, Jonesboro, for Thomas Baird road, Water st., Jonesboro, 1½ miles long and part of it of extra width, \$7,435; other bidders: H. B. Sarg, \$7,995; Wheat, Sisk & Huppel, \$7,447; Omer Mackey, \$7,947; Johnson & Crosby, \$8,264; Drock & Williams, \$7,924; William Yates, \$8,188.

Muncie, Ind.—To John Gubbins & Co., for paving with brick of Broadway in Whately from Whately bridge to Centennial rd., \$31,861.98.

Brookline, Mass.—Constructing coal tar concrete sidewalks, driveways, street crossings and gutters for the ensuing year, to Lowe-Arrington Co., 129 Washington st., \$7,010.

Fall River, Mass.—To Thos. H. Angell for building granolithic sidewalks, \$1,3125 per sq. yd.

Lynn, Mass.—By Purchasing Agent Carleton for 10,000 barrels of cement, more or less, to Smith, Green Co., Boston, \$1.65 per barrel, delivered in duck bags, 10c. rebate on return of bags.

Duluth, Minn.—By Board of Public Works for all wooden walks in city and the cement walks west of Twelfth avenue west to W. H. Kiltin; bid for cement walks \$12,653.50; cement walks east of Twelfth ave. to D. H. Clough, \$14,297; latter also got the contract for the cement walks on Park Point, \$3,987.50; laying the solvay calcium chloride in eight sprinkling districts to the Board of Trade Livery Co., \$18 a ton, which includes cost of the preparation; to Joe Scandin, water sprinkling contracts for districts Nos. 1, 7, 8 and 9; to Board of Trade Livery for districts Nos. 3 and 5; to William Scandin for districts Nos. 2 and 4, and to Eklund and Olin for district No. 10.

Meridian, Miss.—To Healy Construction Co., McAllister, Okla., by Good Roads Commission, to construct twenty miles of paved highways; material used to be novaculite.

Long Branch, N. J.—Graveling Branchport ave., to John H. Hines, \$1.40 per yd., spread.

Jersey City, N. J.—Reconstructing and reinforcing the roadway pavt., curbs and gutter and drainage system of Hudson boulev. in three sections: 1st bet. the Newark and New York R. and Newark ave., Jersey City; 2d bet. Morris Canal and McAdoo ave., Jersey City, and 3d, bet. W. 38th st. and W. 51st st., Bayonne, to Wm. Baker, 137 South st., Jersey City, 59 per cent of cost on all items; following is detail bid; 35,100 lin. ft. concrete curb and gutter, with curb guard, including excav. and allowance for bluestone curb and belgian block, per lin. ft., 59c.; 75,200 sq. yd. macadam pavt. on sides of roadway, requiring an average depth of 8 in. of stone and two applications of tar or asphalt binder, per sq. yd., 47.2c.; 34,600 sq. yd. macadam pavt. on center of roadway, requiring average depth of 12 in. of stone and two applications of tar or asphalt binder, per sq. yd., 64.9c.; 35 new receiving basins, complete, \$44.25; 120 basin heads reset, \$2.95, and 2125 lin. ft. 12-in. vitr. pipe sewer, including excav., per ft., 73½c.

Paterson, N. J.—Furnishing steam road roller for county use, to Buffalo Steam Roller Co., \$2,650.

Trenton, N. J.—The McGovern Construction Co., to place pavement along Stuyvesant ave. side of Cadwalader Park, 15½c., the A. A. Rose Construction Co. bid 16c., the Fell Co. 18c., Pento & Tott Co. 18½c.

Trenton, N. J.—Construction of sidewalks, curbs and gutters by City for fiscal year, to Pinto & Tott, lowest bidders.

Trenton, N. J.—Laying macadam pavement on West End ave. and building drain on Market st. to Thos. J. McGovern.

Albany, N. Y.—Supply of gravel for the bureau of parks to Henry Steers, Incorporated, New York City, \$1.55 per cubic yard.

Ft. Niagara, N. Y.—To Lake Shore Constr. & Supply Co., Dunkirk, for constructing drains, roads and walks, \$12,988.

New York, N. Y.—Paving, widening and curbing 23d st. to the Republic Construction Co., 18 Broadway, New York, \$118,448; other bidders: Barber Asphalt Paving Co., \$121,686; U. S. Wood Paving Co., \$119,275; Mack Bros., \$140,257.

Port Jervis, N. Y.—Paving portions of Pike, Front, Fowler, Sussex and Ball streets with Mack freelay brick to B. M. Shanley's Sons, of Newark, N. J., \$25,682, which includes excavation, brick and setting of curb; other bidders: Murphy & Son, West Hoboken, N. J.; Muldrey Bros., Albany; Hallock & Angle, Newburgh; M. F. Dollard, Albany; J. Foley, Paterson, N. J.; W. H. Ring & Son, Paterson, N. J.; McGreevey, McGrigan & Baum Co., Elmira, and J. B. O'Rourke, Boston, Mass.

Poughkeepsie, N. Y.—Paving streets as ordered, to New Jersey Paving Corporation, \$2.30 per sq. yd. for Metropolitan brick.

Rochester, N. Y.—Brick pavement on Genesee st., to Whitmore, Lauber & Vicinus, \$25.04; Bloss st., asphalt pavement, Saratoga ave. to Fulton st., to Rochester Vulcanite Pavement Co., \$11.763; Oak st., asphalt, Jay to Allen st., to Rochester Vulcanite Pavement Co., \$20.610; Oak st., brick pavement, Jay to Lyell ave., to Whitmore, Rauber & Vicinus, \$22.912.

Belle Valley, O.—Paving road in Noble Township, to Juniper & Nixon, of Nelsonville, \$10.302.

Bowling Green, O.—Macadamizing Sec. 2, M. Rush Stone Road Improvement, to Gaghan & McGee, of Custar.

Cleveland, O.—Paving Lakeside ave., E. 26th st. to E. 40th st., Medina block stone, to R. P. Burnett, \$50.933; Lakeside ave., E. 9th to E. 14th st., Medina block stone and creosoted wood block, to C. F. Reiley, \$22.100; W. 117th st., Lake ave. to Madison ave., 4-in. brick on 4-in. concrete foundation, to Baldwin Bros., \$35.193; Overlook rd., Euclid pkwy. to city limits, sheet asphalt or asphalt block, to Cleveland Trinidad Pav. Co., sheet asphalt, \$9.258.

Port Washington, O.—O. W. Schwab, of Port Washington, for paving road: Grading, 40c. per cu. yd.; foundation, gravel, 70c. per cu. yd.; curb, 30c. per lin. ft.; brick, 80c. per sq. yd., and cement filler, 7c. per sq. yd.

Ravenna, O.—Improvement of the Kent Ravenna road to E. E. Morgan & H. B. Green, city, \$74,981.

Toledo, O.—By County Commissioners, for furnishing crushed stone to be used for repairing the Wackerly road, to Whitehouse Stone Co., \$1 ton on road; County will make repairs itself.

Hugo, Okla.—Paving nearly two miles of residence streets with road asphalt, to F. R. Stone, Lima, O.

Pittsburg, Pa.—To Pittsburg Amacite Company, for furnishing amacite to be delivered on Imperial and Clinton, the Dairy Farm and Glenfield extension roads; to the Standard Bitulithic Company for delivery of amacite on Washington pike, Mount Lebanon and extension road, the Monongahela City and Elizabeth road, and the Butler pike, both at prices regulated according to length of haul; to Pittsburg Bituminous Engineering Company, for furnishing 15,000 tons of lake gravel and screenings, \$1.75 a ton, delivered by Pennsylvania Railroad, and at \$1.50 a ton, delivered by Pittsburg & Lake Erie Railroad; to the C. P. Mayer Brick Company, for 486,000 brick to be delivered on Mt. Lebanon road, at \$14.45 per M.; and for 592,000 brick blocks to be delivered on the Brownsville road, \$14.45 per M.

South Sharon, Pa.—Sidewalking and curbing during year, to M. Davis.

Youngwood, Pa.—Paving with vitrified block on Third, Fourth and Depot sts., to James Nixon Clairton, \$43,536.40.—Warren Mitchell, Youngwood, Borough Engineer.

Dallas, Tex.—Paving Forest ave., Central to Arza, to Texas Bitulithic Co., at \$2.30 per sq. yd., total cost, \$65,018.20. Other bidders: Creosoted Wood Block Paving Co., \$74,303.55 for 3-in. blocks; \$81.458.75 for 3½-in. and \$88,618.45 for 4-in.; to Creosoted Wood Block Paving Co., at \$2.59 per sq. yd., for paving Grand ave., Ervay to Fair Park; total cost, \$70,960.84. Other bidders: John C. Underwood, asphalt macadam, \$41,810.92; brick, \$96,362; Texas Bitulithic Co., \$62,504.24. Paving Worth st., from Pacific ave. to Texas Bitulithic Co., \$2.30 per sq. yd.; total cost, \$55,088.40. Other bidders: Municipal Paving Co., \$55,211.15 for rock asphalt, \$67,594.63 for brick, \$72,619.31 for 3½-in. pine blocks, \$76,971.35 for 4-in. pine blocks; Creosoted Wood Block Paving Co., \$61,283.40 for 3-in. wooden blocks, \$66,671.84 for 3½-in. and \$72,059.88 for 4-in.; to Texas Bitulithic Co., for paving Boulevard from Central to Oakland, from Jeffries to Arza, and from Jeffries to Oakland; for section from Jeffries to Oakland, to cost \$7,429.20, the city will pay its part, \$3,127.85; other sections will be paid for by the property owners; Texas Bitulithic Co. was awarded paving Arza st., Grand ave. to Forest, \$2.30 per sq. yd.; amount will be about \$10,000.

Dallas, Tex.—To Texas Bitulithic Co., for paving South Boulevard, \$2.30 per sq. yd. for bitulithic paving on concrete foundation; total cost, \$3,567.50; to same company, for paving First ave., Parry to Santa Fe sts., \$4,570.97; Bryan st., to Creosoted Wood Block Paving Co., \$2.59 per sq. yd.; total cost, \$74,017.30.

Dallas, Tex.—Laying about 2,000 ft. of combination curb and gutter on Zang's Boulevard and for 1,420 ft. of straight curb, to Lone Star Construction Company, 40c. and 25c., respectively, 3,200 ft. straight curb on Park Row, to Rock Island Grant-toid Company at 32c.

Portsmouth, Va.—Paving South st., to D. Park Lindsay, \$14,260.70.

SEWERAGE

Mobile, Ala.—Board of Public Works has accepted plans submitted by City Engineer Wright Smith for improvement of sewerage and drainage systems at cost of about \$600,000.

Pulaski Heights, Ark.—Council is considering construction of sewerage system giving drainage into the Arkansas River below pumping station.

Oakland, Cal.—City Engineer Turner has recommended construction of two storm sewers at cost of \$15,400; also division of branch of Elmhurst Creek at Foothill blvd., \$20,000.

Plainville, Conn.—Sanitary and Sewer District has voted to have plans prepared for construction of sewer.

Stonington, Conn.—Preliminary surveys and plans are being made by Daboll & Crandall, New London, for installation of proposed new sewer system.

Ridgely, Del.—Citizens will vote April 24 on bonds to install sewerage system.

Summerville, Ga.—Citizens have voted \$75,000 bonds for sewer, street and water improvements.

Thomaston, Ga.—Citizens will vote May 1 on \$45,000 bonds for construction of sewerage system and water works.

Waycross, Ga.—Council has asked bids for extension of sewer mains at cost of \$15,000.

Westfield, Ill.—Plans and specifications are being prepared for sewerage and water works system for village; will be ready about May 15.—W. R. Paige, 101-2 Rose Dispensary Bldg., Terre Haute, Ind., Consulting Engineer.

Mt. Vernon, Ind.—Bids will be asked about May 1 for a storm sewer; cost about \$5,000.—G. W. Sarlls, City Engineer.

Newcastle, Ind.—Council will advertise for bids for the converting into a large, arched sewer of the open stream running through the center of the city, known as the Bowery Brook; will cost not less than \$50,000.

Nevada, Ia.—Engineer S. Steigerwalt will make survey and estimate cost of extending outlet and disposal plant of proposed sewer.

Seymour, Ia.—Council has decided to construct sewer in Dists. Nos. 1 and 2.

Bowling Green, Ky.—Council has adopted resolution requesting State Sanitary Engineer Paul Hansen to submit proposed plan for inaugurating a system of sewerage for city, and also for plan for improvement of filtration plant of water works.

Fitchburg, Mass.—Work will be started about June 1 on construction of trunk sewer along bed of Nashua River; Engineer Hartwell is working on plans; Daniel A. Boyle is member of Sewer Commission.

Spencer, Mass.—Town has appropriated \$1,100 for sewage disposal.

Taunton, Mass.—Board of Sewer Commission has advised \$15,000 loan for sewer work during year.

Wellesley, Mass.—Town has named committee to procure plans for underground sewerage system.

Ely, Minn.—Citizens have voted \$30,000 bonds to extend sewer system and provide for water supply distribution.

Gilbert, Minn.—Plans by Engineer Frank Bowman have been approved for proposed sewer system; \$32,000 available; work will begin at once.

Union, Mo.—L. C. Allersmeyer, elected Mayor, favors installation of sewer system.

Ocean City, N. J.—Citizens will vote, May 9, on \$75,000 bonds for bettering system of drainage.

Trenton, N. J.—Council has decided to construct sewers in portions of Rose st. and Greenwood ave.—Harry B. Salter, City Clerk.

Far Rockaway, L. I., N. Y.—Queens Boro Council is considering construction of system of sewer mains in Wave Crest section of Far Rockaway; estimated cost, \$24,850.

South Glens Falls, N. Y.—Citizens have voted \$40,000 bonds for construction of a sewer system. W. H. Reynolds, Engineer.

Syracuse, N. Y.—Council has adopted ordinance approving plans for 15-in. pipe sewer in Cleveland and Craig sts. at cost of \$1900.

Cincinnati, O.—Council has passed ordinance authorizing \$2,000 bonds for sewer-ing Amthauer st.

Tulsa, Okla.—City Engineer T. C. Hughes has about prepared plans for construction of \$35,000 sanitary sewer systems.

Crafton, Pa.—Council has decided to install complete sewerage system in Crafton Terrace at cost of \$18,000.

Cumberland, R. I.—Citizens will consider installation of sewer system.

Huron, S. D.—Bids have been rejected for proposed sewer extensions.

Clarksville, Tex.—City is considering installation of modern sewerage system.

Richmond, Va.—On recommendation of Committee on Streets, Council has ordered construction of following important sewers: Lehigh st., from 9th to 11th, with con-

nections, to cost \$18,800; sewer in Blood Run ravine, from 31st and Grace sts., to cost \$12,430, and deep sewer in north side of Broad st., 9th to 3d and from 2d to Adams, to cost \$16,000.

Seattle, Wash.—Board of Public Works has adopted plans and specifications for sewers on 25th ave., North and 11th aves. W.

Barboursville, W. Va.—Town Council considering construction of sewer system.

Huntington, W. Va.—Board of Commissioners has ordered construction of later sewers in portions of four streets.

Niagara Falls, Ont., Can.—Plans prepared by City Engineer Paul Gardiner for the conversion of Muddy Run to trunk sewer have been presented to the Board of Aldermen.

CONTRACTS AWARDED

Ft. Morgan, Col.—Constructing pipe sewers, to Meecker & Dobson, McCook, Neb., \$5,146.

Putnam, Conn.—Construction of sewer including approximately 600 ft. of 24-in. pipe, 300 ft. of 20-in. pipe, 1,080 ft. of 15-in. pipe, 600 ft. of 12-in. pipe, 1,700 ft. of 10-in. pipe, and 7,900 ft. of 8-in. pipe, to F. J. Gammino, \$9,916; other bidders: Perossi Co., \$11,574; W. J. McCarty Co., \$13,067; F. M. Cussack Co., \$12,039; L. A. Taylor, \$16,046; M. J. O'Hearn, \$15,473; L. Yadirsen & Co., \$14,930; Pierson Engineering & Construction Co., \$11,384; E. B. Rohertz, \$10,813; Sylvester & Quinn, \$1,202; W. Bryne, \$13,866; C. H. Slucomb, \$10,813; George Phillips, \$15,817; Connecticut Construction Co., \$11,815; R. F. Whipple & Co., \$12,791; F. Williams, \$11,115; Iniff & White, \$13,205; Eudine Bros., \$94,138; F. H. Gilber, \$12,788; L. Perillo & J. Covring, \$20,222; Lopardo & Way, \$19,855; Field, Barker Underwood, \$11,275; A. Vito Construction Co., \$12,179; H. F. Redden Construction Co., \$12,757; F. A. Davis, \$13,182; C. E. Trunbull Co., \$11,120; Thomas Burns, \$14,888; George M. Bryne, \$13,352; Frank H. Cowan, \$11,853; J. B. O'Rourke, \$12,085; Arge Construction Co., \$16,883, and Henry Spillach, \$13,425.

Stamford, Conn.—Construction of the West Side sewer, to Frank Palmer, Stamford, \$45,543.

Marion, Ind.—Building extension Stevenson st. sewer, to Dillard Artes, \$1.15 per lin. ft.

Indianola, Ia.—Building sewer to Lydl Construction Co., Sioux City, as follows: 519 ft. 12-in. vitrified sewer pipe, \$1; 37.8 ft. 10-in., \$1; 12,176 ft. 8-in., 75c.; 3,204 ft. 6-in., 60c.; c.i. 12-in. pipe, \$1.75 per ft.; 10 in., \$1.25; valves, 12-in., \$22; 10-in., \$18.50 concrete reinforced in retaining wall \$10.50; in setting tank, \$12; 41 common manholes, \$35 each; 8 drop manholes, \$5 each, and 5 flush tanks \$100 each.—A. F. Gilleland, City Engineer.

Newport, Ky.—Construction of sewer to McClane & Sons, as follows: Putnam st., \$378.46; 3d st., between Isabella and Central ave., \$750.15; German st., between 9th and 10th sts., \$1,062.35, and German st. between 10th and 11th sts., \$822.90.

North Platte, Neb.—Constructing sewer in Sewer Dists. G3 and G4, P and F, to C. R. McKay, 528 Faxon Blk., Omaha, about \$6,000.

Niagara Falls, N. Y.—Building sewer in North ave., to Wm. Ruffran, \$7,994.

Yonkers, N. Y.—To O'Rourke Constr. Co. for constructing sewer in Alexander st., between Ashburton and Wells aves., \$4,094; other bidders: McDonald & Murray, \$4,658; Nicholas Mangini, \$5,075; Joseph Cozzo, \$4,743.15; Thomas Grady, \$4,750; Frank Cianfagione, \$4,850.

Minot, N. D.—Building North Side sewer system, to G. W. Kemper, city, \$29,925.83; other bidders: Illstrup & Olson, Minneapolis, \$31,854.00; G. W. Haggert, St. Paul, \$31,326.57; C. H. Porritt, Fargo, \$31,549.78; Margee Johnson, Minneapolis, \$31,986.07.

Chester, Pa.—Constructing spurs and sewers, to Pritchard & Oliver; 8-in. terra cotta pipe, \$1.42; 12-in., \$1.45; 15-in., \$1.55; 18-in., \$1.70; rock, \$4.75; manholes, \$39.50; other bidders: E. H. Butler, 8-in. \$1.67, 10-in. \$1.72, 12-in. \$1.77, 15-in. \$1.84, 18-in. \$1.96, rock \$5, manholes \$39; J. & J. Hanna, 8-in. \$1.45, 10-in. \$1.48, 12-in. \$1.52, 15-in. \$1.57, 18-in. \$1.70, rock \$4.75, manholes \$40; W. E. Reiley, 8-in. \$1.59, 10-in. \$1.59, 12-in. \$1.65, 15-in. \$1.65, 18-in. \$2.25, rock \$4.20 cu. yard, manholes \$37. Sewer on Central ave., Seventh to Twelfth st., to Pritchard & Oliver, 96c. per ft.; Y branches, 45c. each, manholes \$39.50, rock \$4.50 cu. yd.; other bidders: John Hanna Sons, 8-in. terra cotta pipe, 98c. per ft., Y branches 45c. each, manholes \$40, rock \$4.75 cu. yd.; E. H. Butler, 99c. per ft., Y branches 44c. each, manholes \$36, rock \$5 cu. yd.; Seventh st., Highland ave. to Wilson st., to John Hanna's Sons, 94c. per ft., branches 45c. each, manholes \$40, rock \$4.75; other bidders: E. H. Butler, 8-in. terra cotta

pe 97c., branches 44c. each, manholes \$3, rock 45 cu. yd. W. E. Reilly, \$1 per 4, branches 50c. each, manholes \$36, place nks \$100, rock \$4; Pritchard & Oliver, 3 ft., branches 45c. each, manholes 950, rock \$4.50 cu. yd.
Valley Camp, Pa.—Building sewage disposal plant, to Pitt Construction Co., Pittsburg.—Chester & Fleming, Union Bank Bldg., Pittsburg, Engineers.

WATER SUPPLY

Ashville, Ala.—Town is considering construction of water works.
Bisbee, Ariz.—City Trustees will shortly award contract for drilling wells and constructing pumping plant; considerable canal work will also be constructed.—Harry E. Lake, Los Angeles, Cal., Surveyor.
San Francisco, Cal.—City Engineer Marsen Manson has prepared plans for building two sections of intake tunnel for Townsend pumping station.
Orlando, Fla.—Orlando Water & Light company contemplates the installation of 2,000,000-gallon per day Underwriters pump.
Flowery Branch, Ga.—Installation of water works is being considered; estimated cost, about \$6,000.—C. R. Parson, Mayor.
Summerville, Ga.—Citizens have voted 75,000 bonds for water, street and sewer improvements.
Thomaston, Ga.—Citizens will vote May 1 n \$45,000 bonds for construction of water works and sewerage system.
Mountain Home, Ida.—Citizens have voted 15,000 bonds for constructing city water system; E. M. Blake, Boise, has made preliminary survey.
Rockdale, Ill.—Village has decided to install municipal water plant and lay mains in all streets.
Westfield, Ill.—Plans and specifications are being prepared for water works and sewerage system for village; will be ready about May 1.—W. R. Paige, 101-2 Rose dispensary Bldg., Terre Haute, Ind., Consulting Engineer.
Gilmore City, Ia.—Citizens will vote on installation of waterworks.
Nevada, Ia.—Installing water works system, to Guy E. Smith, Indianola.
Burden, Kan.—Rolling & Westover, Consulting Engineers, Beals Bldg., Kansas City, Mo., are preparing plans for installation of system of water works; estimated cost \$15,000.
Horton, Kan.—Town has voted \$55,000 bonds to purchase water and light plant.
Bowling Green, Ky.—Council has requested State Sanitary Engineer Paul Hansen to submit plan for improvement of filtration plant at water works.
Baltimore, Md.—Council has authorized Water Board to lay pipes and supply water n Baltimore County.
Cumberland, Md.—Citizens will vote May 6 on \$500,000 of bonds for new water supply; plans by Engineer J. H. Fuertes, New York, call for gravity supply from Swifts Creek, about nine miles from city; water is to be filtered in open reservoir; daily supply, 6,000,000 gallons.
Athol, Mass.—Town is planning the construction of water works system; James L. Tighe, Holyoke, has been selected as engineer.
Cambridge, Mass.—Mayor J. Edward Barry has recommended increased water supply.
Uxbridge, Mass.—Bids will be received about April 15 for laying water mains; estimated cost, \$8,000.—W. E. Rawson, Superintendent Water Works.
Benton Harbor, Mich.—Citizens have defeated proposition to issue \$100,000 bonds for improvement of water works.
Big Rapids, Mich.—Citizens have defeated proposition to expend \$20,000 for repair of water works.
Ely, Minn.—Citizens have voted \$30,000 bonds to provide for water supply distribution and to extend sewer system.
North Mankato, Minn.—Citizens have voted \$20,000 bonds for construction of water works system.
Waseca, Minn.—Citizens have voted \$15,000 bonds for water works extension.
Bassfield, Miss.—Citizens have voted bonds to install water works system.
Seminary, Miss.—Citizens have voted \$10,000 bonds for installation of water works system and erection of school.
Fallon, Nev.—Construction of water works, a sewer system and electric light plant is being considered.—M. L. Wildes, Mayor.
Rahway, N. J.—Consulting Engineer Chas. A. Hague, New York, has recommended installation of cross-compound, high duty, crank and fly wheel pumping engine.
Cortland, N. Y.—Water Board will soon ask for bids for construction of proposed new water tank, capacity 1,000,000 gals.—D. B. Coleman, City Engineer.

Geneva, N. Y.—City is considering the improvement of water works system; estimated cost \$125,000.—C. T. Church, City Engineer.
Rockville Centre, L. I., N. Y.—Village has voted \$7,500 for improvement of water system and roads.
Waterbury, L. I., N. Y.—New bids will be asked for furnishing engines for water plant.
Andrews, N. C.—City is considering \$20,000 bond issue for water works, electric lights and street improvements.
Red Springs, N. C.—Bids will be received April 27 for \$25,000 water works and sewerage bonds.—A. B. Pearsall, Chairman Board Public Works.
Cincinnati, O.—Council has passed ordinance authorizing \$100,000 bond issue for water works improvement.
Logan, O.—Village is preparing to construct system of water works.—H. S. Vance, Village Engr.
Mansfield, O.—Anton Burchard, Cleveland, is preparing plans for water works pumping station to be constructed at Hedges Springs; cost, about \$18,000.
Urbana, O.—City has sold \$100,000 water works bonds to install plant.
Boswell, Okla.—Citizens have voted \$35,000 bonds for installation of water works and electric light plant.
McAlester, Okla.—Citizens will vote April 22 on \$80,000 bonds for extensions of water system.
Waynoka, Okla.—Citizens have voted \$27,000 bonds for construction of water works.
Carlton, Ore.—City has employed engineers who are now surveying a pipe line to tap Panther Creek, nine miles west, and will furnish water for all purposes; it is proposed to construct reservoir on what is known as Wennerberg's Hill.
Klamath Falls, Ore.—Mayor Sanderson has vetoed the water, light and power franchises passed by Council in favor of the Klamath Falls Light & Power Co.
Pottstown, Pa.—Pottstown Water Co. will lay larger mains in several portions of town.
South Sharon, Pa.—Council is considering installation of water plant; cost, about \$160,000.
Springdale, Pa.—Citizens have voted \$50,000 bonds for water works, \$12,000 toward constructing sewers and \$10,000 for grading streets and alleys.
Dillon, S. C.—Installation of \$80,000 water works is being considered.
Clarksville, Tex.—Citizens will vote on \$10,000 bonds to extend water mains.
Norfolk, Va.—Council is considering securing of larger water supply.
Kelso, Wash.—Council has granted water and light franchises to Washington-Oregon Corporation.
Racine, Wis.—Citizens have voted to purchase water works.

Chicago, Ill.—For about \$50,000, valves and hydrants, to J. E. Clow & Sons, Chicago, Ill., for about \$5,500, and lead and jute, to Montana Hardware Co., Lewiston, \$3,000.—O. F. Wasmansdorff, Consulting Engineer.
Cape May, N. J.—Erecting steel stack at water works, to Jos. H. Hanes.
Ventura City, N. J.—Duplicating present water and sewer plant, to Jos. L. Swelgart, \$9,940.38.
Westbury, L. I., N. Y.—Building water plant; Pipe laying, to J. C. Tierney, 1317 Park ave., Hoboken, N. J.; valves and boxes, to the Fairbanks Co., 416-22 Broome st., New York City; hydrants, to Eddy Valve Co., Waterford, N. Y.; pipe and specials, to Standard Cast Iron Pipe and Foundry Co., Bristol, Pa.; tank and tower, to S. D. Cole Mfg. Co., Newnan, Ga.; foundations, pump, station and setting pumps, to F. Powers, Westbury; pumps, to Platt Iron Works Co., 94 Liberty st., New York City; wells, to Thos. B. Harper Est., Jenkintown, Pa.; engines, will advertise for new bids.
Zanesville, O.—To J. E. Clow & Sons, 350 Franklin st., Chicago, Ill., for furnishing water pipe and special castings, to the Water Department; cost about \$5,000.
Checotah, Okla.—Complete installation of water works pump station, 7,600 ft. of 8-in. iron pipe, two double-acting triplex pumps, pole and wire line, etc., to C. R. Nichols, City, about \$13,160.
Akron, Pa.—Building water plant, to O. E. Christ, Ephrate, bids opened April 4; borough, however, will buy engine and pumping machinery and have same placed.
Reading, Pa.—Furnishing water gates, to the Darling Pump & Manufacturing Co., of \$516 each; fire hydrants, to Florence Iron Works, Florence, N. J., \$25.25 each.
Nashville, Tenn.—To J. H. Fall & Co., supply of castings for water works department, \$49 per ton.
Prescott, Wis.—Construction of a gravity water system, to Des Moines Bridge and Iron Co., Des Moines, Ia., \$19,419; other bidders: L. W. Schruth, Fargo, N. D., \$20,700; Pastoret-Lawrence Co., Duluth, Minn., \$21,770; Fraser & Danforth, Rochester, Minn., \$22,900; W. D. Lovell, Minneapolis, Minn., \$19,700; J. P. Nolan, South St. Paul, Minn., \$23,335; J. G. Robertson, St. Paul, Minn., \$21,933.
Souris, Man., Can.—To M. S. Holmes, Portage la Prairie, Man., for laying water mains, \$39,000; to Kitchen Bros., Souris, for power house, \$3,200.
Toronto, Ont., Can.—To the Canada Foundry Co. for 20-in. c.-i. water piping, \$39.95 per 12-ft. length.
Vancouver, B. C., Can.—To Evans, Coleman & Evans, for eighty tons of pig lead at \$3.70 per 100 lb.; to same, for supplying steel pipe for water mains, \$43,217.85; to Robertson & Godson, for supplying valves, \$5,062.65; to Crane & Co., for supply of eighty Ludlow hydrants, at total price of \$2,333.67.

CONTRACTS AWARDED

LIGHTING AND POWER

Kingsburg, Cal.—To Braum, Williams & Russell, of Redondo Beach, for construction of a municipal water works from plans of Olmstead & Gilgelen, Wright & Callender Bldg., Los Angeles, \$25,000.
Sulsun, Cal.—To W. B. Connelly, for the work of raising dam of storage reservoir of municipal water system eight feet, which will increase capacity of the reservoir about twelve million gallons, \$1,940.
Terra Bella, Cal.—To Western Eng. & Water Supply Co., Oakland, for water and sewer system, \$6,034.
Jacksonville, Fla.—To the Reinforced Concrete Culvert Pipe Co., city, to furnish all the reinforced concrete pipe for Hollowman st. and Highway ave. storm sewers—F. W. Long & Co., Jacksonville, General Contractors; R. N. Ellis, City Superintendent.
Wheaton, Ill.—Water works improvements from plans of Jos. B. Rider, 112 N. La Salle st., Chicago; 60-hp gas engine and gas producer, to National Meter Co. of Chicago and New York, N. Y.; 2 centrifugal pumps, to American Well Works, Aurora; 100,000-gal. concrete reservoir, to Eugene Stark, of Wheaton, and excavation work, to J. C. Wheaton, Wheaton.
Herington, Kan.—To J. W. Kelso for increasing water supply, about \$8,000.
Boston, Mass.—Relaying water pipe in Clayton, Park and Hancock sts., Dorchester, to Michael Desesto, \$1,456.
Easthampton, Mass.—Furnishing pipe, to R. D. Wood & Co., Philadelphia, Pa., \$22.12 per ton; about 4½ miles of 8 and 6-in. pipe will be required for the extensions in East and Main sts. and to the Town Farm.
Detroit, Mich.—Furnishing 300 tons special water works castings, to American Car & Fdry. Co., \$2.15 per cwt.
Lewiston, Mont.—Furnishing approximately 50,000 ft. of c.-i. pipe of 120-lb. pressure; also fire hydrants, valves, lead, jute and other materials; c.-i. pipe and specials, to T. S. C. I. Pipe & Fdry. Co.,

Lodi, Cal.—Western States Gas and Electric Co. has purchased site on Cherokee lane for new substation and transformer house for distribution of power in this part of the county.
Willow, Cal.—Peoples Power Co. has been formed for manufacture and distribution of gas.—C. R. Wickes, A. S. Lindstrom, A. H. Quatman, J. W. Smith and E. T. Stern, Directors.
Fairburn, Ga.—City has issued \$10,000 of bonds for construction of electric light plant.
Richmond, Ind.—About \$6,000 will be spent for new stokers at municipal light plant within short time.
Manilla, Ia.—Citizens will vote April 14 on granting of franchise for installation of electric light plant.
Webster City, Ia.—Bids were received for furnishing equipment and material for improvements to municipal electric light and water works system.
Greensburg, Kan.—Citizens have voted \$15,000 bonds for municipal electric light plant.
Kansas City, Kan.—City will begin at once the construction of municipal lighting plant; issue of \$350,000 bonds has been authorized.
Horton, Kan.—Town has voted \$55,000 bonds to purchase light and water plant.
Escanaba, Mich.—Citizens have voted \$30,000 bonds for construction of municipal electric light plant.
Proctor, Minn.—Proctor Water and Light Co. has been granted franchise to install water works plant.
Tower, Minn.—Citizens have voted \$16,000 bonds for construction of water plant at Pike River Falls.
Bolton, Miss.—Power house, containing all the electric light plant and water works machinery, has been destroyed by fire.
Hastings, Neb.—Citizens have voted \$120,000 bonds for municipal lighting plant.

Burlington, N. J.—Citizens will vote April 18 on installation of electric light plant.

Andrews, N. C.—City is considering \$20,000 bond issue for electric lights, water works and street improvements.

Faith, N. D.—Faith Light and Power Co. has been granted franchise to install plant.

Glen Ellen, N. D.—Installation of electric light plant is being considered.

Dayton, O.—Bids have been rejected for lighting boulevard system.

Boswell, Okla.—Citizens have voted \$35,000 bonds for the installation of electric light plant and water works.

Springfield, Ore.—Council has granted franchise to Oregon Power Co.; reducing plant will be established; 4-in. main will be laid to the Eugene gas plant, distance of four miles.

Denver, Pa.—Council has passed ordinance giving D. S. Martin the right to operate electric system.

Royersford, Pa.—Council is considering feasibility of a municipal electric plant.

Temple, Tex.—I. A. Walker, Dallas, has made application to Council for franchise for installation here of a gas plant and distributing system.

Temple, Tex.—Col. P. L. Downs has about completed arrangements for installation of \$100,000 gas plant.

Wichita Falls, Tex.—M. A. Marcus and T. E. Dobson have been granted franchise by Council to install electric light plant; they will organize company.

Clarendon, Va.—Arlington Electric Co. has been chartered to furnish electricity to Ballston, Falls Church and Clarendon.—L. L. Northrop, Secretary.

Chehalls, Wash.—By passing franchise granting Twin City Light & Traction Company lease to operate electric lighting plant in this city for next 50 years, Council has secured building at once of \$75,000 power house.

Kelso, Wash.—Council has granted light and water franchises to Washington-Oregon Corporation.

Brooklyn, Wis.—Citizens will vote on bonds to install electric light and power plant.

Eau Claire, Wis.—Articles of incorporation have been filed by Minnesota-Wisconsin Power Co., capital stock \$100,000, organized to sell light and power from water plant at Eau Claire to towns and villages along river north of Winona.

Somerset, Wis.—Plant of St. Croix Power Co. at Apple River Falls has been destroyed by fire and will be rebuilt at once; St. Paul Gas & Light Co., owner.

Hamilton, Ont., Can.—Board of Control has selected E. T. Sifton, of London, Ont., to prepare plans and estimates for the installation of a municipal electric light plant and street lighting system.

CONTRACTS AWARDED

Escondido, Cal.—To Escondido Utilities Co. for lighting streets of city for a term of five years; contract calls for the installation of 50 lamps.

Jacksonville, Fla.—Furnishing 30-ton electric crane to Niles-Bement-Pond Co., Philadelphia, \$4,960; four new boilers, rebuilding of four boilers and removal of old ones to Babcock & Wilcox Company, New York City, \$39,384; three condensers for service equipment, complete, and replacing the auxiliaries of two other equipments to C. H. Wheeler Manufacturing Company, Philadelphia, \$40,400; one feed water heater to Warren Webster & Co., Camden, N. J., \$1,850, two boiler feed pumps, four duplex service pumps and two duplex piston oil pumps and necessary solid brass plungers to Warren Steam Pump Company, Warren, Mass., \$4,578; two 1,500-kilowatt turbo-generators and two 100-kilowatt turbo-excitors to General Electric Company, Schenectady, \$54,650.

Auburn, N. Y.—Lighting city for ten years, to Auburn Light, Heat & Power Co.; about 35 ornamental lamps, \$91.75.

Darby, Pa.—Councils have made contract with Delaware County Electric Co. to light borough for a period of five years; arc lights of approximately 2,000-candle power are to be used on Main st.

Scranton, Pa.—By the Scranton Electric Company for laying steam mains on Washington Ave.; Gaynor Contracting Company, digging trenches; pipe contract to the American District Steam Company, Lockport, N. Y.

Sharon, Pa.—Having in contemplation erection of a municipal lighting plant, Council has signed contract with the Shenando Valley Electric Light Co. for only one year at \$72 per lamp.

Sherbrooke, Que., Can.—Erecting municipal lighting plant, to Canadian Westinghouse Co., \$40,000.

FIRE EQUIPMENT

Birmingham, Ala.—Board of Fire Underwriters has recommended that plain hose wagon now in reserve be equipped with 1,200 ft. of 3-in. hose; establishment of flying squadrons at two stations, each to be provided with auto combination hose wagon; also minor equipment.

Montgomery, Ala.—Bids have been rejected for house in South Montgomery; city will let contract for work.

Lodi, Cal.—Trustees have instructed Fire Chief H. E. Welch to purchase two hose wagons and harness.

Los Angeles, Cal.—Fire commission has asked appropriation to purchase six new ladder trucks, six auto pumping engines and six chassis for hose wagons, also 150 new fire alarm boxes to cost \$12,000, 150 police boxes \$12,000, central office equipment \$22,500, extra lead covered cables \$33,315, extra wire \$16,690, and red lights for police department \$5,000.

Stockton, Cal.—Fire Department has asked appropriation for purchase of several auto engines.

Hartford, Conn.—Citizens have voted \$65,000 appropriation for erection of engine house for No. 3 and erection of water tower on Market st.

Washington, D. C.—American consul in Canada states that one of town councils in his district has adopted resolution authorizing purchase of outfit for hook and ladder company and of 500 ft. of hose. Address 6485, Bureau of Manufactures.

Statesboro, Ga.—City will erect fire department building with stable in rear.

Waycross, Ga.—Council will ask for bids for furnishing auto combination hose and chemical wagon.

Moline, Ill.—Council has rejected all bids for purchase of auto fire truck.

Odebolt, Ia.—City has decided to erect fire station.

Waterloo, Ia.—Fire Chief A. A. Dunham has recommended need of motor apparatus and purchase of fire helmets.

Middleboro, Ky.—City will erect \$75,000 combined fire department, jail and city hall building.

New Braintree, Mass.—Town will soon purchase some fire appliances.

Palmer, Mass.—Town will enlarge station for new auto truck.

Springfield, Mo.—Fire Chief Samuel Hunter has recommended purchase of four pieces of auto apparatus.

St. Louis, Mo.—City will erect fire house at Clayton and Central aves. automobile engine will be installed.

Snyder, Neb.—Fire company has been organized.—H. G. Meyer, President.

Red Bank, N. J.—Council is considering erection of brick fire house for Relief Hose Co. on Pearl st.

Succasunna, N. J.—Purchase of chemical engine is being considered.—E. C. Harvey can be addressed.

Niagara Falls, N. Y.—Board of Public Works has approved of proposition of Fire Commissioners to erect two new fire halls and purchase new apparatus at estimated cost of \$42,500.

Syracuse, N. Y.—Board of Contract and Supply has decided to ask for furnishing 85-ft. extension ladder and exercising wagon for Fire Department.

Cincinnati, O.—Architect Harry Hake will prepare plans and supervise erection of \$22,000 engine house at Eastern Ave. for Company No. 11.

Carbondale, Pa.—Mayor A. L. Sahm has recommended need of chemical and ladder service in fire department.

Lansdale, Pa.—Purchase of \$2,000 steam fire engine is being considered.—John F. Lane is interested.

Nesquehoning, Pa.—Town will soon have \$5,000 hose house.

Norristown, Pa.—Montgomery Fire Co. has decided to purchase auto fire apparatus.

Sellersville, Pa.—Council is considering petition of citizens for suitable fire apparatus.

Williamsport, Pa.—Fire Chief Frank E. Striker has again recommended need of new apparatus.

Baltic, S. D.—City has decided to erect fire station and city hall.

Fairmont, W. Va.—Fire Chief Reed has recommended purchase of fire engine and erection of fire station in Fourth Ward.

Wheeling, W. Va.—Residents of Mozart Hill are urging installation of chemical engine.

CONTRACTS AWARDED

Rochester, N. Y.—Furnishing 10,000 ft. of cable for fire alarm telegraph system, to Standard Underground Cable Co., New York, \$1,350.

Georgetown, S. C.—Construction of a fire engine house, to Weston & Brooker, Columbia, \$9,021.

Nashville, Tenn.—By Board of Public

Works, to the Gamewell Fire Alarm Co., New York, eight fire alarm boxes \$1,000; to Seagraves Co., one hose wagon \$750.

Dallas, Tex.—Furnishing 2,000 ft. of rubber hose, to Eureka Fire Hose Co., New York City.

Ashland, Va.—Council has decided to purchase Howe gasoline fire engine manufactured by Howe Engine Co., Indianapolis, Ind., \$1,750.

BRIDGES

Oakland, Cal.—City Engineer Furness has estimated cost of placing culvert across Thirtieth Ave. and at Thirty-fifth Ave. at \$7,100; also recommended erection of culvert to carry Sausal Creek at Fruitvale Ave. from Central Pacific tract to Tidal Canal, \$60,000; culvert in Fortieth Ave., \$12,000, and culvert across Fleiter Ave., \$500.

Pasadena, Cal.—Plans for proposed W. Colorado st. bridge, containing patent inventions of W. M. Thomas and design under Thomas system by Thomas & V. Engineers, have been received by Mayor Early.

Brooksville, Fla.—Town will vote April 25 on \$2,000 of bonds for bridge construction.—W. A. Thaxton, Town Clerk.

Tampa, Fla.—Board of Public Works considering erection of permanent bridge over Hillsborough River.

Brownlee, Ida.—Appropriation of \$100,000 is available for construction of Snake River bridge.

Chicago, Ill.—Citizens have authorized \$6,430,000 bond issue for bridges and parks.

Rising Sun, Ind.—County Commission have adopted plans for a bridge across Island branch.

Topeka, Kan.—County Commissioners planning to erect \$7,000 bridge at Valey and \$30,000 bridge at Grantville.

Covington, Ky.—Bids will be asked for rebuilding Robbins st. bridge.

Littleton, Me.—Town has appropriated \$800 for new bridge.—B. R. Tingley, Town Clerk.

Whitinsville, Mass.—Town has appropriated \$5,500 for small bridges and roads.

Lansing, Mich.—Citizens have voted to build modern \$85,000 bridge at Johnson.

Fulton, N. Y.—Plans have been completed for erection of proposed \$170,000 bridge. Address City Engineer Hackett.

Lorain, O.—County Commissioners considering construction of high level bridge at 31st st.; estimated cost \$40,000.

Springfield, Tenn.—County Court has appropriated \$4,250 for building bridge Beutne's Ford.

Logan, Utah.—County will vote May on \$150,000 bonds for building bridges on roads.

Richmond, Va.—Council Committee Streets has recommended adoption of sign B, submitted by I. J. Smith & Co. for erection of reinforced concrete a bridge over James River, to replace May bridge.

Hudson, Wis.—Citizens have voted \$200,000 bonds to build wagon bridge across Lake St. Croix.

Marquette, Wis.—Citizens have voted \$50,000 bonds to build bridge over Menominee River.

CONTRACTS AWARDED

Birmingham, Ala.—Building bridge over Elyton branch to A. C. Brooks, \$1,372.50.

Champaign, Ill.—Constructing 700 ft. bridge, to J. M. Breese, Mattoon, \$14,000.

Waterloo, Ia.—Erecting 2-span concrete bridge, to Miller & Rey, approximately \$11,000.

Pomfret, N. Y.—Erecting concrete bridge at Laona, to Holleran Bros., Elmira, \$2,700.

Reading, Pa.—Construction of three concrete bridges in the county: Mohnton Bridge No. 1, crossing the Wyomissing Creek in Mohnton, to Carl R. Camp, Moore, \$5,461; Bordner's Bridge No. 2, located in Jefferson and North Heidelberg Townships and crossing the Tulpehocken to Willauer & Co., of Pottstown, \$7,300.

Bordner's Bridge No. 2, located in Berks and Tulpehocken Townships and crossing the Swatara, to Nelson, Meredyth & Co. of Chambersburg, \$6,560; other bidders were as follows: Mohnton Bridge No. 1, Nelson, Meredyth & Co., Chambersburg, \$5,475; L. H. Focht & Co., Birdsboro, \$8,532.50; Ferro-Concrete Co., Harrisburg, \$6,053; Daniel Wanner, Reading, \$5,800; Willauer & Co., Pottstown, \$5,521.68; Bordner's Bridge No. 1, Nelson, Meredyth & Co., \$8,617; Ferro-Concrete Co., \$7,457; Bordner's Bridge No. 1, Ferro-Concrete Co., \$7,269; Willauer & Co., \$6,897.

Richmond, Va.—Construction of 12 modern bridges in Southampton County, to about \$21,000, to Virginia Bridge and Iron Co., Roanoke.

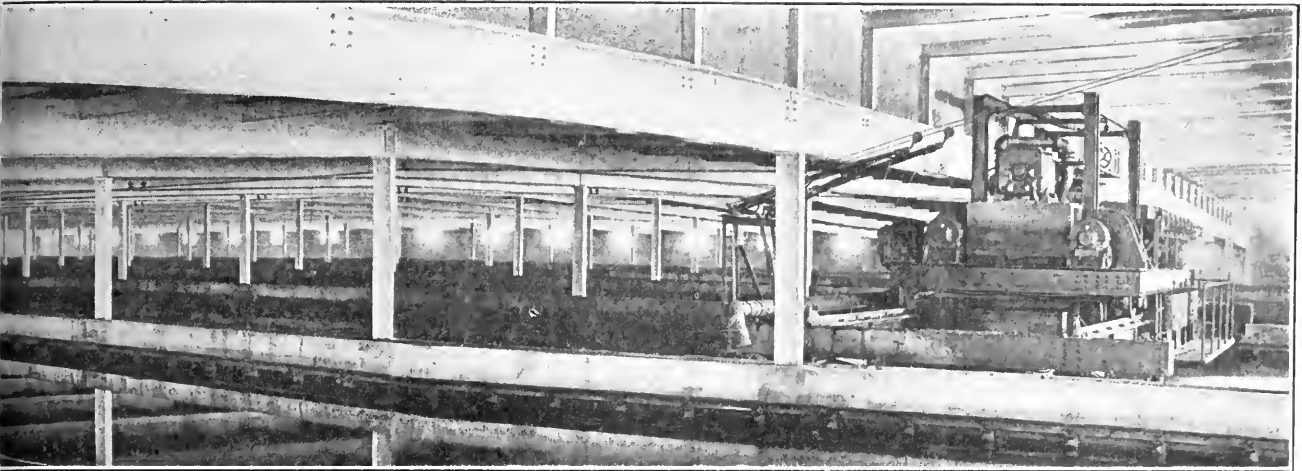
Municipal Journal

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No. 16



INTERIOR OF WILMINGTON SAND FILTERS. SAND WASHING MACHINE AT RIGHT

WATER PURIFICATION AT WILMINGTON

Report of Work Done by New Filtration Plant—Sponge Filters for Preliminary Clarification—Defective Rate Controlling Device Lowers Efficiency—Low Cost of Operation—Sand Cleaning Machine

THE water purification plant of the Wilmington, Del., water department, then nearing completion, was described in our issue of November 10, 1909. It has now been in service for a number of months, and some details of its operation are given by the bacteriologist, A. Robin, in the 1910 report of the water commissioners, an abstract of which report is given below. As described in our article above referred to, the plant consists of a sponge filter on the bank of Brandywine Creek, the effluent from which is pumped to a reservoir 120 feet higher, adjacent to which is a slow sand filter resting upon the roof of a pure water reservoir.

THE PRELIMINARY FILTER

Preliminary filtration or prefiltration has become an established practice in the construction of slow sand filters. The object of prefiltration is to remove from the raw water as much of the suspended matter as can be strained out rapidly and economically. In this respect prefiltration takes the place of sedimentation, and, comparing the relative values of the two methods, first cost as well as the cost of maintenance should be taken into consideration. It is now fairly well established that prefiltration is to be preferred to sedimentation, not alone on the ground of economy, but the greater flexibility of the preliminary filter. The question of the best filtering medium is still open for final settlement. Coarse sand is now generally employed, but to this there is the objection that the void in the sand is only about 35 per cent, and therefore the beds clog up rapidly, requiring frequent cleansing. When this is to be done with water that has been pumped, the cost of washing is materially increased. Sponge would seem to be an ideal medium were it not for the difficulty in cleaning the sponges when clogged up. The air-wash employed in our

preliminary filter has been very effective in delaying the complete clogging of the sponges, but not in preventing it altogether. The time is fast approaching when it will become necessary to remove the sponges from the beds and clean them thoroughly. Whether this will offset the low cost of maintenance of the sponge filter as compared with the sand filter remains to be seen.

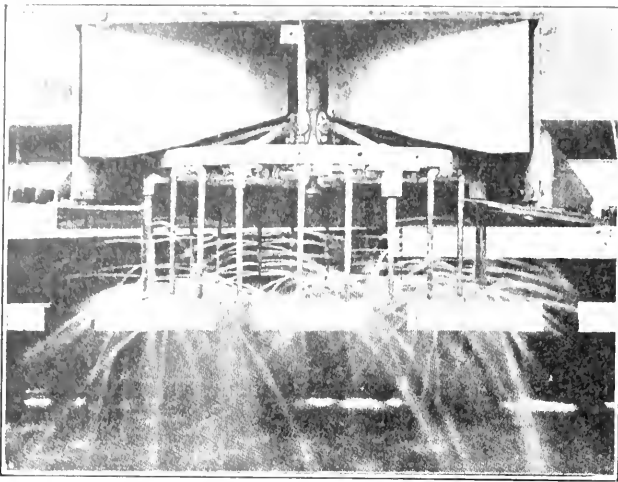
The defect in the rate-controlling devices of our preliminary filters, referred to in my last report, has materially reduced the efficiency of the plant. As operated at the present time, there is absolutely no way of determining the time when any given bed should be cleaned. We do not know whether any given bed is cleaned too often or not often enough, and the entire operation is in the nature of guesswork. Under the circumstances I feel that our figures as to efficiency and relative cost of maintenance are incorrect and should not be used as a basis of comparison.

It is my opinion that this defect should be remedied. As there is no practical advantage to be gained by the removal of bacteria by prefiltration, the study of the bacterial efficiency of the preliminary filter is a waste of time and culture medium, and I would recommend that this routine study be discontinued.

To sum up my recommendations with regard to the preliminary filter:

- (1) The sponges should be removed, thoroughly washed and replaced.
- (2) An efficient rate-controlling device should be installed together with a loss-of-head indicator for each bed.
- (3) Routine determination of turbidity before and after filtration.

According to the daily analyses made, the turbidity (silica scale) of the raw water varied from 10 to 1200, the former



WASHING MACHINE, SHOWING TEETH AND WATER JETS

being the turbidity about 50 per cent of the time. The turbidity of the prefilter effluent varied from 3 to 300. That of the sand filter effluent was ascertained only a part of the time, but was always zero; the sedimentation in the reservoir before final filtration reducing the turbidity to between 5 and 70. The mean turbidity of the raw water during the year was 38; of the prefilter effluent, 17; and the average efficiency in reducing turbidity was 56 per cent, the maximum efficiency for any day being 70 per cent. In removing bacteria the prefilter was very erratic, some days showing an efficiency of more than 90 per cent, and on others an increase in numbers of 75 per cent. The sand filters showed a bacterial efficiency varying between 74.4 and 99.6 per cent, the average being 94.9.

Chief Engineer John A. Kienle reported: "The quantity of water which passed through the filter during the period of its operation amounted to approximately 1,700 million gallons, and the total cost of operation amounted to \$2,324.20 exclusive of laboratory charges, or an equivalent of \$1.36 $\frac{3}{4}$ per million gallons. This unit cost is approximately 40 per cent less than for sand filter plants of similar capacities located elsewhere, and, neglecting the saving in first cost of constructing the plant, this marked economy in operation is sufficient warrant for the radical step taken by this department in adopting the latest improvement in cleansing the filter sand in place on the beds by machine methods."

In our issue of January 4, 1911, we described the Blaisdell

sand cleaning machine, and we give herewith two illustrations of it. These cuts show the inverted box and the carriage from which it is suspended, also the perforated teeth. The filter is cleaned without withdrawing the water from the box being lowered to the sand and the teeth forced below the surface of the sand for any distance desired. Water forced into the hollow teeth and leaves them through perforations, the teeth meantime revolving around the center of the box as an axis and the box as a whole moving over the surface. A centrifugal pump connected with the top of this inverted box sucks out the water which is discharged through the teeth.

REMOVAL OF DOMESTIC ASHES

In response to an inquiry Frederick T. Elwood, Commissioner of Public Works of Rochester, N. Y., described as follows the method employed in that city for removing ashes:

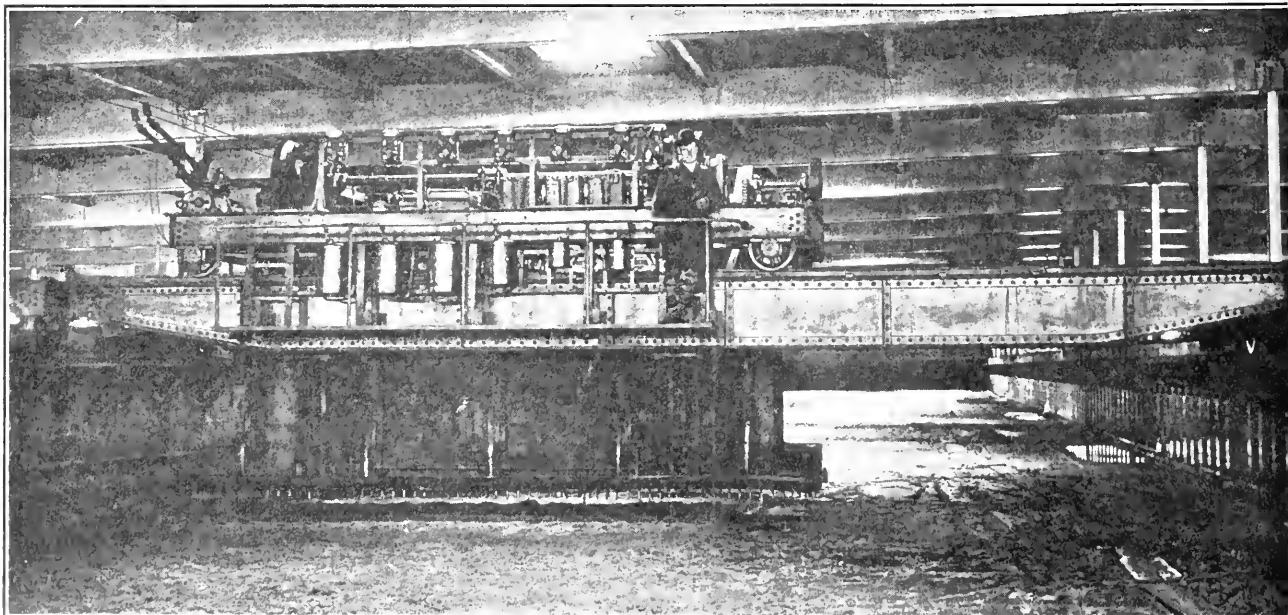
The city is divided into nine districts. Three of these (the more congested part of the city) have two ash gangs each while each of the other six has one ash gang. Each gang contains four truckers, four loaders, two returners and a foreman.

The truckers enter the premises and take the ashes to the curb, beginning work shortly in advance of the teams; they are followed by the teams and loaders, who, after emptying the receptacles, replace them on the curb; these, in turn, are closely followed by the returners, who replace the receptacles in their proper places on the premises. Our men are not allowed to enter any buildings; receptacles are placed in rear lot by the occupant of the premises.

The gang works along one side of a street and back on the other side, and at no time are the truckers and loaders widely separated. The teams are always closely followed by the returners. All receptacles brought out by the truckers must be dumped and returned before the gang stops work for the night.

In each district the work is commenced at the same point every Monday morning, and in most cases the route is covered by Friday noon. The average haul to the dump is about 1.5 miles, and each gang keeps from five to seven teams moving.

The nuisance of having ash and garbage cans standing on the sidewalk for hours is only a little less than that caused by the emptying of the former into the wagons on windy days and the carrying of garbage through the streets in open wagons. Many cities and towns remove the cans from the back yard of residences, but we believe that the three gangs acting in succession, as described above, is unusual. It would seem, though there might be an economy in this, as the cart is kept in almost continual motion instead of stopping at each house while the driver and helper get and return the can.



FILTER SAND WASHING MACHINE

STREET CLEANING MACHINE

On sweeping the paved streets of Augusta, Ga., the ordinary sweeping machines are used, which work the sweepings toward the side of the street, the last machine of the series leaving the pile in a row in the gutter. The previous method, and one followed in most cities, was to have men with shovels take this into piles, after which a cart which followed the sweeping machines would remove the sweepings, which were shoveled into it by an attendant. Recently the city has adopted a pick-up machine which takes the place of this cart and the six men employed to shovel the sweepings into piles. This machine runs along the gutter and picks up the sweepings by the regular sweepers, collecting them in a receptacle which forms a part of the machine. When the receptacle is full the material is dropped in a pile and the machine proceeds to pick up the sweepings ahead of this, which are again deposited, thus leaving the sweepings deposited in a few large piles instead of a number of small ones as formerly. The cart is loaded as before, but it now has to stop only two or three times to obtain a full load, where heretofore it stopped approximately every fifty feet. City engineer and commissioner of public works Nisbett Wingfield, to whom we are indebted for this information, states that this effects a saving of the labor of the men and a considerable part of the time of the cart and driver, and that this saving more than offsets the cost of the pick-up machine.

OKLAHOMA CITY'S FIRE SYSTEM

OKLAHOMA CITY is now provided with a system of independent water mains for the fire protection of the central portion of the retail and wholesale business district of the city. This system is fed through a 20-inch cast iron main direct from the pumping station 8,500 feet away. The lateral mains laid through the district are 18 inches and 12 inches in diameter. At each street intersection there is a Ludlow hydrant of the slide valve type with an 8-inch valve opening and equipped with four independently controlled hose nozzles and one 5½-inch steamer nozzle. All gates larger than 12 inches are set in manholes as to be readily accessible for operation or repairs. All the pipes are cast iron of standard weight, class C bell and spigot pattern. There are 11,500 feet of 20-inch pipe, 2,100 feet of 18-inch, 11,050 ft. of 12-inch, all laid at sufficient depth to pass under all other water lines, gas lines and conduits. No services of any kind are taken from this system. The inde-

pendent system and the domestic system are interconnected, but check valves are placed in the connections, so that while the domestic pressure of 65 pounds is always effective in the independent system, the fire pressure of 115 pounds which is created in the independent system on the occurrence of a fire is not transmitted to the domestic system. This pressure of 115 pounds is the maximum which it is expected to carry in the independent system. There are also by-pass connections provided with valves, and should any of the domestic line mains break or be otherwise put out of service the domestic system could be fed through these connections by opening the valves.

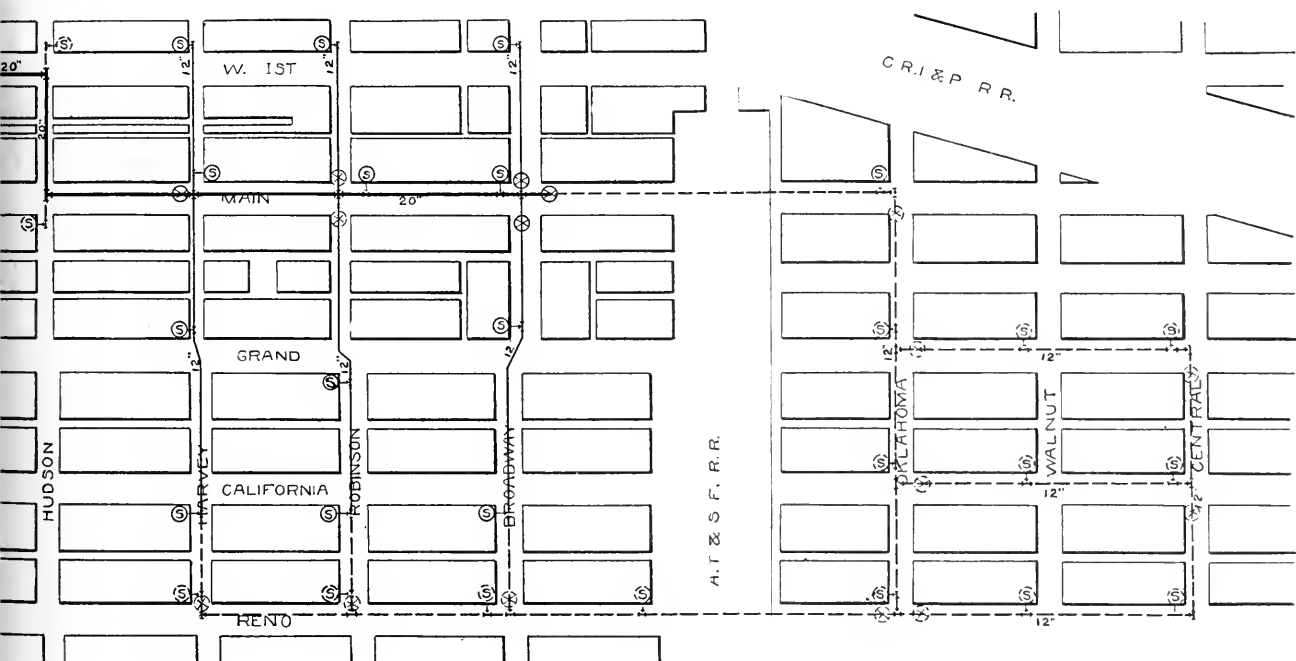
Through a special arrangement of gates at the pumping station any of the four high-duty pumps may be utilized for pumping directly into the independent system. These four pumps comprise two direct-acting, triple-expansion Worthington pumps of 3,000,000 gallons capacity each, one triple-expansion Prescott of 6,000,000 gallons capacity, and one cross-compound, crank and fly-wheel pump of 10,000,000 gallon capacity made by the Platt Iron Works.

As 115 pounds is the maximum pressure which the independent line is supposed to carry it is apparent that this could not correctly be called a high-pressure system. The professed object of the system, however, is to furnish an independent fire system through which may be delivered large quantities of water with good pressure at the hydrant, thus eliminating the friction loss and diversion of a portion of the supply which would occur in the domestic distribution system.

For the above information and for the map which accompanies this article we are indebted to Mr. Vincent G. Shinkle, engineer and superintendent of the Water Department.

THE COST OF DRINKING FOUNTAINS

The city of Cambridge in 1910 maintained 29 drinking fountains, 6 of which were kept provided with ice during the summer months so as to furnish cold water. The cost of supplying these ice water fountains with ice for 6 years had varied from \$89.49 per fountain per year to \$185.68; the costs varying both with the cost of ice in the several years and also with the extent of use made of the several fountains. In 1906 ice cost from 25 to 40 cents per 100 pounds, but in the other years the price was from 12½ to 15 cents per 100 pounds. The average cost per day per fountain, averaging the six fountains, was \$1.20, 94 cents, \$1.57, \$1.09, \$1.04 and \$1.15 for each of the 6 years respectively.



MAP OF INDEPENDENT HIGH-PRESSURE FIRE SYSTEM, OKLAHOMA CITY, OKLA.

Each steamer hydrant is supplied with an 8-inch valve

BRICK PAVING SPECIFICATIONS

Standard of the Association for Standardizing Paving Specifications—Preparing Sand Cushion—Expansion Joints—Grout, Pitch and Asphalt Fillers

The standard specifications for brick paving adopted by the Association for Standardizing Paving Specifications this year are much more complete than those of last year, especially in the matter of testing. This was made possible by the final agreement of the N. P. B. M. Association on a standard rattler. The committee unanimously dropped the absorption test. The specifications for grout filler were changed in their wording, and new ones adopted for pitch and asphalt fillers. The specifications are given below.

"By permission of the association these extracts are reprinted from the copyrighted proceedings of the Association for Standardizing Paving Specifications. John B. Hittell, Secretary-Treasurer, 5017 Winthrop avenue, Chicago."

Character of Brick

Section 1. All brick must be strictly No. 1 pavers, of the size commercially known as "vitrified block," the widths of which must not vary more than one-eighth of an inch. They must be thoroughly annealed, tough and durable, regular in size, shape, and evenly burned.

When broken the brick shall show a dense, stone-like body, uniform in color inside, free from lime, air pockets, cracks or marked laminations. Kiln marks must not exceed three-sixteenths of an inch, one edge, at least, to show but slight kiln marks. All bricks so distorted in burning as to lay unevenly in the pavement shall be rejected.

The standard size of brick shall be three and one-half ($3\frac{1}{2}$) inches in width, four (4) inches in depth, and eight and one-half ($8\frac{1}{2}$) inches in length. They shall not vary to exceed one-eighth ($\frac{1}{8}$) of an inch in width and depth, and not more than one-half ($\frac{1}{2}$) inch in length. If the edges of the brick are rounded the radius should not exceed one-eighth ($\frac{1}{8}$) of an inch. Only brick with raised lugs on one side not to exceed one-fourth ($\frac{1}{4}$) inch in height shall be used.

Inspection

Section 2. All brick shall be subject to thorough inspection before and after laying and rolling, and all rejected material shall be immediately removed from the street.

Delivery of Brick

Section 3. The brick shall be hauled, carefully unloaded by hand, and neatly piled on the walks or outside of the curbs before the grading is finished, and in laying shall be carried from there to the pavement.

Rattler Test

Section 4. The brick shall not lose more than per cent of their weight after being submitted to the following tests:

Samples of brick of uniform shape and appearance shall be taken from each car (estimated at 10,000 brick). Brick having a defect that would cull them shall not be used. Three grades of samples shall be tested, one of the softest, one of the medium, and one of the hardest burned. If all of the tests overrun the above percentage of loss the car shall be rejected. If one or two of the tests overrun another test of said grade or grades shall be made. Should only one of these tests overrun the specified percentage of loss the contractor may cull said grade, provided they do not exceed ten (10) per cent of the amount of brick in the car, and deliver the balance on the improvement. Otherwise the whole car will be rejected.

In order to prevent the continued shipments of inferior brick only two cars of two separate shipments of any make of brick will be tested. Should they fail to meet the requirements stated above said make of brick will be rejected for this improvement. *(Inasmuch as your committee has made but a limited number of tests with the proposed rattler and charge it was decided at this time to not recommend any allowable percentage of loss due to abrasion, but from the best obtainable information the committee suggests that in the absence of exhaustive tests an increase of three (3) points be allowed by the cities over their previous requirements until further data are procured.)*

Number and Condition of Brick

Section 5. Ten paving brick shall constitute the number to be used in a single test. The brick shall be thoroughly dried for at least three (3) hours, in a temperature of one hundred (100) degrees Fahr. before testing.

Tests Before Unloading

Section 6. The contractor shall notify the proper city official of the location and car number of each carload of brick received. Samples from such car shall be taken and tested by

the city, and no brick shall be delivered on or adjacent to improvement on which the brick are to be used until in receipt of a written statement from the engineer or his authorized representative, that the samples have passed the required Decision relative to each carload will be made within two (2) hours of notice. Permission to deliver brick on line of work shall not be considered a final acceptance in respect.

Following this in the standard specifications is a description of the standard rattler and method of using the same which was described on pages 352 and 353 of our issue of March 1911. The specifications then continue as follows:

Foundation

Section 12. All brick to be laid on a — inch concrete with sand cushion.

Sand Cushion

Section 13. Over the foundation shall be spread to a uniform depth of one and one-half ($1\frac{1}{2}$) inches (after rolling) a cushion of clean, sharp sand, free from loam or foreign matter. The sand must pass a one-quarter ($\frac{1}{4}$) inch screen. The cushion shall be carefully shaped to a true cross-section of roadway by means of a template having a steel-faced edge covering at least one-half ($\frac{1}{2}$) the width of the brick work and so fitted with rollers as to be easily drawn on the curb guide timbers or rail.

Template

Section 14. See plan of template.

Guide Timbers

Section 15. Guide timbers shall be one and one-half (1½) inches by four (4) inches by sixteen (16) feet, dressed on sides, laid to a true surface in the center of the street and flush to the curb, if curb cannot be used.

Shaping Cushion

Section 16. Before shaping the cushion a one-half ($\frac{1}{2}$) inch strip shall be laid on the curb, and guide timbers or rail, the template drawn over the same, after which the one ($\frac{1}{2}$) inch strip shall be removed, the cushion slightly moistened and rolled over its entire surface with a hand roller. The roller shall be not less than thirty-six (36) inches in diameter, twenty-four (24) inches in width, and weighing not less than ten (10) pounds per inch in width, and having a handle two (2) feet in length. After rolling the template shall be drawn over the curb and guide timbers or rail, to complete the cushion. The cushion shall be prepared at least fifty (50) feet in advance of the brick laying.

How Laid

Section 17. The brick shall be laid in straight lines on the curb at right angles to the curb; at intersections they shall be laid as directed. Brick shall be laid with the lug sides in the same direction. Brick must be placed close together, breaking joints at least three (3) inches. At every fourth course the bricks shall be driven together to secure tight joints and straight courses, and all thick brick shall be removed.

When any section shall contain more than ten (10) per cent of culls the brick shall be taken up and the cushion adjusted. Brick shall be laid from curb to curb, or car track to curb.

No bats or broken brick shall be used except at curbs or on the street car tracks. After the brick are laid the end joints are to be made close by use of a bar applied at the ends flush to the curb. Barring shall immediately follow the laying.

Joints shall be cut square with the top and sides of brick, and all joints must be kept clean and open to the bottom until finished as specified.

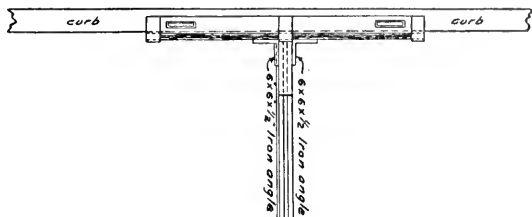
Street Car Tracks

Section 18. Along the street car tracks the brick must be laid within one-quarter ($\frac{1}{4}$) of an inch of the rail, and must be rolled shall be one-quarter ($\frac{1}{4}$) inch below the top of the rail.

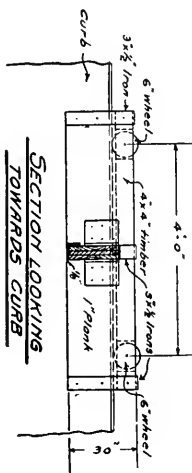
The space between the web of rail and the brick shall be filled with cement mortar, consisting of two (2) parts sand and one (1) part Portland cement. The mortar shall be in proper condition and the edge constructed to a straight line before the brick are laid.

Expansion Joints for Cement Grout Filler

Section 19. Expansion joints shall be placed parallel with and at each of the curb lines, and shall be one and one-half (1½) inches in width. The joints shall be made by placing wedge-shaped strips six (6) inches in width, and dressed two faces together on edge, parallel with the curb. The strips next to the curb shall be one (1) inch wide on top, beveled to a thickness of one-half ($\frac{1}{2}$) inch at the bottom, and the strips next to the brick shall be of the same dimension and placed in a reverse position. The brick shall be laid lightly against the strips. Soon after the pavement has been grouted and cement filler has set, and the pavement is in all other respects finished, the strips shall be removed, the joints thoroughly cleaned out, and immediately completely filled with a bituminous



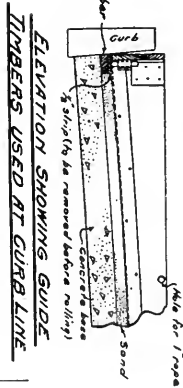
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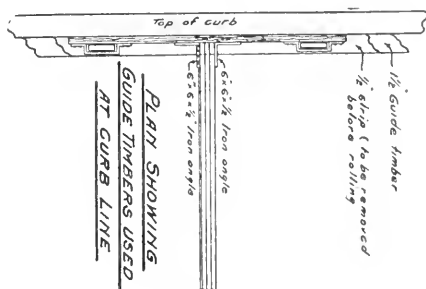
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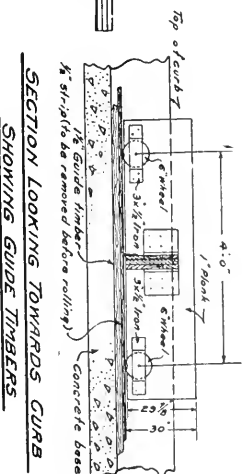
ELEVATION



ELEVATION SHOWING GUIDE TIMBERS USED AT CURB LINE



PLAN SHOWING GUIDE TIMBERS USED AT CURB LINE



SECTION LOOKING TOWARDS CURBS SHOWING GUIDE TIMBERS USED AT CURB LINE

TEMPLATE FOR SHAPING SAND CUSHION UNDER BRICK PAVEMENT

1910

PLAN OF TEMPLATE FOR SHAPING SAND CUSHION

tiller composed of a material which, when penetrated by a No. 2 needle under a weight of 200 grammes for one (1) minute at a temperature of 32 degrees Fahr., will not be less than 20, and when penetrated with a No. 2 needle under 50 grammes for five (5) seconds in a temperature of 115 degrees Fahr., will not have a penetration of over 100.

The section concerning rolling is the same as last year's specifications, but there has been added to it the following:

After final rolling the pavement shall be tested with a ten-foot straight edge, laid parallel with the curb, and any depression exceeding one-quarter of an inch must be taken out. If necessary, the pavement shall be again rolled.

In the old specifications at the end of the article on rolling the sentence beginning "expansion, etc.," is omitted. The balance of the specifications dealing with cement filler has been changed so considerably that it seems desirable to reprint the new form entire. This section and the rest of the specifications follow:

Portland Cement Grout Filler

Section 21. The filler shall be composed of one part each of fine, clean, sharp sand and Portland cement. All cement used for this work must stand the test as approved and adopted by the Organization of City Officials for Standardizing Paving Specifications, January 13, 1911.

The sand shall pass a No. 20 standard sieve. Sand shall be measured in a box having the same cubical contents as one sack of cement.

One sack of cement with an equal amount of sand shall be thoroughly mixed together dry in a box four (4) feet eight (8) inches long, thirty (30) inches wide, and fourteen (14) inches deep, resting on legs of different lengths, so that the mixture will rapidly flow to the lower corner of the box, the bottom of which shall be six (6) inches above the pavement. One box shall be used for each fourteen (14) feet in width of roadway, and at least two (2) boxes must be used in all cases.

After the cement and sand have been thoroughly mixed until the mass assumes a uniform color, enough clean water shall be added to make a liquid mixture of a consistency of thin cream. From the time the water is applied until the last drop is removed and floated into the joints of the pavement the mixture must be kept in constant motion. Before the grout is applied the brick shall be thoroughly wet by being gently sprayed.

The grout must be removed from the box with scoop shovels and applied to the brick in front of the sweepers, who shall rapidly sweep it lengthwise of the brick into the unfilled joints until the joints are filled to within not more than one (1) inch of the top of the brick. After the grout has had a chance to settle into the joint and before the initial set develops the balance of the joints shall be filled with a thicker grout, and, if necessary, refilled, until the joints remain full to the top.

After this application has had time to settle and before the initial set takes place the pavement shall be finished to a smooth surface, with a squeegee or wooden scraper, having a rubber edge, which shall be worked over the brick at an angle with the brick.

When completed and the cement has received its initial set the pavement shall be covered with a one-half ($\frac{1}{2}$) inch layer of sand, which shall be frequently sprinkled in warm weather. No travel shall be permitted on the pavement for a period of from seven (7) days after grouting, or longer, as the engineer may require on account of weather conditions.

Ample barricades and watchmen shall be provided by the contractor for the proper protection to the grouting.

(While your committee is in favor of a cement grout filler we believe that where conditions do not favor the use of the same for good and sufficient reasons, we recommend the adoption of bituminous filler under the following specifications.)

Coal Tar Paving Pitch Filler

Section 22. The joints or spaces between the paving blocks and between the paving blocks and the curb, railroad tracks, around manholes, etc., shall be filled with coal tar paving pitch, which shall comply with the following requirements:

Physical Properties

When in place in the pavement it shall be of such character that it will adhere firmly to the paving block and to the curb, and shall be sufficiently plastic to allow for the contraction and expansion in the pavement without developing cracks in the joints. It shall be proof against action by water and all acids or alkalis to which the pavement may be exposed.

Melting Point

It shall have a melting point varying not more than 5 degrees from 135 degrees Fahr., determined by the cube method (hereinafter described.)

Method of Use

The filler shall be heated and poured into the joints to the full depth thereof, at a temperature of not less than 300 degrees

Fahr., nor greater than 350 degrees Fahr. All joints shall be completely filled to the top. The top dressing of sand shall be spread over the pavement immediately after the filler is applied and while it is still soft. In cold weather the sand shall be heated so as to readily bond with the pitch. Extra care shall be used at the gutters and around catch basins, etc., to actually prevent the leakage of water into the subroadway. Free carbon shall not be less than 25 per cent nor more than 40 per cent; the specific gravity shall not be less than 1.20 nor more than 1.30 at 60 degrees Fahr.

Asphalt Filler

Section 23. The interstices of the brick shall be completely filled with an asphalt filler heated to a temperature of not less than 350 degrees Fahr., nor more than 450 degrees Fahr. The asphalt filler shall not contain pitch nor any part of coal tar. It shall contain at least ninety-two (92) per cent of bitumen soluble in carbon disulphide. It shall remain pliable at all temperatures to which it may be subjected as a street paving filler. It shall be absolutely proof against water and street liquids. It shall firmly adhere to the brick and be pliable rather than rigid. Care shall be exercised to completely fill all open spaces around street structures and the street shall not be used for traffic until the filler is completely set. A top dressing of sand shall be spread immediately after the filler is applied while it is still soft.

Test for Melting Point of Pitch and Asphalt Fillers

Section 24. A clean-shaped one-half ($\frac{1}{2}$) inch cube of pitch or asphalt to be formed in the mold and suspended in the beaker so that the bottom of the pitch or asphalt to be tested is one (1) inch above the bottom of the beaker. The pitch or asphalt is to remain for five (5) minutes in water at a temperature of 60 degrees Fahr. before heat is applied. The water to be applied in such a manner that the temperature of the water is raised 9 degrees Fahr. each minute. The temperature recorded by the thermometer at the instant the pitch or asphalt touches the bottom of the beaker to be considered the melting point. The filler shall be such that it retains its consistency under extreme temperatures. For materials which show a narrow range of consistency at extreme temperatures a lower melting point should be used than in such materials which show a wide range of consistency.

The penetration shall conform to the following:

No. 2 needle, 5 sec., 100 grammes at 77 degrees Fahr., 25 or less.

No. 2 needle, 1 min., 200 grammes at 32 degrees Fahr., below 25.

No. 2 needle, 5 sec., 50 grammes at 115 degrees Fahr., below 110.

The melting point or consistency of the filler shall be decided upon and specified for the particular locality in which the paving is to be done.

Maintenance

Section 25. The period of guaranty shall be five (5) years. During the period of guaranty, whenever the surface of a paved brick pavement becomes uneven, holding water one-fourth ($\frac{1}{4}$) of an inch or more in depth in a distance of four feet or less, or when the pavement has settled over trenches filled previous to the completion of the pavement, then the brick shall be taken up and relaid to proper crown and grade.

Any brick which may be found soft, unsound, broken, disintegrated shall be removed and properly replaced with sound material. All portions of the pavement which may become rough by reason of the chipping or breaking of the edges of the brick so as to produce joints exceeding one ($\frac{1}{2}$) inch at a point one-quarter ($\frac{1}{4}$) inch below the surface of the brick shall be replaced with new material. If in any continuous three hundred (300) lineal feet of the pavement it is found necessary to repair more than one-third ($\frac{1}{3}$) of the area, or if the cracks in the brick exceed the proportion of three (3) cracks to one foot of pavement, then all the brick in such area shall be taken up included in the three hundred (300) feet and the curb lines and be relaid with new brick.

The members of the committee which reported these specifications were E. H. Christ, chairman, member Board of Public Works, Grand Rapids, Mich.; D. M. Roberts, secretary, civil engineer, Terre Haute, Ind.; Henry Maetzel, chief engineer, Columbus, O.; John B. Hittell, chief engineer of street Board of Local Improvements, Chicago, Ill.; James H. Sullivan, deputy superintendent of streets, Boston, Mass.; E. A. King, superintendent, Department of Public Works, Little Rock, Ark.; Geo. L. Campen, assistant city engineer, Omaha, Neb.; I. Cellarius, city engineer, Dayton, O.; H. W. Klausmann, civil engineer, Indianapolis, Ind.; T. S. Oxholm, engineer in charge, Bureau of Engineering Construction, Borough of Richmond.

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A. PRESCOTT FOLWELL, Editor
F. E. PUFFER, Assistant Editor

Business Department

S. W. HUME, President

T. MORRIS, Manager. A. PRESCOTT FOLWELL, Secretary

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CHANGE OF ADDRESS

Subscribers are requested to notify us of changes of address, giving both old and new addresses.

Contributions suitable for this paper, either in the form of special articles or of letters discussing municipal matters, are invited and paid for.

Subscribers desiring information concerning municipal matters are requested to call upon MUNICIPAL JOURNAL AND ENGINEER, which has unusual facilities for furnishing the same, and will do so gladly and without cost.

APRIL 19, 1911.

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Massachusetts Institute of Technology

THE Massachusetts Institute of Technology has just completed a half century of existence and on April 10th celebrated the anniversary of the signing of the charter by the Governor of the State, the exercises being continued on April 11th by the presentation of papers by alumni of the school illustrating the part which it has played in the advancement of science. It speaks well for the interest which the general public takes in this institution, as well as for the enthusiasm of the alumni, that hundreds were excluded from the meetings through lack of capacity of the halls.

To municipal engineers and sanitarians this school has been and is of especial interest, since it has for some years conducted a regular course of instruction in municipal sanitation and operated a laboratory especially devoted to sewage disposal and its graduates have done the lion's share of what has been accomplished in this country in advancing the art and science of water and sewage purification and the application generally of engineering, biology and chemistry to solving the problems of preventing and removing unsanitary conditions in cities.

During the past twenty-five years it has graduated a large percentage of the city engineers, city planning experts, superin-

tendents of water works and other officials and expert advisers of those municipal departments which are engaged in controlling the forces and utilizing the materials of nature in the evolution of the modern city.

With the rapidly increasing importance of the scientific man in all branches of human endeavor, and by no means least in municipal undertakings, the demand for graduates of the Institute has increased to such an extent that it has outgrown its capacities, although used to their utmost, and the problem which the Institute is now endeavoring to solve and which it is believed will be solved within the next few months is finding a new location where can be constructed buildings and facilities more nearly adequate to its present demands and giving possibilities for future expansion.

Legislation Against Rapid Filtration

THERE was introduced in the Pennsylvania Legislature last month a bill which if it should pass would work the greatest injury to sixty-one municipalities of that state. This is entitled "An article to prohibit the use of alum and alum compounds in the filtration of water by any person or persons, corporation or municipality furnishing water to the public and providing a penalty for a violation thereof." The bill is extremely brief, being practically only a repetition of the title above quoted, with provision for a fine of \$100 for each day of violation of the act or imprisonment of 100 days. This would take effect on the first of January next.

This bill had already been placed upon the calendar before it was noticed by any who realized its importance. As soon as this happened, however, word was immediately sent to water companies and municipalities throughout the state which were operating rapid filtration plants, of which there are 61 in the state supplying about 150 million gallons of water per day, and 80 representatives from these companies and cities gathered at Harrisburg to protest against the bill. It is fortunate that possibly the best object lesson which the state representatives could have been shown in illustrating the objections to the bill was right at hand in the form of the Harrisburg filtration plant, which is one of the best in the country.

It is almost inconceivable that the Legislature would pass such a bill, as it would undoubtedly mean that a majority of the municipalities in Pennsylvania now supplied with filtered water would return to the use of crude water, finding or believing themselves financially unable to build slow sand filters between now and next January. There are certain objections to the use of alum in purification plants, but the great majority of sanitarians who have made a special study of water purification believe that rapid filtration with the use of alum possesses advantages which far outweigh the disadvantages; and for certain water, in fact, there appears to be no substitute for this method of filtration, the large amounts of fine suspended matters making the use of slow sand filters impracticable.

A Town as a Delinquent Consumer

THE water registrar of Clinton, Mass., in his report for the year 1910-1911 to the Water Commissioners of the municipal water works makes the following statement: "All water rates for the year, except \$160 for street sprinkling, have been collected. I was assured that this amount would be paid before the end of the fiscal year, but as the town refused the required appropriation the standpipes are shut off and will remain so until payment is made."

This statement seems to reveal a very unusual condition for several reasons. In the first place we doubt whether many municipal water plants can state that all water rates have been paid, except those (if any) owing from the city. It is certainly not to the credit of the town that it should be the only delinquent consumer. And, finally, we do not recall having ever heard of another case in which a city or town was treated so summarily and had its water shut off like any common consumer. If the plant is run on such thoroughly businesslike principles in all other respects, it should be a financial success and a profitable investment for the taxpayers.

COMPTROLLER W. M. A. PRENDERGAST, of New York City, will undoubtedly receive the thanks of the creditors of that city and will probably enable several of the departments to secure better prices if he should succeed in the attempt which he is now making to secure more prompt payments of the undisputed bills received by the city. On April 3 the comptroller wrote to Mayor Gaynor urging him to demand from the commissioners of the several departments that they send vouchers for all purchases within twenty days, in which case he practically guaranteed that the Department of Finance will audit the bills for payment within ten days, thus securing the payments on a thirty-day cash basis. At present the average time between the date of an invoice and the receipt of the vouchers by the Finance Department is about two months in the case of the Departments of Education and Fire; three months or more in the case of the Department of Corrections, while the Department of Street Cleaning seems to top the list with delays of as much as fourteen months, and in no case less than two or three.

These delays the comptroller attributes to lax business methods in the departments and offices of the city government, and they have, he states, "given our city an unenviable reputation among its own contractors, merchants and trades people, and have forced many of our best business houses to refuse city orders." There have even been numerous instances where the city's regular employees have been compelled to wait two or more months for their pay, thus causing great hardships, especially among those whose pay was so small as to preclude the possibility of laying aside very much to meet this or other emergencies.

STATE CONFERENCE OF MAYORS

For a great many years superintendents and engineers of water works plants and other officials engaged on city improvements and utilities, and civil engineers generally, have united in organizations meeting once or oftener each year to compare notes and discuss matters connected with the work in which they are engaged, with the idea of profiting by each other's experience. Recently this idea has been taken up by other classes of city officials, especially those whose official functions are in the nature of a profession, such as health officers and comptrollers; but a convention and conference of mayors, not for mere social enjoyment but for actual comparison of ideas and acquisition of information useful in their office, is something comparatively new.

Such a conference was inaugurated last year by the mayors of the second and third class cities of New York State, and a second is to be held on May 25, 26 and 27 at Poughkeepsie. The serious aim of this convention is evident by an inspection of the program. This shows the morning of the first day occupied with addresses and discussions on the cleaning and care of streets; the afternoon on municipal accounting and the evening on the police department. On the second day the morning is to be devoted to a discussion of taxation and assessments and municipal transit; the afternoon to commission and other forms of municipal government, and the evening to a continuation of the same topic. During these two days the only thing in the nature of amusement on the program is a visit to West Point between 4.30 and 8.30 p. m. of the first day, and a clam-bake in place of dinner on Friday. The third day is occupied by a discussion of municipal water supplies and a trip to the Ashokan dam. The leaders in the discussions of the several subjects include prominent city engineers, street lighting experts, comptrollers, tax commissioners, legislators and mayors.

A conference of this kind indicates an appreciation of the great responsibilities of their positions by the mayors of the second and third class cities of New York and a serious intention on their part to do the best for their cities which they can, not only with the information already at their command but with any which they can acquire. In other words, it would appear that our city officials are coming to realize more strongly the duties attached to their positions and are not contenting themselves with merely enjoying the honors.

Fine Mesh Screen Lessens Sludge and Scum—Effect of Time Baffles and Scum Boards in Sedimentation— Philadelphia Experiments

Among the tests made at the Philadelphia Sewage Experiment Station was a series on the use of a fine-mesh screen. The conclusions from these tests are reported as follows:

Crude sewage was played through twenty-four $\frac{1}{4}$ -inch nozzles set to discharge at right angles to the conical surface of fine-mesh screen, composed of red metal cloth having thirty-two meshes per inch, leaving clear openings of $\frac{5}{10}$ millimeter by $\frac{5}{10}$ millimeter. That portion of the applied sewage which did not pass through the screen splashed over the surface, washing the screenings down into a gutter and thence to the drain.

On account of the construction of the screen it was not possible to obtain the screenings in a semi-dry state, as the splashing water washed them away. As the screen removed all the large solids which could not be included in analysis by a Gooch crucible, a mere comparison of suspended solids in the influent and effluent would give a lower percentage removal than the truth, and it must be borne in mind that the sewage applied to the fine screen had been withdrawn from beneath the surface of the flow in the intercepting sewer, had passed through a coarse screen, and had passed through a plunger type pump. The percentage removal of suspended solids by the screen is therefore not comparable with a disposal works screen.

The crude sewage applied to the screen during its entire run contained on an average 200 parts per million of suspended solids as measured by the Gooch crucible, and the average effluent 133. This would represent a removal of 33.5 per cent of the suspended solids, or 560 pounds dry solids per million gallons sewage screened.

As a check upon these figures a run was made on two tanks under identical conditions, except the influent to one was screened and to the other was crude sewage. The difference in the amount of dried residue deposited in the tanks was used to determine the percentage removed by the screen. Allowing for the inaccuracies in sampling both the sewage and sludge the test indicates a removal of 37.3 per cent of the total suspended solids in the crude sewage by the fine-mesh screen.

For comparison with an actual installation of a fine screen of similar mesh to the one described, the operation of the Reading plant, as reported by Mr. Emil Kuichling in his notes on "Sewage Disposal for Rochester" (*MUNICIPAL JOURNAL AND ENGINEER*, June 1, 1910), may be of interest. There the crude sewage contained 215 parts per million of suspended solids, and the screened sewage 125, showing a removal of 90 parts per million, or 750 pounds of dry solids per million gallons sewage. This is a removal of 41.8 per cent of the total suspended solids.

The most important result of the fine-mesh screening of a sewage containing trade wastes, such as wool and hops, was the fact that the screened sewage contained no particles larger in size than one mm, as frequently determined by microscopic measurements, and as the clear openings in the screen used were 0.5 mm. square, only soft flexible solids larger than that size would be driven through by the force of the jets. This means that the irregularity of the load of suspended solids upon a sewage disposal plant produced by the erratic contribution of trade wastes would be eliminated by fine-mesh screening.

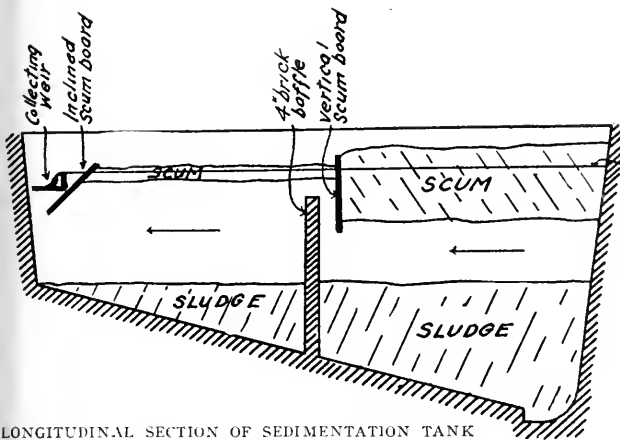
The use of a fine-mesh screen produces a marked effect upon the sludge collected in subsequent sedimentation, lessens the quantity of sludge produced, increases its percentage moisture, and by removing all large particles yields a sludge composed of very finely divided solids, consequently easily pumped.

If sprinkling filters are used, the clogging of nozzles is re-

iced to a minimum—in fact, the nozzles of the lower sprinkling filter, the influent of which was settled screened sewage, were never clogged during its nine months' operation.

SEDIMENTATION

Sedimentation by horizontal flow was studied in three tanks, and in addition a modification of the Emscher tank was used in studying vertical flow. Of the horizontal flow tanks one had a ratio of depth to length of 1 to 1½; a second, 1 to 2½, and the third a ratio of 1 to 4, the last being found the best proportion. These all had level bottoms at the beginning of the experiments, but the two first were given bottoms with a slope of 16 degrees to the horizontal later on, the deepest portion being at the inlet end. At first there were no baffle walls in the tanks, but during the later experiments sludge baffles, scum boards and effluent weirs were provided. The illustration shows the general form of the first two tanks and the location of the baffles and scum boards.



LONGITUDINAL SECTION OF SEDIMENTATION TANK

The experiments with these tanks indicated that when the storage period—that is, the time nominally occupied by the sewage in passing from the inlet to the outlet end—exceeded ½ or 3 hours there was a very slight increase in the percentage of suspended solids removed, and that consequently this length of time appeared the most economical. Although no reference is made to it in the report, it is probable that the velocity of flow is an important consideration, and that the economical length of storage period increases with the length of the tank. The sloping bottom gave a certain advantage, in providing a storage place for the sludge without too greatly contracting the area of flowing sewage. Much more beneficial, however, were the baffles and scum boards, the former resulting in confining near the inlet end a large part of the sludge, thus leaving the outlet end with a larger cross-section, which gave lower velocity to the sewage and thus permitted the depositing of the finer and lighter suspended matters. There was also less tendency to gas formation in this outlet end, and thus less taking of fine matter into resuspension by the flowing sewage. The scum boards similarly retained a very large percentage of the floating matter near the inlet end, thus permitting the free escape of gases from the sewage in the outlet portion of the tank.

The third tank was divided into three sections by two baffle walls, and it was found that two-thirds of the sludge was deposited at the inlet end, one-fourth in the middle section and the remaining one-twelfth in the outlet section. Another advantage of the use of baffle walls was that it secured a more uniform flow throughout the vertical cross-section of the tank. When the tanks were unbaffled it was found that visible trade wastes passed from the influent to the outlet end at a rate which showed a current of high velocity through the tank, thus implying low velocities through other portions of the vertical cross-section, but after baffles were provided these evidences of high velocity were not noticed.

A part of the sewage passed through the tanks had previously been screened by the fine screen described above, and practically no scum collected on the tanks through which this screened sewage was passing.

The percentage of suspended solids removed varied from about 59 to about 77, and the parts per million remaining in the effluent varied from about 45 to 81. The figures are not directly comparable, however, as the sewage used in the tests varied in strength from day to day.

The experiments in vertical flow sedimentation were made with a cylindrical tank 10 feet deep and 5 feet in diameter. A tank only 5 feet deep was used at first and found too shallow for effective sedimentation. The crude sewage was compelled to pass downward from an inlet in the center of the tank to a depth of about 4 ft. 6 in., and then to reverse the flow and pass upward to an overflow at the circumference of the tank. A 10-inch tube through the center of the tank permitted the escape of the gases. A space about 4 feet in depth in the bottom of the tank was available for the collection of sludge. The method of depositing solids was entirely different from the Emscher construction, except that the digesting chamber at the bottom of the tank was separated from the upper portion where sedimentation took place so that the gases given off by the sludge could not rise and carry solid matter into the effluent. The effluent from this showed no appreciable loss of dissolved oxygen nor reduction of nitrites or nitrates during its passage through the tanks, which was attributed to the fact that the gases of decomposition from the sludge did not reach it. The sludge was found to be very low in moisture, uniform in consistency and free from hydrogen sulphide or other gas having objectionable odors.

MASSACHUSETTS EXPERIMENT STATION

LAWRENCE, MASS., April 14, 1911.

Editor MUNICIPAL JOURNAL AND ENGINEER,
239 West 39th St., New York, N. Y.

Dear Sir—You state in an editorial in this week's issue of the *Municipal Journal and Engineer*, when speaking of the Philadelphia sewage disposal experiments, that "while the experiments of the Massachusetts State Board of Health and the reports upon the same, which are unsurpassed for completeness and scientific thoroughness, are recognized in Europe as well as in this country as being of the greatest importance and reliability" that "their value has been somewhat restricted during the past few years by a conservatism in the adoption of new ideas, which seem to us unnecessary and unfortunate." As you have made this statement I should be glad to have you inform me just what new ideas in sewage disposal the Experiment Station has failed to "adopt," or in other words, just what method of sewage purification has not been either developed or thoroughly studied here, just what data in regard to modern methods of sewage disposal are lacking in our reports? Trickling filters were in operation here before being operated, I believe, anywhere else in the world, and are still continued in operation. Contact filters, septic tanks, etc., have also been studied through many years and data in regard to them given in our reports. Moreover, whatever Mr. Dibdin may say to the contrary, slate contact filters were in operation here several years before being operated in England by him, and we had no knowledge when we started them that he had written a letter to some English engineer in regard to such filters. A two-compartment septic tank for the concentration and disposal of sludge, somewhat similar to the present Imhoff or Emscher tank, was operated here in 1899 and 1900, eleven years ago, and a description of its results can be found in our reports for those years. During the past two years, moreover, such tanks have again been studied. In looking over the Philadelphia report, of which I have a copy, I find little or nothing new. It is simply a much to be commended trying out of methods of sewage disposal as applied to the Philadelphia problem. In fact, I am fain to believe that you criticise Lawrence work without being sufficiently familiar with the large amount of data in regard to all modern methods of sewage purification published in the reports each year. Yours very truly,
H. W. CLARK,
Chief Chemist.

In the article Mr. Clark refers to we intended to distinguish between "experiment" and "adoption." We practically stated all that he claims as to the thoroughness of the *experimenting* done by the board, limiting our criticism to the *adoption* or approval of processes for use by Massachusetts cities. The most recent case in point is the refusal of the board to approve of the use of rapid sand filtration by cities, in spite of its recommendation by most sanitary engineers.

Current Subjects of General Interest, Under Consideration by City Councils and Department Heads—Street Water Works, Lighting and Sanitary Matters—Fire and Police Items—Government and Finance

ROADS AND PAVEMENTS

Good Roads Experiment

Fort Worth, Tex.—A suggestion from W. G. Turner and approved by the Board of Trade is to be given a practical test on the Tarrant County roads, the most used road in the county being selected for the test. The suggestion or assertion is that it is cheaper as well as better to keep a road in repair than to let it run on until general repairs are required. The stretch of road from here to Arlington is the one selected for the experiment, a part of the Fort Worth-Dallas pike. A road keeper has been appointed, who began work last week. It will be his duty to keep the road in the highest state of efficiency, and for this purpose he is provided with a horse and cart and such tools as a man can use, shovels, picks, etc. His duty will be to fill all depressions with gravel or whatever may be the road material, so that the surface of the road may be maintained at its proper level; open and keep open all drainage ditches, and keep the weeds and brush along the sides of the road cut down. In fact, his work will have about the same scope as that of the railway section hand. After the road is built and properly surfaced it is claimed that one or two men can keep it in perfect repair all of the time. This it is claimed will be cheaper than letting it go down and then rebuilding it with large outlays, as has been done in the past.

Plan Central Boulevard Through City.

Providence, R. I.—In a report made public last week by a special municipal commission appointed for the purpose, Providence's most troublesome engineering problem that has vexed the souls of the city fathers for the past half century, namely, a commodious and convenient thoroughfare from the center of business interests to the East Side residential section, seems in a fair way of meeting an adequate solution. The engineering member of the commission is John R. Freeman, a consulting engineer of wide renown, who was one of the board to inspect the Panama Canal at the invitation of the United States Government. Under his supervision plans and estimates have been prepared, which provide for the construction of an easy grade street with a maximum width of 100 feet, intended for all classes of travel, to reach from the new Federal Building and post office, at the foot of the city's civic center, to the top of College Hill, and to cost in the neighborhood of \$1,350,000.

Town Buys Stone Crusher and Plant

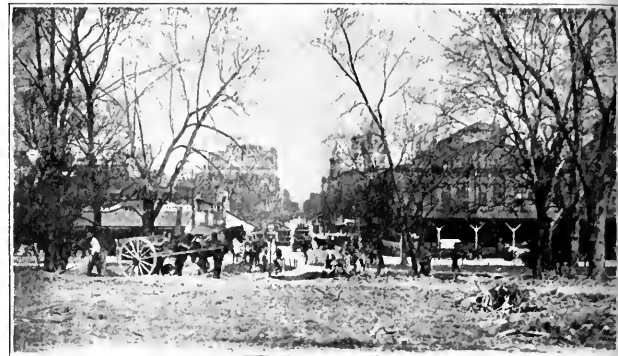
South Burlington, Vt.—The town of South Burlington has purchased the stone crusher and plant of the E. F. Morse estate on the Williston road and will use it in furnishing material for road work this summer. The principal object in buying the plant was to make work easier and less expensive on the Williston road. State Road Commissioner C. W. Gates has expressed a desire to have the present excellent road which goes part way continued as far as the Williston line, and with the aid of the State that can be accomplished, although it would be out of the question under former conditions, when stone was purchased from the Phelps or city quarries, as the haul would be too long.

Citizens Offer to Pay for Oiling Streets

New Britain, Conn.—Owing to the shortage of water in Shuttle Meadow reservoir, it is not deemed best to sprinkle the streets with city water at present. The residents of West Main street have been greatly inconvenienced by the gales of dust and W. L. Hatch conferred with President J. E. Moore of the Board of Public Works to see if a plan could be devised to eliminate the dust. Speaking for himself and a few other property owners on West Main street, Mr. Hatch said that he would be glad to pay a special assessment for sprinkling the street with oil.

Oil Macadam Driveway for Smithsonian Grounds

Washington, D. C.—A new oil macadam driveway, practically 30 feet wide, flanked on either side by 6-foot cement walks, is being constructed in the Smithsonian grounds at the Ninth street entrance from B street North. It will connect with the driveway which passes the front of the new National Museum Building and with the driveway which sweeps down through the center of the grounds from the Smithsonian Building, thus offering outlets on Seventh



Courtesy Washington Star.

EXTENDING NINTH STREET THROUGH THE MALL

Ninth and B streets south as well as north. Workmen have already begun to plow the ground and lay out the driveway and walks. Its construction necessitates a modification of the curve of the driveway from the south which now divides at the east side of the museum building, which is also being made, the curve being lessened and the outlet to Seventh street made more direct. This work is being done under the supervision of F. F. Gillen, of the office of Public Buildings and Grounds, and under the immediate direction of C. H. Tompkins, engineer of the Smithsonian Institution.

Merchants Favor Broader Streets

St. Paul, Minn.—Barring some legislative difficulties that probably will have to be settled, the people of St. Paul, according to the sentiment reflected by merchants in the retail business district, are ready to enter on the project of widening the thoroughfares in downtown sections. Several managers of big department stores who were seen favorably without exception the widening of the streets. Except as regarded Wabasha, there was not entire unanimity of sentiment as to which streets should be widened first. Everybody agreed that Wabasha street should be widened. It was thought necessary both to relieve the congestion along this street and to widen it in order to conform to the plan of beautifying the city as embraced in the projects for Capitol approaches. Many who talked of that street in particular also declared the Wabasha street bridge would have to be widened or doubled in order to make the entire plan harmonious. In some quarters there was a disposition among the merchants to hold aloof if the plans proposed should embrace additional costs to the municipality. The plans that commanded general indorsement were those followed in Philadelphia, where the streets have been widened slowly by the establishment of lines to which buildings must conform within fifteen or twenty years.

Hagerstown Turnpike Now Free of Tollgates

Hagerstown, Md.—The final details of the purchase of the Hagerstown and Conococheague Turnpike by the State were completed last week and the road declared free of tollgates. T. A. Poffenberger, representing the State, received a draft for \$22,500, which he turned over to the Turnpike Company, and the deal was closed. Notice was served on tollgate keepers to stop collecting tolls.

SEWERAGE AND SANITATION

City Will Adopt Health Reform

Manitowoc, Wis.—Rigid reforms, among which are medical inspection of public schools, elimination of swine from city and other things recommended by the city health board are before the City Council and will become city ordinances.

Plan Engineering Division of State Board of Health

Pensacola, Fla.—At the twenty-second annual meeting of the State Board of Health of Florida, held February 14 and 15, 1911, at Jacksonville, the Board instructed the State health Officer to have drafted a bill to be placed before the Legislature, which, if adopted, would provide for a sanitary engineering division of the State health work. The State Board of Health has for a number of years at its annual meetings been impressed with the necessity existing throughout the State for expert advice and supervision of the installation of public water supply systems, the construction of plants for the proper disposal of sewage and domestic wastes, and also in relation to drainage in so far as these matters may affect the public health.

City Installing Sanitary Drinking Fountains

Pasadena, Cal.—The first of the cupless drinking fountains which the city is installing is now in place and working, the porcelain font being placed where formerly stood the cast iron affair for man and beast, at the City Hall corner. It is the plan of the city to install four or five more of similar design and the next will be placed at the corner of Colorado street and Raymond avenue, where a similar cast iron fountain will be displaced.

Health Department Scrutinizes Bakeries

Jacksonville, Fla.—Eudeavoring to have a clean and healthy city, Chief Sanitary Inspector George C. Floyd, of the City Board of Health, is carrying on the good work vigorously, and has notified all of the bakeries in the city to properly screen their places of business to prevent the invasion of flies.

State Department Orders Sewers Accepted

Lackawanna, N. Y.—On authority based upon an order from the State Department of Health, the Board of Health of Lackawanna has served notice upon Mayor Reed and other city officials, including Dr. Ira P. Trevett, president of the Lackawanna Board of Health, to open the sewers of Lackawanna to public use. The order is signed by Dr. Eugene H. Draper, State Commissioner of Health. Dr. Trevett said last night that he did not believe that the order would conflict with the legal proceedings now on to prevent the acceptance of the sewer by the city. He said that there was no epidemic at Lackawanna, but there were conditions that might cause trouble if the city was allowed to continue as it did last summer without means for the disposal of sewage. On that account, he and members of the Board of Health laid the matter before the State health authorities a few weeks ago and the order was the result. The troubles Lackawanna has had over its sewer have been kept before the public for the last two years. The indictment and conviction of members of the old Town Board of West Seneca were part of the troubles. On appeals and otherwise, those cases are still in the hands of the District Attorney. On the last day of its existence the old Town Board was served with an injunction restraining it from accepting the sewer and making the final payments to the contractors. The injunction was obtained by the Lackawanna Steel Company. It was based upon the allegation that the sewer was not built according to contract and was otherwise faulty. The injunction was continued against the city of Lackawanna. The matter has since been in the courts. George Clinton was appointed referee to take testimony and decide upon the merits of the contention that the sewer was improperly built. He has not yet rendered his decision. Pending the adjustment of the proceedings, residents of the city have been prevented from making connections with the sewer. It would seem that the order of the State Board of Health conflicts with the injunction.

Town to Have Sewer System

Melrose, Minn.—Contractor A. F. Dueber has started a crew of men to work digging for the new sewer which the city is putting in. The system will cost \$12,000 and will extend through the entire business section and along several of the best residence streets in town. Two miles of pipe will be laid. The system is so planned that extensions can be made from time to time, and before long the entire town will be supplied.

Sewerage System Completed

Gaffney, S. C.—At last, after a wait of two years, Gaffney's sewerage system is completed and is now in use. The filter plant has been finished, but is not yet in use. The enormous new standpipe, which doubles the capacity of the old one, has also been completed, and doubtless the water will be turned into it at no distant date. On the whole, the people of Gaffney have reason to feel proud of what they have accomplished in this line. The sewerage system was installed by Bowe & Page, of Charleston and Augusta, while the filter plant was built by the Greer Filter Company, of Pittsburg, Pa. The sewer system was installed at a cost of \$75,000, while the new filtering water plant cost about \$35,000. The bonds were voted for \$125,000.

Take Steps to Secure Ventilation of Playhouses

South Bend, Ind.—South Bend photo-playhouses may be compelled to install exhaust fans as a means of purifying the air in the small theaters according to action taken at a meeting of the Board of Health. Authorities have spent several weeks investigating conditions in the smaller houses and have made preliminary plans to compel the installation of fans. Officials have been instrumental in causing a number of photo-playhouses to be filled with smoke that it might be seen if the air moves in a sluggish manner in the theaters.

WATER SUPPLY

State Board Investigates City's Water

Lima, Ohio.—An investigation of the Lima water works system is being made by the State Board of Health, L. H. Van Buskirk, engineering assistant, being here analyzing samples of the city water.

Filtration Plant Nears Completion

Cohoes, N. Y.—That the filtration plant will be in readiness for use by the early part of next month is the inference of a communication which the Board of Water Commissioners has received from the New York Continental Jewell Filtration Company, the concern which is doing the work. It is stated that the strainer system is finished, and the gate stands are being placed in position. The sand and gravel for the filter beds has arrived, but cannot be hauled to the plant until the roads dry up. Experts will be in Cohoes soon to test the gas engines and producers and connect the electric cables. The large standpipe is still to be tested and connected with the city water main on Vliet street. City Engineer George Bolton has declared that he is perfectly satisfied with the work that has been accomplished on the plant.

Municipal Plant Too Small

Orangeburg, S. C.—The present capacity of the local water, light and power plant has been exhausted and the plant must be enlarged. The present location of this plant is very near the center of the city and some distance from the railroads. As the city has purchased the opera house property for a City Hall, the present City Hall, which is located on the plant property, will have to be torn down and this space used. The water reservoir will also have to be made larger.

Council Fixes Water Rates

Gunnison, Utah—April 1 has been set by the City Council as the date on which to begin the water rate. The amount of \$12 was fixed as such rate and \$10 for making connections. These amounts were ordered paid in advance and the recorder was ordered to send statements to all water users accordingly.

City Will Have Pure Water by May 1

Niagara Falls, N. Y.—Pure water before May 1 now seems assured. Engineer W. D. Robbins reported to the Board of Water Commissioners last week that the new pumping station is almost ready for starting the work of pumping water from the green channel at the foot of Buckhorn Island. The Allis-Chalmers Company has the pumps all set, the motors in shape for the test, and nearly all the cables ready to connect. Smith Brothers have the station all completed with the exception of cleaning up the refuse, the Elderfield-Hartshorne Company have the heating and steam pipes and other plumbing finished, and all that remains to be done is the completion of the work of laying the cable to the intake crib. The filtration plant will not be ready before fall.

Add to Water Supply for Summer Use

Tacoma, Wash.—In an effort to forestall any water famine this summer, Commissioner of Light and Water Nicholas Lawson has started the digging of another well in the South End to get an extra supply of water. A crew of men at work for a week struck water at a depth of 17 feet in the well last week. The excavation is being made at Bean and Lawrence streets, about two blocks from the Northern Pacific right of way. The well is 15 feet by 24 feet, the Commissioner deeming it more effective in that shape than if a pipe only were sunk. The water from the well will be pumped into the high service main and will be the means of relieving that section of the city where the largest number of complaints from water shortages are reported in the summer. The motor now at the Hood street pumping station will eventually be used at the new well.

City Fears Water Famine

Northampton, Mass.—The City of Northampton, which a few years ago thought it had a water supply that would be sufficient for a great many years, finds that notwithstanding the water commissioners have provided a storage capacity of nearly 500,000,000 gallons, in a long drouth, such as that of the past fall and winter, there is great danger of a water famine. Forty years ago, when the first reservoir was built, with a capacity of 100,000 gallons, it was predicted that this would be sufficient to supply the town with water for about 100 years. Engineer Goodhue of the State Board of Health is surveying the surrounding country for the purpose of recommending the most desirable place for a reservoir that will hold about half a billion gallons.

Municipal Ownership of Water System Considered

Bristol, Conn.—The hearing on the bill to give Bristol the right to municipally own and conduct a water system, either by an independent plant or by purchase of the property of the Bristol Water Co., was held in Room 60, Capitol Building, last week, before the Committee on Cities and Boroughs, Senate Chairman F. A. Bartlett of Bridgeport presiding. A good deal of time had been given to the preparation of the bill and several drafts had been made. The one submitted had been completed at a conference of the attorneys.

Plan to Supply Many Cities with Pure Water

Buffalo, N. Y.—Colonel Thomas W. Symons, U. S. A. (retired), who for many years was stationed in Buffalo in charge of the work on the government breakwater and other federal engineering, believes that he has a feasible method by which Buffalo and all the Niagara Frontier cities may have pure water at a reasonable cost. Colonel Symons has written a letter to Mayor Fuhrmann, of Buffalo, in which he suggests a Niagara Frontier water supply district, including Buffalo, Tonawanda, North Tonawanda, Niagara Falls, Lockport and such other communities as may wish to come in. Colonel Symons declares it is impossible to get pure, unpolluted water from the Niagara River and that when obtained from that source it can be made fit for use only at great expense. Water obtained from the middle of Lake Erie is, according to Colonel Symons, unpolluted and unpollutable. This is true, he says, of the Emerald Channel, which Buffalo's new inlet pier taps. The suggestion of Colonel Symons is that a water supply district be organized which Buffalo can supply for many years to come if the new pumping plant is equipped as contemplated.

STREET LIGHTING AND POWER

Cumberland's Lights Cheapest in Country

Cumberland, Md.—The report of Commissioner Smith of the Water and Electric Department shows Cumberland lights to be the cheapest in the country. The total cost of operating the department for the last 10 months, including interest on bonds, was \$9,048.93. This amount divided by 333 lamps, gives \$27.17 as the cost of a lamp for 10 months and \$2.71 a lamp for a month, or \$32.52 for 12 months.

Ornamental Lights Installed by Property Owners

Jacksonville, Fla.—The ornamental street lights on Forsyth street are being extended from Julia to Cedar on the south side by the Gas Users' Association. Workmen are now busily engaged in putting down the underground cables and the work will be rushed to completion with all possible speed. The lights will be the same as are now in use on Forsyth from Main to Julia, being the Corinthian column, surmounted by a cluster of globes. Twelve columns will be placed in the block by the association, as they will greatly improve abutting property, as well as being useful for illuminating purposes.

Mayor Vetoes Gas Franchise

Columbus, O.—Advising that the City Council appeal to the Legislature for aid in compelling public service corporations to furnish information concerning their business upon which the fixing of fair rates may be based, Mayor Marshall vetoed the ordinance passed three weeks ago granting the Columbus Gas and Fuel Company a franchise to furnish gas for 10 years at 30 cents per 1,000 feet for the first five years and 35 cents for the last five years. If sufficient information were at hand, the Mayor says, he believes it would be shown that a 15 or 20-cent rate were sufficient to do business at a profit, unless the stock is watered. If the Legislature will not pass the required legislation Mayor Marshall recommends the granting of a two years franchise at a 30-cent rate. In the meantime, he thinks the constitution would be amended so as to give cities the desired power. The company's franchise expires July 1 and the officials have threatened to turn off the gas supply unless a 35-cent rate is granted.

Plan Better Lighting for City

Saginaw, Mich.—The special committee of the Board of Trade on a better lighting plan for this city has recently visited Lansing to inspect the municipal lighting plant there, which Secretary Tracy of the Board says is the best of its kind for a city of similar size in the country. This step may lead to a city-owned lighting plant and commission government. Saginaw has had considerable trouble over rates and the figures given by the report of the committee show what can be done if controlled by a commission. Saginaw has voted to revise the charter, which may lead up to a commission government. The inspection of the Lansing plant and the gratifying results is the opening wedge to a change in the city's life.

Planning for Municipal Light Plant

Sharon, Pa.—Explaining his remark in Council that the city would be no further in debt five years from now than it is at present, even should the city decide to construct its own electric light plant, Chairman John S. Spencer this morning said: "At the present time our electric lights are costing us \$12,000 a year, which is between one-seventh and one-sixth of our total revenue. It is too much for a borough the size of Sharon to pay. By saving the electric light rental each year and what we will be able to save out of the city's revenue we expect to be able to pay the entire cost of the building of the electric light plant in the five years. Every member of Council is now working to ascertain the feasibility of putting the plant in."

Wires Go Under Ground

Indianapolis, Ind.—An order was issued by the Board of Works of this city to all service corporations that all wires within the "miles square" must be placed under ground by September 1 and that the work must begin by April 15. The order comes as a result of the recent fire horror in New York City.

FIRE AND POLICE

Records of Fast Runs by Chief Croker

New York, N. Y.—The following are some records of runs made by Chief Croker in his Mercedes 40-45, in response to alarms in various parts of New York. In making comparisons it should be taken into consideration that the street is well cleared; engines and other apparatus in case of the long runs may have preceded the Chief's car and there are many traffic policemen to warn pedestrians, vehicles and surface cars.

From 170th street and Amsterdam avenue to Broadway and Fifty-fourth street, 10 minutes.

From Great Jones street to 135th street and Southern boulevard, 13 minutes.

From Great Jones street to Beaver and William streets, 17 minutes.

Underwriters Test High Pressure System

Jacksonville, Fla.—A test of the high pressure system is recently given by Fire Chief T. W. Haney, when three representatives of the National Board of Fire Underwriters called on him and stated that during their stay in Jacksonville they wanted to see the high pressure pumps tried out.



Courtesy the Florida Times-Union.
TESTING HIGH-PRESSURE SYSTEM

After an hour's exhibition, in which at times as many as six streams were thrown at one time and measurements taken, they expressed themselves as satisfied. The system has not been used many times, but during a fire in January which threatened the wholesale district it did effective work.

Women Do Police Duty in Seattle

Seattle, Wash.—Women are to be given an equal chance with men in the Police Department in such positions as detectives, desk men and patrolmen. This was decided by the Public Safety Committee of the Council when a bill was presented for passage directing Chief of Police Banker to appoint a special police-woman to the first vacancy on the list of patrolmen. The committee directs the appointment to be made from an eligible list to be submitted to the Civil Service Commission. This bill will give every woman who makes application an opportunity to take the examination and the Chief will be required to make the appointment from the first three on the list.

New Police Signal System Tested

Buffalo, N. Y.—An inspection of the new police signal system recently installed in the third precinct was made last week. The inspection party was headed by Chief Egan. The new system has a number of boxes throughout the precinct with a red and green light that are used to call men out on their beats when wanted. Bells are also attached to be used in case of emergency. The system enables a man to be called anywhere on the street at any time and is considered a great improvement over the present method. It is proposed to install the system throughout the city.

Auto Hose Wagon Test Satisfactory

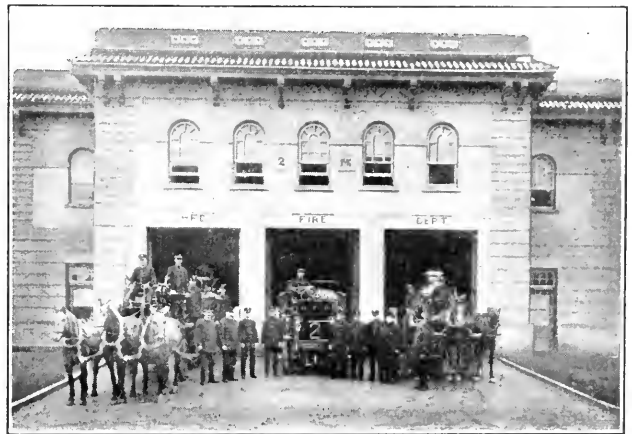
Long Branch, N. J.—The final test of the new Scagrave automobile hose wagon was made one day last week. Members of City Council met at the Independent fire house and, after inspecting the wagon, started out for a run. The trip to the West End section and back was made in good time, and the demonstrator showed the different features of the machine. Those who witnessed the various tests expressed themselves as being well pleased.

Take Steps to Secure Auto Fire Apparatus

Hanford, Cal.—At a meeting of the City Trustees recently, following a report of the Chief of the Fire Department regarding the number of calls answered, condition of apparatus, etc., it was decided to purchase a new auto chemical fire truck, and an effort will be made to trade in the entire present apparatus and secure up-to-date auto apparatus.

New Engine House Inspected

Hartford, Conn.—The Fire Commissioners have made their first official visit to the new fire house on Windsor avenue occupied by Engine Company No. 2. Three pieces of apparatus are housed in the building, a hook and ladder truck, a steam engine and an auto combination hose and chemical engine. The house is handsome in appearance and conforms in general to the style of the houses built in



Courtesy Hartford Times.
HARTFORD FIRE HOUSE PURCHASE PIECES OF APPARATUS

the city during the last two or three years. The wide entrance and accessibility of the apparatus to the street is the most noticeable feature. An open space in front of the wings of the building affords an opportunity for ornamentation with a lawn and shrubbery.

Girl Telephone Operator to Be Police Chief During Night

Wakefield, Vt.—Miss Helen Murphy, chief operator of the local telephone exchange, has been made night Chief of the Wakefield Police. Every half hour the patrolmen will call Miss Murphy by telephone and she will record the calls, which will be listed and submitted to Chief Pollard the following morning. In case she may desire to get into communication with any of the members of the force she has but to touch an electric button. This will light a red incandescent lamp which is attached to the box on the street. The patrolman upon seeing this must call at once to the young woman in charge, who will give directions as to what is required. The exchange will further serve as Police Headquarters in that persons may call up and report concerning fires, lost articles, robberies and all matters which would come under the police, emergency or fire category. This will be but a part of the young woman's work, as she will also be expected to take care of her telephone work. A feeling of apprehension for the welfare of the young operator and the town is expressed by some of the skeptical ones. They ask what would happen if she were to be held up by desperadoes who might force her to direct the members of the Police Department to go to distant sections of the town while they made their raids—if the young woman became suddenly ill when a big fire was in progress or any accident befell her.

GOVERNMENT AND FINANCE

Women on School Board

Springfield, Ill.—Springfield women last week elected two of their number to the City School Board. Eight hundred women braved the rain to vote.

Women Vote in Bronxville

Bronxville, N. Y.—Thirty women voted at the special election held in Bronxville last week to decide whether or not the village should undertake the care of the private roads in Lawrence Park. The proposition was carried by a vote of 53 to 50. The women were about equally divided, as were the men voters. Most of the women who voted were property owners directly interested in the question.

Franchise Is Amended

Wilmington, Del.—Amendments have been made by the Street and Sewer Directors to the franchise granted by them to the Wilmington Southern Traction Company to enter Wilmington by way of Market street from the New Castle Causeway. Under the amendments made last week the Wilmington Southern Traction Company shall pay 2 per cent of its gross receipts, based on the mileage within the city, to the city, but it is provided that this 2 per cent shall be charged against the company's taxes. If the taxes are more than the 2 per cent of the gross earnings the amount of the taxes shall be paid. The 2 per cent is not independent of the taxes required by law to be paid.

New Administration Favors Municipal Ownership

Eugene, Ore.—The city election last week resulted in a victory for the administration forces, the old guard electing the Mayor and two out of the four Councilmen. The Council will hereafter be composed of six Aldermen and the Mayor favoring municipal ownership and two Councilmen against.

New Segregation Ordinance Becomes Law

Baltimore, Md.—A new ordinance, providing as far as practicable for the residence of whites and negroes in different neighborhoods in this city, which had passed both branches of the City Council, has been signed by Mayor Mahool. The measure was introduced by Councilman Samuel L. West, author of a previous segregation ordinance that was declared unconstitutional.

Colorado Elects Thirteen Women

Denver, Col.—Thirteen women will head important municipal offices in Colorado as a result of last week's elections. Pueblo, the second largest city in the State, elected a woman auditor. Leadville, Telluride, Idaho Springs, Greely and Montrose elected women treasurers, as did also the smaller towns of Fairplay and Ridgway. Colorado City and Las Animas elected city clerks and Durango a woman alderman. The little town of Alma will have two women city officials, the city clerk and treasurer. There are four women members of the Colorado Legislature and one of the commissioners of the county of Denver is a woman.

Make Bonding Elections as Convenient as Possible

Binghamton, N. Y.—After giving the matter due consideration, Mayor John J. Irving has decided to sign the ordinance introduced by Alderman Walter Tayntor and passed by the Common Council at its last meeting, directing the Corporation Counsel to prepare an amendment to the city charter and send it to Broome County representatives at Albany, providing seven polling places instead of one for bonding elections. The Mayor is strongly in favor of giving every taxpayer the fullest opportunity to express his opinion as to how the money he pays into the city treasury shall be expended and to this end he believes that the ordinance should become a law. He accordingly signed the ordinance and the amendment to the charter will be prepared at once.

Sell Bonds to Improve Playgrounds

St. Paul, Minn.—At a meeting of the sinking fund and public playgrounds committees it was decided to sell \$8,000 of the authorized issue of \$25,000 public playgrounds bonds over the counter, City Comptroller Farnham having received subscriptions for this amount from individuals.

STREET CLEANING AND REFUSE DISPOSAL

Dispense with Unloading Station for Garbage

Toledo, O.—The recommendation of Mayor Whitlock and Service Director Cowell that garbage be hauled directly to the new disposal plant has been received with favor. The public affairs committee indorsed the proposition and turned it over to the finance committee to provide the means. This plan would obviate the necessity for a disposal and unloading station in the North End, which residents of that section have been fighting for a year. A large delegation of them attended the meeting of the committees last week.

Municipal Spring Clean-Up Becoming General

Syracuse, N. Y.—In the general street cleaning plan inaugurated by the Commissioner of Public Works, Frank M. Westcott, about 210 men and over 70 teams were employed on Sunday cleaning the paved streets in which it is difficult to work on week days because of heavy traffic. Mayor Edward Schoeneck and the Commissioner later made an inspection of the street cleaning in all parts of the city. They said that the work is progressing rapidly. The foremen in all the wards will organize gangs of men and start cleaning up the unpaved streets. The road machines will be used, and preparations made for using broken stone and making other improvements. The laying of crosswalks and sidewalks will be ordered as soon as danger from frost is past, which will probably be about the last of next or the first of the following weeks. Bids on several sidewalk jobs have been received and contracts will be awarded within a few days. The aldermen have started proceedings for some 12 or 15 new sidewalk jobs on which bids will be submitted in a short time. Two electric sprinkling carts and three flushing machines are in use under the orders of Commissioner Westcott to the contractors. Other carts will be put on and it is expected to have all the carts and machines in operation soon.

Hagerstown, Md.—The Civic League has petitioned the Mayor and City Council to set aside a clean-up day. It is the purpose to make the day a holiday in the public schools.

Wilkes-Barre, Pa.—By the Mayor's official order the first week in May has been set apart as clean-up week.

Trenton, N. J.—Trenton will get in line with the other Eastern and Western cities that are setting apart a special "Spotless Town" day.

Spokane, Wash.—Arbor Day has been designated a clean-up day in Spokane. The Mayor will proclaim a public holiday.

Demonstration of Street Flushing Machines

Newark, N. J.—A demonstration of flushing machine was given for the benefit of the Board of Works Commissioners last week at Broad and Clinton streets. A dozen machines were used. There was one apparatus of the automatic mobile type used as a sweeper to pick up refuse. Acting Chief Engineer James C. Hallock arranged the demonstration after a visit with General Superintendent Shipman of Brooklyn, at the invitation of Mayor Gaynor of New York. The commissioners expect to purchase three machines.

Streets May Be Flushed

Fulton, N. Y.—Up to within the past year or two the streets were regularly flushed twice a week, but owing to the lack of water the practice was discontinued. At that time the water users were being supplied at a flat rate, but since then all places are supplied at meter rates. Consequently not near the amount of water is used. It has been suggested that if the supply from Great Bear Spring was not sufficient that one of the fire engines be used for the purpose and that the water be drawn from the canal. This could be done twice a week at practically no cost and it would be a great benefit to the city. It is possible that the Chamber of Commerce may take up the matter.

Trolley Sprinklers in Use at Woonsocket

Woonsocket, R. I.—The trolley sprinkler furnished for use here by agreement with the Rhode Island Company was operated here for the first time last week. The trolley sprinkling will cover all streets through which car tracks run, leaving five watering carts to cover other sections.

For Clean Streets

Waterbury, Conn.—Supt. Benjamin Chatfield has announced that he is preparing to start in very soon on his crusade for clean streets. He realizes that the only possible way to secure them is to have the co-operation of citizens, and to this end he is having prepared notices in English, Italian, Lithuanian and Hebrew, setting forth the need of care on the part of residents in keeping their yards clean of papers and refuse. These notices will be posted about the city in the localities where the yards are most freely littered. If the notices do not have any effect more drastic measures may be tried.

Salt Water Is Used for Street Sprinkling

Salem, Mass.—Salt water is being used to sprinkle the streets of Salem. People are satisfied with it. Indeed, few notice any difference between salt and fresh water. The salt water is cheap, especially in these times when fresh water is alarmingly scarce. An electric pump has been set up on the shores of the South River. It pumped 600 gallons of water into a watering cart in 54 seconds. Another pump will be set up on the banks of the North River. It is expected that the salt water will be used all summer for sprinkling the streets.

RAPID TRANSIT

To Extend Chester Trolleys

Chester, Pa.—This city is to have another trolley line running the entire length of the city from east to west. The Philadelphia Rapid Transit Company has in contemplation the construction of a branch line extending from its present Short Line, at its new bridge spanning Ridley River to Fourth street and Highland avenue, in the extreme western section of the city, thereby giving the residents of that part of the town the convenience of a direct trolley route clear through to Fifteenth and Market streets, Philadelphia.

New Type of Cars for Topeka

Topeka, Kan.—The Street Railway Company has just received a shipment of six new cars, which will be placed in service at once on the Potwin-West Eighth street line and on the new Douthitt avenue line, which was built last fall and opened to traffic early last January. They are pay-as-you-enter cars of the double-end type, with enclosed vestibules on each end.

Paint Street Cars as Safety Measure

Chicago, Ill.—Painting street cars a light color instead of a dull, dark color, as they are at present, and the installation of new model cars with inclosed platforms were suggestions incorporated in the monthly report of City Attorney Clyde L. Day as tending to increase the safety of both street car patrons and pedestrians.

Franchise Is Granted

Chesterton, Ind.—The Chesterton Town Board granted a franchise last night to the Calumet United Railways for an interurban railway to connect Chesterton with East Chicago. This new road is supposed to be a link in the Northern Indiana system. The company is backed by the United Gas Company, of Philadelphia, and \$10,000,000 will be spent in electric lines in the Calumet district.

Traction Company Must Pay for Avoiding to Clean

Pittsburg, Pa.—A verdict for \$226,000 in favor of the city in its suit against the Pittsburg Railways Company to recover the company's share of cost of street cleaning has been returned by a jury that had been engaged on the case for two weeks and two days. The city sought to recover \$500,000 and interest, which increased the total to \$704,945.

Pay-as-You-Enter Cars in San Francisco

San Francisco, Cal.—Pay-as-you-enter cars are now in use on the Sutter-Jackson streets line, and have met with favorable criticism from the public. It is intended to extend the system as rapidly as possible.

MISCELLANEOUS

Favor City Abattoir

Grand Forks, N. D.—The City Council stamped its approval of the establishment of a municipal abattoir at the regular meeting and appointed a special committee to confer with the Commercial Club and Civic League and make a thorough investigation before final action is taken.

Mail Tube System for Cincinnati

Cincinnati, O.—A pneumatic tube mail carrying system is to be installed here. Cincinnati has been selected especially for the first trial of 30-inch tubes. All those at present in use in other cities of the country are very much smaller, being generally eight or ten-inch tubes. These will all be supplanted by the larger size in the event the experiment in this city is a success.

Property Owners Take Steps Toward Civic Improvement

Niles, O.—One of the most interesting sessions ever held in this city was that engaged in by the property owners of Sayers avenue last week at the Board of Trade rooms. The gathering was rather unique in some ways, one of the kind never having been held in this city before, and was called for the purpose of deciding upon a method of improvement which would be uniform in design and add to the beauty of that select residence location. The matter of sidewalks, planting of trees, regulation of trolley and telephone wires were discussed and a committee was appointed to lay before the City Council the improvements desired.

Urge Creation of Playground Board

St. Paul, Minn.—Creation of a public playgrounds board which would have power to carry out the measures considered best for playgrounds of the city is advocated in the annual report of the St. Paul Public Playgrounds committee filed with the Park Board at its last meeting. As constituted, the playgrounds committee is merely an advisory body and all its recommendations must be approved by the Park Board before they can be put into effect. The report holds the greatest difficulty in providing proper playgrounds for the city lies in the indirect form of management of the work. It is suggested this condition be corrected in the proposed new city charter.

Mayor Endeavors to Save Shade Trees

Tampa, Fla.—Mayor McKay has sent to the Council a communication in which he voiced his disapproval of the resolution which passed the Council at the previous meeting of that body, which called for the removal of all shade trees between the curb line of all streets in the city. His communication was accompanied by a resolution passed by the Tampa Civic Association.

Plan Municipal Playgrounds

Lawrence, Kan.—A movement which is expected to result in municipal playgrounds for Lawrence children was instituted last week when committees from three civic organizations met to discuss feasible plans for inaugurating such an innovation here.

Burlington, Vt.—Mayor Roberts has been requested, in accordance with a resolution passed last week by the Board of Aldermen, to appoint a playground commission, with a view to obtaining some place in the city where the children may play this summer.

Poles and Signs Must Come Down

Vincennes, Ind.—The first step toward improving the appearance of Main street was taken at a regular session of the Council, when an ordinance was presented and read the first time, which is designed to have removed from that street all unsightly poles and dangerous and unsightly overhanging signs of every description. The ordinance, after being read, was, on motion of Councilman Heltner, referred to the committee on civic improvement.

Start Work on New Municipal Building

Chico, Cal.—The ground has been broken for the erection of Chico's new \$30,000 municipal building. Contractor E. D. Sharp had a number of excavators at work, and declares that from now on the work will continue unabated.

LEGAL NEWS

A Summary and Notes of Recent Decisions—Rulings of Interest to Municipalities

Defective Sidewalks—Notice.

City of Haskell vs. Barker.—In an action against a city for injuries from a defective sidewalk the court instructed that what facts would be sufficient to constitute notice to the city is a question for the jury, and unless the city through some one of its officers had notice, either actual or constructive, of the defective sidewalk, then the city was entitled to a verdict. Held, that the instruction was erroneous, as it stated in effect that notice to an officer of the city who has no authority over the streets and sidewalks would be notice to the city.—Court of Civil Appeals of Texas, 134 S. W. R., 833.

Prisons—Nuisance—Liability.

City of Bowling Green vs. Rogers et al.—The keeper of a prison is liable for damages resulting from his negligent failure to keep it clean and sanitary and to see that the prisoners conduct themselves in an orderly manner. A city is not liable for negligence of its officers in exercising its governmental functions. A prison is not a nuisance per se. A city is not liable to an adjoining owner for damages arising from maintenance of a prison, authorized by Kentucky Statute, that being discharge of a governmental duty.—Court of Appeals of Kentucky, 134 S. W. R., 921.

Injuries Incident to Public Improvement.

Board of Council of City of Danville vs. Fox.—A city, in the improvement of its streets, acts in its governmental capacity and is not liable for injuries to one whose horse was frightened by the escape of steam from a steam roller.—Court of Appeals of Kentucky, 134 S. W. R., 883.

Stray Animals—Impounding.

Tutt vs. City of Greenville et al.—Where a city estray ordinance provided that a violation thereof should constitute a misdemeanor, that an animal permitted to roam at large in violation of the ordinance might have been impounded and subjected to any fine imposed against her owner did not relieve him from liability nor did it grant the city authority to subject the animal without giving the owner an opportunity to be heard.—Court of Appeals of Kentucky, 134 S. W. R., 890.

Taxation—True Value of Bank Shares.

Mayor and Common Council of City of Newark vs. Tunis.—In taxing the shares of a national bank the true value which is the basis of the assessment is under ordinary and normal conditions their exchangeable value in the market and not their book or liquidation value. In assessing shares of a national bank the total valuation of all the shares at their true value is to be ascertained, and from this is to be deducted the amount of the assessment on real estate and such other items as the statute permits to be deducted. Each share is assessable upon its pro rata of the balance.—Supreme Court of New Jersey, 78 A. R., 1066.

Appointment of Police Officers.

Keegan vs. Mayor of City of Bayonne et al.—The charter of the city of Bayonne confers upon the Common Council the power to establish, regulate and control a day and night police and to regulate and define their duties and compensation. Under this power an ordinance was adopted establishing and regulating a police department, and later a supplement thereto provided that there might be appointed by the council, upon the nomination of the Mayor, two or more sergeants of police to perform such duties as might be prescribed by the Mayor and approved by the council. Held, that this legislation did not authorize the appointment of more than two sergeants of police. Such an ordinance would permit the Mayor and council, by nomination and appointment, to increase to an indefinite number sergeants of police and it is in effect establishing, regulating and controlling the police force by a method other than by ordinance, as required by the charter.—Supreme Court of New Jersey, 78 A. R., 1053.

Extension of City Limits—Reasonableness

State ex inf. Major, Atty. Gen., vs. Kansas City.—A city may reasonably extend its limits so as to take in contiguous lands, when they are platted and held for sale as town lots whether platted or not if they are held to be sold as town property when they reach a value corresponding with the views of the owner; when they furnish an abode for a densely settled community or represent the actual growth of the town; when they are needed for any proper town purposes or for the extension of needed police regulations, and when such additional territory is valuable by reason of adaptability for prospective town uses; but the limits may not be extended to take in contiguous lands when they are used only for agriculture or are valuable on account of such use, or when they are vacant and do not derive special value by adaptability for city uses. Facts held to sustain the finding of a commissioner in quo warranto proceedings that an ordinance extending the limits of Kansas City from 26.70 square miles to 57.75 square miles, taking in surrounding territory, deriving a large part of its value from its contiguous location to the city, was reasonable.—Supreme Court of Missouri, 134 S. W. R., 1007.

Street Railway—Rights in Use of Highway.

City of Shelbyville, Ky., vs. Glover.—The fiscal court of a county in Kentucky granted to an electric railroad company right of way to construct its line on a pike to the limits of a city. Held that, whether such grant by implication included the right to build a Y at the city limits necessary to the company for the making of a terminal station at that point depended on whether the court in making the grant contemplated the reasonable possibility that such point would constitute the terminus of the road either permanently or temporarily, and that pending final determination of such question, in a suit, it was within the discretion of the court to grant a temporary injunction restraining interference with the construction and use of such Y.—United States Circuit Court of Appeals, 184 F. R., 233.

Bonds—Sufficiency.

City of Summit vs. Coletta et al.—Both obligor and surety on a bond are estopped to deny, for the purpose of avoiding liability thereon, any recited fact therein. An appeal bond not given for an illegal purpose, complying substantially with the statute, voluntarily entered into, will be held binding, although the proceedings, anterior to its execution, may have been irregular.—Supreme Court of New Jersey, 78 A. R., 1047.

Private Sewer—City's Liability for Nuisance

Hines vs. City of Nevada.—A city, with the aid of some of its citizens, constructed a sewer, the terminus of which was near plaintiff's home. An ordinance was passed allowing property owners to connect with the sewers, provided the persons so connecting should hold the city harmless from any damages resulting therefrom and that they would not permit any improper material to be thrown into the sewer nor connect any vault therewith and would keep the inlet properly protected with grating or trap to prevent stench from escaping from the sewer. The city also reserved to itself the right to abate any of the connecting drains on proof that the same had been improperly used and to abate or discontinue the main sewer at any time should it become a nuisance. Held, that such an arrangement was not the grant of a franchise by the city for the construction of a sewer for the exercise of which right the city would not be liable; its reservation of the power of control and regulation rendering it liable for the creation of a nuisance arising from improper use of the sewer.—Supreme Court of Iowa, 130 N. W. R., 181.

Assessment—Review—Appeal

Newton vs. City of Superior et al.—Where landowners took an appeal from the final determination of the City Council in street improvement proceedings, under Laws 1909, and such property owners also commenced actions in equity to set aside the assessment and to restrain the issuance of improvement certificates, but such appeal was not consolidated with the equitable actions, the Supreme Court on appeal from the judgments in the equitable action could not review any matters arising on such appeal to the Circuit Court.—Supreme Court of Wisconsin, 130 N. W. R., 243.

Electric Vehicle for Trimming and Inspecting Arc Lamps

THE trimming of the lamps on the newly erected twin lamp poles in the central section of the city of Philadelphia proved to be quite a problem. After the use of a temporary makeshift design and construction of an electric tower wagon was considered. The main difficulty was to devise a plan to obviate the necessity of having an extra man to do the trimming, as otherwise the driver would be compelled to climb to the top of the tower to trim each pair of lamps. At the suggestion of A. H. Manwaring, engineer of arc lighting of the Philadelphia Electric Company, a tower wagon was designed that could be operated from either the upper platform or the driver's ordinary position at the floor level, and equipped with a turntable at the top to enable the operator to trim the lamps on both the street and house sides of the poles. The Commercial Truck Company, of Philadelphia, collaborated with Mr. Manwaring, and the illustration shows the result of their work.

The tower wagon is constructed on the ordinary 500-pound chassis, the weight of which without the tower and including the battery, is 2,600 pounds. The weight of the tower is 650 pounds, making a total weight of 3,250 pounds. The vehicle is equipped with a 42-cell, 7-plate Philadelphia storage battery, which will furnish an average speed of 15 miles per hour on the level, and has a mileage capacity of 30 miles per charge. The wheels are equipped with 2½-inch by 36-inch Firestone tires, both front and rear. The controller is mounted on the upper platform, and can be operated from either the upper or lower seat by a tube outside the steering shaft. The reversing mechanism is a Z-slot bushing keyed on the controller tube, which is worked from the upper seat by the foot and from the lower seat by the hand. The steering

gear is mounted in the usual manner, and is worked from the upper or lower seat by a shaft which runs through the controller. The brakes can be worked from the lower seat by a foot lever in the usual manner, and from the upper seat by a foot lever rod and bell crank. The upper foot lever has an extension, so that the operator can set the brakes from the top seat, climb down and release the brakes from the lower seat, or vice versa. The electric bell is operated from either the upper or lower seat by a floor push in the toe-board. The platform is 13 feet 6 inches from the ground, and an additional height can be secured by hanging a portable stand from the side rails, which will increase the height to either 14 feet or 15 feet 6 inches, depending on which rail is used.

A test of the stability of the machine was made by suspending a weight of 700 pounds from the end of the platform when turned in the position occupied by the trimmer in trimming the lamps. This test was made before the battery was installed and proved the stability of the tower wagon under the most severe working conditions.

The tower wagon has been giving very satisfactory service, and enables the trimmer to cover each of his routes in approximately six hours, while by the old method nine hours were required to accomplish the same results.

Formerly the inspection of these lamps necessitated the stationing of a horse-drawn wagon and driver at a centrally located point, and also the use of a motor cycle, the operator of which covered the district lighted by the ornamental lamps in about four hours. He reported all faulty lamps to the driver, who would proceed to the various locations with the team and start or change the defective lamps.

The tower wagon eliminated the necessity for the horse-drawn wagon and motor cycle, as by its use all the lamps on ornamental poles are inspected in approximately two and one-half hours, and faulty lamps started or changed by the operator, who carries a number of lamps for this purpose on the tower wagon.

This new meth-

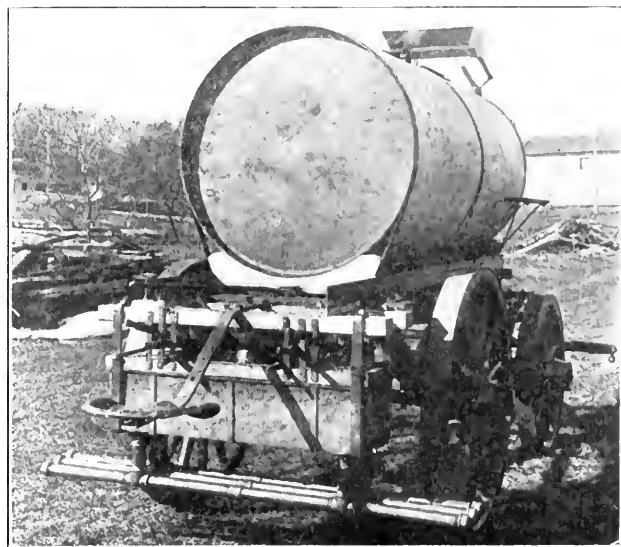
od of trimming and inspecting the ornamental lamps shows a daily saving in the cost of transportation and labor of approximately 33.1-3 per cent over the former method of using the horse-drawn wagon and motor cycle.

Road Oiler

THE Etnyre improved road oiler, manufactured by E. D. Etnyre & Co., Oregon, Ill., has a very carefully arranged system of controlling the distribution of road oil or tar by means of pipes and valves. The apparatus consists of a cylindrical tank wagon of substantial construction, and a detachable auxiliary tank with levers, valves and pipes. The auxiliary tank is a rectangular steel box of a little less width than that of the wagon track. A large pipe leads from the main tank into the center of the auxiliary tank. The flow of oil is controlled by a simple valve and lever. There are three parallel distributing pipes immediately below the auxiliary tank. Vertical pipes lead from each end of the auxiliary tank into the distributing pipe, so that each distributing pipe is fed from two points. As the distributing pipes are divided in the middle by partitions, the feed is practically in the middle of each half section. Separate levers, six in all, control the flow through the vertical feed pipes into the distribution pipe. It is evident then that in operation either one or two or three feed pipes may be used either on one or both sides. This enables the operator to distribute as much or little oil as is desired, whether it is of a very liquid character or very viscous. The distribution pipes are six feet long, so that a width of three or six feet of roadway may be treated. The use of the auxiliary tank also has the advantage that the pressure of the oil in the discharge pipes is uniform, no matter whether the supply tank is nearly full or empty. The manufacturers state that the distributor can be detached from one wagon and attached to another in two minutes, so that one distributor can be used to distribute oil hauled by two or more wagons. All levers controlling valves are within easy reach of the operator who sits on an iron seat attached. The orifices in the distribution pipes all of different sizes.



TRIMMERS' WAGON FOR ARC LIGHTS



ETNYRE IMPROVED ROAD OILER

MUNICIPAL APPLIANCES

Steel Playground Apparatus

In issuing its catalogue of steel playground apparatus the Fred Medart Manufacturing Company, De Kalb and President streets, St. Louis, Mo., express the wish that its readers might compare the construction of apparatus outlined therein with that which the company offered ten years before. The company says the improvements shown, made gradually from year to year, are the result of a most careful study of the uses and requirements and a desire to furnish the best and most practical construction possible. The apparatus is claimed to be practically indestructible. This result has been accomplished by the elimination of all wooden parts and the substitution of galvanized steel. In order to make the apparatus cheaper to the purchaser the Medart company will furnish apparatus and special fittings, allowing the pipe, of standard sizes, to be purchased in the local market. The special fittings, the use of which the company recommends in all cases, facilitate the setting up of the apparatus because they are not threaded. Complete specifications for the pipe to be purchased in the local market are furnished and ordinary workmen can erect the frames.

The illustration shows one of the Medart standard gymnastic outfits, as well as one of the fittings on a larger scale. This apparatus requires a ground space measuring 46 by 47 feet, and is 14 feet high. The apparatus weighs 4,400 pounds, the special fittings 300 pounds and the pipe for the outfit 390 pounds. It consists of four incline ladders, two incline poles, two long slides, four guard rails, four teeter ladders, four swinging climbing poles, two flexible ladders, five traveling rings, four pairs of flying rings and three horizontal bars. The fitting illustrated is a triple brace fitting connecting a 3-inch horizontal pipe, a 3-inch vertical pipe and two 2-inch pipe braces. The company makes a ball bearing swinging fitting, used for attaching swings, flying rings, traveling rings, etc., to 3-inch pipe frames, which is the most important of any of the fittings used in playgrounds, as it has to stand constant wear. The ball bearing feature affords an easy movement, overcomes squeaking and wears almost indefinitely.

The incline ladder included in the

outfit illustrated is 20 feet long. It is intended to be put into the ground to a depth of 2 feet, and brought out 12 feet from the frame on the ground. This gives the ladder an angle of nearly 45 degrees. Each side is made of a piece of 2-inch galvanized pipe. The rungs are made of 3/4-inch galvanized pipe. The rungs are let into the pipes which form the sides and are riveted through. The long slide is built so that it can be used by older boys and girls, though originally intended for the use of small children. It is 30 feet long and is covered with galvanized sheet steel. The sides are made of polished rock maple. It is shaped so that the speed will be checked just before reaching the ground.

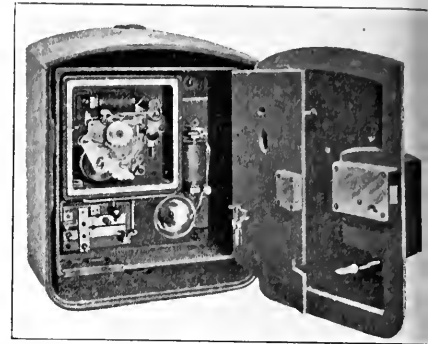
Hose Nozzle for Street Flushing

S. F. HAYWARD & Co., 39 Park place, New York City, manufacture an attachment for a Callahan shut-off nozzle which is used by the New York Street Cleaning Department for flushing streets. The nozzle is the regular Callahan device with 2 1/2-inch thread to connect direct to a hose coupling. A special attachment is made to take the place of the ordinary screw tip. This is a single piece of brass cast with a fan shaped end having a flat stream outlet about 3 1/2 inches long by about 3-16 inch wide. In using this street cleaning nozzle the man holding the hose directs the stream on the pavement at a distance of about 10 or 15 feet in front of him and moves forward as the street is cleaned. A paper by a board of consulting engineers reporting a year or more ago on street cleaning methods made a comparison of the efficiency of the flat and the ordinary nozzle. It was stated that by the use of the special nozzle 40 per cent less water would be used and 25 per cent more surface cleaned.

Fire Alarm Street Box

THE Metropolitan fire alarm street box shown in the illustration, made by the Star Electric Company, Binghamton, N. Y., is equipped with a simple, substantial and reliable mechanism, including local and distance non-interfering mechanism, instantaneous circuit controller, lightning-proof insulating protector, silent test attachment and other proprietary features.

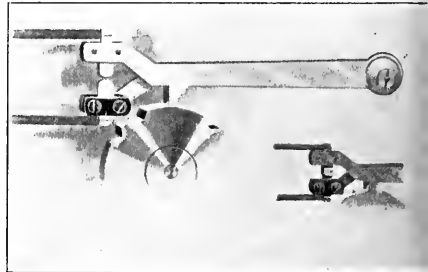
The instantaneous acting circuit controller, also illustrated, is claimed to be one of the most marked improvements in fire alarm boxes made during the past decade, as it is the only circuit controller or breaker used in any fire alarm box upon the market which has an instantaneous action in both opening and closing the circuit. At the same time it provides, at the instant of open-



STAR METROPOLITAN FIRE BOX

ing the line, a gap large enough to break an electric current of 100 or 200 times the energy intended to be on fire alarm circuits. As there is no electrical connection between the controller arms and the signal wheel, dirt on the signal wheel can have no effect upon the transmission of an alarm, and as there is a blade upon the lower arm working in a jaw in the upper arm no dirt can prevent a good contact.

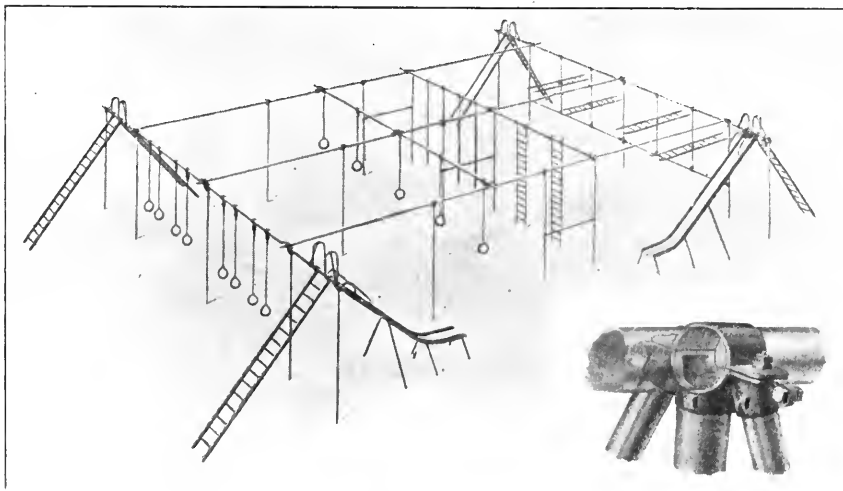
The contact blade and jaw are of hard rolled silver, which is not only of highest electrical conductivity, but ex-



STAR CIRCUIT CONTROLLER

posure to the atmosphere or even to gases destructive to other metals only turns it black, which hardly makes an appreciable change in its electrical resistance, while instead of having a separate contact or tooth for each stroke of an alarm, the fact that the contact is always made and broken in the same place assures the greatest accuracy and reliability. Any tendency toward welding from strong currents will be overcome by an ingeniously arranged separating pin, which by the running of the clockwork breaks the circuit and allows the alarm to proceed.

The action of this controller provides a path for the line current of maximum capacity at the instant of closure and maintains full contact for a uniform interval, as compared with the variable action of brushes, pens, etc., thus preventing the confusing "double blow" occasionally encountered in use of other type of boxes and permitting the use of a short, concise closure of the circuit, resulting in maximum efficiency of the non-interference of all other boxes in circuit with it, regardless of their style of non-interference.



MEDART ALL STEEL GYMNAS TIC APPARATUS FOR PLAYGROUNDS

NEWS OF THE SOCIETIES

American Association for Highway Improvement.—Some of the associations which have already joined this national body are: The International League for Highway Improvement, of New York, whose president is John A. Stewart; the Southern Appalachian Good Roads Association, whose secretary is Dr. Joseph Hyde Pratt; the North Carolina Good Roads Association, whose president is Dr. Pratt; the South Carolina Good Roads Association, whose president is F. H. Hyatt, of Columbia, S. C.; the Ohio Good Roads Federation, whose president is Archibald Huston; the Arkansas Good Roads and Drainage Association, whose president is Judge Joseph Asher; the Gulf Coast Good Roads Association, J. H. Hawley, secretary; the New Santa Fé Trail Association, R. F. Faxon, president, Garden City, Kan.; the Montana Society of Engineers, and the Capital Highway Association of Pinehurst, N. C., Leonard Tufts, president. While the American Association for Highway Improvement will not supplant any of the existing organizations, it will be of great use to all its associate members. The association is nationalizing the movement having in view the improvement of public roads. In aid of all such enterprises, the Washington association will, as its facilities develop, provide well-informed and thoroughly capable lecturers, writers and organizers, and will not restrict its efforts in this direction to the attainment of a salaried staff of assistants, but is even now obtaining the gratuitous aid of men conspicuous for their success in all walks of life and who are willing to aid the national movement for good roads from the standpoint of broad minded patriotism. As an example, if any of the organizations which have become associate members are struggling with a problem of how best to provide a suitable system of improved roads, the association will endeavor to have representatives from some other county that is successfully solving the same problem give their aid to the movement by addressing public meetings or by writing an explanation of their work. As the State and local associations come into the American Association for Highway Improvement they will find that their strength will be increased one hundred fold. The policy of the association will be to throw its strength just when and where it is needed. This will guarantee results. If any other assurance of success for the new nationalizing movement were needed it would be furnished by the list of officers of the American Association for Highway Improvement, including L. W. Page, director of the United States Office of Public Roads, as president; W. C. Brown, president of the New York Central, as vice-president; Lee McClung, Treasurer of the United States, as treasurer, and Louis Hill, president of the Great Northern Railroad Company, as chairman of the board of directors. The President of the United States, William Howard Taft, has become a regular member of the association.

Municipal Art Society, Hartford, Conn.—The total attendance at the municipal exhibit under the auspices of the Municipal Art Society and the Civic Club during the two weeks in which it was opened was 14,762.

Conference of Sanitary Officers of New York State.—Announcement is made by the State Board of Health of a Central New York conference of sanitary officers to be held in Syracuse on May 2 and 3. Health Officer D. M. Totman estimates that there were 35 health officers in Onondaga County and that there would probably be an attendance of 100 more from adjacent counties at the meeting. Instead of a programme of papers there will be a clinical presentation of subjects. The first day's sessions will probably be held in the city laboratory at the City Hall. The programme of the evening will be a discussion and answers to questions which may be placed in a question box. The officials will go to Skaneateles Lake on May 3 to inspect some parts of the water supply and the village sewage disposal plant. This trip will be made after the health officers have done some field work in the way of looking over some of the nearby dairies. On their return to the city, if there is time available, they will inspect the new intercepting sewer work.

Playgrounds Institute of North Central States.—The first playgrounds meeting to be held in the Northwest was called to order at the Radisson Hotel, Minneapolis, April 6. E. B. De Groot, Chicago Playgrounds Commissioner, made an address describing the Chicago playgrounds. Edward J. Ward, adviser of the department of civic and social development, University of Wisconsin, spoke of "Civic and Social Centers in Public School Buildings." Prof. Carl Rothpress, of the St. Paul Y. M. C. A., talked on "What to Do in Winter." Miss Lilla Louise Wood, director of the Minneapolis Kindergarten Normal School, spoke on "Playground Activities for Children Under Ten Years of Age." Mrs. Harriett Heller, University of Nebraska, spoke on "Activities for Older Girls." Leo F. Hamner gave a description of the playground work in the various cities of the country. D. Lange, St. Paul, spoke on "Boy Scout Patrols on the Playgrounds."

Engineers' Society of Pennsylvania.—The seventh anniversary was celebrated in the rooms of the society in the Gilbert Building, Harrisburg, Pa., March 31. President David E. Tracy acted as toastmaster and made the principal address, which was followed by addresses by former presidents, who reviewed briefly the events of their presidency. They are as follows: W. B. McCaleb, president in 1906, and the only member of the original society present last night; G. W. Parsons, president in 1905; F. Herbert Snow, president in 1909. William C. Cuntz, a former member, now located in New York, was present and made a short address by special request. Colonel H. C. Demming also spoke briefly. The history of the society was read by the secretary, E. R. Dasher, after which refreshments were served to the guests. The Engineers' Society at its organization had an enrollment of 200 members, but in the seven years of its existence this number has been increased to 800. It is conducting elaborate courses of lectures, maintains a valuable library, is publishing monthly a journal of proceedings, which has reached an exceptionally high place in this class of publications, conducts extensive excursions to examine objects of engineering interest and is taking a very active part in the welfare of Pennsylvania engineers.

Congress of Technology.—The Congress of Technology, which met in Boston on April 10 and 11 in celebration of the semi-centennial of the signing of the charter of the Massachusetts Institute of Technology, was a pronounced success on the two main lines laid out by its projectors. The Congress opened on the afternoon of April 10 with an address by President MacLaurin, of the Institute, on "Some Factors in the Institute's Success." The greatest of these, he said, was the method of teaching due to William Barton Rogers, the founder of the Institute, and now phrased as "the learning by doing."

The second day of the Congress was given over to the presentation of papers on various aspects of applied science. These papers were grouped in six divisions, so arranged that the large numbers of the outside public which attended all the sessions were able to hear papers on the topics in which they were especially interested.

The Congress came to its climax with the banquet in Symphony Hall on the evening of April 11, when the enthusiasm of the thousand of institute alumni and their guests who filled the floor of the hall was a sort of summary of the impressions made by the two days' proceedings. The papers presented at the public session gave to the audiences an extraordinarily adequate idea of how completely applied science shapes and controls the living conditions of the present. And as all the papers were by alumni or members of the faculty of the institute it was also made clear how large a part the institute had played in creating the applied science of today.

These two ideas were expressed along with the third idea more immediately practical at the great banquet. It has been clear for some time that the future development of the Institute of Technology is hampered by the lack of adequate endowments and buildings. The feeling that the beginning of the next half a century of the institute ought soon to see a new Technology, carrying on the standards of the past with greater facilities, was the dominant note in all the speeches at the banquet. The alumni are eager to do their full share toward making this new Technology a reality. Their earnestness was shown by President MacLaurin's announcement at the banquet that alumni have already definitely pledged themselves to give a very large part of the price necessary for buying a new site for the institute and that Edward N. Hagar, Tech. '03, president of the Universal Portland Cement Co., has promised as a gift all the cement needed for erecting the new buildings in reinforced concrete. Meanwhile the question of the site itself, Dr. MacLaurin said, had been narrowed to a choice between three sites, all of which are within a short distance of the present buildings. It is expected that this question of a new site, upon which everything else in the development of the institute depends, will very soon be settled.

Brooklyn Engineers' Club.—An exhibit of engineering materials, models and plans of engineering machinery, together with photographs and drawings of important engineering structures, is being held at the clubhouse, 117 Remsen street, during the current week. The exhibits include a variety of subjects, from a model of a refuse destructor plant to one showing the complete working of a modern fire alarm system.

Calendar of Meetings

- April 27-28.
Good Roads Association of Florida.—
Annual Meeting, Tallahassee. C. L.
Bittinger, Secretary, Ocala, Fla.
- May 11.
Massachusetts Highway Association.—
Quarterly Meeting in conjunction with
the New England Conference on Street
Cleaning, Springfield, Mass.
- May 15-17.
National Conference on City Planning.
—Philadelphia, Pa.—Flavel Shurtleiff, Sec-
retary, 19 Congress street, Boston, Mass.
- May 18-19.
Ohio Society of Mechanical Steam and
Electrical Engineers.—Annual Con-
vention, Youngstown.—F. E. Sanborn, Sec-
retary, Ohio State University, Columbus.
- May 23-25.
National Fire Protection Association.—
Annual Meeting, New York City.—F. H.
Wentworth, Secretary, 87 Milk St., Bos-
ton.
- May 23-26.
National Good Roads Association.—
Fourth National Good Roads Congress,
Birmingham, Ala.—J. A. Rountree, Sec-
retary, Birmingham, Ala.
- May 25-26.
League of Second and Third Class
Cities of New York.—Poughkeepsie, N. Y.
- May 29-June 2.
National Electric Light Association.—
New York City.—T. C. Martin, Secretary,
31 West 39th St.
- June 5-14.
National Probation Officers' Association.
—Boston, Mass.—Roger N. Baldwin,
Secretary, 903 Security Building, St.
Louis, Mo.
- June 6-10.
American Water Works Association.—
Thirty-first Annual Convention, Powers
Hotel, Rochester, N. Y.—John M. Diven,
Secretary, 14 George street, Charleston,
S. C.
- June 7-14.
National Conference of Charities and
Correction.—Boston, Mass.—Alexander
Johnson, Secretary, Ft. Wayne, Ind.
- June 7.
National Association for the Study and
Prevention of Tuberculosis.—Denver, Col.
—Dr. Livingston Farrand, Executive Sec-
retary, 105 East Twenty-second street,
New York City.
- June.
New England Conference on Street
Cleaning.—Springfield, Mass.—Corre-
sponding Officer, Carol Aronovici, 55 Ed-
dy street, Providence, R. I.
- June 11-16.
International Association of Chiefs of
Police.—Eighteenth Annual Convention,
Rochester, N. Y.—Major Richard Syl-
vester, Superintendent of Police, Wash-
ington, D. C., President.
- June 13-18.
New York State Association of Chiefs
of Police.—Annual Convention, Roches-
ter, N. Y.
- June 13-16.
American Society of Civil Engineers.—
Annual Convention, Chattanooga, Ten-
nessee.—Charles Warren Hunt, Secretary,
220 West 57th St., New York.
- June 21-22.
National Conference of Poor Law Offi-
cials.—Boston, Mass.—Dr. Robert W.
Hill, President State Board of Charities,
105 East Twenty-second street, New
York City.
- August 15-18.
Firemen's Association of the State of
New York.—Watertown, N. Y.—A. H.
Otto, Secretary.
- September 19-22.
International Association of Fire Engi-
neers.—Annual Convention, Racine, Wis.
- September 19-22.
American Hospital Association.—New
York City. J. N. E. Brown, M.D., Sec-
retary, Toronto General Hospital, Can.
- September 24-30.
International Congress on Tuberculosis.
—Rome, Italy.—Professor Ascoli, Sec-
retary-General, Via Lucina, Rome, Italy.
- September 26-29.
American Society of Municipal Improve-
ments.—Grand Rapids, Mich.—A. Pres-
cott Folwell, Secretary, 239 West Thirty-
ninth street, New York City.
- October 4-6.
League of American Municipalities.—
Annual Convention, Atlanta, Ga.—John
MacVicar, Secretary, Des Moines, Ia.

PERSONALS

CAUL, REV. A. W., newly elected Mayor of Vinton, Iowa, was inducted into office last week following the session of the last year's council to close the business of the fiscal year. A clean sweep of appointments was made by the new Mayor. COOK, THEODORE F., has been re-elected superintendent of the municipal water and light plants of Dover, Del. DUNCAN, REV. L. J., a Unitarian minister, was elected Mayor of Butte, Mont., on the Socialist ticket. Mr. Duncan was elected by the largest plurality ever given a Mayor there. FREEMAN, J. M., was re-elected Mayor of Paris, Tenn. GASS, OTTO, former assistant to City Engineer Rudolph, of Manitowoc, has been officially named as city engineer at Two Rivers, Wis. GILMORE, W. A., a former Seattle attorney, has been elected Mayor of Nome, Alaska. GRICE, DR. JOSEPH, has been elected City Bacteriologist of Providence, R. I. LAMBERT, CHARLES S., has been elected Mayor of East St. Louis, Ill. MCINTOSH, HERBERT M., has been re-appointed City Engineer of Burlington, Vt. MENTON, JOHN A. C., who was a professional pugilist 15 years ago, has taken the oath of office as Mayor of Flint, Mich., and assumed the reins of the first Socialist municipal administration ever elected in the State of Michigan. MORLEY, ALFRED J., has been elected Mayor of Victoria, B. C. PHELPS, H. H., has been elected President of the Board of Water and Light Commissioners of Duluth, Minn. STEINMETZ, DR. CHAS. P., the distinguished electrical engineer, recently gave a talk in Schenectady on "The Prosperity of Schenectady," in which he pointed out the defects of the city and suggested improvements. TILLSON, GEO. W., Chief Engineer of the Department of Highways in Manhattan, has been appointed by Pres. Steers Consulting Engineer of the Borough of Brooklyn. The position was made vacant by the resignation of R. W. Kreuzbauer. WILSON, MRS. ELLA, has been elected Mayor of Hunnewell, Kansas. She has the distinction of being the first woman Mayor in the United States. It is stated that Mrs. Wilson will appoint Mrs. Rosa Osborne, defeated candidate for Police Judge, to the office of Chief of Police.

MAJORITY ELECTIONS.

IDAHO.

Boise—Harry Fritchman.
Sandpoint—Dr. Chas. S. Moody.
Moscow—Dr. J. N. Clarke.
Genesee—E. E. Dyer.
Wardner—D. W. Peeples.
Harrison—A. A. Crane.
Greenville—W. W. Brown.
Hailey—S. M. Friedman.
Payette—H. J. Brannock.

OKLAHOMA.

El. Reno—P. P. Duffy.
Mangum—B. L. Tisinger.
Altus—J. C. Kirby.
Blackwell—N. D. Kisler.
Anadarko—W. M. Plum.
Hugo—R. J. Jones.
Sulphur—D. J. Kendall.
Wilburton—R. A. Morris.
Ponca City—F. E. Sparks.
Chickasha—J. B. Burton.
Ardmore—E. H. Dawson.
Wagoner—J. C. Cook.
Muskogee—D. H. Middleton.
Sayre—W. P. Fisher.
Enid—Peter Bowers.
Poteau—C. D. Hill.
Cherokee—A. J. Titus.

TRADE NOTES

Cast Iron Pipe.—Chicago: Indications are that this will be a satisfactory year in the pipe industry. Quotations 4-inch, \$25.50; 6 to 12-inch, \$24.50; 1 inch and up, \$24. Birmingham: Prices are firm. Stocks of seconds suitable for culvert work have been exhausted. Quotations: 4 to 6-inch, \$23; 8 to 12-inch, \$22; over 12-inch, average \$2. New York: Public lettings are much below the average for the season, but private buying is about normal. Quotations: 6-inch, carloads, \$21 to \$22.

Lead.—Market is dull but firm. Quotations: New York, 4.45c; St. Louis, 4.30c.

Rubber Tires.—The Firestone Tire and Rubber Company has published in pamphlet form a paper read by Dan C. Swander before the Electric Vehicle Association. The author reviews the history of the use of rubber and of rubber tires and then takes up the subject of the required qualities of a rubber tire. He explains the advantages and disadvantages of softness and hardness in a rubber tire and states that the ideal combination of qualities makes the most expensive tire to manufacture. The more recent improvements in the construction of tires and rims are explained, special reference being made to the Firestone manufactures.

Asphalt Mastic Floors.—The American Asphaltum and Rubber Company, 600 Harvester Building, Chicago, Ill., has published a pamphlet describing the merits of its mastic floors and illustrates some of the large plants where they have been laid. Sanitation, comfort and economy are the merits of this material. It is sanitary because it will not absorb liquids like wood and will not crack or chip like cement. It is economical in first cost because only one inch thick and in maintenance because if it should have to be relaid the old material can be heated, new asphalt added and the mixture relaid.

Wooden Paving Blocks.—Acting on a recommendation of City Engineer Shipley, Cincinnati, O., Service Director Sundmaker has instructed that official to draw up a supplementary contract with Warren Brothers, contractors for the Clifton avenue improvement, to complete the paving of Clifton avenue, between McMillan street and Ludlow avenue, with wood block of the Southern Wood Preserving Company, of Atlanta, Ga. There is still some 5,000 square yards to be paved in Clifton avenue, and the supplementary contract will provide a reduction of 20 cents a yard, this being the difference in price secured by Warren Brothers from the Southern company from the price paid by them for the block under the old specifications. The contract price is \$2.50 a yard, and in the supplementary contract this will be reduced to \$2.30 a yard. Warren Brothers were given permission by Director Sundmaker some time ago to seek wood block elsewhere under the new specifications, though the contract had been let under the old specifications, which, it was alleged, confined the wood block permitted to the product of one company. They reported to Engineer Shipley that they could secure block up to the new specifications from the Southern company at 20 cents a yard less than that paid for the block under the old specifications. Samples of the block and oil were tested by City Chemist Wehmer and found to be in accordance with the new requirements.

Earth Excavation.—The Barron & Cole Company, 127 Franklin street, New York, N. Y., has issued a folder having several illustrations of the Maney scraper, by the use of which it is stated earth can be moved for 4 cents per cubic yard.

Seamless Steel Barrels.—The Pressed Steel Tank Company, Milwaukee, Wis., manufactures a patented seamless steel barrel. The barrel has the bilged body and integral head formed from a single piece of open hearth steel shaped by a hydraulic press. The barrel is suitable for the safe transportation of gasoline and for other purposes.

Pipe Works Burned.—Fire seriously damaged the south pipe foundry of the Camden Iron Works, R. D. Wood & Co., Camden, N. J., April 6. The roof was burned through, but did not fall, thereby saving what might have been a heavy loss from damaged machinery and equipment. This department will be idle several weeks for repairs, but a good share of the work will be taken care of in other departments of the plant. The loss is estimated at \$15,000.

New Asphalt Pavement.—The Neuchatel Asphalt Company, 265 Broadway, New York City, has just completed the construction of a practically new form of roadway pavement on Thomas street from Broadway to Church street, New York. This pavement consists of what is known as compressed rock asphalt slabs, laid upon a concrete base, finished on top with a thin "rubber" coating of pure rock asphalt richer in bitumen. These slabs are composed of natural rock asphalt obtained from the mines of the Neuchatel Asphalt Co., Ltd., at Travers, in the Canton of Neuchatel, Switzerland. The rock, after being mined, is ground to powder, which, after having been properly heated, as in the case of ordinary compressed asphalt, is compressed in special moulds under a hydraulic pressure of 3,000 pounds to the square inch. These slabs when laid are about 10 inches square and 1 3/4 inches in thickness, and are laid upon a concrete base 4 to 5 inches in thickness, with a cushion of cement and sand mixed dry, of just sufficient thickness (about one-quarter of an inch) to level up any inequalities of the concrete base, so as to afford a firm and level bed for the slabs. The slabs are laid with the joints as close as possible, in exactly the same manner as tile on a tile floor. When all the slabs are laid and leveled the entire surface is sprinkled with water from a sprinkling can, so that sufficient moisture may penetrate through the joints to enable the cement underneath to set up. After this the entire surface of the slabs is covered with a thin coating, not more than one-quarter of an inch in thickness, of rock asphalt mastic, heated in kettles and spread over the surface with a wooden float in the same manner as an ordinary rock asphalt sidewalk or floor, and dusted over with a light coating of dry cement, lightly brushed in with a broom. This forms what is called the "rubber" coating, so called from the "rubbery" nature of the wearing surface thereby obtained. On account of this rubbery character, the surface affords, it is claimed, a sure foothold for horses, as their shoes indent the surface sufficiently to prevent any slipping whatever while turning or backing in cold weather or when the surface is wet or covered with snow. The rubber coating is intended to be renewed from time to time as necessary, so that there is no direct wear on the asphalt slabs.

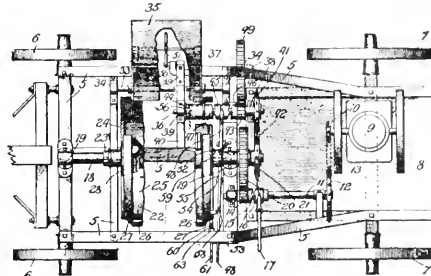
PATENT CLAIMS

987,726. PROCESS FOR MAKING ROADS, PAVEMENTS, ETC. Jules Lassailly, Issy-les-Moulineaux, France. Serial No. 476,953.

The method of making roads, paths, sidewalks, etc., which consists in mixing calcareous-clayey sand 80 per cent and dry coal-tar pitch 20 per cent, then spreading the mixture upon a base, then adding a solvent and turning said mixture into a soft pitch and a bituminous cement.

937,974. CONCRETE-MIXER. Andrew J. Fisher, Buda, Ill., assignor to Louis H. Scott, Princeton, Ill. Serial No. 501,610.

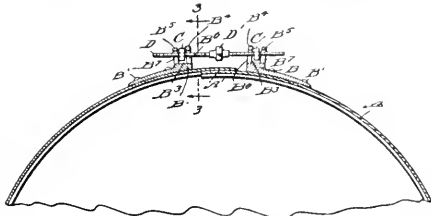
In a portable concrete mixer, the combination with a frame, of a rotary shaft journaled to extend lengthwise of the frame, means for rotating the shaft, a mixing-shell rotatably suspended on the shaft provided with a receiving and discharging opening, a lug on said shell, a second shaft provided with a drum and pinion, disposed in a parallel plane to said first-named shaft and geared thereto, a slidable clutch on said second shaft interposed between the drum and pinion, an operating lever connected with the clutch and adapted to shift



it into and out of engagement with either the drum or pinion, a chain secured at its ends to said drum and shell, adapted to turn the shell upon rotation of the drum for dumping its contents, a bell-crank pivoted to said frame with one of its arms connected with the operating lever and with its free arm in the path of movement of said lug, operating to disengage said clutch from the drum upon turning of the shell to dump the contents thereof, and means connected with said pinion to be actuated thereby for charging materials to be mixed into the shell, for the purpose set forth.

988,109. CULVERT. Adolph Henry Kaufmann, Guthrie, Okla. Serial No. 570,544.

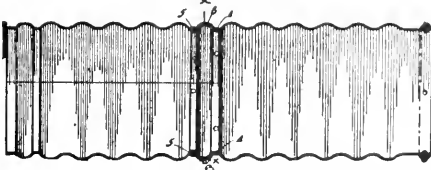
The combination of a split culvert section, blocks on opposite sides of the joint thereof and having body portions recessed in their outer sides and having said recesses non-circular and having the inner and outer walls of the recesses provided with slots for the passage of an operating screw, nuts fitting in said recesses and



conforming thereto whereby they are held from turning and having their threaded openings in alignment with the inner and outer slots in the walls of the recesses and a right and left screw having a central head portion and having the laterally extending threaded portions operating in their respective nuts and extending through the slots in the inner and outer walls of the recesses receiving said nuts, substantially as set forth.

989,343. CORRUGATED CULVERT. Ferdinand J. Feldt, Peoria, Ill. Serial No. 579,414.

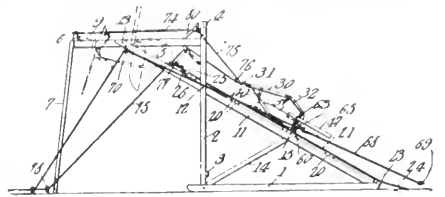
In corrugated metal culvert sections means for uniting them, comprising matching terminal portions of each formed with



perforated flat bearing surfaces, and a circumferential corrugation, intervening between the flat surfaces and rivets or the like for uniting the parts substantially, as shown.

989,263. GRAVEL LOADER AND EXCAVATOR. Fred Hollowell, Orleans, Ind. Serial No. 561,575.

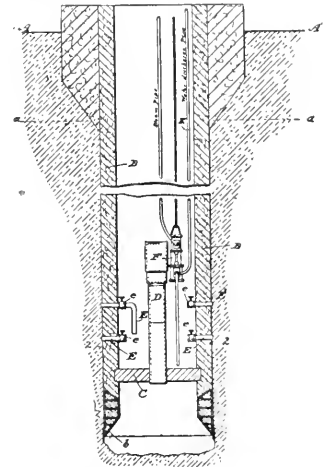
An excavator and loader having an incline, a track beginning at the upper end of said incline and extending away therefrom, a traveler movable on said track and



having a pulley connected therewith, and a cable extending over said pulley and adapted to be connected with draft power, and a conveyor movable on said incline and connected with said cable.

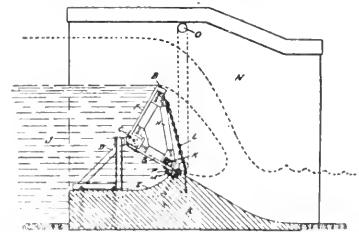
989,110. SINKING DEEP SHAFTS IN WATER-IMPREGNATED GROUND. Frank Billings, Cleveland, Ohio. Serial No. 578,314.

The herein described process of sinking shafts through water-impregnated ground which consists in lowering into the excavation as it is deepened a shaft having an air caisson at its lower end, in draining water from the surrounding ground into said shaft through ports in the walls thereof above said caisson, and in pumping said water from the shaft.



989,079. MOVABLE CREST FOR DAMS. George F. Stickney, Albany, N. Y. Serial No. 590,169.

In a device for increasing the head at dams, the combination of a stationary substructure; a movable crest, comprising two connecting leaves placed at an angle to each other; a means for tying said leaves rigidly in position relative to each other; a



means for relatively supporting said crest above said stationary substructure; a means for limiting the movement of said crest; and a means placed in contact with said substructure and one of the leaves of the crest for decreasing the leakage between the leaf of the crest and the substructure.

987,597. COMPOSITION OF MATTER FOR USE IN MAKING ROADS AND PROCESS OF MAKING SAID COMPOSITION. Edward A. Paterson, Port Arthur, Ontario, Canada. Serial No. 567,959.

The process of producing a solution for use in making roads, consisting in dissolving lime in the absence of carbon dioxide in a hot solution of sugar to produce sucrate of lime, and then mixing a diluted solution of the sucrate of lime in suitable proportion with an alkaline silicate.

MUNICIPAL INDEX

Continued from last week, page 534

STRUCTURAL MATERIALS

- Cement.** Recent Investigations into the Nature of, at the Geophysical Laboratory, Carnegie Institute of Washington. By E. S. Shepherd. Illustrated, 1½ pp., Engineering News, Mar. 23. 15 cts.
- Sand.** Some Experiments with. By G. P. Dieckmann. Illustrated, 2 pp., Cement Era, April. 10 cts.
- Concrete Practice.** By Thomas Potter. 41-2 pp., Cement, February. 20 cts.
- Concrete Piles.** By C. E. Paul. Illustrated, 5 pp., Cement World, March. 15 cts.
- Failures of Concrete Construction and the Lessons Which They Teach.** By Peter Gillespie. 2½ pp., The Canadian Engineer, Mar. 16. 10 cts.
- Waterproofing of Masonry.** From report to American Railway Engineering and Maintenance of Way Association. ½ p., Engineering News, Mar. 30. 15 cts.
- Experiments Made in Waterproofing with Water.** Paper before N. A. C. U. Convention. By Clyde M. Chapman. Illustrated, 11-3 pp., The Canadian Engineer, Mar. 2. 10 cts.
- Electrolytic Corrosion of Iron in Concrete.** Discussion before Joint Electrical Meeting in Chicago. 2-3 p., Electrical Review and Western Electrician, Mar. 4. 10 cts.
- Rusting of Steel Inside of Concrete Covering.** Report to Concrete Institute. 1 p., Contract Journal, Mar. 22. 20 cts.
- Wood Preservation.** By A. L. Kuehn, Gen'l Supt., American Creosoting Co. 2½ pp., The Canadian Engineer, Mar. 16. 10 cts.

MISCELLANEOUS

- Town Planning and Housing.** 1 p., The Surveyor and Municipal and County Engineer, Mar. 3. 20 cts.
- Liverpool Town Planning Conference.** 3-2-3 pp., The Municipal Journal, Mar. 4. 15 cts.
- Town Promotion and City Planning.** By Elmer S. Batterson, 12-3 pp., The American City, March. 15 cts.
- City Planning in American Cities.** 1½ pp., Municipal Journal and Engineer, April 5. 10 cts.
- City Planning.** By P. E. Nobbs. 2 pp., Canadian Municipal Journal, April. 15 cts.
- Bolton Town Planned.** Illustrated, 1 p., Municipal Journal, Mar. 18. 15 cts.
- Housing Awakening.** The Teaching the tenant. By Johanna von Wagner, Expert, Los Angeles Housing Commission. Illustrated, 71-4 pp., The Survey, Mar. 4. 10 cts.
- The Housing Awakening.** The Romeo Flat, San Francisco. By A. S. Griffith. Illustrated, 7 pp., Survey, April 1. 25 cts.
- The Overcrowded City.** New York's congestion, causes and dangers. Editorial. 2 pp., The Outlook, Mar. 25. 15 cts.
- Municipal Building.** Progress on the New York. Illustrated, 2 pp., Engineering Record, Mar. 25. 10 cts.
- Market House, Fort Wayne.** Construction of concrete columns and pavilions; market tables of concrete. By E. P. Bailey. Illustrated, 1½ pp., Municipal Journal and Engineer, Mar. 22. 10 cts.
- Public Comfort Station at Seattle, Wash.** Illustrated, 3-2-3 pp., Municipal Engineering, March. 50 cts.
- School House.** Some Uses of the Public. Paper before Fourth Annual Playground Association. By Elmer Ellsworth Brown. 10½ pp., The Playground, March. 25 cts.
- Library.** New York Public. Largest circulating library in the world. The new building described. By John S. Billings, Director of the Library. Illustrated, 14 pp., The Century, April. 35 cts.
- American City.** The German and the. Comparison of methods and results. By Frederic C. Howe. 7½ pp., Scribner's, April. 25 cts.
- Some Impressions of America.** By W. Francis Goodrich. 2 pp., Engineering News, Mar. 23. 15 cts.
- Garden Contest, Salem's.** By Miriam Adelaide Tighe. Illustrated, 21-3 pp., The American City, March. 15 cts.
- Trees.** The City's Duty to Its. By William Solotaroff, Secretary and Superintendent of the Shade Tree Commission of East Orange, N. J. Illustrated, 3½ pp., The American City, March. 15 cts.
- Pageant, The Deerfield.** By William C. Langdon. Illustrated, 11-4 pp., The Playground, March. 25 cts.
- Public Works, Philippine.** Illustrated, 5 pp., The Far Eastern Review, December. 25 cts.

- Municipal Improvement at Corey, Ala.** Illustrated, 1-3 pp., Engineering Record, Mar. 4. 10 cts.
- Ancient Temples and Cities of the New World.** Illustrated, 16 pp., Bulletin, Pan-American Union. By S. G. Morley. March. 25 cts.
- Civic Spirit, The New.** By John Hlder. Illustrated, 4½ pp., The American City, March. 15 cts.
- Civic Co-operation in Philadelphia.** ½ p., Municipal Journal and Engineer, Mar. 8. 10 cts.
- Reports, Promptness in Municipal.** 1-4 p., Municipal Journal and Engineer, Mar. 8. 10 cts.
- Subway Crisis, New York City's.** By W. F. Brashears. Illustrated, 3½ pp., Public Service, March. 20 cts.
- Recommended Plan and Estimate of Cost for a Passenger Subway System for the City of Chicago.** Illustrated, 71-3 pp., Engineering-Contracting, Feb. 15. 10 cts.
- Tracks, Street Railway.** Preventing low joints and motion of rails. Styles of rails. 2½ pp., Municipal Journal and Engineer, April 5. 10 cts.
- New Design of Steel Tie for Electric Railways.** Illustrated, 2-3 p., Engineering News, Mar. 30. 15 cts.
- Overcrowding, Prevention of Street Car, in Several European Cities.** Illustrated, 11-3 pp., Engineering News, Mar. 30. 15 cts.
- Ferries, A Defense of New York's Municipal.** 2 pp., Public Service, March. 20 cts.
- Engineering, Practical Side of.** By H. Rettinghouse. 5 pp., Iowa Engineer, January. 15 cts.
- Standard License Law for Engineers.** Recommended by American Society of Civil Engineers. 1½ pp., Engineering-Contracting, Feb. 8. 10 cts.
- Some Public Relations of the Engineer.** Extracts from address delivered before Clarkson Memorial School of Technology. By M. N. Baker. 1 p., Engineering News, Mar. 23. 15 cts.
- Partnership Agreements for Civil Engineers.** By Wm. L. Bowman. 20 pp., The Cornell Civil Engineer, March. 20 cts.
- Estimates, Reliability of.** Accuracy of New York engineers. 1-4 p., Municipal Journal and Engineer, Feb. 22. 10 cts.
- Contracts, Notes on Engineering.** Paper before students of Iowa University. By W. H. Bailey. 1½ pp., Contractor, Feb. 15. 20 cts.
- Various Forms of Contracts in Use.** By Daniel J. Hauer. 21-4 pp., The Contractor, Mar. 1. 20 cts.
- Bids for Municipal Work.** Low. 1-3 p., Municipal Journal and Engineer, April 5. 10 cts.
- Municipal Bidding in Toronto.** ½ p., Municipal Journal and Engineer, April 5. 10 cts.
- Contractor's Proposals and Bonds.** By D. J. Hauer. 2 pp., Contractor, April 1. 20 cts.
- Specifications, Broader Interpretation of.** 3-4 p., Contractor, Feb. 15. 20 cts.
- Construction Work, Use of Tents on.** By D. J. Hauer. 2½ pp., Contractor, Feb. 15. 20 cts.
- Contractor's Outfit, The Selection of.** By Daniel J. Hauer. 21-4 pp., The Contractor, Mar. 15. 20 cts.
- Some New Excavating Machines.** 11-3 pp., Engineering News, Mar. 16. 15 cts.
- A Disposal Boat for Canal Work.** Illustrated, 2 pp., The Contractor, Mar. 1. 20 cts.
- Concrete, Preparation and Handling of, on Large Undertakings.** Paper before N. A. C. U. Convention. By H. M. Cryder. Illustrated, 1 p., Concrete, March. 15 cts.
- Rock, Some Principles Governing the Blasting of.** By R. D. Brinsmade. Illustrated, 5 pp., Canadian Engineer, Mar. 30. 15 cts.
- Ditching and Trenching.** Excavating Machinery for. Paper before Illinois Society of Engineers and Surveyors. By E. E. R. Tratman. Illustrated, 31-3 pp., Engineering News, Feb. 23. 15 cts.
- Shaft Sinking against Water in Fissured Ground by Cement Injection.** Paper before the Institution of Mining and Metallurgy. By A. L. Sharagher. Illustrated, 2½ pp., Water and Water Engineering, Mar. 15. 25 cts.
- Sinking a Wet Shaft.** By J. P. Hogan. Illustrated, 16 pp., Proceedings of American Society of Civil Engineers, March. \$1.
- Motor Trucks, Recent: Their Adaptability to Contractor's Haulage.** Illustrated, 2 pp., Engineering-Contracting, Feb. 22. 10 cts.
- Practical Points on Traction Engine Hauling.** By W. F. Dewitt, 3-4 p., Contractor, Feb. 1. 20 cts.
- Traction Engine Hauling.** Illustrated, 2 pp., The Canadian Engineer, Mar. 2. 10 cts.
- Coal, The Purchase of, by Specifications.** By Leo. Loeb. Illustrated, 14 pp., Engineering Magazine, March. 25 cts.

- Fountain, Plan for Concrete Basin in Park.** Illustrated, 3-4 pp., Concrete, March. 15 cts.
- Public Service Property, Development Expense as a Factor in the Valuation.** Remarks before the American Society of Civil Engineers. By Halbert P. Gillett. 11-3 pp., Engineering-Contracting, Mar. 10. 10 cts.
- The Disastrous Explosion at Jersey City.** N. J., on Feb. 1, 1911. Illustrated, 1 p., Engineering News, Feb. 9. 15 cts.

BOOK NOTICE

Digest of Short Ballot Charters. Edited by Chas. A. Beard, Ph.D. Quarto. 130 pages. New York, The Short Ballot Organization. \$5.00.

This book is out of the ordinary in several respects, one of them being that it is not permanently bound, but is in the loose-leaf form, contained in substantial cloth covers, which have a capacity for more than double the number of pages as present furnished. In order to conveniently permit of additions not only at the end of the present matter, but intermediately throughout the work, the book is page after the decimal system employed in library indexing, the first page being 10.00 and the last page 91.101; the idea apparently being to allot 100 pages to each of the minor subdivisions of the matter. The work is further described in the sub-title as being "A documentary history of the commission form of municipal government." The editor is associate professor of politics in Columbia University, and he has been assisted in the work by the office of the secretary of the Short Ballot Organization.

The work opens with a definition of the "short ballot charter," a portion of which was quoted by us in our article in the February 22nd issue. Next comes a list of short ballot cities corrected to March 15, 1911, but which it is proposed to add from time to time, it being proposed to furnish new leaves to replace the one printed with this edition. There is then given a list of quasi short ballot cities. Following this are articles treating of municipal government and written by President Eliot; Richard S. Childs, secretary of the Short Ballot Organization; Robt. Tyson, of the American Proportional Representative League; John MacVicar, Commissioner of Des Moines, and Elliot H. Goodwin, secretary of the National Civic Service Reform League. The next section discusses the elements and factors of commission government, followed by outlines of short ballot charters of all the cities and states which have provided for commission government. The next part gives in tabular form various items of information concerning all of the commission-governed cities, such as population, number of commissioners, salary, etc. Following this are the charters in full of a great many of the cities. The editor has obtained from special correspondents reports concerning the operation of commission government in several of the cities, it being presumed that these are impartial and unbiased reports from actual observation and investigation. In the report upon Houston appears a statement which, although it is by no means new, seems to us to be worth being restated and generally born in mind: "Now, the question that will occur is, 'What did the commission form have to do with all this?' Save that the commission form gives the power to a powerful man who is powerful for the right, it had nothing to do with it. A powerful man, powerful for the wrong, could, under the commission form, go just as far in the opposite direction." It is for this reason that the recall seems to us to be a desirable part of commission government, so that if the wrong man should be elected he could be removed quickly as soon as his undesirable character shows itself. The work closes with a bibliography of books and articles dealing with city government generally, commission government, the government of individual cities and special phases of city government. There is also an appendix of a few pages giving miscellaneous documents, the only two so far contained therein being the charter of Boston, Mass., and the constitution of Oklahoma. The publishers announce that they will send, as soon as they can be published, an additional article on Franchises by Mr. Delos Wilcox and letters from special correspondents concerning commission government in six or more additional cities.

We believe that this work, although it is confessedly presented as incomplete—in fact, the editor would probably say that it never can be complete until municipal government has ceased to exist—probably contains a greater amount of reliable data and information concerning commission government than any other publication which has yet appeared.

THE WEEK'S CONTRACT NEWS

Relating to Municipal and Public Work—Street Improvements—Paving, Road Making, Cleaning and Sprinkling—Sewerage, Water Supply and Public Lighting—Fire Equipment and Supplies—Bridges and Concrete Work—Sanitation, Garbage and Waste Disposal—Police, Parks and Miscellaneous—Proposals and Awards

To be of value this matter must be printed in the number immediately following its receipt, which makes it impossible for us to verify it all. Our sources of information are believed to be reliable, but we cannot guarantee the correctness of all items. Parties in charge of proposed work are requested to send us information concerning it as early as possible; also corrections of any errors discovered.

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREET IMPROVEMENTS				
Michigan	Morenci	Apr. 21, 1 p.m.	Paving various streets with brick	C. R. Kellogg, Village Clerk.
Utah	Salt Lake City	Apr. 21	Curbing and pav. in Pav. Exten. No. 64, 6th S. South St.	H. G. McMillan, Chm. Bd. Pub. Wks.
Ohio	Cincinnati	Apr. 21, noon	Improving various streets by grading, setting cement combined curb and gutter, paving roadway with brick or macadam and constructing drains and inlets	John J. Wenner, Clk. Bd. P. Serv. W. P. Chandler, Recorder. Fred W. Toan, Aud. Wood County. Cuno H. Rudolph, Comr. G. S. Barber, Chm. Bd. Road Comrs.
Tennessee	Knoxville	Apr. 21, noon	Paving, curbing, guttering and grading various streets	Capt. Wm. D. Davis, C. Q. M. U. S. A.
Ohio	Bowling Green	Apr. 21, 1 p.m.	Constructing county road 2 miles long	Fred H. Gates, City Clerk.
Dist. of Col.	Washington	Apr. 22, 2 p.m.	Making repairs to asphalt pavements for period end. June 30, 1911	City Clerk.
Michigan	Bessemer	Apr. 22, noon	Grading about 11 1/2 miles of county road, Gogebic County	Wm. B. Lippincott, Chm. Twp. Com. Edgar Koehl, City Clerk.
New York	Plattsburg Bar'k.	Apr. 23, 10 a.m.	Constructing 154 sq. yds. of concrete walk; and installing window and door screens in two buildings	S. Percy Hooker, Chm. St. Hwy. Com. C. L. Allen, County Auditor.
Pennsylvania	Wilkes Barre	Apr. 24, noon	Grading, curbing and paving portions of various streets with sheet asphalt, vitrified brick or wooden blocks	Frank Agnew, Secy. Bd. Co. Comrs. Fred Cary, City Clk.
Kentucky	Maysville	Apr. 24	Paving with Tarvia with macadam base various streets	
New Jersey	Moorestown	Apr. 24	Constructing macadam road on Central ave. & No. Church rd.	
Ohio	Ashland	Apr. 24	Grading and paving with brick Diamond Alley	
New York	Albany	Apr. 24, 26, 28	Constructing various State highways	
Ohio	Marion	Apr. 24	Constructing about 7 miles of macadam road	
Ohio	Youngstown	Apr. 24, 1:30 p.m.	Improv with slag and limestone mac. var. rds. in Mahoning Co.	
Minnesota	Little Falls	Apr. 24, 8 p.m.	Paving with creosoted wood blocks the Broadway wagon bridge	
Ohio	Cincinnati	Apr. 25, noon	Grading, curbing, paving with brick and constructing drains and inlets in portion of Lischer ave.; and furn. crushed stone and stone chips	John J. Wenner, Clk. Bd. Pub. Serv. Bascom Sykes, City Engineer. W. D. Hall, Sec'y Bd. Local Imp. Gail L. Barnard, County Engr. Stanley Struble, Pres. Bd. Co. Comrs.
Virginia	Portsmouth	Apr. 25, 8 p.m.	Paving County and Glasgow streets and the Air Line Turnpike	W. E. Morgan, Clk. Village Council. City Clerk.
Illinois	Harvard	Apr. 26	Const. 12,560 sq. yds. vitr. brick pvmnt. on 5-in. conc. found.	Bert J. Shelton, Aud. Union Co. Bert J. Shelton, County Audr.
Florida	Jacksonville	Apr. 28, 10 a.m.	Resurfacing St. Johns ave. about 27,000 sq. yds. with as. mac.	Commissioners Portage County. D. V. Moffett, Aud. Putnam Co. Nicholas Volz, Aud. Ripley County
Ohio	Cincinnati	Apr. 28, noon	Improving the Eight Mile road in Anderson township	David H. Moffit, Aud. Warren Co. S. Percy Hooker, Chm. Hwy. Com.
Ohio	Geneva	Apr. 28, noon	Improving streets by grading, draining, curbing and paving with brick on concrete foundation and laying storm sewers	Nicholas Valtz, County Audr. County Comrs.
Pennsylvania	York	Apr. 29	Lay. about 4,000 ft. conc. curbing and guttering at Penn Park	Commissioners Public Works. City Clerk.
Ohio	Marysville	Apr. 29	Improving county roads, Harris and Union townships	
Ohio	Marysville	Apr. 29	Constructing 2 1/2 miles of road in Union Township	
Ohio	Ravenna	May 1	Grad. and pav. with brick 2.12 miles of county road	
Indiana	Greencastle	May 1	Improv. 13,333 1/2 ft. of macadam road in Madison township	
Indiana	Versailles	May 1, 1 p.m.	Constructing 11,370 ft. of macadam road in Adams township	
Indiana	Williamsport	May 1, 1 p.m.	Constructing a gravel road in Kent township	
New York	Albany	May 1, 1 p.m.	Paving about 8,500 mi. of roads in various counties	
Indiana	Versailles	May 1	Constructing 11,370 ft. macadam road in Adams Township	
Indiana	Bedford	May 2	Constructing roads Nos. 1 and 2	
New York	Hudson	May 2, 10:30 p.m.	Repairing portion of Warren Street with vitrified brick	
New York	Niagara Falls	May 2	Repairing and repaving various streets	
Florida	Jacksonville	May 3, 10 a.m.	Constructing about 13,000 sq. yds. asphalt macadam surfac.	Gail L. Barnard, County Engr. John Wilson, City Engr.
Ontario, Can.	Ft. William	May 4, 5 p.m.	Paving with asph. blk., sheet asph. or bit. about 14,100 sq. yds.	
New York	Seneca Falls	May 4, 2 p.m.	Paving Main and Bayard sts., including 12,500 cu. yds. of excavation; 17,000 lin. ft. of curbing; 15,000 lin. ft. of 3-in. drain tile; 5,000 lin. ft. vitrified pipe; 42 catch basins; 25,000 sq. yds. brick or macadam pavement	J. W. Brennan, Village Engr. Stanley Struble, Pres. Bd. Co. Comrs.
Ohio	Cincinnati	May 5, noon	Improving Carthage avenue in Columbia township	
Tennessee	Memphis	May 16	Constructing 5.1 mi. gravel paving, 3.9 mi. tar macadam, 1.4 vitrified brick, 2.9 wood block or bit. and 1/2 mi. old stone	Geo. C. Love, Comr. Dept. Sts.
SEWERAGE				
Ohio	Dayton	Apr. 21, noon	Constructing storm water sewers in various streets	J. C. Ely, Dir. Public Service.
Oregon	Central Point	Apr. 21	Constructing sewer system	J. W. Jacobs, City Recorder.
Michigan	Allegan	Apr. 21, 8 p.m.	Constructing Depot Hill sewer	John W. Peet, City Clerk.
Ohio	Massillon	Apr. 21, noon	Constructing sanitary sewer in Front Street	Wm. A. Pietzcker, Dir. Pub. Serv.
New Jersey	Roselle	Apr. 21, 8 p.m.	Constructing 8- and 12-in. stoneware and iron pipe sewers with all appurtenances in various streets	Jacob L. Bauer, Boro. Engr. Robert J. White, Chm. H. & S. Com.
Pennsylvania	Williamsport	May 24, noon	Constructing storm water sewer in two streets	
Pennsylvania	Pittsburg	Apr. 24	Constructing about 4,280 ft. concrete sewer from 5 ft. 8 in. x 5 ft. 11 in. to 7 ft. 4 in. x 7 ft. 9 1/2 in., and 19,800 lin. ft. brick sewers; and 8, 10, and 15-in. pipe sewers in various streets	Jos. G. Armstrong, Dir. Public Wks.
Minnesota	Mankato	Apr. 24, 10 a.m.	Constructing 1,080 ft. of 20-in.; 725 ft. of 10-in. and 160 ft. of 12-in. pipe sewer and five manholes	A. H. Scherer, City Clerk. O. R. Stone, Village Clerk
Ohio	Beream	Apr. 24	Constructing sewer and appurtenances on Waite street	Lawrence Gresser, Boro. Pres.
New York	Long Island City	Apr. 24	Constructing sanitary sewers and appur. in var. streets	J. H. Shores, Supt. Streets.
South Carolina	Spartanburg	Apr. 24	Constructing 2,150 ft. of sewers	E. L. Barnes, Secy. Sew. Com.
South Carolina	Rock Hill	Apr. 25	Constructing sewer system complete	John M. Babcock, Clk. of Council.
Ohio	Toledo	Apr. 27, noon	Installing complete high pressure fire system	C. F. Bell, City Auditor.
Ohio	Fremont	May 1	Constructing 700 ft. of tile sewer in Linden street	D. E. Goddard, Town Clerk
Wyoming	Lusk	May 1, 8 p.m.	Constructing sewer system	
Minnesota	Cloquet	May 1	Constructing sewers and water mains, including 13,600 cu. yds. excavation, 10,300 lin. ft. of 8-in. and 10-in. sewers, 12,000 lin. ft. 6-in. and 4-in. water mains	City Clerk.
Indiana	Kokomo	May 1	Constructing about 12,935 ft. of intercepting sewer, from 10 to 48 inches diam.; with appurtenances and connections	A. J. Havens, City Clk
Alberta, Can.	Edmonton	May 2, 3 p.m.	Constructing 3,290 ft. of concrete sewer 10 ft. 6 in. in diameter	Ben J. Latocell, City Engr
Florida	Pensacola	May 2	Constructing 15,060 lin. ft. storm water drains from 10 to 66-in. in diam.; and 23,880 lin. ft. of san. sewers from 6 to 24-in. in diam.	John A. Merritt, Chm. Bd. Bond Tr. John Coon, Comr. Streets. The J. L. Worley Co. Engrs., K. C.
West Virginia	Huntington	May 8, 1 p.m.	Constructing lateral 12-in. sewers in various streets	G. B. Geary, Mayor.
Kansas	Humboldt	May 8	Constructing 8, 10 and 12-in. vitrified pipe sewers	K. B. Mathes, Chm. Bd. Sew. Com.
Ontario, Can.	Toronto	May 9, noon	Constructing about 13,196 lin. ft. low level interceptor	
New York	Batavia	May 15, 10 a.m.	Constructing sewage disposal plant	
Oregon	The Dalles	May 15	Construct. a section of Dist. No. 1 sewer system, cost about \$225,000	L. T. Boyle, City Engineer.
California	San Jose	July 3	Construct septic tank for County hospital	City Clerk.

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
WATER SUPPLY				
Dist. of Col.	Washington	Apr. 21, 2 p.m.	Furn. 2,111 tons 16 and 20-in. cast iron water pipe; and 90 tons cast iron water pipe specials.	Cuno H. Rudolph, Comr.
New York	Warwick	Apr. 21	Repairing and rebuilding storage reservoir.	C. S. Lazar, Clk. Bd. Wt. Comrs.
Michigan	Saginaw	Apr. 21, 7:30 p.m.	Furnishing c. i. pipe and special castings.	City Clerk.
Maryland	Baltimore	Apr. 26, 11 a.m.	Furnishing a 30,000,000 gal. vertical, triple-expansion pump, boilers and other equipment at pumping station.	Alfred M. Quick, Water Engr.
North Dakota	Fargo	Apr. 27	Furnishing a high duty crank and fly wheel pumping engine with a capacity of 4,000,000 gals. each 24 hours; constructing a water purification plant complete 4,000,000 gals daily.	E. R. Orchard, City Auditor.
Ohio	Toledo	Apr. 27	Installing complete highpressure fire system including c. i. pipe, hydrant etc., except the pumping station, machinery, etc.	F. Shane, Secy. Bd. Pub. Service.
Pennsylvania	Somerset	Apr. 27	Constructing a reservoir.	Chas. I. Shaver, Secy. Boro. Council.
Florida	Fort Dale	Apr. 29, 10 a.m.	Constructing extension of water system.	Construct. Quartermaster, U.S.N.
New Jersey	Skillman	May 1, 10:15 a.m.	Extending water system, together with necessary hydrants, gates, valves, etc., at Village for Epileptics.	Jonas A. Fuld, Secy. Bd. Managers.
Sask., Can.	Scott	May 1	Drilling a deep well.	Geo. M. Phillips, Sec'y.
Ohio	Lakewood	May 9	Erecting an elevated steel tower on concrete base.	E. R. Lieblein, Clk. Bd. Pub. Aff.
Brit. Col., Can.	Penticton	May 15	Constructing filtration chambers, reservoirs, works and excavation for and laying pipes for water works system.	
Brit. Col., Can.	Vancouver	May 31, 4 p.m.	Furn. steel pipe, i. pipe; also 18-in. flexible joint c. i. pipe.	Wm. McQueen, City Clerk.
BRIDGES				
Washington	Walla Walla	Apr. 21, 3 p.m.	Furnishing material for a reinforced conc. bridge.	T. D. S. Hart, City Clerk.
Illinois	Cissna Park	Apr. 21	Const. a reinforced conc. bridge in Pigeon Grove Township.	J. H. Rothery, Town Clerk.
Ohio	New Lexington	Apr. 24	Constructing bridge over Rush creek.	Auditor Perry County.
Illinois	E. St. Louis	Apr. 25	Constructing 5 railroad bridges in Madison County.	H. D. Sexton, Pres. Bd. Trustees.
Ohio	Napoleon	Apr. 25, 1 p.m.	Repairing Perry St. Maumee River Bridge.	C. C. Mukison, County Auditor.
Iowa	Mason City	Apr. 25, 2 p.m.	Constr. 2 concrete slab bridges; one concrete arch bridge; one conc. girder bridge; two steel bridges in Cerro Gordo County.	A. S. Clark, County Auditor.
Iowa	Estherville	Apr. 26, noon	Constr. several reinforced concrete or steel bridges.	C. A. Root, County Auditor.
Pennsylvania	Reading	Apr. 26, 10 a.m.	Constructing Bordner's Bridge No. 1, crossing the Tulpehocken and Bordner's Bridge No. 2 crossing the Swatara.	County Commissioners.
California	San Francisco	Apr. 26	Const. a reinf. concrete viaduct and an earth filled approach.	Jos. L. McCormick, Sec'y B. of P. W.
Pennsylvania	Washington	Apr. 27, noon	Constructing necessary small bridges and culverts for improvement of various county roads.	John M. Moffitt, County Comptroller.
New Jersey	Rutherford	Apr. 28, 2:30 p.m.	Constructing a steel and concrete bridge over Passaic river.	John H. Burke, Chm. Bd. Chos. Fh.
Ohio	Cleveland	Apr. 29, 11 a.m.	Elimination of grade crossings and building bridge over tracks.	John F. Goldenbogen, Clk. B. C. C.
Pennsylvania	Braford	May 1, 5 p.m.	Construct. bridges and abut., repav. and construct. sidewalks.	E. C. Charlton, City Clerk.
Oklahoma	Muskogee	May 1	Constructing 35 county bridges.	County Clerk.
LIGHTING AND POWER				
Pennsylvania	Wilkes Barre	Apr. 24, 7:30 p.m.	Lighting certain streets in Plymouth township with 20 or more arc lights for the term of 5, 7 or 10 years.	Martin Curley, Pres. Bd. Twn. Comr.
Manitoba, Can.	Winnipeg	May 1, 11 a.m.	Furnishing ornamental lighting standards.	Magnus Peterson Secy. Civic B. Con.
California	Benicia	May 1	Furn. elec. supplies for year ending June 30.	Lieut.-Col. J. W. Benet, Com. Officer.
Texas	Fort Bliss	May 1, 11 a.m.	Installing electric lighting system.	G. C. S. Quackenbush, Constr. Q.M.
FIRE EQUIPMENT				
South Africa	Johannesburg	Apr. 21, noon	Furn. 2 patrol motor fire engines.	Town Clerk.
New Jersey	Paterson	Apr. 21	Furn. automobile hook and ladder outfit and converting 2 first-class fire engines into gasoline-propelled vehicles.	T. S. Standeven, City Clk.
New York	Rensselaer	May 8	Furn. 500 ft. 2 1/2-in. fire hose.	Salt, City Clerk.
New Jersey	Princeton	July 5	Furn. auto pumping engine.	E. M. Urdike, Chm. F. & W. Com.
MISCELLANEOUS				
Montana	Glendive	Apr. 21	Constructing new concrete jail, and construct. steel cells.	R. L. Wyman, Clk. Bd. Coun. Comrs.
Pennsylvania	Reading	Apr. 24, noon	Constructing new library buildings.	Chas. H. Hunter, Secy. Bd. Trust.
Massachusetts	Boston	Apr. 24	Disposal of the refuse of the city collected by the Public Works Department, except W. Roxbury and E. Boston Dists., for a term of ten years.	Louis K. Rourke, Comr. Pub. Wks.
Michigan	Grand Rapids	Apr. 29, 3 p.m.	Repairing and construct. piers at various harbors in Michigan.	C. S. Riche, Lieut. Col. Engrs.
Connecticut	Hartford	May 2, noon	Constructing new fire station.	Geo. W. Sanford, Bldg. C. B. F. C.
Ohio	Cincinnati	May 10, noon	Constructing hospital buildings.	Messrs. Hannaford & Sons, Arch.
California	Oakland	May 11	Constructing city hall, value of contract \$1,000,000.	Frank R. Thompson, City Clerk.

STREET IMPROVEMENTS

Birmingham, Ala.—Council is considering paving of Twenty-first st. First to Twelfth ave., north, with bitulithic.

Tuscaloosa, Ala.—City will soon ask bids on 4,155 sq. yd. concrete sidewalks, 8,339 lin. ft. concrete curb and 4,465 lin. ft. combined curb and gutter.—W. H. Nicol, City Engineer.

Los Angeles, Cal.—Specifications for two new roads have been prepared by Highway Commission and Commission recommends that bids be called for their improvement on May 1.

Santa Barbara, Cal.—City Engineer F. L. Johnson has been instructed to prepare plans for paving of 12 blocks on various streets; will be curbed with stone and guttered.

Sawtelle, Cal.—City is considering grading, curbing and oiling of Third and Sixth sts. and Washab ave.

Terra Bella, Cal.—Engineer Irving Alt-house, Porterville, has been commissioned to prepare plans for Terra Bella Boulevard; distance, 3 miles.

Willows, Cal.—Trustees will pass ordinance requiring property owners in old incorporation of Willows to construct cement sidewalks; means between six and seven miles of sidewalks will be built this year.

Bridgeport, Conn.—Bids will be invited by Paving and Sewer Commission for laying hard surface pavement on State st., from Broad st. to its westerly terminus at Fairfield ave.

Washington, D. C.—C. B. Hunt, Engineer of Highways, has completed plans for laying of asphalt and asphalt block on unpaved streets; \$79,500 available.

Lakeland, Fla.—Polk County is considering election on \$500,000 bonds to build good roads.

Americus, Ga.—Citizens have voted \$105,000 bonds for improvements; business streets will be paved.

Carnesville, Ga.—Franklin County Commissioners are considering election on \$50,000 road bonds.

Newnan, Ga.—Citizens have voted \$150,000 bonds for paving streets and other improvements.

Chicago, Ill.—Mayor Busse has signed ordinance for widening of 12th st. as the first step in the development of plans of the Chicago Plan Commission.

Greencastle, Ind.—Bids are being received for construction of 10,000 sq. yd. of asphalt macadam paving, estimated at \$26,000. A. A. Lane, City Engineer, and S. E. Sayer, City Clerk.

Princeton, Ind.—Gibson County Commissioners are considering asking for bids for construction of three gravel roads at cost of \$30,000.

Richmond, Ind.—Council is in favor of oiling streets under direction of the city officers, cost to be borne by property owners.

Vincennes, Ind.—Board of Public Works has confirmed original resolution calling for improvement of Jefferson Ave. from Second St. northwesterly to Terra Haute road.

Waveland, Ind.—Town Trustees will order every brick sidewalk in town replaced with concrete; will call for about 3 miles of walk.

Hutchinson, Kan.—Ordinance for paving in downtown district is to be introduced at next session of the Commission.

Hutchinson, Kan.—County Commissioners will consider petitions for new roads in Little River and Sylvia townships.

Olathe, Kan.—Commissioners of Johnson County have ordered survey and plans for rock road running two miles south from Shawnee.

Lexington, Ky.—Council has passed ordinance for paving Forest ave. with sheet asphalt; Upper Fifth st. with brick, wooden block or asphalt; also for improvement of other streets.

Natchitoches, La.—Police Jury adopted resolution making application to State Highway Department for State aid provided for construction of eighteen miles of good road from this city to Robeline, to join with the De Soto good road work.

Shreveport, La.—Bids will be received Apr. 25 for \$250,000 paving bonds. Address Commissioner of Finance Rives.

Ledger Hill, Md.—Public road will be macadamized at cost of \$8,000.

Boston, Mass.—Approximately \$1,000,000 will be spent on roads this season under the direction of the Massachusetts Highway Commission; of this amount about one-half will go into construction of new State roads, and the other \$500,000 will be devoted to improvements of other main highways and to the maintenance of the roads which already have been built by Commission.

Lynn, Mass.—Between \$15,000 and \$20,000 will be cost of paving Oakville st. with granite blocks, as proposed by the Municipal Council.

Rockport, Mass.—Special Committee will consider advisability of purchasing stone crusher.—John H. Dennis, Moderator.

Grand Rapids, Mich.—Cost of paving Oakes st. with brick has been estimated at \$2,000.

Duluth, Minn.—St. Louis County Commissioners are planning to expend \$225,000 on roads during coming year.

veleth, Minn.—Cost of paving Jones, ...
... has been estimated at \$13,466.05;
... macadam with binder will be used.
berty, Mo.—Clay County Commission-
... are considering election on construction
... 10% miles of rock road from Kansas
... to Excelsior Springs.
edalia, Mo.—Pettis County will vote May
... on \$350,000 of bonds for construction of
... miles of rock roads.
sbury, Park, N. J.—All bids received
... furnishing and laying about 10,500 sq.
... of creosoted wood blocks, vitr. brick or
... lithic on Main St. have been rejected;
... has been laid over until Sept.—
... C. Burroughs, City Clerk.
renton, N. J.—Plans will be prepared
... County Engineer Eppel for building
... newell, Mount Rose and Princeton road.
inghamton, N. Y.—Citizens will vote
... y 12 on \$25,000 paving bonds.
inghamton, N. Y.—Council has decided
... pave Water st., Court to Stuart st., with
... ck; also considered improving of Che-
... ngo st. with macadam at cost of \$2,600.
orinth, N. Y.—Citizens will soon vote
... \$2,500 bonds to alter position of part of
... d through town and extend Main st.
udson, N. Y.—Commission of Public
... has adopted specifications drawn up
... Superintendent O'Hara, of Albany, for
... paving Warren st. with vitrified brick
... m Third to Seventh.
lilion, N. Y.—Board of Trustees and
... et Board are considering paving of
... in st.
Niagara Falls, N. Y.—Residents of Niaga-
... ra ave., Portage road and 27th st. are
... ging paving of that thoroughfare.
chenectady, N. Y.—Council has adopted
... nance to repave Mott Terrace.
hamlet, N. C.—Citizens will vote May 2
... \$5,000 of bonds for street improvements.
Cleveland, O.—Bids will be received Apr.
... noon, for \$616,000 street improvement
... d \$60,000 elevated roadway bonds.—H. L.
... vis, City Treasurer.
Port Clinton, O.—County Commissioners
... ve ordered building of two stone roads in
... len Township, which are estimated to
... st about \$42,000.
Weston, O.—County Commissioners have
... dered building of two stone roads to
... olschin Stone Co.; roads extend five
... les between Weston and Milton Town-
... ips.
Muskogee, Okla.—Council has decided to
... prove unpaved portions of eleven streets.
... F. McGarr, Mayor; Chas. Wheeler, City
... erk.
Baker, Ore.—City Commissioners have
... cided to pave Fourth st.
Portland, Ore.—Citizens will vote June 5
... \$1,000,000 bonds to establish municipal
... ving plant.
St. Johns, Ore.—Council has adopted
... ecifications for paving Jersey st. at cost
... \$25,000.
Butler, Pa.—Council has adopted ordin-
... ces for paving Cliff and Oak sts.
Hazleton, Pa.—Highway Committee has
... dered repair of large number of streets.
Norristown, Pa.—Citizens of Upper Dub-
... l Township, Montgomery County, will
... te May 9 on \$35,000 bonds to complete
... acadamizing and improvement of high-
... ways.
Pittsburg, Pa.—Paving of Lenora and St.
... ndrew sts. is being urged.
South Bethlehem, Pa.—Borough Engi-
... ner R. E. Neumeyer will prepare plans for
... ving South Main st.; cost about \$5,000.
Harrisville, R. I.—Bids will be asked for
... ving Main st., Pascoag.—M. S. Inman,
... chairman, Special Committee.
Providence, R. I.—Construction of street,
... to 100 ft. wide, from post office to
... town and Angel sts., has been recom-
... ended by J. R. Freeman, Engineer of
... nicipal Commission.
Woonsocket, R. I.—Council is consider-
... g \$4,300 appropriation for paving inter-
... ction of Hamlet ave. and Front st. with
... ving brick.
Mountain View, Tenn.—Council will issue
... 0,000 bonds for street improvements.
Aransas Pass, Tex.—San Patricio County
... as voted \$100,000 bonds for good roads,
... 0,000 of which will be spent on auto
... ulveard to Ingleside, 6 miles south.
Dallas, Tex.—Municipal Commission has
... cided to pave Cole st., Lemmon ave. to
... ox st.; bids will be asked.
Mineola, Tex.—Mineola Precinct has
... ted \$30,000 bonds for road work.
Wharton, Tex.—Citizens have voted \$15-
... 0 bonds for street improvements.
Bristol, Va.—Council has joined people
... of the Goodson District of Washington
... nty in agreement to spend \$50,000 in
... nstruction of pike roads, leading in four
... rections out of Bristol.
Richmond, Va.—Southeastern Virginia
... od Roads Association has organized with
... C. Roland, Garrett, President, and will
... nstruct 87 miles of road between Rich-
... nd and Carolina line via Petersburg.
Union Level, Va.—Buckhorn District,
... ecklenburg County, is considering elec-
... on on bonds for good roads.

Bremerton, Wash.—Cost of paving num-
... ber of streets in business district has
... been estimated at \$55,000.
Mt. Vernon, Wash.—Council has passed
... resolutions providing for paving of por-
... tions of Division, 1st, Washington, Mont-
... gomery, Myrtle, Kincaid sts., Cleveland
... ave. and other streets.
Seattle, Wash.—Plans and specifications
... have been adopted by Board of Public
... Works for grading and walks on Green-
... wood ave.; concrete walks on East and
... West Green Lake Blvd., and resurfacing
... West 64th st.
Spokane, Wash.—City Engineer Morton
... Macartney has completed plans for sewers
... in 25th, 26th, 9th and 10th aves., Garfield
... road and Highland and Rockwood boule-
... vards; cost in all about \$30,815.
Tacoma, Wash.—Municipal Commission
... has adopted resolutions for improvement of
... four streets.
Milwaukee, Wis.—Council has set aside
... \$114,200 for crushed stone and other street
... materials.

CONTRACTS AWARDED

Seale, Ala.—By Russell County Commis-
... sioners to D. M. Wheeler & Co., Birming-
... ham, \$1,000 per mile for grading road from
... Seale to Girard.
Los Angeles, Cal.—Street improvements:
... Selma ave. to A. W. Beesmyer, \$18,627;
... Kenwood st. to Fairchild, Gilmore, Wilton
... Co., Pacific Electric Building, \$9,429, and
... frees st. to L. N. Davies, \$4,152; to Ar-
... thur Sikes, 959 W. 43d st., for constructing
... cement sidewalks, aggregating \$4,539.
Long Beach, Cal.—Paving Pine ave. with
... asphalt from 10th to 14th st., to Fairchild-
... Gilmore-Wilton Co., between \$13,000 and
... \$15,000.
Denver, Col.—To J. Fred Roberts for
... constructing concrete curbs and gutters
... and grading streets in East Side Improve-
... ment Dist. No. 4, \$35,620.
Jasper, Fla.—Grading 30 miles of road
... to Jasper Land Improvement Co., \$300 per
... mile.
Miami, Fla.—To Standard Oil Co., to
... treat six miles of county road with oil, \$330
... per mile.
Canton, Ill.—To Roller & Saville for pav-
... ing five blocks around South Park; excava-
... ting, 30c.; curbing, 55c.; paving, \$1.17.
Chicago, Ill.—Paving work: Alley, Jack-
... son boulevard, to Central Paving Co., 172
... Washington st., \$3,216 for wood block and
... brick; alley, Adams st., to J. A. McGary,
... 188 Madison st., \$3,570.50 for wood and
... granite block; alley, Ashland ave., to Cen-
... tral Paving Co., \$1,080; alley, Jackson boule-
... vard, to Alexander Todd, 197 N. Hamlin
... ave., \$1,951; Bauwans ave. to American
... Asphalt Paving Co., 138 Washington st.,
... \$2,555.66; California ave. to Citizens' Con-
... struction Co., 138 Washington st., \$2,414.50;
... Congress st. to Standard Paving Co., 1101
... S. 48th st., \$17,003.50; Drexel ave. to L. F.
... Conway Co., 138 Washington st., \$7,436.90;
... Cottage Grove ave. to Calumet Coal &
... Teaming Co., 2926 E. 95th st., \$24,484; Lake
... ave. to Parker Washington Co., 138 Wash-
... ington st., \$101,107.20; three streets to Farr
... Bros., \$13,181; various materials are to be
... used.
Bloomfield, Ind.—Construction of two
... macadamized roads in Greene County to
... Gageby & Cunningham, Linton, \$3,365 and
... \$1,730.
Bloomington, Ind.—Construction of stone
... road in Monroe County to McCormack &
... Rodgers, Smithville, \$5,338.
Brownstown, Ind.—By Commissioners of
... Jackson County for construction of gravel
... road in Owen Township to Samuel Small-
... wood, \$5,099.
Kokomo, Ind.—Constructing three gravel
... roads in Monroe Township to F. Ham-
... bert, \$2,650; H. H. Stewart, \$7,768; Mac-
... Kay, Druce, Miller & Co., \$7,949.
Lafayette, Ind.—By Tippecanoe County
... Commissioners to D. H. Fatout, Indianap-
... olis, for construction of the George Gaylord
... road in Wabash Township, \$3,225; two
... other contracts for other roads were
... awarded to Mahoney & Allen, Greencastle,
... \$4,840 and \$1,900.
Laporte, Ind.—By County Commissioners
... for the McBride macadam road, to Joseph
... Jenkins, Michigan City, \$2,595; road is
... three-eighths of a mile long.
Monroe, Ind.—Building two macadamized
... roads in Wabash and St. Mary's town-
... ships to Eli Engle & Son, city, \$6,198 and
... \$6,370.
Montpelier, Ind.—Building Burns mac-
... adam road, in Harrison Township, to J. F.
... Buckley, city, \$9,291.
Richmond, Ind.—Oiling streets, to C. E.
... Davis, Connorsville; only streets will be
... oiled whereon majority residents petition.
Sullivan, Ind.—Building two stone roads
... in Cass Township to D. E. Everhart, Sul-
... livan, and Keegan Brothers, Brazil, \$9,464
... and \$8,465, respectively.
McPherson, Kan.—Constructing 19,000 sq.
... yd. of paving and 6,100 lin. ft. of curb
... and gutter to Throgmorton & Gardner,
... Fort Scott \$46,903.

Wichita, Kan.—Resurfacing North Main
... st. from English st. to Murdock ave. to
... Warner-Quintan Paving Co., paving, \$1.64
... per sq. yd.; to H. L. Miles for constructing
... curbing, 39c. per yd., and gutter, 37c.
... per yd.
Franklinton, La.—By Washington Parish
... Police Jury to J. S. Moody to build mile of
... improved road.
Houma, La.—Board of Aldermen has ac-
... cepted bid of Comerford, Garber & Co. for
... paving Church, Lafayette and Roussel sts.
... with cement sidewalks.
Baltimore, Md.—Paving to cost about
... \$175,000, to W. M. Elder for sheet asphalt.
Baltimore, Md.—By Board of Awards for
... steam roller for City Engineer's depart-
... ment to Kelly-Springfield Co., \$1,800.
Boston, Mass.—Furnishing North River
... flagging, to Wm. E. Harvey, 36c. per sq.
... ft. of wharves and 11c. on streets or yards;
... construction of artificial stone sidewalks,
... to W. A. Murtfeldt Co., Jeremiah J. Sullivan,
... Jas. Doherty, John Landis and Maher Bros.
Adrian, Mich.—Paving East Maumee St.
... with Townsend block to William F. Bowen,
... city, \$21,462.
Crookston, Minn.—Constructing 31,372
... sq. yd. of asphalt macadam pavement to
... P. McDonald, Duluth, Minn., \$42,000.
Other bidder: Central Westrumite Paving
... Co., Whiting, Ind., \$42,500.
Detroit, Mich.—Paving to Thos. E. Cur-
... rie, 20 McGraw Building, with cedar blocks
... on Beaufait st., Sec. 1, \$15,565, and Sec. 2,
... \$7,245; to J. A. Mercier, 211 Hammond
... Building, with cedar blocks on Ellery st.,
... \$24,641, and with cedar blocks on Lawrence
... ave., \$11,841, and to F. Porath & Son, 301
... Penobscot Building, for paving with brick
... Fort st. W. at \$17,642.
St. Paul, Minn.—To Dana Warehouse Co.
... for furnishing 20,000 paving brick, \$21 per
... M and 20,000 at \$22.50 per m; furnishing
... lumber for Engineering Department, to
... Jefferson & Kasson Co., \$22,940.
Long Branch, N. J.—Building two roads
... in the Borough of West Long Branch, to
... R. L. Hughes, Cedar ave., \$957 and \$1,227.
New York, N. Y.—Regulating and re-
... paving with granite block pavements on a
... concrete foundation the roadway of
... Richmond Turnpike from Brook St. to
... Cobra Ave. to John E. Donovan, Port
... Richmond, \$28,875. Other bidders: Joseph
... Johnson & Sons, West New Brighton, \$29,-
... 850; Uvalde Asphalt Paving Co., New
... York City, \$30,247. Regulating and re-
... paving with vitrified brick the gutters of
... Broadway, Port Richmond, from Richmond
... Terrace to south end of street; John E.
... Donovan, Port Richmond, \$20,179; Joseph
... Johnson & Sons, West New Brighton, S. L.,
... \$18,781. Other bidders: John E. Donovan,
... Port Richmond, \$20,179; Dominick Bon-
... nacci, 612 Degraw St., Brooklyn, N. Y.,
... \$19,279; Cornelius Vanderbilt, \$18,909;
... Thomas A. Carlin, \$19,133, and Jos. E.
... Donovan, Port Richmond, \$20,189. For fur-
... nishing and delivering 8,000 tons of broken
... stone and screenings to Manhattan Con-
... tract Co., \$1.53 per ton. Furnishing and
... delivering 10,000 tons of broken stone and
... screenings to Clinton Point Stone Co., 115
... Broadway, City, \$1.75 per ton in Dist. 2.
Other bidders: Jacob E. Conklin, \$1.80 per
... ton; Joseph Johnson & Sons, \$1.85 per ton;
... John E. Donovan, \$1.89 per ton. Furnishing
... and delivering 10,000 tons of broken stone
... and screenings in Dist. 3 to Clinton Point
... Stone Co., 115 E. W. ave., New York, \$1.95 per
... ton. Other bidders: Jacob E. Conklin, \$2 per
... ton; Jos. Johnson & Sons, \$2.08 per ton;
... Regulating, grading, curbing, recurling,
... flagging, reflagging and repaving with as-
... phalt block on a concrete foundation Jack-
... son Ave. from Thompson St. to Woodside
... Ave., Boro. of Queens, to Barber Asphalt
... Paving Co., 30 Church St., \$152,431; Hast-
... ings Pavement Co., New York City, bid
... \$154,213.
Utica, N. Y.—Paving Wurz ave., Miller
... road to North Genesee st., to James W.
... Johnston, \$17,770; to same, for paving with
... vit. brick Root st. from Catharine st. to
... the Erie Canal, \$1,110.10.
Fayetteville, N. C.—Street Committee has
... decided to recommend to Board bids of F.
... J. McGuire, of Richmond, Va., for con-
... struction of 10,000 ft. of additional paving,
... and of Bowe & Paze, of Charleston, S. C.,
... for curbing.
Ironton, O.—To Fred B. Davies for 15,-
... 000 sq. yd. street paving.
Lowellville, O.—Constructing sidewalks
... during year to Kimbrough & Elder, New
... Castle.
New Philadelphia, O.—Paving Port Wash-
... ington River road to O. W. Schwab, Port
... Washington, \$2,300.
Norwalk, O.—Building 9 1/2 miles of pike
... in Norwalk Township to Taylor & Briggs,
... Findlay, \$41,990. Other bidders: Starr,
... Harmon & Witham, Desher, O., \$42,539;
... F. L. Rice & Sons, Shelby, O., \$42,740.
Paulding, O.—Macadamizing roads: To
... Hancock Stone Co., Findlay, for Sections
... 1, 2, 4; A. Scott, of Oakwood, for Secs. 3 and
... Lynn & Burke, Paulding, for Secs. 5, 6, 7
... and 8; total, \$176,136.

BIDS RECEIVED

Clifton Heights, Pa.—Building cement walks, to Gillespie & Son, 22c. per sq. ft.; blue stone curb, 6c. per lin. ft.; vitr. brick gutter, \$1.95 per sq. yd.; furnishing stone on highway for year to come; rough stone, \$1.25 perch; spauls, double load, \$2.25; Glen Mills trap rock, \$1.60 per ton; crushed stone from Clifton Heights Quarries, \$1.50 per ton; all stone to be delivered on any highway of borough designated by Highway Committee.

Ingram, Pa.—Paving portion of Stanley St. to Thos. Cronin Co., Pittsburg, \$11,032. Other bidders: Ridge Bros. Co., Pittsburg, \$11,370; Nulen & Daly, Pittsburg, \$11,578; Powders Paving & Construction Co., Pittsburg, \$11,259; F. J. Erbeck, Homestead, \$11,167; Samuel Gamble, Carnegie, \$11,263, and R. D. Dickson, Sewickley, \$12,075.

New Brighton, Pa.—Paving street leading up and over Reservoir Hill, by Supervisors of Daugherty Township, to the McQuiston Co., \$5,203.42; other bidders: Miller Bros., New Castle, \$5,301.13; J. G. McGuire Co., \$5,949.54.

Philadelphia, Pa.—Resurfacing Spring Garden St. to Barber Asphalt Paving Co.; Resurfacing by means of ironing process, 93c. per sq. yd., work to be completed in 40 days; resurfacing with new material, \$1.22, work to be completed in 20 days; work includes 14,000 sq. yd. of asphalt and 1,700 sq. yd. of granite for renewal of foundations; to same company at unit prices for supplying last asphalt for various localities to municipal repair gangs which will make asphalt repairs.

Knoxville, Tenn.—To Mann Construction Co., city, to build 10 miles of pike in McMinn County.

Dallas, Tex.—Paving certain streets in Exposition Park addition, to Standard Engineering and Construction Co., \$24,696.95; asphaltic macadam will be used.

Dallas, Tex.—Paving Walton st., Elm to Worth sts., to Texas Bitulithic Co., \$2.30 per sq. yd.; total cost, \$5,065.77; Ross Ave., to Croesotted Wood Block Company, \$2.59 per sq. yd.; total, \$21,999.03.

Bellingham, Wash.—To C. G. Barnett for paving Forest st., \$11,726.

Everett, Wash.—North Rucker and Sixteenth st. improvements, to Atlas Construction Co., \$13,750 and 1,315.

Montasano, Wash.—Paving Spruce St., from court house to bridge, to the Anderson Construction Co., Tacoma, \$16,266.

North Yakima, Wash.—Paving Pleasant and W. Yakima ave. to Warren Constr. Co., Portland, Ore., clearing and grubbing, lump sum, \$250; 24,100 cu. yd. excav., 65c.; 8,829 sq. ft. concrete alley crossings, 17c.; 47,173 sq. yd. bitulithic paving, \$2.17; 21,392 lin. ft. combined curb and gutter, straight, 73c.; 1,797 lin. ft. combined curb and gutter, curved, 85c.; 2,393 lin. ft. special curb and gutter, 85c.; 13,919 sq. ft. cement walks, 14c.; 1,847 lin. ft. 12-in. siphon, 75c.; 91 siphon inlets, 12 in., each, \$15; 67 catch-basins, each, \$30; 9 monument covers, each, \$8; 135 gutter crossings for walks, each, \$8.75; 1 reinforced concrete culvert for matches and cowyoke canal, lump sum, \$400; 270 lin. ft. concrete flume, 12 in., 75c., and incidentals, \$3,477.43; total for both streets, \$148,480; Pacific Bridge Co., Portland, Ore., bid for both streets total of \$150,970, and Elwood Wiles, Portland, Ore., bid for West Yakima ave. only, \$134,899.

Tacoma, Wash.—Paving with asphalt K st., to Olin Robinson & Co., \$2,294; with same, three streets, to Keasal Construction Co., \$27,728.

Appleton, Wis.—Paving to cost \$50,000; sheet asphalt to J. F. Hill; concrete work to August Knuppel.

Fulton, Wis.—City will soon construct 12,000 sq. yd. of macadam with binder and 10,000 sq. yd. of brick paving at an approximate cost of \$40,000. P. D. Thumond, City Engineer.

Milwaukee, Wis.—New work on Lake Shore drive and in the parks: Black earth for the drive, to John T. Hoff, \$1.25 a cu. yd.; black earth for the boulevards, to Edward Becker, \$1 per cu. yd.; laying water pipe in Highland Park, to R. J. Hickey, 84c. per lin. ft.

Racine, Wis.—Paving Erie and Dodge Sts. to the McCugo-Bullock Co., Waukegan, \$14,626.

Brantford, Ont., Can.—Paving Market st. to Warren Bituminous Paving Corp., Toronto, for the part of street between curb and the street railway track and for surface only, city laying the foundation, about 3,200 yd., \$1.63 per sq. yd.; part between street railway tracks, including 6-in. concrete foundation, to P. H. Secord & Sons, Brantford, vitrified block, \$2.24 per sq. yd., about 850 sq. yd.

Oshawa, Ont., Can.—Asphalt block pavement to Ontario Asphalt Block Co., Windsor, Ont., at \$2.49 per sq. yd.—F. Chappell, Civil Engineer, Engineer in Charge.

Peterboro, Ont., Can.—Furnishing Portland cement to R. Hicks & Co., \$1.65 per bbl.

Hartford, Conn.—Paving five streets—(a) Warren Bros., Boston; (b) Narragansett Improvement Co., Boston; (c) S. N. E. Paving Co., Hartford; (d) surface asphalt, High, Main and Lafayette Sts., \$1.62; Farmington Ave. and Sheldon St., \$1.57; binder, \$1.0 per sq. yd. concrete, \$1 per sq. yd.; excavation and handling, 55 cts.; 90 days; (e) surface asphalt, \$1.67 on all streets; binder, \$1.5; concrete, \$6.32; excavation and handling, 89 cts.; 10 to 20 days; (f) asphalt, High, Main and Lafayette Sts., \$1.27; Farmington Ave., \$1.35; Sheldon St., \$1.31; binder, \$9; concrete, \$5.35 on Sheldon St., \$5.65 on Farmington Ave.; excavation and handling, 75 cts.; 4 to 12 days.

Marion, Ind.—Building Earl Plough stone road, continuation of Western ave., Ryan & Carroll, Jonesboro, and Harvey B. Sisk, Bluffton, both bid \$3,100; other bidders: Wheat, Sisk & Ruppel, \$3,115; William Yates, \$3,300.

Louisville, Ky.—Reconstruction of Grand Ave. and Osage Ave. between 18th and Clark Sts.: G. W. Goshell, \$1.55; the Barber Asphalt Co., \$1.58, and the American Standard Asphalt Co., \$1.60.

Lynn, Mass.—Smooth paving: David J. Shehan Co., Portland cement and concrete 6 ins. in thickness, \$1.70 per sq. yd.; if city does subgrading, \$1.53 per sq. yd.; Connecticut Hassam Paving Co., Mack brick block paving on concrete base, \$2.75 per sq. yd.; concrete base furnished by city, \$2 per sq. yd.; Connecticut Hassam Paving Co., Hassam paving, \$1.75; on base furnished by city, \$1.25; Connecticut Hassam Paving Co., granite blocks on concrete foundation, \$3.15 per sq. yd.; on base furnished by city, \$2.40; Shawmut Contracting Co., Boston, Portland cement, sand and fine trap rock, \$1.65. excavation removed within one-half mile without extra cost; excavation removed beyond that point at the rate of 1c. per cu. ft.; Warren Bros. Co., Boston, bitulithic pavement on bituminous foundation on streets where there are no street railway tracks, \$2.20; where there are street railway tracks, \$2.25 per sq. yd.; bitulithic on 4-in. concrete foundation, \$2.30 on streets where there are no street railway tracks; \$2.35 where there are street railway tracks; bitulithic on 5-in. concrete foundation, \$2.40 per sq. yd. on streets without railway tracks; \$2.45 on streets with railway tracks; if existing macadam on any of the streets to be repaved is of sufficient thickness and in condition to allow all or part of it to be used as foundation without disturbing same, the company will scarify, excavate, furnish necessary new stone, coat foundation with bitumen and lay a bitulithic wearing surface 2 inches thick after compression on bituminous base so provided; cost of scarifying to be at the rate of 10c. per sq. yd.; excavated material removed from streets measured in wagon, 50c. per cu. yd.; foundation stone spread and rolled in place measured in wagons and delivered, \$1.50 per sq. yd.; coating foundation and laying bitulithic wearing surface on streets, \$1.75 on streets where there are no street railway tracks; \$1.80 per sq. yd. on streets with railway tracks; bitulithic wearing surface and surface finish of broken stone, foundation to be prepared by the street railway, \$1.75 per sq. yd. on streets with no railway tracks; bitulithic wearing surface and surface finish on concrete foundation, furnished by city, \$1.65 on streets with no railway tracks; company further agrees to drop 10c. off all of the foregoing prices if no guarantee is required; also offers to repair at its own expense any part of 38,488 sq. yds. of bitulithic pavements which need attention, regardless of the fact that the guarantees have expired, provided it is awarded this year's contract; United States Road Preserving Co., wood block pavement on 5-in. concrete basis, with 1-in. sand cushion, \$3.15 per sq. yd.; Barber Asphalt Paving Co., sheet asphalt, 5 ins. of Portland cement, with 1½-in. surface of asphalt, \$2.65; on city's foundation and no guarantee, \$1.58 per sq. yd.

Metuchen, N. J.—Resurfacing of Main st., Pennsylvania Railroad to Middlesex ave., Thomas F. Dunigan, Woodbridge, Bermudez asphalt macadam, 66c. per sq. yd.; amiste, 99c. per sq. yd.; Liddle & Pfeiffer, of Perth Amboy, tarvia X, 68c. per sq. yd.; amiste, 3 in. of bottom amiste and 1 in. of top dressing, this to be placed on present road after scarifying and no extra stone to be used, \$1.39 per sq. yd.

New Brunswick, N. J.—Estimates for macadam on the road between Cranbury and South River: J. L. Butcher & Son, Farmingdale, \$10,475; A. A. Rose Construction Co., Trenton, \$12,943.31; Harry N. Scott, Cranbury, \$9,429.42.

New Brunswick, N. J.—By County Commissioners for building retaining wall at Spotswood: George M. Davison, Jamesburg, \$2,245; Thomas & Welsh, South Amboy, \$2,565; Charles P. Hillier, Old Bridge, \$2,445 and 10c. cu. yd. for extra

concrete; John P. McGovern, New Brunswick, \$2,168 and 8c. cu. yd. for additional concrete; Marcus S. Wright, South River, \$2,103; William Davison, Jamesburg, \$2,481.90; Abraham Jellin, New Brunswick, \$1,647.

Brooklyn, N. Y.—Street improvement Regulating and repaving with granite pavements on a concrete foundation the roadway of Fifth Ave. from Prospect Ave. 25th St., J. J. Derkin, \$27,832; McFarland Contracting Co., \$29,751; Richard L. Russell, \$31,265; M. J. O'Hara, \$30,082; H. Mullin, \$30,095; Modern Pavement Co., \$29,112; Newman & Carey Co., \$32,325; John Guinan, \$30,360; J. J. McLaughlin, \$30,890; Morris E. Hickey Co., \$31,126. Regulating and repaving with asphalt on concrete foundation roadway of Washington Park from Myrtle to De Kalb Ave. and Cumberland St. from Lafayette to Atlantic Ave., Borough Asphalt Co., \$28,226; Uvalde Contracting Co., \$22,494; Cranford Co., Ninth St., \$20,740; Barber Asphalt Paving Co., \$22,578; Brooklyn Alcatraz Asphalt Co., \$21,614. Regulating and repaving with asphalt on concrete foundation the roadway of 11th St. from Second to Fourth Ave. Uvalde Contracting Co., \$10,313; Brooklyn Alcatraz Asphalt Co., \$9,614; Cranford Co. 52 9th St., Brooklyn, N. Y., \$9,126; Barber Asphalt Paving Co., \$9,662. Regulating and repaving with asphalt on concrete foundation roadway of Fulton St. from Vanderbilt Ave. to Marcy Ave., Barber Asphalt Paving Co., \$41,108; Uvalde Contracting Co., \$44,487; Cranford Co., \$40,339; Brooklyn Alcatraz Asphalt Co., 407 Hamilton Ave., \$40,181.

Bucyrus, O.—Paving South Walnut s. H. N. Oberlander, Bucyrus, \$6,266; A. Caldwell, Galion, \$6,652; P. Drake & Son, Marion, \$6,467; J. W. Scott, Marion, \$6,665; George J. Bock, Coshocton, \$6,490; Hofstetter & Dawson, Marion, \$6,053; J. V. Paule, Mansfield, \$6,053; L. R. McMichael, Bucyrus, \$6,071.

Cleveland, O.—Paving, lowest bidder C. F. Reiley, Lakeside ave., East 9th East 14th st., \$22,100; R. P. Burnett, Lakeside ave., East 26th to East 40th st., \$50,933; Baldwin Bros., West 17th st., \$35,119; Cleveland Trinidad Paving Co., Overlook road, \$9,258.

Montpellier, O.—Laying 25,500 sq. yds. paving, Hennessey Bros., Piqua, brick, \$1.10 to \$1.91 per sq. yd.; H. S. Enck, Lima, brick, \$1.88 to \$1.94 per sq. yd.; Carpenter & Anderson, Grand Rapids, Mich., asphalt, \$1.89 per sq. yd.; Cleveland Trinidad Paving Co., Cleveland, asphalt \$2.06 per sq. yd.; S. S. Saxton, Richmond, Ind., asphalt, \$1.10 per sq. yd.; Andrews Asphalt Paving Co., asphalt, \$1.99 per sq. yd.; Kneal & Ryan, Lansing, Mich., brick, \$1.88 to \$1.94 per sq. yd.; Moelering Construction Co., Fort Wayne, Ind., brick, \$1.96 to \$2.02 per sq. yd.; Fishbaugh & Karsch, brick, \$1.94 to \$2.09 per sq. yd.; G. A. Heffner & Sons, Celina, brick, \$1.64 to \$1.71 per sq. yd.; based on using local gravel; add 20c. per sq. yd. if commercial gravel is used; Lynn Burke, Paulding, brick, \$1.79 to \$1.83 per sq. yd.; Asphalt Block Co., Toledo, 2-in. asphalt, \$2.10; 2½-in. asphalt block, \$2.20 per sq. yd.; Freshwater & Sons, Celina, brick pavement, \$1.84 to \$1.91 per sq. yd. asphalt pavement, \$1.89 per sq. yd.—The Riggs & Sherman Co., Nasby Bldg., Toledo Consulting Engineers.

Portsmouth, Va.—Paving South st. in the Seventh Ward west of Chestnut st. to city limits: Bascom Sykes, Engineer of the Ward, 510 Middle st.; E. P. Lindsay offers to pave street with tarvia on 6-in. base for 95½c. per sq. yd.; Bermuda asphalt paving, \$1.03 per sq. yd.; tarvia on ½-in. base, \$1.14 per sq. yd., and \$1.23 for Bermuda asphalt on similar base; excavating work, \$1,587.50; James T. Wrenn, vit. brick on a 2-in. sand base, Mack, \$2.68 per sq. yd., granite curbing, 60c. per lin. ft.; tarvia on 8-in. base, \$1.18 per sq. yd.; Bermuda asphalt, 8-in. base, \$1.28; tarvia on 6-in. base, \$1.04; Bermuda, 6-in. base, \$1.10; Lewis Lawson, Mack brick, \$1.67 per sq. yd.; Carlisle brick, \$1.69; tarvia, 6-in. base, \$1.25; tarvia, 8-in. base, \$1.45; curbing, 60c. per lin. ft.; add 20c. per sq. yd. to foregoing figures for asphalt paving; Dalby Nottingham Co., bituminous macadam, 8 in. base, \$1.48 per sq. yd.; bituminous macadam, 6-in. base, \$1.28; add 18c. per sq. yd. to foregoing figures for Bermuda asphalt paving; E. J. McGuire, excavation work, \$1,500; vit., Mack brick, 2-in. sand base, \$1.65 per sq. yd.; curbing, 60c. per lin. ft. bituminous macadam, 16 ft. wide, 8-in. base, \$1.40 per sq. yd.; bituminous macadam, 16 ft. wide, 6-in. base, \$1.20; add 15c. per sq. yd. to foregoing figures for asphalt paving; R. D. Denby, for excavation work

Racine, Wis.—Paving of Erie and Dodge sts. from State st. to North Main st., Bullock & McHugo, Waukegan, \$2.36 per sq. yd. for Barr brick, \$2.32 for Danville an \$2.36 for Purington brick, and bid of 50c. per ft. for curb and gutter; entire job figures up to about \$14,500.

SEWERAGE

Tuscaloosa, Ala.—W. H. Nicol, City Engineer, has completed preliminary survey or proposed storm sewer to be constructed from 8th to 14th St., cost \$5,700; bids will be asked for 450 ft. 42-in., 350 ft. 36-in. and 400 ft. 30-in. concrete sewer, 450 ft. 24-in., 350 ft. 20-in. and 1,000 ft. 18-in. terra-cotta sewer, 7 manholes, 25 inlets; also some sidewalk, curb and gutter.

Fort Smith, Ark.—Mayor Fagan Bourland has recommended that work on storm sewer on south side of city be commenced at once.

Concord, Cal.—Citizens have voted \$29,000 bonds for sewer construction; bids will be asked by Engineers Sloan & Robson, San Francisco.

Dixon, Cal.—Bids will soon be received or installation of sewerage system and disposal works; cost, \$40,000. Reynolds & Whitman, Engineers.

Oakland, Cal.—Plans and specifications for sewerage of Allendale sanitary district has been adopted by Council, and more than 20 miles of sewer will be installed.

Oakland, Cal.—City Engineer Fred C. Turner is drawing up plans and specifications for storm sewer to relieve the flooded conditions of Vernon Heights and Linda Vista districts; cost, \$15,000.

Orland, Cal.—Citizens will vote May 2 on \$25,000 bonds to install sewer system.

Manchester, Conn.—South Manchester Sanitary District is planned to extend sewer system.

Palatka, Fla.—Mayor H. A. Davis has recommended extension of sewer system.

Sarasota, Fla.—City is planning to install sewer and water systems.

Americus, Ga.—Citizens have voted \$105,000 bonds for improvements; sewerage system will be extended several miles in business districts.

Blakely, Ga.—Citizens will vote April 22 on \$60,000 bonds for improvement of sewerage system and erection of school building.

Aurora, Ill.—Contract will be let in about 30 days for the construction of pipe and concrete sewers: Dist. 7, cost \$55,000; Dist. 8, cost \$35,000, and Dist. 9, \$20,000.—M. J. Tarble, City Engineer.

Danville, Ind.—After citizens had voted to install a general sewer system, to be paid for by bond issue, it was discovered that such system could not be built without exceeding 2 per cent. tax limitation, contrary to law; Board has ordered preliminary survey to determine the cost of the system, and if cost not too great sewers will be ordered built under Barrett law.

Kokomo, Ind.—Plans and specifications for a sanitary sewer, prepared by Prof. Robert L. Sackett, Purdue, have been accepted and approved by Board of Works.

South Bend, Ind.—Board of Public Works has decided to construct sewer on Pine st.

Avoca, Ia.—John S. Crick, Omaha, Neb., will make survey for installation of sewerage system.

Grinnell, Ia.—Extension of sewer system to West Grinnell is being considered.

Valley Junction, Ia.—Iowa Eng. Co., Clinton, will prepare plans for proposed sewer system.

Hutchinson, Kan.—City Commission has ordered construction of lateral to sanitary sewer in Jefferson st. district; cost about \$1,200.

Winchester, Ky.—Chas. E. Collins, Drexel Bldg., Philadelphia, is preparing plans for installation of sewage disposal plant, including settling tanks and sprinkling filters.—Dr. M. S. Browne, Chairman Sewer Committee.

New Orleans, La.—Calcasieu Savings Bank & Trust Co. has purchased entire issue of sewerage bonds, totaling \$160,000. Bids will be asked for covering construction in the course of a few weeks. T. H. Mandell, City Engineer.

Eaton Rapids, Mich.—Council has decided to build sewer on State and River Sts. in First Ward.

Austin, Minn.—City will construct 6,600 ft. of sanitary sewers; cost, \$6,800. Martin Clausen, City Engineer.

Gilbert, Minn.—Bids will be advertised at once for construction of proposed sewer system.

Dolgeville, N. Y.—Chas. E. Collins, Drexel Building, Philadelphia, Pa., is preparing plans for extension of sewers, cost \$12,000.—H. I. Patrie, Chairman Sewer Commission.

Duluth, Minn.—Cost of building sanitary sewer in Park Point has been estimated at \$19,642.70.

New Hartford, N. Y.—Town Board will order establishment of sewer district.—A. M. Scripture, Engineer.

Port Chester, N. Y.—Plans by F. S. Odell have been approved for installation of \$100,000 sewage disposal plant on Fox Island.—C. O. Frederick, Acting President Bd. Trustees.

Niles, O.—City has sold \$20,500 bonds for south side sewer improvements to Dallas Savings Bank.

Britton, Okla.—Citizens have voted \$20,000 bonds for improvements to sewer and water systems.

Eugene, Ore.—Citizens have voted \$28,000 sewer bonds.

Reading, Pa.—Council will consider \$250,000 loan with which to complete storm water sewer system.

West Midland, Pa.—Borough Council has formulated plans for probable construction of sewage disposal plant and taken steps toward having town sewer.

Clinton, S. C.—Citizens have voted \$45,000 bonds for installation of sewerage system; bids for bonds will be asked at once.

Dallas, Tex.—Bids will be asked by Municipal Commission for constructing 6-in. sanitary sewer in Cochran St.

Richmond, Va.—Board of Aldermen has passed resolution for construction of sewer in East Leigh st., \$18,800; in Bloody Run Ravine, \$12,430; deep sewer in Broad st., \$16,000.

Burlington, Wash.—A. L. Strong, of Mt. Vernon, has been selected as engineer for proposed storm pipe sewers.

Melville, Sask., Can.—Ratepayers will vote April 24 on \$63,000 by-law for main storm water sewer.

CONTRACTS AWARDED

East Moline, Ill.—To complete sewer system to E. R. Harding & Co., Racine, Wis., \$50,995.

Lawrence, Kan.—Building lateral sewer in District No. 5, to Graeber Bros., 96½c. per ft.; Fairground and Haskell sewers, to Kennedy Plumbing Co., 51c. and 46c. per ft.

Billings, Mont.—Construction of sewer system, to Frank Savareys; pipe \$1.30 per ft., manholes \$70 each, flush tanks \$150 each, extra excavating \$60.

Girard, O.—Building sewer in Main and Stambaugh Sts. to Van Meter Construction Co., \$2,952. Other bidders: Pasqual Dioro, Youngstown, \$3,414.95; John W. Gay, Youngstown, \$3,536.73; Charles Hukari, Ashtabula, \$3,787.05; Patrick Grady, Youngstown, \$3,841.85; McGlashen & Russell, \$3,865.25; C. L. Allen, Marion, \$3,915.05; Geladini & Manfo, \$5,242.90; Joe Moss made irregular bid.

Columbia, S. C.—Building storm drain on Gervais st., Assembly to Pulaski, to L. E. & E. N. Beatty, Georgetown, S. C.; 614 ft. 30-in. cir. concrete drain, \$2.44; 446 ft. 42-in. pipe, \$2.56; 1,617 ft. 48-in., \$2.93; 12-in. vit. pipe, 75c.; 140 ft. 15-in., 90c.; 175 ft. 18-in.; \$1; 600 ft. 20-in., \$1.25; 30 ft. 24-in., \$1.60; 30-in. vit. pipe, \$2.60; 6 manholes, \$25.15; 25 inlets, \$43.40; total, \$10,192; other bidders: Weston & Booker \$11,430, and Palmette Paving Co., \$11,199.—John McNeal, City Engineer.

Seattle, Wash.—Building sewers on North and East 65th Sts. to Hayden & Sons, \$18,879.10.

South Milwaukee, Wis.—Building sewers, to R. J. Hickey, 1,291 ft. 8-in. pipe, average cut 7.5 ft., 98c.; 600 8-ft., 24c.; cut, 14 ft., \$1.97½; 32 manholes, \$33.75, total \$14,210.98; other bidders: A. C. Schreiber, \$16,764.15; Jas. Brogan, \$17,975.80; N. F. Reichert, \$20,275; Jos. Whelan, \$15,900.62; T. Stukalski, \$18,579.35, and E. R. Harding, \$18,888.75; sewage disposal plant, to same: class C sand, \$6,789; about 2,270 cu. yds. sand will be required.—J. W. Alvord and C. B. Burdick, Hartford Bldg., Chicago, Engineers.

WATER SUPPLY

Tuscaloosa, Ala.—Water Works Commission has recommended installation of additional pump costing about \$1,500.—F. G. Blair, President.

Winkelman, Ariz.—Robert Lynn has been granted franchise to establish water system.

Dorris, Cal.—Bids will be received by Town Clerk May 1 for \$12,500 water system bonds.

Orland, Cal.—Citizens will vote May 2 on \$25,000 bonds to install water works system.

Palo Alto, Cal.—Citizens have voted bonds to install auxiliary water pumping plant.

Portola, Cal.—Portola Water Co. is planning to construct large concrete reservoir at the spring under Beckwith Peak.

Leadville, Col.—Citizens have voted to install municipal water works.—N. C. Rose, Mayor.

Gunnison, Col.—Citizens have voted \$90,000 bonds for water works; about \$70,000 will be issued at this time.—Burns & McDonnell, Kansas City, Mo., Engineers.

Sarasota, Fla.—City is planning to install water and sewer systems.

Colquitt, Ga.—Citizens have voted \$22,000 of bonds for extension of water works, construction of electric light plant and erection of school building.

Jackson, Ga.—City is preparing to make extensive improvements on water works system; new mains will be laid on Indian Springs and West 3d sts. and on West ave.

Anna, Ill.—C. W. Brown, Jacksonville, is preparing plans for water works; cost about \$20,000.—J. L. Hammond, City Clerk.

Plainfield, Ill.—Village Trusts, have decided to construct water works; cost, \$25,000.

Rushville, Ill.—The Fuller-Coult Co., Chemical Bldg., St. Louis, Mo., has been selected by city to prepare plans for the construction of pumping station and pipe line; estimated cost, \$30,000.

Shelbyville, Ill.—Shelbyville Water Co. has decided to construct reservoir, capacity of 2,000,000 gal.; estimated cost, \$8,000. Charles Chester, Superintendent.

Peru, Ind.—A. T. Maltby, Consulting Engineer, Great Northern Building, Chicago, has been selected to provide new and increased water supply and rebuild water works plant.

Cherryvale, Kan.—Citizens will vote on installation of water works.

Elk City, Kan.—Bids will be received about May 1 for the construction of water works from plans of L. Y. McFarland; cost about \$25,000.—R. B. Shaffer, City Clerk.

Sedgwick, Kan.—City is considering installation of water works; cost, \$20,000. R. R. Hobbe, City Clerk.

Corbin, Ky.—City is considering construction of water works.—W. M. Steele, Secretary.

Homer, La.—City will shortly install complete water system.

White Castle, La.—Council has decided to extend water works on Lower Bowie St.

Freeport, Me.—Town has voted to authorize purchase of town water supply plant at a price not less than \$25,000.

Gagetown, Mich.—Citizens have voted bonds for installation of water works.

Newago, Mich.—Mayor W. J. Bell has recommended that plans be started for construction of water works system.

Aurora, Minn.—Council is considering installation of one 500-gal. underwriters' pump.

Taconite, Minn.—Duluth Engineering Co., Duluth, has prepared plans for installation of water works system; cost about \$15,000.

Bassfield, Miss.—Board of Aldermen has selected A. Kramer, Magnolia, as Consulting Engineer for proposed water works.

Biloxi, Miss.—Council is considering extension of the water system, including 85 new hydrants, 13,000 ft. 4-in. pipe, 43,000 ft. 6-in. pipe and 1,800 ft. of 8-in. pipe; if a line to the Camp Grounds is put in there will be 5,300 additional feet of 6-in. pipe; approximate cost, \$60,000, not including cost of proposed pumping station improvements.

Tylertown, Miss.—I. L. Sauls has asked for 25-year franchise to install and operate water works and electric light plant.

Bridgeport, Neb.—Citizens have voted \$17,500 bonds for construction of water works.

Red Cloud, Neb.—Citizens will vote on \$6,000 bond issue for water works improvements.

Weare, N. H.—Town is considering construction of reservoir to cost about \$18,800.—J. B. Warren, Town Clerk.

Branchville, N. J.—Branchville Water & Improvement Co. has decided to construct reservoir.

Fredonia, N. Y.—Village Board of Trustees has instructed Engineer Wilder to prepare plans and estimates for improving present water works system.

Lyons, N. Y.—Witner & Brown, Consulting Engineers, Buffalo, have presented proposition to Board of Village Trustees relative to securing supply of pure water.

Riverhead, L. I., N. Y.—W. E. Sexton, Consulting Engineer, Mineola, has been engaged to prepare plans and specifications for installation of municipal water system, including eight miles of 5 to 12 in. mains, 125 fire hydrants, two triplex power pumps, each 750 gal. per min., two 75-horsepower gas engines and gas producers; brick and concrete pumping station, 150,000-gal. steel tank; tower, 150 ft. high; estimated cost, \$90,000.

Kenton, O.—Voters have decided to issue \$10,000 water works bonds to replace plant recently condemned.

Helena, Okla.—Town has issued \$10,000 of bonds for extension of water works.—L. A. Rulley, Town Clerk.

McAlester, Okla.—Council has adopted a suggestion by Commissioner of Public Works Schreiber, whereby city will build additional dam north of the dam on the city water shed at the cost of about \$50,000; dam when completed will hold 1,500,000-000 gals. of water; also will construct pipe line from Gaines Creek, which will require about 10,000 ft. of pipe; line with boilers and pump will cost approximately \$30,000; 6-in. steel pipe will be used.

Hood River, Ore.—City has sold \$90,000 bonds to Uten & Co., Chicago; municipal water works system will be constructed.

Blain, Pa.—Council has adopted ordinance providing \$7,000 appropriation to provide adequate water supply.—W. H. Hench, President.

McKeesport, Pa.—Mayor Arthur has recommended installation of standpipe to supply pressure in mill district.

Clinton, S. C.—Citizens have voted \$20,000 bonds for extension of water mains; bids for bonds will be asked at once.

Nocona, Tex.—Citizens will vote May 8 on \$17,500 bonds for water works.—J. L. Davis, Secretary.

Winters, Tex.—O'Neil Engineering Co., Dallas, has prepared plans for construction of water works; cost, \$20,000. W. J. McFarland is in charge.

Yorktown, Tex.—Citizens will vote May 6 on \$6,000 bonds for extension of water mains.

Ridgetown, Ont., Can.—Ratepayers will vote April 25 on \$35,000 by-law for installation of system of water works.—D. Cochrane, Town Clerk.

CONTRACTS AWARDED

Atlanta, Ga.—Furnishing fire hydrants, to the Columbian Iron Works, Chattanooga, Tenn.; approximately 200 4-in. hydrants at \$20.75 each and 100 hydrants, 6x5 in., at \$27.40; filter house, to George A. Clayton, \$5,810.20; Macke-Crawford Contracting Co. bid \$5,914.

Sparta, Ga.—Construction of water works and sewers to Walton & Wagner, Atlanta, about \$34,000; includes 3 miles of sewers and purification plant and 3½ miles of water mains, 4 to 8 in.; two 750,000-gal. pumps, air compressor, boiler, power house, 100,000-gal. brick reservoir, 80,000-gal. tank on steel tower 150 ft. to top of tank.

Chicago, Ill.—Setting two batteries, each of 300-horsepower boilers, at Roseland pumping station, 104th st. and Stewart ave., to Jos. T. Dorgan, 109 Randolph st., \$4,195; furnishing open feed water heater and purifier to Roseland pumping station, 104th st. and C. & W. I. R. R., to Platt Iron Works Co., \$888; furnishing hydraulic packing for the pumping stations to Quaker City Rubber Co., 186 Lake st., \$1,500; other packing to Anchor Packing Co., \$5,810; furnishing, delivering and erecting in place two electrically driven centrifugal pumps, including bed plates, transformers, switchboards, piping, etc., necessary to deliver 4,000,000 gal. of water against a head of 130 ft., to Platt Iron Works Co., 311 Dearborn st., \$53,900; plant is to be erected at the pumping station located at 22d st. and Ashland ave.

East Moline, Ill.—To complete water works system to E. R. Harding, Racine, Wis., \$15,500.

Montpelier, Ind.—Drilling three water wells at the light and water works to John C. Burkett, Balbec.

Coldwater, Kan.—Furnishing material and constructing water and electric lighting systems from plans of J. S. Worley Co., 217-19 Reliance Building, Kansas City, Mo., to Fred M. Clark, Savannah, Mo., \$29,180.

Easthampton, Mass.—Furnishing pipe to R. D. Wood & Co., 400 Chestnut St., Philadelphia, \$22.12 per ton; about 4½ miles of 8 and 6 in. pipe will be needed.

New Bedford, Mass.—Furnishing 60 tons of high grade "Quaker" brand of pig lead, to Bruce & Cook, New York City, and Chadwick-Boston Lead Co., Boston, Mass., \$92.40 per ton of 2,000 lbs.

St. Paul, Minn.—Pumping machinery and electric motor for the new west side well plant, to R. B. Whittaker & Co.

Kansas City, Mo.—Furnishing self-contained, vertical, triple-expansion crank and flywheel pumping engine to the Allis-Chalmers Co., Milwaukee, Wis., \$129,500 for a direct flow pump, 66-in. stroke.

South River, N. J.—To the Buffalo Steam Pump Co., of Buffalo, N. Y., for furnishing pumps for water works plant; equipment consists of two 5-in. 2-stage centrifugal pumps, each having a capacity of 800,000 gal. of water per day against a total head of 135 lb.; pumps will be driven by 75-horsepower, 1,700-r.p.m. Fort Wayne motors.

Ogdensburg, N. Y.—Construction of pumping station, filters, intake and mains to L. B. Cleveland, Watertown, \$79,349.

Fernbank, O.—Furnishing material and laying water pipe, furnishing valves and boxes to U. S. Cast Iron Pipe & Foundry Co.; to Bourbon Copper & Brass Works Co. and to J. H. L. Barr; total cost, \$14,238.

Sugar Creek, O.—Construction of the water works system, pipe and specials to the Clow Pipe Co., Coshocton, 4-in., \$23.50; 6-in., \$22.50 per ton; pipe laying to A. Sheets, Newcomerstown, 18c. for 4-in., 20 cts. for 6-in.; 40,000-gal. tank and tower to Des Moines Bridge & Iron Co., Des Moines, Ia., \$1,995; valves, hydrants and valve boxes to Darling Pump & Mfg. Co., hydrants, \$22; 4-in. valves, \$6.50; 6-in. valves, \$10.50; valve boxes, \$2.70; bids for pumps and engines will be asked as soon as water supply wells are completed.

Columbia, S. C.—Laying water mains, to Weston & Brooker, \$2,368; bid of the Hill Engineering Co., Atlanta, \$2,203.40, was not accepted because it did not comply with

specifications of the City Engineer; water pipe and other supplies will be furnished by Lynchburg Foundry Co., Lynchburg, Va., \$3,780.20; bid of the American Cast Iron Pipe Co., Birmingham, Ala., \$4,077.72.

BIDS RECEIVED

Ontario, Cal.—Construction of pumping plant: The Fairbanks, Morse Co., Los Angeles, \$22,180, including building; Pacific Coast Mfg. Co., \$30,122 for plant consisting of 250-h.p. De La Vergne, crude oil engine, air compressor, triplex pump, etc.; Pomona Mfg. Co., \$15,091 for a gas engine plant to lift 100 miners' instruments 6 ft. above wells; also to install electric power plant, including two 75-h.p., \$12,946; Smith, Booth, Usher Co., four bids, ranging from \$3,365 to \$1,773 for plant to lift water from pumping plant to reservoir; George E. Dow Pumping Engine Co., same plant, \$3,715 to \$5,100.—F. E. Trask, Laughlin Bldg., Los Angeles, Engineer.

Toulon, Ill.—Constructing system of water supply pipes, from plans of W. S. Shields Co., 1201 Hartford Bldg., Chicago; M. Murphy, Chicago, \$15,712; Des Moines Bridge & Iron Co., \$14,968; E. Pronger & Fletcher, Blue Island, \$14,792; A. J. Anderson & Co., Kewanee, \$16,238.60; Kewanee Sanitary Supply Co., Kewanee, \$13,142.60; C. T. Bartlett, Evanston, \$14,740; Cook Constr. Co., Des Moines, Ia., \$14,972; Geo. A. Maleny, Kewanee, \$14,782; A. D. Thompson, Peoria, \$14,711, and John O'Neil & Sons, Peoria, \$17,148; work consists of 1,200 ft. 8-in., 8,150 ft. 6-in. and 13,340 ft. 4-in. c. i. water pipe, 47 hydrants, 22 valves, 3-in., 6-in. and 4-in., and 21 boxes.

New York, N. Y.—Making test borings, section 1, for proposed pressure tunnel crossing under Harlem River, north of Central Bridge; section 2, for three proposed tunnels, one at Westchester ave. and Bronx River, and one at River ave. and New York Central Railroad, and one at 135th st. and Mott Haven Canal; Grant Rohrer, 299 Broadway, section 1, \$10,955; section 2, \$16,690.

Troy, N. Y.—Construction of the Martin-Dunham Reservoir: Reservoir Construction—McDonough Construction Co., Troy, \$155,278; Corliss Construction Co., \$158,851; Philip Casey, \$174,703; Brown & Lowe, \$186,284; Powers & Mansfield Co., \$199,219; Haggerty & Drummond Co., \$214,410; Winston Construction Co., \$219,529. Cast Iron Pipe—John Fox & Co., \$2,163; Donaldson Iron Co., \$2,153; Charles Millar & Sons Co., \$2,138; R. D. Wood & Co., Utica, N. Y., \$1,997. Valves, etc.—Ludlow Valve Co., Troy, \$978; Eddy Valve Co., \$1,033; Rensselaer Valve Co., \$1,037.

Falls City, Ore.—Construction of the municipal water works: Jahn Contracting Co., Portland, \$21,206; B. Henske, Portland, \$23,514; K. Sauchet, Corvallis, \$24,200; Moffett Parker, Oregon City, \$24,299.25.

Galveston, Tex.—Construction of the city's duplicate water main across Galveston Bay: Isaac Heffron, of Galveston, \$66,389 and \$6.16 per lin. ft. for extra 30-in. pipe that may be needed; A. M. Blodgett Construction Co., causeway contractors, \$70,652 and \$6.50 per ft. for extra pipe; Kelso & Vautrin, of Galveston, \$72,024.54 and \$7.25 for extra pipe; A. L. Patterson, of New Orleans, \$85,051.40 and \$7.90 per ft. for extra pipe.

LIGHTING AND POWER

Fresno, Cal.—Pacific Gas & Electric Co. will lay 7½ miles of 6, 8 and 10 in. gas mains; cost, \$40,000. A. W. Florence, District Manager.

Los Angeles, Cal.—Eagle Rock Water Co. has secured franchise for stringing poles and wires for street illuminating system and commercial lighting system.

San Bernardino, Cal.—Southern California Gas Co. has asked Board of Supervisors for a franchise for laying of network of gas mains in county.—C. M. Grow, Local Manager.

Americus, Ga.—Citizens have voted \$105,000 bonds for improvements to water works, sewers and streets.

Colquitt, Ga.—Citizens have voted \$22,000 bonds for erection of electric light plant.

Shoals, Ind.—Bids will be asked about July 1 for construction of power plant. F. W. Bateman, City Engineer.

Central City, Ia.—Power plant to produce electricity to light five Iowa towns is to be erected this summer by Fred J. Cross, of Monticello; towns are Cogon, Central City, Center Point, Walker and Springville.

Clarion, Ia.—M. E. Mozengo and W. H. Carr have purchased electric light plant; will install day current and other improvements.

Jewell, Ia.—W. H. Grover, of Ames, will soon commence construction of electric light plant.

Walker, Ia.—Citizens have voted to grant Mr. Cross, of Monticello, franchise for electric power and heating plant.

Webster City, Ia.—Special election is being considered on \$25,000 bond issue to equip electric light and power plant.

Homer, La.—Town Council has under consideration proposition of acquiring electric light plant owned and operated by Ed. Sawyers.

Baltimore, Md.—Superintendent of Lamps and Lighting is having specifications drawn asking for bids for electric light globes, which are to be renewed yearly.

Jackson, Mich.—Michigan United Rys. Co. is considering erection of power plant and substation to have 6,000-kilowatt capacity. M. S. Ralls, Chief Engineer.

Marquette, Mich.—Cleveland Cliffs Iron Co. has decided to erect power dam on Carp River between Nagaunce and Marquette; power station will be built to develop 7,000 horsepower.

Duluth, Minn.—Council has passed resolution calling upon City Engineer for estimate of probable cost of constructing plant for furnishing electric light, heat and power.

Tylertown, Miss.—Q. L. Sauls has asked for 25-year franchise to install and operate electric light and water works plant.

Chillicothe, Mo.—Fuller & Coulte, Consulting Engineers, St. Louis, Mo., will at once prepare plans for proposed light plant.

Franklin, Neb.—Bids will be asked about May 1 for construction of an electric light plant; cost about \$8,000.

Scotts Bluff, Neb.—F. H. Robert and A. B. Cross will build concrete electric lighting and power plant; cost, \$25,000. F. H. Robert, Engineer.

Gardnerville, Nev.—Truckee River General Electric Co. will extend power lines as far as Virginia Ranch; distance, 2½ miles.

Raleigh, N. C.—Plant of Rockingham Power Co. at Blewitt Falls has been transferred to the Yadkin River Power Co., Raleigh, with \$4,000,000 capital; company has purchased 11½ acres of land northwest of city for a big transforming station; lines are being surveyed from Blewitt Falls to Raleigh, hence to Durham, Henderson, Goldsboro and Fayetteville, with Raleigh as a distributing center.—Chas. E. Johnson, President.

Barberton, O.—Bids will be advertised for soon by city for lighting streets for the coming year; present contract with the Mohican Oil & Gas Co. expires June 1.

Helena, Okla.—Town has issued \$10,000 of light bonds.—L. A. Ruley, Town Clerk.

Corvallis, Ore.—Albany Interurban Railway has asked to use certain streets in city over which power transmission lines will be constructed.

Eugene, Ore.—Citizens have voted \$25,000 bonds to install and equip series Tungsten electric light system.

Altoona, Pa.—Plans have been completed and work will be started at once by Penn Central Electric Light and Power Co. on construction of a conduit system for its wires within fire district, aggregate cost of which will be in the neighborhood of \$250,000.—Kein Dodge, General Manager.

Philadelphia, Pa.—Philadelphia Electric Co. will erect auxiliary power plant on 30th st.

Edgefield, S. C.—Election on installation of electric light plant is being considered.

Granbury, Tex.—Granbury Water, Ice, Light & Power Co. will need electrical machinery.

Llano, Tex.—Municipal lighting system will be extended.

Tulia, Tex.—Citizens have voted \$25,000 bonds for construction of electric light plant and water works.

Tacoma, Wash.—Municipal Commission has authorized Commissioner of Light and Water to advertise for bids on certain cross arms for the light department; also for bids for 1,000 h. p. electrical current for operating the pumping plant at station C during the "on peak" hours.

Bayfield, Wis.—Water & Light Commissioners will soon improve electric light plant.

Monterey, Mex.—William Mackenzie, Toronto, Canada, President of Canadian Northern Railroad, will soon begin installation of gas plant and construction of distributing system in city; W. A. Aldrich, Grand Rapids, Mich., has finished making investigation of situation; Lewis Lukes is in charge.

New Westminster, B. C., Can.—Council is considering installation of municipal gas plant.

Thessalon, Ont., Can.—City will install electric light plant and power house.

CONTRACTS AWARDED

Key West, Fla.—Lighting streets with tungsten lights, three years, to Key West Electric Co.

Chicago, Ill.—Furnishing 2,270,000 arc light carbons to the National Carbon Co., Cleveland, O., \$31,665.

Freeport, Ill.—Lighting city for five years to Freeport Railway & Light Co., arc lights, \$67 per year; boulevard lights, \$36 per post.

Richmond, Ind.—Engine and other machinery and equipment for the municipal electric light plant to the Horen, Owens, Rentschler Co., Hamilton, O., \$8,250.

Salem, Mass.—Street lighting, five years, to Salem Lighting Co.; company will supply 25 magnetite arc lamps, 225 6.6-ampere arc lights and 700 tungsten lamps of 60 candlepower, \$36,756 per year.

Carlisle, Ky.—Council has renewed contract with Carlisle Electric Light and Power Co. for lighting streets.

Westfield, Mass.—Furnishing cables for underground conduit system of electric light and power system in connection with improvements in E. m. st. and Park Square, to Safety Insulating Wire and Cable Co., New York, \$11,655.

Eveleth, Minn.—To John S. Swanson, Duluth, to install and furnish material for Grant ave. White Way, \$4,796.

Phillipsburg, N. J.—Council has decided to enter into contract with Easton (Pa.) Gas and Electric Co. to light streets for 10 years, \$65 per year for each arc light.

Prospect, Ore.—By Rogue River Electric Co., to Prospect Construction Co., 218 West Main St., Midford, which will sublet the following: 50 miles of pole line, 40-ft. poles, 30 to the mile; building 5,000 ft. of 5x9-ft. wood flume and hauling 750 tons of supplies.

BIDS RECEIVED

Jacksonville, Fla.—Building city electric light power station; furnishing traveling crane; for a 30-ton, 3-motor traveling crane, proposals were received as follows: Pawling & Harnischfeger Co., Milwaukee, \$5,375; Manning, Maxwell & Moore, New York, \$6,365; Case Crane Co., Columbus, O., \$4,671; Toledo Bridge & Crane Co., Toledo, \$5,175; Niles Electric Traveling Cranes, Philadelphia, \$4,960. For four 500-horsepower, horizontal, water-tube boilers for 200 lbs. working pressure. Under the notice for bids in this connection proposals were also asked for removal of two batteries of boilers, now in use at the old station, together with separate bids for installing complete, ready for main steam and oil connections, sixteen Peabody oil burners and pipe for re-erected boilers: Babcock & Wilcox Co., New York, boilers, \$39,384; burners, \$1,172; E. Keefer Co., Williamsport, Pa., boilers and burners, \$20,186; Casey-Hedges Co., Chattanooga, boilers, \$19,200. For two surface condensing equipment: Henry R. Worthington Co., New York, \$53,000; Alberger Condenser Co., New York, \$40,775; C. H. Wheeler Manufacturing Co., Philadelphia, \$32,950. Eight super heaters for connection to and use with water-tube boilers: Power Specialty Co., Philadelphia, \$13,000; Babcock, Wilcox Co., New York, \$8,156. Two outside, center packed, plunger boiler feed pumps: Exeter Machine Works, Philadelphia, \$2,315; Harrison Safety Boiler Works, Philadelphia, \$2,100; Warren Webster Co., Camden, N. J., \$1,850. Six piston pattern pumps, with drip pan, the following bids were received: Warren Steam Pump Co., Warren, O., \$4,228; Epping Carpenter Co., Philadelphia, \$3,300; C. H. Wheeler Manufacturing Co., Philadelphia, \$5,985; T. T. Burchfield Co., Philadelphia, \$4,890; Henry R. Worthington Co., New York, \$6,183. Two turbo-generators, 1,500 kilowatts, 6,600 volts, three-phase, 60-cycle: Allis-Chalmers Co., Milwaukee, \$57,930; General Electric Co., Schenectady, \$50,675; Westinghouse Machine House, Pittsburgh, \$55,829. Removal and re-erecting the two 1,500-kilowatt turbo-generators now in use at the old plant: Allis-Chalmers Co., Milwaukee, \$7,504.

Eveleth, Minn.—Installing Grant Ave. White Way: Adams-Bagna Co., Chicago, 46 standards, complete, \$1,546.52; incomplete, \$44.07 each; Lukk Bros., Aurora, Ill., costs, \$27.60 each; with base, 40 each; without base, \$33 each; with base, \$46 each; without base, \$38 each; John S. Swanson, Duluth, system complete, \$4,359; city furnish material, \$460; 200 lamps, 500 watts, \$39.50 each; 46 alabaster globes, \$1,226; 10-in. lamp, \$1.69 each; 6-in. lamp, 70 cts. each; wiring, etc., \$1,637; McDonald Boiler Works, Des Moines, Iowa, Crown post, \$27; Regal post, \$33; Machbeth post, \$36; Imnerial, \$44; Egyptian, \$44; Flour City Iron Works, 46 posts, \$50 each; globes, \$299; Capital post, \$46; Corinthian post, \$65; Twitchler Electric Co., Virginia, system, complete, \$4,908; Lawrence & Rutherford, Virginia, material, \$1,127.20; work of installation, \$150; Zenith Electric Co., Eveleth, installation, \$697; tungstens, \$1.35 each; 16-in. globes, \$2.98 each; 12-in. globe, \$1.18; wiring, etc., \$1,798.55; Marshall-Wells, Duluth, 230 tungstens, 100 watts, \$1.03 each; 16-in. globes, \$1.58 each; 12-in. globes, 60 cts.; Western Electric Co., Minneapolis, posts, complete, \$43.20 each; incomplete, \$1.72; 16-in. globe, \$1.72; 12-in. globe, 50 cts.; 230 tungstens, 100 watts, \$1,108; H. E. Franklin Co., Milwaukee, posts, complete, \$45 each; installation, \$2,070; 100-watt tungstens, \$1 each; 16-in. globe, \$3 each; 12-in., \$1.50.

Dayton, O.—Dayton Lighting Co. has submitted proposals for lighting city streets by boulevard lighting system; company proposes to turn over to city direction of the lighting which it has served for several months by private contract with property owners; there are 351 poles in city; company's bid is for \$125 per pole per year for one-year contract and \$67.50 per pole per year for five-year contract; no other bids were submitted.

FIRE EQUIPMENT

Thorsby, Ala.—City wants chemical fire extinguisher; also to correspond with manufacturers. P. K. Villadsen can be addressed.

Fort Smith, Ark.—Mayor Fagan Bourland has recommended erection and equipment of fire house at North B and H sts.

Hanford, Cal.—City Board of Trustees has decided to purchase auto chemical fire truck; present chemical and hose apparatus is to be exchanged.

Palo Alto, Cal.—Citizens have voted bonds to purchase auto fire engine.

Sacramento, Cal.—Architect E. C. Hemmings will prepare plans for erection of fire station on 20th st.

Denver, Col.—City will have \$15,000 available for purchase of steamer and two auto fire trucks.—T. F. Owens, Chief.

Naugatuck, Conn.—Town will vote in May on appropriation to purchase auto chemical and pump. Address Fire Chief Clark.

Stratford, Conn.—Site at Nichols and Johnson Aves. will be purchased for erection of fire house. Alfred Shippe, President Fire Company.

Bridgeville, Del.—Local firemen have decided to erect \$3,000 hall.

Brunswick, Ga.—Council will ask for bids for furnishing fire truck.

Sterling, Ill.—Council is considering purchase of additional fire apparatus.

Princeton, Ind.—Council is considering bettering of fire equipment.

Des Moines, Ia.—E. R. Townsend, Engineer, National Board of Underwriters, has recommended need of two auto fire trucks and first-class steam fire engine.

Houma, La.—New volunteer fire department has been formed.—J. F. Campbell, Chief.

Lancaster, Mass.—Town has appropriated \$1,500 for combination chemical engine.

Lee, Mass.—Town will erect \$12,000 fire house this summer. Address Chief Engineer Hayden.

Battle Creek, Mich.—City will purchase 1,000 ft. of hose and auto for Chief.—W. P. Weeks, Fire Chief.

Iron River, Mich.—City is considering purchase of combination hose and chemical wagon and other equipment. Chas. McFarland, Chief.

Omaha, Neb.—Purchase of additional apparatus is being considered. Address Fire Chief Salter.

Keypoint, N. J.—Eagle Hose Company has plans under way for erection of fire house on Broadway.

Milbourn, N. J.—Fire Committee will : for bids for furnishing hand-drawn hose wagon equipped with two 35-gal. chemical tanks.

Red Bank, N. J.—Citizens will vote on erection of fire house for Relief Engine Company No. 1.

Albany, N. Y.—Plans and specifications for standpipes and a complete system of fire protection to be installed in the State Capitol are about completed by State Architect Ware.

Bogota, N. Y.—Bids will be asked for installation of fire alarm system. C. V. R. Bogert is interested.

Niagara Falls, N. Y.—Citizens will vote May 16 on \$42,500 for two new fire halls and fire apparatus.

Pearl River, N. Y.—Fire Department is considering purchase of gasoline fire engine, combination chemical engine and hose wagon and hose.—E. Van Horn, Secretary.

Tarboro, N. C.—Local fire department is considering purchase of apparatus. M. W. Haynes is interested.

Devil's Lake, N. D.—Citizens have voted \$10,000 bonds to erect fire station.

Mott, N. D.—Fire Department has been organized.—W. W. Wright, Chief.

Weston, O.—Village Council has passed ordinance providing for volunteer fire company of 30 members which will soon be organized.

McKeesport, Pa.—Mayor Arthur has recommended need of fire engine.

Port Kennedy, Pa.—Fire company has been organized. H. S. Hittell, President.

Cresbard, S. D.—Allen Fire Co. is considering purchase of auto fire engine.

Texarkana, Tex.—Mayor De Loach has been authorized to contract for and purchase two additional auto fire machines for fire department, each machine to cost about \$4,500.

Weatherford, Tex.—City has sold \$15,000 bonds to build fire station and city hall.

Portsmouth, Va.—Council will consider \$2,500 appropriation for purchase of hose.

Rutland, Vt.—Fire Chief Dunn has recommended purchase of combination chemical truck.

Tacoma, Wash.—Council has decided to erect \$12,000 brick fire house at North 25th and Proctor sts.

Corral, Chile.—M. J. Gonzales desires information and lowest prices from manufacturers on chemical fire extinguishers.

CONTRACTS AWARDED

Texarkana, Ark.—Council has purchased two combination chemical hose wagon automobiles manufactured by White Co., Cleveland, O., and Kanawha Co. at Charleston, S. C.; cars will have White trucks and be equipped with Kanawha chemical apparatus; \$1,112.50 for each car.

Lake Charles, La.—Erection of a brick fire station to Delatte & Lagrange; cost \$9,364. T. H. Mandell, City Engineer.

Nutley, N. J.—Furnishing 60-h.p. auto fire engine, to Pope-Hartford Co.

Everett, Wash.—By Fire and Police Commission, to Gorham Rubber Co. to supply department with 1,000 lb. of hose.

BIDS RECEIVED

New Orleans, La.—Erecting engine house at Carrollton ave. and Moss st., Petty & Irwin, \$11,790; John Minot, \$11,900; John Reusch, \$11,589; Caldwell & French, \$12,300; Chesce & Co., \$12,514; Chisolm & Co., \$11,975; J. W. Lennox, \$13,450.

Long Branch, N. J.—Building and furnishing of fourth-class steam fire engine: The Ahrens Fox Fire Engine Co., \$5,000; American La-France Fire Engine Co., \$4,900; Combination Ladder Co., \$4,600, allowing \$600 for the old engine. Furnishing 11 non-interfering fire alarm signal boxes: The Loper Fire Alarm Co., \$90 each, f.o.b. Long Branch; Foote Pierson & Co., \$90 each, f.o.b. Long Branch; Gamewell Fire Alarm Telegraph Co., \$825, f.o.b. Long Branch; Star Electric Co., \$715, f.o.b. Long Branch. Construction of hose tower and installation of a bell and striker: D. K. White, \$1,260; with bell same as in Oceanic Fire Company's tower, \$1,089; R. B. Storm, with McShane bell, \$1,376; R. B. Storm, with McShane bell, \$1,105; R. B. Storm, with tower as per blue print and McShane bell, \$1,001.25; R. B. Storm, with tower as per blue print, with McShane bell, \$1,271.25. Furnishing of firemen's coats and boots: 10, 10, White, 45 rubber coats like sample submitted, \$4.50 each; 45 pairs of firemen's Storm King boots like sample 7F, \$4.75 per pair; 45 pairs of firemen's Storm King boots like sample 8F, \$4.35 per pair; Joseph Goldstein, 45 pairs of Banigan's Storm King boots, \$4.50 per pair; 45 firemen's rubber coats in three grades, No. 1, \$4.40 each; No. 2, \$4.35 each; No. 3, \$4.25 each; R. B. Storm, Goodyear firemen's rubber coats, \$4.70 each; Goodyear firemen's Storm King boots with roll soles, \$5.03 per pair; same grade without roll soles, \$4.90 per pair; C. A. Johnson & Co., 45 pairs of rubber boots as per sample submitted, \$4.92 per pair; Chester M. Truax, 45 pairs of rubber boots as per sample submitted, \$4.75 per pair.

Jersey City, N. J.—Fire Engine: International Power Co., \$5,450; Nott Power Engine Co., \$6,250; American La-France Engine Co., \$5,500, with \$175 extra for rubber tires. For 85-ft. extension ladder truck: Webb Motor Truck Apparatus Co., \$12,000; American La-France Co., \$6,600, and the Combination Ladder Co., \$6,000.

BRIDGES

Hollister, Cal.—County Surveyor A. M. McCray is preparing plans for concrete bridge to replace San Juan Bridge.

Sacramento, Cal.—Supervisors will erect \$30,000 bridge across American River.

Thomasville, Ga.—Thomas County Commissioners will purchase material and construct steel and concrete bridges.—C. M. Smith, Chairman.

Bluffton, Ind.—Board of County Commissioners has adopted profiles for 14 new bridges to be constructed the coming summer at total cost of about \$10,000.

Fowler, Ind.—Benton County Commissioners are asking for bids for construction of three cement and I-beam bridges. Lemuel Shipman, County Auditor.

Goshen, Ind.—County Commissioners are considering construction of bridge over Rock Run on N. Main st.; cost about \$7,000.

Clinton, Ia.—County Supervisors will locate such bridges as Board desires to erect and invite separate bids for erection.

Foxcroft, Me.—Town has voted to build \$25,000 bridge across Liscatoquis River.

West Falmouth, Me.—Town has voted to build reinforced concrete bridge over Presumpscot River.

Sharptown, Md.—State Roads Commission, Union Trust Building, Baltimore, will construct proposed bridge over Nanticoke River; structure will be 1,000 ft. long, with 75 ft. draw; cost about \$50,000.

Niagara Falls, N. Y.—Board of Public Works has recommended to Council erection of reinforced concrete bridge over Gill Creek at Pine Ave. at cost of \$6,000.

Portland, Ore.—Citizens will vote June 5 on \$1,400,000 bonds to build proposed Woodward ave.—Alameda st. bridge across Willamette River in South Portland.

Butler, Pa.—City Engineer Carson has completed his survey of Center Ave. for proposed street wide viaduct.

Angleton, Tex.—Citizens have voted \$100,000 bonds to erect two bridges across the Brazos.

Uffington, W. Va.—Monongalia County Commissioners have decided to erect bridge at Uffington; cost from \$7,000 to \$8,000.

CONTRACTS AWARDED

Washington, D. C.—To the Penn Bridge Co., Beaver Falls, Pa., for reconstructing the bridge spanning Rock Creek Park at Calvert St.; cost about \$42,000.

Rockport, Ind.—Construction of 25 bridges in Spencer County to Vincennes Bridge Co., Vincennes; A. L. Greenburg Iron Co., Greenburg; and Haynes & Kinman, Evansville.

Vincennes, Ind.—Erecting three bridges to Vincennes Bridge Co., \$3,398.

Republic, Mich.—Constructing a 2-arch reinforced-concrete bridge, 150 ft. long, to the Illinois Bridge Co., \$4,937. V. S. Hillyer, County Engineer.

Monticello, Miss.—Constructing bridge over Silver Creek to Memphis Bridge Co., Memphis, Tenn., \$2,376.

Germantown, O.—To Charles Bird, Springfield, for concrete arch bridge, \$6,300. Other bidders: W. E. Croemer, \$6,400; E. H. Fouver, \$4,800, and Gabler Bros., \$6,600.

Luray, Va.—To the Virginia Bridge and Iron Co., Roanoke, for building bridge across Shenandoah River at Alma, this county, \$11,030.

Richmond, Va.—By Council Committee on Streets, to I. J. Smith & Co., city, for erecting reinforced concrete bridge over James River, to replace Mayo's bridge.

BIDS RECEIVED

Jersey City, N. J.—By Hudson Boulevard Commissioners for construction of bridge over Central R. R. of New Jersey in Bayonne, Joseph Murphy & Son, \$69,999; Carlington Construction Co., \$70,700; Stillman, Delehanty & Ferris Co., \$86,300; bridge over Pennsylvania R. R. near Pavia Ave., Vulcan Rail & Construction Co., of Brooklyn, N. Y., \$6,642; Snare & Triest Co., \$7,654; Oltmer Selbach Co., \$8,115.

Albany, N. Y.—Constructing center pier of the Minischoenge Creek drawbridge; E. S. Sickles, New Baltimore, \$5,018, and Theodore C. Hailes, Jr., \$5,745; W. J. Doyle, Albany, \$10,285; M. Fitzgerald, Hoosick Falls, \$11,243; Lupfer & Remick, Buffalo, \$11,138; P. M. McCaghey, Little Falls, \$10,766; Cunningham-Woodward Co., Hudson Falls, \$10,962. State Architect Ware is considering bids.

New York, N. Y.—Completely erecting and constructing reinforced concrete bridge from Hunter Island to Twin Island in Pelham Bay Park; S. Amanna, 3188 Villa Ave., \$5,950 and \$5,900; Loudins & Galls, 159 East 306th St., \$6,800 and \$6,700; Hasourg Construction Co., 126 Liberty St., \$8,377 and \$8,187; John F. O'Heir, 3052 Perry Ave., \$5,573 and \$4,833; Snare & Triest Co., 143 Liberty St., \$8,280 and \$8,000; Wm. Werner, 657 Vanderbilt St., Brooklyn, \$7,986 and \$7,780; higher prices are for bridge with guard rails to be of galvanized iron pipe.

MISCELLANEOUS

Greenville, Ala.—Butler County Commissioners are considering erection of \$25,000 jail.

Hamilton, Ala.—Marion County Board of Commissioners has passed order to receive plans and specifications at June term for modern jail.

Fort Smith, Ark.—Mayor Fagan Bourland has recommended installation of police patrol wagon and bettering of street draining and scavenger service.

Los Angeles, Cal.—Supervisors have purchased site for erection of addition to jail.

Los Angeles, Cal.—Police Commissioners will ask for \$25,000 appropriation for improvements at East Side station and \$20,000 for erection of substation in Hollywood.

Oakland, Cal.—Election bonds in sum ranging from \$2,000,000 to \$4,000,000 for the construction of subway beneath the estuary waters may be called by the Board of Supervisors in near future.

Palo Alto, Cal.—Citizens have voted to build city garbage incinerator.

Riverside, Cal.—Park Commissioners are consulting with Landscape Engineer Wilbur D. Cook, Wright & Callender Bldg., Los Angeles, with view to improvement of Fairmount Park; cost \$30,000.

Seaford, Del.—Town is considering erection of brick jail.

Wilmington, Del.—Incinerating plant of Wilmington Sanitary Co. at foot of Liberty st. has been destroyed by fire.

Sumterville, Fla.—Plans and specifications will be received May 1, 10 a. m., for erection of \$12,000 to \$20,000 Court House and \$5,000 jail. H. O. Collier, Chairman Board of County Commissioners.

Noblesville, Ind.—Council has passed ordinance to issue \$20,000 bonds to purchase site and erect city building and to purchase site for proposed Carnegie library.

Clinton, Ia.—Board of Park Commissioners has secured services of O. C. Simonds, Chicago, to plan improvements for Clinton Park, De Witt Park river front park and the Main st. park in Lyons.

Kingman, Kan.—City is to acquire the park and grounds now owned by Cattleman's Association.

Lake Charles, La.—Favrot & Livaudais, New Orleans, have been appointed architects for City Hall; cost approximately, \$75,000.—T. H. Mandell, City Engineer.

Bangor, Me.—Council has requested early erection of proposed public library on Harlow st.

Wells, Me.—Town is planning to rebuild municipal building destroyed by fire.

Boonsboro, Md.—Citizens will vote May 8 on erection of town hall.

Boston, Mass.—Council has passed order appropriating \$800,000 for city hall annex.

Cambridge, Mass.—Mayor J. Edward Barry has recommended better garbage collection methods and installation of \$5,000 incinerating plant; also proposed commission to study problems involved in remodeling new construction of city buildings.

Salem, Mass.—Board of Prison Commissioners has recommended erection of jail in this city.

Charlotte, Mich.—Citizens have voted \$18,000 bonds for improvements.

Lansing, Mich.—Citizens have defeated proposition to erect public station.

Eveleth, Minn.—Bids will be advertised for hauling city garbage for one year from May.

West Concord, Minn.—Citizens will soon vote on \$5,000 bonds to erect village hall.—D. M. McCarthy, Village Recorder.

Linden, N. J.—Citizens have voted to erect town hall.

Trenton, N. J.—Council has adopted resolutions for installing new street signs.

Bath, N. Y.—Citizens will vote on purchase of site for proposed village hall.

Yonkers, N. Y.—Landscape Artist Capon has submitted tentative plan to Commissioner of Public Works Wradly for treatment of approach to new city hall.

Hamilton, O.—Mayor A. Rothwell has recommended establishment of parks, purchase of additional property for erection of \$200,000 city hall, removal of Third Ward fire house to point farther north, and suggested installation of modern reclamation plant.

Portland, Ore.—Park Superintendent Mische has been directed by Park Board to proceed immediately with plans for playgrounds and a swimming tank in Marquam Gulch, South Portland.

Portland, Ore.—Citizens will vote June 5 on \$200,000 bonds to erect municipal building, \$600,000 for public auditorium, \$250,000 to purchase land for park site and \$75,000 to establish municipal system of garbage collection.

Titusville, Pa.—Purchase of flushing machine for street cleaning is being considered.—H. A. Holstein, City Engineer.

York, Pa.—Bids will be asked at once for furnishing about 1620 street signs; expansion screws will be used.

Galveston, Tex.—Board of City Commissioners has decided to ask for bids for installation of garbage crematory; \$8,500 available.

Bennington, Vt.—Citizens have defeated proposition to erect \$2,000 municipal building.

Portsmouth, Va.—Council will consider erection of \$100,000 city hall.

Richmond, Va.—Highland Park has voted for additional \$50,000 bond issue to be expended in general improvements.

Seattle, Wash.—Council has passed ordinance providing for election on Sept. 5 on \$500,000 bonds to purchase site for museum of arts and sciences.

Spokane, Wash.—County Commissioners have ordered preparation of plan for erection of two-story \$20,000 addition to present jail building.

Milwaukee, Wis.—Council has set aside \$1,300 for comfort station in connection with Sixth st. viaduct.

CONTRACTS AWARDED

Michigan City, Ind.—To Fitzsimmons & Connell Co. to erect sea wall along west side of harbor, \$17.45 per lin. ft. for cooping.

Hutchinson, Kan.—Sprinkling streets to M. M. Booher, W. H. Shipp and G. Hildebrandt.

Salina, Kan.—Erecting city hall, to Nelson Building Co., \$38,491.66; jail, to same, \$1,017.15.

Lake Charles, La.—Building Court House to the Texas Building Co. for fireproof building to cost \$180,132.

Boston, Mass.—Furnishing about 722 lb. iron picket fence for Charlesbank Playground to Geo. A. Houdlette & Son, \$1,235.

Gilbert, Minn.—Emptying garbage cans of village every second day, to O. Mattal, \$90 per month.

Paterson, N. J.—Building retaining wall and steps at Westside Park, to George W. Cisco, 34 1/2c and 32c.

Auburn, N. Y.—By Council for subway in East Genesee st. from John st. to Hunter ave. to Brayer Bros., Auburn, fib duct, \$25,808.50.

Buffalo, N. Y.—Installing 40-ton garbage refuse destructor, with accessories, to be erected at the present utilization plant Hamburg and Scott sts., to the Destructor Co., 111 Broadway, New York City, \$14,770.

Saranac Lake, N. Y.—Collection of garbage and refuse from the village, to R. L. Johnson, \$2,340 for year.

Schenectady, N. Y.—Building cottage Rotterdam pumping station, to Cook Ripley, \$3,097.78.

Syracuse, N. Y.—By Board of Supervisors for erecting Coroners building; painting, Woese Decorating Co., \$750; mason work to D. Rafferty & Son, \$9,377; carpenter work, to J. J. Sherlock, \$6,256.

Syracuse, N. Y.—Flushing streets, to Wm. Lowry, \$5.74, and sprinkling with electric cars, to American Sprinkler Car Co., \$5 per month.

Carnegie, Pa.—Collecting and disposing of garbage, to W. H. Prosser, city, \$4.2 per year.

South Bethlehem, Pa.—To Wm. I. Repsher to collect garbage for two years, \$10,767.

Columbia, S. C.—Furnishing summer uniforms of Columbia policemen and firemen to the M. L. Kinard Clothing Co.

Sabinal, Tex.—Erecting jail, to A. Toepferwein, contractor.

Heathsville, Va.—By Board of Supervisors of Westmoreland County, to Pauly J. Building Co., of St. Louis, Mo., George Smith, contracting agent, for construction of a modern two-story jail at Montross.

Portsmouth, Va.—Furnishing police uniforms for summer, to Breslauer & Anthony, city.

North Yakima, Wash.—Paving two improvement districts with concrete, Warren Construction Co., \$150,000.

Seattle, Wash.—Construction of two-story free bathing pavilion on Alki Av. and 61st St., West Seattle, to Jenkins Jones, Hinckley Block, \$29,892. Other bidders: Alex. Dow, \$24,876; Rounds-Hurst Co., \$25,425; B. H. Graft, \$25,739; Butcher Construction Co., \$25,900; McClelland Hickey Co., \$29,266; work includes a 30 ft. sea wall.

Berwood, W. Va.—To Dixon Eng. Co., Toledo, O., for crematory of 12 tons' daily capacity, about \$8,000.

Milwaukee, Wis.—Furnishing 1,700 new street signs, to Clifford A. Loew; each w. cost 3 1/2c.

Winnipeg, Man., Can.—By city to Bruce and A. Bostrum for installation of public baths, \$44,880.—William Bruce Architect.

BIDS RECEIVED

Long Beach, Cal.—Constructing 30-ft. cement walk and sea wall over 1 1/4 mi. in length, with ornamental electric light poles carrying cluster lights every 100 ft. for entire length of boulevard; J. D. Kee Co., \$120,985; J. C. Beer, \$122,947; Arthur S. Bent, \$140,000; J. W. Young, \$121,490.

Syracuse, N. Y.—Street sprinkling, five districts; John Young was only contractor to put in bids for sprinkling with calcium chloride solution; in each district the price was \$4.40 for 100 ft. per week; lowest bidder, William J. Lowery, \$5.74; other bidders: John Young, \$6.95; Central City Paving Co., \$6.85; Albert Gaffey, \$6.89; C. Hookway, \$6.58; C. P. De'ong, \$6.49; C. Amos, \$6.42; only bid for sprinkling with electric car was by American Sprinkler Co. Co., \$550 a month for each car; streets covered by contract are only those in which there are street car tracks.

Akron, O.—Erection of comfort station Main and Market sts., John Crisp & Son, \$7,099; Hunt & Wigley, \$6,853; Akron Storage and Contracting Co., \$9,764, and McShaffrey & Son, \$7,790.

TOO LATE FOR CLASSIFICATION

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREET IMPROVEMENTS				
Minnesota	Duluth	Apr. 21, 10 a.m.	Grading, paving and otherwise improving portion of Third Alley; construct, repair, and relay plank sidewalks for season of 1911.	Olof G. Olson, Pres. Bd. Pub. Wks.
Pennsylvania	Harrisburg	Apr. 24, noon	Constructing a road in Wildwood Park.	Chas. A. Dishrow, Chm. Pk. Com.
Pennsylvania	Harrisburg	Apr. 24, noon	Grading various highways.	W. W. Caldwell, Commissioner
New York	Long Island City	Apr. 24, 11 a.m.	Grading, curbing and paving with sheet asphalt various streets.	Lawrence Gresser, Boro. Pres.
Texas	Galveston	Apr. 24, 11 a.m.	Sloping, bulkheading, surfacing and paving a highway in Gal. Co.	John M. Murch, County Auditor.
New York	Dunkirk	Apr. 25, 8 p.m.	Grading and macadamizing about 17,300 sq. yds.	R. H. Heppell, City Clerk.
Illinois	Danville	Apr. 25, 7 p.m.	Paving with bituminous mac. about 11,000 sq. yds.; and 5,000 lin. ft. concrete gutter.	Walter E. Winne, City Engr.
New York	Plattsburg	Apr. 25, 7:30 p.m.	Constructing about 1,400 sq. yds. asphalt block pavement; and 1,400 sq. yds. vitrified brick pavement and 1,500 sq. yds. concrete pavement.	C. A. Barnard, City Clerk. Board Public Works.
Kentucky	Louisville	Apr. 26, 2 p.m.	Paving one mile of streets with vitrified brick, est. cost \$44,000.	John M. G. Carrera, City Clerk
Florida	St. Augustine	Apr. 26, 7:30 p.m.	Furnishing 10,000 gals. bituminous asphalt; 700 tons crushed stone; 50 tons screenings.	Cuno H. Randolph, Commissioner.
Ill. of Col.	Washington	Apr. 27, 2 p.m.	25,300 gals. bituminous binding mat. for bit. macadam roads.	John H. Moffitt, Co. Comptroller.
Pennsylvania	Washington	Apr. 27, noon	Constructing various country roads of macadam or brick; necessary culverts and small bridges.	Henry N. Knott, City Clerk.
Minnesota	Minneapolis	Apr. 28, 7:30 p.m.	Furnishing a stone crushing plant.	W. B. Dryden, Secy. B. P. Imp.
Missouri	St. Louis	Apr. 28, noon	Installing a municipal asphalt plant.	John J. Wenner, Clk. B. P. Serv.
Ohio	Cincinnati	Apr. 28, noon	Grading, setting cement curbs, paving roadway with brick and constructing drains and inlets in portion of Ludlow ave.	Fred. Shane, Secy. Bd. Pub. Serv.
Ohio	Toledo	Apr. 28, noon	Grading portion of Albert street and paving central 20 ft. with tar mac. together with nec. curb, retain. walls, drainage, etc.	Jacob Klein, Dir. Pub. Serv.
Ohio	Springfield	Apr. 29	Construct. sidewalks and gut., and mac. portion of College ave.	Nathan G. Wallace, Audr. Vigo Co.
Indiana	Terre Haute	Apr. 29, 11 a.m.	Grad. and pay. with gravel various roads in Vigo County.	Lemuel Shipman, Audr. Benton Co.
Indiana	Fowler	May 1, 1 p.m.	Constructing free stone roads in Benton County of crushed blue stone, together with bridges and drainage.	S. W. Murray, City Clerk.
New York	Binghamton	May 3	Paving portion of Water street with vitrified brick.	P. D. Thurmond, City Engineer.
Missouri	Fulton	May 4	Construct. 9,000 yds. brick pavement on 5-in. concrete foundation; 12,000 yds. mac. with binder and 10,000 ft. con. curb.	Edgar A. Stagg, Audr. Clay County.
Indiana	Brazil	May 5, 11:30 a.m.	Constructing two gravel roads in Clay township.	Philip Prieoleau, City Engr.
Florida	Jacksonville	May 12, 2:30 p.m.	Grading, curbing and paving with vitrified blocks of some standard brand various streets.	
SEWERAGE				
Ohio	Cincinnati	Apr. 28, noon	Constructing main and lateral sewers.	John J. Wenner.
North Dakota	Canton	May 2	Extending the sewer system at the Canton Insane Asylum.	Dr. Harry R. Hummer, Supt.
Wisconsin	Baraboo	May 17	Constructing trunk sewers, 3,000 lin. ft. 30 and 27-in. pipe.	A. H. Huebing, City Clerk.
WATER SUPPLY				
New York	New York	Apr. 21, 2 p.m.	Furnishing valves.	Henry S. Thompson, Comr. W. S.
Iowa	Sioux City	Apr. 22, 10 a.m.	Constructing 100,000 gal. steel tank and tower and furn. two triplex single or double acting power pumps and two gas. eng.	G. B. Healy, Supt. Pks. & Propert.
Pennsylvania	McKeesport	Apr. 24, 4 p.m.	Laying 2,710 ft. of c. i. water pipe mains.	C. E. Soles, City Comptroller.
Pennsylvania	Harrisburg	Apr. 24, 3 p.m.	Furn. c. i. pipe and special castings, valves, hydrants, etc., for year ending May 31, 1912.	John A. Affleck, Pres. W. & L. D.
Connecticut	Ft. H. G. Wright	Apr. 25, 11 a.m.	Constructing additions to water system, including 2 reinforced concrete pump houses, 2 electrically driven centrifugal pumps, water mains and reinforced concrete storage reservoir.	Capt. F. T. Arnold, Con. Q.M., U.S.A.
New York	New York	Apr. 26, 2 p.m.	Installing pump slip indicators, and constructing pitometer vaults, at 2 pumping stations.	Henry S. Thompson, Conr. W. Sup.
New Jersey	Rahway	May 3, 8 p.m.	Furn. one 5,000,000 gal. horizontal, high-duty, cross-compound, crank and fly-wheel pumping engine.	A. F. Kirstein, Supt. Bd. W. Comrs.
BRIDGES				
New York	Niagara Falls	Apr. 24, 3 p.m.	Construct. abut. of bridge over tracks of N. Y. Central.	Asher T. Cudaback, Pres. B. G. C. C.
New Jersey	Hackensack	Apr. 25, 2:30 p.m.	Constructing bridge across Passaic river.	John H. Kehoe, Chm. Pas. Co. Com.
Pennsylvania	Danville	Apr. 29, 2 p.m.	Construct. a reinforced conc. bridge near Washingtonville, 50-ft. clear span.	Horace Blue, Clerk Co. Comrs.
LIGHTING AND POWER				
Illinois	Ottawa	Apr. 25	Elec. wir. and light posts to light Ill. river bridge and appr.	Benj. F. Krouse, City Clerk.
Ill. of Col.	Washington	May 1, 2 p.m.	Furn. 830 more or less c. i. lamp posts and access. special design	Cuno H. Randolph, Conrs.
MISCELLANEOUS				
Pennsylvania	Harrisburg	Apr. 24, noon	Constructing an engine house.	C. A. Garverich, Chief Engineer
Pennsylvania	Reading	May 3	Furn. sup. for fiscal year; clean. paved sts. and catch basins.	Caleb Steidner, City Clerk

STREET IMPROVEMENTS

St. Augustine, Fla.—Council has decided to have Bay st. paved with asphalt macadam from Fort to King st.

Muncie, Ind.—Board of Public Works will let contracts during spring for paving number of streets with brick.

Pennville, Ind.—Grier F. Gemmill and other residents have petitioned Board of Commissioners of Jay County for brick streets.

Denison, Ia.—City has made a contract with the Consolidated Engineering Co., Omaha, Neb., to make plans and specifications for laying 30 blocks of paving in the near future.

Lawrence, Kan.—Council has decided to pave Quincy st.

Augusta, Ky.—Bracken County Fiscal Court has ordered election on \$25,000 bonds for turpentine repairs.

Georgetown, Ky.—County Board is considering purchase of 1,500 road roller.

Louisville, Ky.—North side of Broadway, fourth ave. to Campbell st., will be newly asphalted at estimated cost of \$30,000.—M. J. Neal, Vice Chairman Board of Works.

Hodgenville, Ky.—Town Board will extend \$1,000 in improving College st.

Dodge Park, Md.—Kent Citizens' Association is planning to build road from Malboro pipe, this town, to Huntsville, distance 1/2 miles.—O. C. Strawn, President.

Lowell, Mass.—Following estimates have been given by Engineer Kearney: Moody st., macadam from bridge to Sixth ave., 7,100; wooden block paving, for Moody st.

bridge, \$5,200; Riverside st., macadam, \$4,850; macadam for Summer st., \$1,310.

Somerville, Mass.—Mayor Burns has recommended following appropriations on funded debt account: Highway construction, \$44,000; highways, paved gutters and crossings, \$6,000; sidewalk construction, \$16,000.

Worthington, Mass.—Town has voted \$500 to be used with like sum appropriated by State Highway Commission for betterment of roads.

Eveleth, Minn.—Aldermen are considering estimate of City Engineer P. F. Huntington of over \$13,000 to pave streets and alleys between Monroe and Jones sts. and Douglas and Grant and Adams aves. with tar macadam.

Long Branch, N. J.—Council will consider resurfacing entire length of Broadway and 3d ave. and portions of North Broadway.—B. B. Newcomb, City Clerk.

Cincinnati, O.—Service Director Sundmacher has approved revised plans and specifications for improvement of Ludlow ave., between Brookline and Clifton aves., and ordered work readvertised.

East Mauch Chunk, Pa.—Petition is being circulated for construction of public road from this place across Bear Mountain to Walksville.

Farmersville, Tex.—Citizens have voted \$10,000 bonds for street improvements.

Dallas, Tex.—City Commissioners have rejected all bids for paving Columbia ave.

McGregor, Tex.—Commissioners' Court of McLellan County has ordered road bond election May 27 on bond issue of \$100,000 for purpose of building macadamized roads.

San Marcos, Tex.—Road District No. 1 will vote May 20 on \$20,000 road improvement bonds.

Norton, Va.—John Nuveen & Co., Chicago, have purchased \$25,000 street and sewer bonds; work will begin at once.

Chehalis, Wash.—Council has passed street improvement resolutions providing for about \$56,000 worth more of hard surface paving.

CONTRACTS AWARDED

Bridgeport, Conn.—Paving East Housatonic ave., to Burns Company, 47 1/2c. per lin. ft.

Rochester, N. Y.—Street improvements: Kingston st., brick pavement, to Thomas Holahan, \$8,597; Arch st., brick pavement, to William H. Sears, Second, \$6,603; Francis st., brick pavement, to Clarence Aikenhead Co., \$3,615; Brooks ave., cement walks, to M. J. Erinn, \$385.25; Reservoir ave. sewer, to Passero & Petrossi, \$293.50; Anthony st. sewer, to the John Petrossi Co., \$470.50; Fairview ave., cement walks, to M. J. Erinn, \$888.75.

Lawton, Okla.—Street paving, to C. H. Shaw Construction Co., city, 21,036 cu. yds. excavation, 2,600 ft. full haul, 23c.; 75,483 sq. yds., Oklahoma natural rock paving, \$1.69; 20,936 lin. ft. straight combination curb and gutter with stone cushion, 70c.; gravel cushion, 70c.; 3,115 lin. ft. radius combined curb and gutter, stone cushion, 72c.; gravel cushion, 70c.; 2,236 lin. ft. straight curb, stone cushion, 60c.; gravel cushion, 58c.; 7,652 lin. ft. straight gutter,

stone cushion, 55c.; gravel cushion, 55c.; 333 lin. ft. radius gutter, stone cushion, 60c.; gravel cushion, 60c.; 3,982 lin. ft. marginal curb, 3 x 12 oak header, 10c.; 39 catch basins, \$1,750; 410 lin. ft. 8-in. vit. sewer pipe, 40c.; 10-in. sewer pipe, 10c., and 12-in., 10c.; latter two items may be substituted; total \$156,319.39; 200 days; other bidders, E. R. Kerby, city, \$165,180.46, 180 days; Mayfield, Shaw & Redman, city, \$158,244.99, 200 days; C. I. Derr, Oklahoma City, \$173,643, 180 days; Engineer's estimate, \$179,002.17.

Columbia, S. C.—Paving Gervais st., Main to Pulaski, to Weston & Brooker, with Augusta vil. brick, \$2.19 per sq. yd.; Lady Washington and Hampton sts., Sumter to Assembly st., to same, with 3-in. creosoted block gum blocks, \$2.45 per sq. yd. material to be furnished by U. S. Wood Preserving Co.; as many as six blocks and not more than 13, to Atlantic Bitulithic Co., Richmond, Va., with bitulithic, \$2.12 per sq. yd.; company's bids as follows on (a) stone headers, (b) concrete curb, (c) concrete sidewalks, (d) granite curb, (e) laying vit. pipe, 12-in., 18-in., 20-in. and 21-in.; West Construction Co., (a) 49c. per lin. ft., (b) 69c. per lin. ft., (c) 74c. per sq. ft., (d) 60c. per lin. ft., (e) 39c., 49c., 53c. and 65c.; company also bid \$1.95 on sheet asphalt, \$1.95 on asphaltic concrete and \$2.24 on bitulithic; Atlantic Bitulithic Co., (a) 55c., (b) 58c., (c) 16c., (d) 76c., (e) 40c., 45c., 52c. and 60c.; John J. Cain, (a) 38c., (b) 48c., (c) 13c., (d) 52c., (e) 18c., 23c., 28c. and 33c.; company also bid on vit. block paving, \$2.48 for So. clay, \$2.83 for Mack brick and \$2.86 for Metropolitan; Palmetto Paving Co., (a) 60c., (b) 62½c., (c) 97½c. per sq. yd., (d) \$1, (e) 41c., 53c., 57c. and 71c.; company also bid \$1.73 on bituminous concrete; Weston & Brooker, (a) 75c., (b) 47½c., (c) 14c., (d) \$1.40, or \$1.90 for curve, (e) 50c., 66c., 76c. and 95c.; approximate quantities, 24,000 sq. yds. of brick, 19,000 sq. yds. of wood block and 38,000 sq. yds. of bitulithic.—John McNeal, City Engineer.

SEWERAGE

Guthrie Centre, Ia.—Installation of sewerage system is being considered.

Somerville, Mass.—Mayor Burns has recommended \$20,000 appropriation on funded debt account for sewer construction.

Dallas, Tex.—City Commissioners will ask for bids for building 6-in. sanitary sewer on Fifth st., Jefferson to Bowling.

CONTRACTS AWARDED

Bridgeport, Conn.—Building sewers: Putnam st., to Pierce Mfg. Co., 92c. per ft.; Hanover st., to B. D. Pierce, Jr., Company, 73c.; Vine st., to same, 88c.; Westfield ave., to Burns Co., \$1.67.

WATER SUPPLY

Wilcox, Ariz.—Finance Committee on artesian well proposition has elected committee consisting of A. Redus, Dr. Wilson, Tom Fughum, A. I. McAllister and H. A. Morgan to make necessary arrangements and drill the well.

Dodge Center, Minn.—Citizens are considering election on construction of water works system.

Anselmo, Neb.—Citizens will vote Apr. 25 on \$7,500 bonds to install water works system.

Clay Center, Neb.—Citizens have voted \$5,000 bonds for installation of water works system.

Milford, Neb.—Citizens have voted \$13,000 bonds for installation of water works system.

Fargo, N. D.—Council has decided to locate water purification plant just outside the southern limits of city.

Lott, Tex.—Citizens have voted \$14,000 water works bonds; city will take over private system, expand and operate it.

Altoona, Wis.—Chippewa Valley Railway, Light & Power Co. has been granted franchise to install water works system.

LIGHTING AND POWER

Glenwood, Ia.—Council has ordered that all telephone and electric light poles be removed from around square; this is a preliminary step toward introduction of electric lighting system.

New Market, Ia.—Citizens will vote May 1 on granting franchise to Lee Electric Co. for installation of electric light plant.

Philadelphia, Pa.—Bids will be invited by Department of Public Safety through Electrical Bureau for installing 148 new lights and rehabing 42 now in service on South Broad st. boulevard.

Baraboo, Wis.—Citizens have voted \$4,000 bonds for lighting plant.

Monterey, Mex.—Council is considering installation of its own power plant.—D. Fernut Martinez, Mayor.

FIRE EQUIPMENT

Pasadena, Cal.—Citizens will vote Apr. 28 on \$18,000 bonds to purchase auto fire engine and hose wagon for Mentos st. department and to complete hose house.

Honey Brook, Pa.—Honey Brook Fire Company is considering erection of \$5,000 public hall.

Scranton, Pa.—Chairman F. W. Zizelm of Common Council, has appointed D. Jones, of Seventeenth Ward; John Lewis, Fifteenth Ward, and William Murphy, Twenty-first Ward, members Councilmanic Committee to take up question of equipping fire houses.

MISCELLANEOUS

Passadena, Cal.—Citizens will vote \$170,000 bonds to purchase and improve parks and playgrounds.

Brooksville, Ky.—Bracken Fiscal Court has ordered election on \$35,000 bonds erection of court house.

Marblehead, Mass.—Architect William Quiner, Jr., has submitted to Selectmen plans for remodeling of the police station.

Somerville, Mass.—Mayor Burns has commended following appropriations funded debt account: Auto police patrol ambulance, \$4,000; building of public bus, \$65,000, and recreation field at Alew brook, \$15,000.

Buhl, Minn.—Council has decided to erect town hall this summer.

Caledonia, Minn.—Citizens have voted \$6,000 bonds to erect town hall.—C. Trask, Town Clerk.

Longview, Tex.—Citizens have voted \$2,000 bonds for improvements.

CONTRACT AWARDED

Reading, Pa.—Scraping and cleaning of unpaved streets, to Harrison S. Harman; Streets 80 feet wide, \$5.94 a square foot, 60 ft., \$4.74; 40 ft., \$4.74; 20 ft., \$4.

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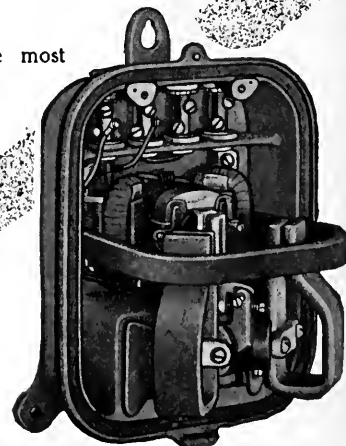
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Municipal Journal

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No. 17

SQUAW CREEK IMPROVEMENT

Rectifying a Stream in Lawton, Oklahoma—Open Conduit Lined with Reinforced Concrete—Forms for Concrete Lining—Expansion Joints—Iron Railing—Bridges at Street Crossings

By Z. M. SCIFRES, City Engineer

THE city of Lawton, Okla., with a population of about 10,000, drains into Squaw creek, a stream about twenty-five feet wide and six feet deep where it winds its way snake-like through and across the southern portion of the city. The ground is flat on each side of the stream back for an average distance of about 600 feet. The greater part of the city lies north of Squaw creek on a gradually sloping hillside, rising about 80 feet to the mile; while the rise on the south side is much greater yet gradual.

The drainage area of this creek above the city is approximately 4,000 acres. The outlets for the storm water sewer system for the entire city were made into the old channel of Squaw creek; one outlet (a 48-inch brick sewer) emptied into the old creek a short distance below the west boundary of the city, and the other outlet (a 62-inch brick sewer) was designed to empty farther down the stream near the east boundary line.

On account of the very tortuous course of this creek, its uneven bottom and the obstruction to flow through the channel due to rubbish, brush, etc., frequent overflows occurred during heavy rains, doing much damage to the surrounding property and shutting off that portion of the city lying on the north from the main part during such overflows. And during the dry season pools of water were held by low places in the bottom of the creek and these, becoming stagnant, created a condition very menacing to the health of the neighborhood.

After many complaints from the citizens suffering these inconveniences, an attempt was made to partially remedy the condition by straightening the course in the extreme cases and filling the pools at as little expense as possible. But this was of no avail and it was soon found that an improvement of a more permanent nature was absolutely necessary, as that portion of the city lying along this stream was becoming very valuable on account of its closeness to the business center.

About four years ago bonds were issued to improve Squaw creek, but the amount of the issue was found insufficient to meet the demands and, because all the property could not participate of the benefits to come from the expenditure of this amount, some dissatisfaction arose over the proposed improvement and the whole affair was dropped at that time. A second

and bond issue of \$40,000 was voted about a year ago and plans were made to cover as much of the improvement as possible with this issue.

The city engineer was placed in charge of this work. Cross sections were taken 25 and 50 feet apart on various routes and all information as to existing conditions was obtained. It was decided after thorough investigation that the route should be along I avenue, from that point where the creek touched the avenue between Second and Third streets to the point where the creek crossed the avenue between Eighth and Ninth streets, and beyond each end of this stretch the route would follow the general direction of the old channel of the creek, making the course as straight as possible. The street grades on I avenue and all cross streets had been previously established so that all street drainage was to the avenue, making this the proper route to be selected.

A plan was adopted for an open conduit with bottom and sides of concrete, reinforced and 6 inches thick. This conduit is 11 feet wide at the bottom and 16 feet wide at the top, both inside measurements. The depth varies with the grade of the street alongside of the conduit, being 6 feet at the minimum and 7.8 feet at the maximum, the average being about 6.5 feet. The total length of work so far constructed is about 3,500 feet. A number of streets intersect Avenue I and at each of such intersections a bridge spans the conduit, the bridges being sufficiently wide to include both roadway and sidewalks. These bridges are of steel beam and concrete arch construction. The conduit opening is guarded by a railing constructed along the top of each wall and continuing unbroken along each side of each of the bridges. This consists of posts and two rails of two-inch gas pipe, the posts being set into the concrete curbing which forms the top of the conduit lining.

At each bridge provisions were made for catch basins and outlets for future storm sewers. In addition to these, outlets were provided at various places for the purpose of draining water from the old channel; these outlets being planned as a temporary arrangement only, to be abandoned when the old creek bed has been filled up. Avenue I is 80 feet wide, and an ordinance was passed establishing the tree lines, sidewalk lines and curb lines so that there would be a driveway approxi-



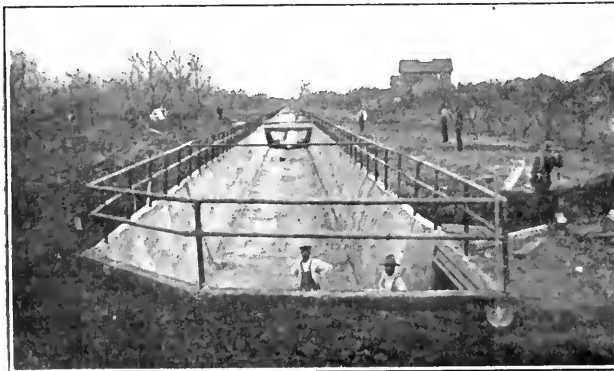
FORMS FOR CONDUIT WALLS IN PLACE
Outside forms braced against bank.

mately 17 feet wide on each side of the conduit. The tops of the concrete walls extend three inches above the crown of the street, forming a curb in the same manner in which a center parking in a roadway is enclosed.

The plans were approved by the Mayor and Council, and the contract was let to E. R. Kerby, a local contractor. Work on actual construction began about the first of last November, and was finished the latter part of January, excellent weather conditions permitting the work to be carried on at a very rapid pace.

Earth from the excavation was deposited along the banks of the old creek and in some places even in the old channel, which crossed and recrossed the conduit in three or four places. Some risk was taken in filling the old channel, but connections between the stream and the new conduit were made in ample time to avoid damage from floods due to the obstruction of the old channel.

A varying depth of conduit combined with a constant width at both the bottom and the top, resulting in a varying slope at the sides, made it somewhat difficult to design a form to be used in the construction of the concrete walls. This difficulty was overcome by making the form for the inside of the walls in two sections, so that a slight change in the batter could be made in the upper half to secure the necessary width at the top of the walls. These forms were made in 12-foot sections and consisted of 1-inch tongued and grooved boards, nailed to 2 x 4 vertical strips spaced 4 feet apart, two strips being placed about 2 inches apart at intervals and the struts being slipped into the slots thus formed. Each section of the form was about 4 feet by 12 feet and could therefore be easily handled. To hold these in place a set of standard cross struts was made for the bottom set of forms, these consisting of two horizontal 2 x 6's and three pairs of vertical 2 x 4 strips so nailed to these as to hold them parallel and about 3 feet apart. The ends of the strut pieces were then cut on the proper bevel so that, when slipped into the slots on the forms previously described, it held these at the proper distance apart



COMPLETED CONDUIT

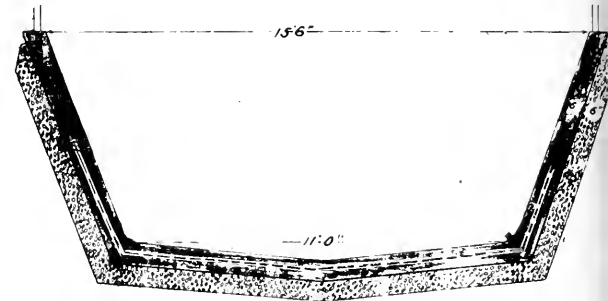
Taken at bend in conduit. Shows railing and bridge a block away.

and at the proper batter. As the upper section of the form varied in batter from section to section, the struts for the walls were made in much the same way except that the upper and the two horizontal pieces was adjustable in its length, thus permitting the tops of the upper form sections to vary in the distance from each other. These struts were found to hold the wall forms very rigid.

The sides of the excavated ditch were trimmed so as to be used as the back form for the concrete lining. The soil was a "gumbo" and was found in excellent condition for serving this purpose. In some cases the banks were low and back lagging was necessary, this being braced against the surface of the ground. In most cases this back lagging was removed before the back-filling was done, the concrete standing on itself until the back-filling could be placed. In extreme cases back lagging and the 4 x 4 braces were left in place, in most cases the lagging being removed and the braces only being left.

The forms were not greased or otherwise treated, but the concrete was never any trouble from the concrete adhering to the forms. The forms were carefully swept off each time before being used again. They were usually removed about the third day after the concrete had been placed. Any rough places or honeycombing which appeared upon the surface of the walls were then plastered up with cement mortar. The bottom of the conduit was constructed in advance of the walls.

The concrete was mixed by a machine mixer which was moved along the side of the conduit and discharged the concrete through an inclined trough into hand carts which carried it to its place in the bottom or walls. During the construction of the walls runways for the wheelbarrows were supported by the struts which braced the wall forms.



SECTION OF CONDUIT AT EXPANSION JOINT

Inner section is conduit; outer section is support for expansion joint.

At intervals of 100 feet expansion joints were left in the concrete lining. These were one inch wide and were made by inserting a board between two sections of concrete, which board was afterward withdrawn and the space filled with asphalt filling. This joint was continuous across the entire section of the concrete lining. Under the joint was placed a 6-inch concrete slab which lapped 2 1/2 inches under each section of lining. These slabs were constructed in advance of the lining proper.

By means of wooden pins set in the concrete coping of the side walls, holes were left for the gas pipe posts of the railing. A crew cut the pipe and set the railing after the concrete walls had hardened fully to permit this work. A second crew followed which did all the remaining back-filling, grading and placing the work in a presentable condition.

Since the conduit has been completed the old channel has been filled and the property once taken up by old Squaw Creek is being reclaimed and improved extensively. It is proposed to extend the conduit to take the place of the tortuous channel where it winds the remainder of its course through the city.

The contract prices of this work were as follows: Concrete, \$7.00 per cubic yard; earth excavation, 26 cts. per cubic yard; reinforcement, 4 cts. per pound; bridge steel, \$63.90 per ton; corrugated metal, \$14.00 per square; 3-inch field tile, 15 cts. per foot; 2-inch gas pipe, 18 cts. per foot. The total cost of this improvement was \$39,833.

MUNICIPAL IMPROVEMENTS IN MEXICO

Encouraged by Federal Government—Practically All by United States Contractors—Water Supply a Difficult Problem—Paving and Gas

By W. D. HORNADAY.

The construction of quite a number of municipal works and improvements in different cities of Mexico is being held in abeyance pending the settlement of the existing disturbed conditions due to revolutionary uprisings in various localities.

It was not so many years ago that Mexico entered upon an era of municipal betterments. Prior to that time there had been practically no attention given to the establishment of modern public utilities in the different cities and towns. Even those having a population of several hundred thousands of people, such as the capital of the republic and Guadalajara, were primitive in the type of their municipal works. The federal government of Mexico is largely responsible for the general interest that is being taken in the establishment of modern municipal improvements in the different communities. It has been the policy of the government to bear a part if not all of the expense of constructing a certain character of municipal improvements in the coast cities. This paternal spirit had its origin through the necessity of making the gulf ports as well as those on the Pacific side of the country as sanitary as possible and to free them of the possibility of yellow fever and other diseases to which they had formerly been subjected. The government during the last ten years has spent many million dollars in the construction of sanitary and sewer systems as well as water-works plants and distributing systems in the cities of Vera Cruz, Tampico, Coatzacoalcos, Salina Cruz, Manzanillo and Mazatlan. Through these expenditures of federal funds, augmented by appropriations made by the different states in which the cities concerned are situated, there has been brought about a complete transformation of these deepwater ports. Their health conditions have been brought up to a high standard. Yellow fever and other contagious diseases, due to unsanitary conditions that formerly prevailed in these places, have been practically eliminated. With the inauguration of these public utilities have come other municipal improvements, such as street paving, surface drainage, the establishment of parks, driveways and the construction of new sidewalks and a variety of other pleasing features that go to make up a town of complete modernness.

Following the example set by the federal and state governments as to these deepwater ports the municipal authorities of interior towns set about making similar improvements with the result that a great deal has been accomplished along this line during the last few years, but there remains an enormous amount of improvements in the way of establishment of public utilities, street paving and sidewalk construction still to be done.

It is a notable fact that practically all of the construction of these municipal enterprises has been done by American contractors. Exceptions to this rule are in the cities of Vera Cruz, Coatzacoalcos and Salina Cruz, where the work was carried out by a British contracting firm. The material for the sewers in the different towns has come chiefly from the United States, as has also the machinery for the water-works plants and equipment that is necessary in carrying on the works of improvement. The asphalt and brick that are used in paving streets and laying sidewalks are native products.

While the municipal improvements so far have been confined to the larger cities it is expected that with the further development of the country the smaller towns will join the upbuilding movement, thus affording splendid opportunities for the further sale of American-made machinery.

Among the interior cities that have made extensive municipal improvements during the last few years are Monterey, which has been equipped with complete water-works and sewer systems at a cost of about \$5,000,000; Chihuahua, which has

also been supplied with these public utilities; Torreon, Zacatecas, Guadalajara, Hermosillo, Merida, Puebla and Durango. There are a number of towns of considerable size which have under consideration the establishment of municipal works, among them being Saltillo, San Luis Potosi, Aguas Calientes, Parral, Culiacan, Tepic, Oaxaca, Toluca, Irapuato, Campeche, Chilpancingo, Cuernavaca, Morelia, Jalapa, Nuevo Laredo, Queretero, Guanajuato, Victoria, Pachuca and Colima. These towns range in population from 15,000 to 45,000, and while several of them are already equipped with water-works systems of more or less primitiveness there remains a great amount of other improvements to be made to bring them up to the standard of the other cities of the country that have already adopted the policy of modern improvements in their public utilities.

Perhaps the most notable feature of the work of advancement of the cities of Mexico is street paving. An enormous amount of this character of work has been done during the last few years. This is particularly true as to the City of Mexico, Guadalajara and Vera Cruz. In Monterey considerable street paving has been done and arrangements are now being made to extend this improvement to all of the streets in the business portion of the city and into the residence districts. The original paving in Monterey, covering several blocks in the heart of the city, was done several years ago, vitrified brick being the material that was used. It is now purposed to use asphalt for the new paving that is to be put down. In San Luis Potosi and Chihuahua there has also been done a considerable amount of street paving, thereby adding wonderfully to the good appearance of those cities.

One of the difficult problems for most of the larger cities of Mexico, particularly those that are situated upon the arid central plateau, is that of providing an adequate water supply. In Monterey this difficulty was overcome by the construction of a great reservoir some distance from the city which is supplied by wells and the water is brought down to the distributing system by gravity. In Durango a similar method is in operation for obtaining the water supply, the main reservoir being situated close to and high above the city. Great difficulty was experienced in developing the water supply for the cities of Zacatecas and San Luis Potosi, but it was finally overcome and the water supply is now ample for all the needs of the people of those places. Where underground flows can not be found it is usually practical to obtain the necessary supply by the construction of storage reservoirs, by which means the flood waters are gathered. Many of the larger towns of Mexico are not situated upon or near running streams of water, and this adds to the difficulty in providing ample and permanent supply for such places. The installation of a water supply and distributing system for the City of Mexico has been in progress for several years and is still lacking a great deal of being finished. It is estimated that an additional expenditure of \$10,000,000 will be required to carry out the plans that have been adopted for the big municipal enterprise.

The industrial development and rapid growth which the capital and other cities of the country have taken on within the last few years are creating a constant necessity for enlargements and further improvements to the existing public utility plants.

Municipal ownership of electric light and power plants and systems has not found favor in Mexico, although in a few instances these concerns are owned and operated by the cities.

It is only within the last year that the introduction of gas for municipal use in Mexico has been accomplished. An American concern headed by E. L. Doheny of Los Angeles, Cal., recently completed the installation of a gas plant and distributing system in the City of Mexico, and the establishment of a similar plant in Guadalajara by an American syndicate is now in progress. A syndicate of Canadians headed by William Mackenzie of Toronto has been granted a franchise for installing a gas plant and distributing system in Monterey. It is expected that similar enterprises will be inaugurated in other cities of the country within the next few years.

DETERMINING YIELD OF WELLS

Law of Flow of Ground Water into Wells—Methods of Making an Actual Test and Results Obtained

Paper before the Illinois Water Supply Association by Arthur N. Talbot, Professor of Municipal and Sanitary Engineering, University of Illinois

It is well known that the yield of a well (in other words, the rate of flow into the well) depends upon the depth to which the pumping lowers the water below its normal level, provided, of course, that the general level of the water at a distance from the well, or its pressure in the case of artesian wells, is not lowered by the pumping. The principles of hydraulics may be applied in the analysis of the rate of flow, the spaces in the porous earth between particles acting as small tubes, and the general relation between head and yield are susceptible of expression by mathematical formulas. However, the complexity of the formulas and the uncertainty of information on size of grain and porosity in the water-bearing stratum usually make us hesitate to accept the formulas. This paper describes a simple instance where the measurement of the inflow into a well illustrates the analytical law of flow into wells.

Wells may be classified for our purpose as (1) "non-artesian," defined as those in which the level of the water in the well is below the top of the porous stratum which carries the water to the well and (2) "artesian," defined as those in which the water in the well remains above the top of the porous stratum and in which this stratum is overlaid with a relatively impervious one. The terms "non-artesian" and "artesian" are here used in a broad sense for want of better terms. The analysis of the yield of these two classes of wells is somewhat different. In the first the water actually stands in the porous layer at the level which produces the flow. In the second the water-bearing stratum remains filled and is under a varying head or pressure.

Class No. 1.—*Non-artesian Wells.*—The porous water-bearing layer extends at least from the general level of the water to a point at or above the bottom of the well. (See Fig. 1a.) The formula for yield of well or rate of flow may be shown to be as follows:*

$$Q = k' \frac{H^2 - h^2}{\log \frac{R}{r}}$$

where r is the radius of the well, R is the distance to a point where the level of the water in the ground is not sensibly lowered, H and h are shown in Fig. 1, and k' is a coefficient depending upon the size of grain and porosity of the ground and upon other conditions. The formula for y may also be obtained.

The above formula shows that as the water is lowered in a well the yield increases at first very rapidly, then more slowly until the water is pumped down to the bottom of the water-bearing layer. Fig. 1 (b) illustrates the changing rate of yield. It is seen that when the well is pumped down one-quarter of the depth, the yield will be over 50 per cent of the maximum yield: i. e., over half of the yield when the water in the well is lowered to the bottom of the water-bearing stratum. When the water is down to one-half of the depth, the yield is 75 per cent of the full yield. This relation may not represent the exact conditions of flow, but it expresses a general principle. The analytical formula by which k' is determined (not given here) is of interest in showing the effect of porosity and size of grain upon the yield

*See Turneure and Russell's "Public Water Supply" for the derivation of this formula.

and also in assisting the judgment in an estimate of the yield of a well under different conditions.

Class No. 2.—*Artesian Wells.*—A porous water-bearing stratum is overlaid with a relatively impervious layer, and the water-bearing layer is under pressure. (See Fig. 2a.) A similar analysis to that used in deriving the formula in the previous section may be used for this class, resulting in the following formula:

$$Q = 2k't \frac{H-h}{\log \frac{R}{r}}$$

or

$$Q = mz$$

where k' is a coefficient depending upon the porosity and size of grain of the water-bearing stratum, t is the thickness of the water-bearing stratum, r is the radius of the well, R is the distance to the point where the pressure upon the water-bearing stratum is not changed sensibly by the pumping, H and h are shown in Fig. 2, z is the distance the water is pumped down from the level of the well, and m is a coefficient for any given well as determined from the first equation. The time required to fill the well between the level H and z may be shown to be $f(\log H - \log z)$.

An important deduction from the equation $Q = mz$ is that the yield varies as the depth the water is pumped down. That is to say, if the yield when the level in the well is 50 ft. below the normal level is a certain amount, the yield when the water is pumped down 100 ft. would be twice as great, and when pumped down 200 feet would be four times as great. This has an important application to deep wells generally. Of course it is here assumed that the general water level remains constant and that the water is not lowered below the top of the water-bearing stratum. The loss of head into the well and, in the case of deep wells, the loss through the well itself must be allowed for.

TEST OF A WELL OF THE ARTESIAN CLASS

In the well here referred to (see Fig. 3a) the excavated part of the well was 16 ft. in diameter and about 30 ft. deep.

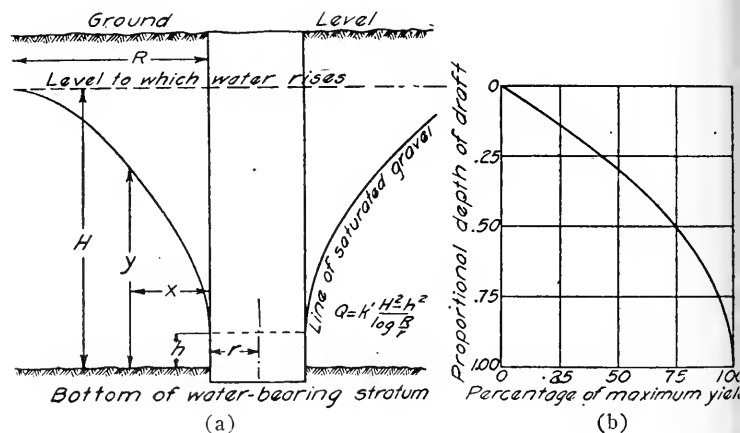


FIG. 1. FLOW IN NON-ARTESIAN WELLS

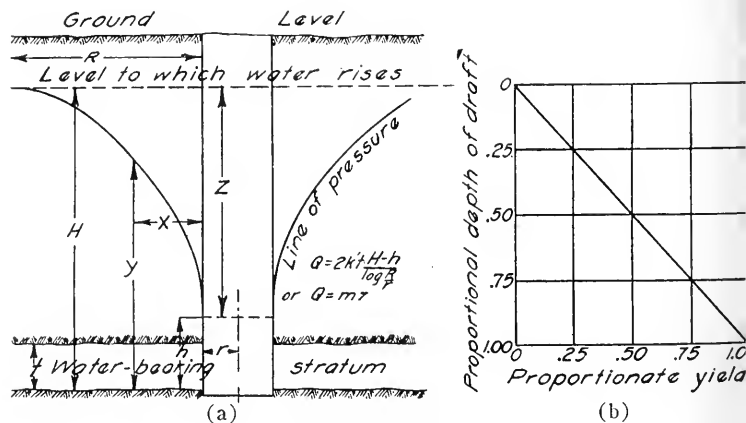


FIG. 2. FLOW IN ARTESIAN WELLS

From the bottom of this a 6-in. tubular well extended down to a depth of about 120 ft., passing through relatively impervious earth to the water-bearing stratum. When not drawn upon the water would rise to within one foot of the surface of the ground. This gives the conditions of artesian flow. The problem was to find the rate of inflow at any given level of water in the well. The following simple plan was used:

The well was pumped down until the water was, say, 20 ft. below its highest level, the pump stopped and the distance of the water below the well platform measured by a city employee at the time of day noted. At four or five times during the next twelve hours the distance down to the water level was measured and the hour noted. With these data before me and knowing the diameter of the well, it was easy to find the constants for use in the formula before given. The formula becomes:

$$\text{Yield in gallons per 24 hours, } Q = 3,250 z,$$

where z is the distance below the highest water level for the point at which the rate of flow or yield is determined. When the water stands 10 ft. below its highest point the inflow is at the rate of 32,500 gallons in 24 hours. The formula for time required for filling between levels H and y becomes

$$T = 11 \frac{1}{2} (\log_e H - \log_e y),$$

the symbols as before.

The diagram, Fig. 3b, shows that these results follow closely the theoretical or analytical conditions.

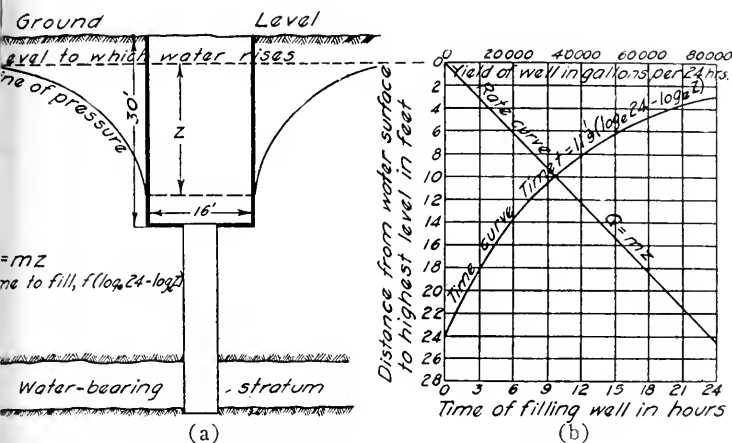


FIG. 3. DIAGRAM OF WELL TESTED AND RESULTS OF TEST

A word as to the applicability of this test. The city wanted to increase its supply. Several propositions for increase had been made. It was a question whether another tubular well could be put down, or whether the wet well should be deepened, or the method of pumping changed from operating the pump an hour twice daily to pumping for a short period several times daily, or whether to lower the pumps and pump continuously. Much misinformation had been given me on the amount of water pumped, the distance the water was commonly pumped down, and the time it took the well to fill. The simple test threw much light on the actual conditions of operation and gave trustworthy information bearing on the best method of securing a larger supply. It not only illustrates the law of flow into wells, but it may suggest the desirability of making tests of existing plants before extending the well system.

RUST IN SERVICE PIPES

The following caution by Superintendent of Water Works George H. Snell, of Attleborough, Mass., may be applicable in other cities. The supply is from wells pumped to a standpipe. Superintendent Snell said, in his report for 1910:

I wish at this time to warn those who are building or piping houses to avoid the use of galvanized iron pipe or galvanized range boilers if they wish to prevent rust in water, which invariably is caused by galvanized pipes. It is a well known fact that the town water acts on galvanized or lead pipe. The department, in their part of the service, use cement and tin-lined

pipe, and if the same or some other non-corrosive material were used inside the house the rusty water would be eliminated. The rust is more noticeable during the months of August, September and October, when the temperature of the water is the highest, and for this reason the rust is more noticeable in the hot water fixtures than in the cold.

DISINFECTING SWIMMING POOLS

Experiments on the Use of Chloride of Lime for This Purpose—Danger of Infection Removed—Economical Advantages

By MELVILLE C. WHIPPLE

Condensed by the author from a paper read before the Chemical Society of the Brooklyn Polytechnic Institute, February 18, 1911.

In view of the importance which is being attached to the sanitary control of swimming pools, and the general lack of definite information in regard to their bacteriological contents and the means of keeping the bacteria within safe limits, a series of experiments was conducted during the past year to provide data and information along this line. More particularly was it desired to determine the value of chloride of lime, or bleaching powder, in this connection.

There can be no doubt that in the ordinary swimming pool there lies a means of spreading infection and disease which in the past has been generally disregarded or underestimated. More commonly this infection occurs in the form of colds or annoying disorders of the respiratory tract. Individual cases and even epidemics have been brought to the attention of the author, which it was perfectly reasonable to expect had their origin in the use of an unsterilized pool. Swimmers suffering from these affections and even those who are not visibly inconvenienced thereby, consciously and unconsciously emit portions of mucous secretions containing thousands of bacteria. Many forms of bacteria that are commonly found on the skin and in the nose, mouth, and throat, depend for their harmful effect merely upon a depressed condition of vitality. While not as great, the danger likewise exists of contracting venereal diseases, and diseases of the intestinal tract,

such as typhoid and dysentery.

The ideal water for swimming purposes, from both the aesthetic and hygienic standpoint, is an artesian supply, abundant in quantity and low in bacteria and organic matter; but a very large number of swimming tanks are necessarily supplied with water which does not conform to such a standard. The experiments with which this article is concerned were conducted upon the tank in the gymnasium of the Brooklyn Polytechnic Institute. This tank is lined with white tile, has a capacity of approximately 25,000 gallons, and is supplied with Brooklyn city water. It has been customary to fill it twice a week with fresh water, maintaining a circulation between times through a heater, and adding fresh water only in the emergency of leakage or of high temperature.

Five separate runs or series of experiments were made, both with and without the use of chloride of lime. Samples were taken each day from the deep and the shallow ends of the pool, and determinations made of turbidity, free and albuminoid ammonia, total bacteria at 37 degrees C. and 20 degrees C, and a presumptive test for the *Bacillus coli communis* which occurs in the intestinal tract. Temperature and other general observations were made at the time of the collection of samples. During the course of each run the tank was not emptied, nor was fresh water added in any appreciable quantity. In a period of five or six days, the time usually occupied by one run, the turbidity rose from 1 to 4 or 5 parts per million. Free and albuminoid ammonia values also increased, the proportion of free being relatively greater when the number of bacteria was greater. The growth of the latter did not show regular pro-

gressive changes but appeared to vary considerably from day to day. This might have been due to differences in the available food supply, variation in temperature or from outside causes. The question of temperature evidently plays an important rôle in the bacteriological contents of a swimming pool. It was repeatedly found that a temperature above 75 degrees brought about a marked and a sudden rise in the number of bacteria. This fact has also been noted by other observers.*

Below is given a partial list of results obtained from analyses made during Run No. 1 when no disinfectant was used, Run No. 4 when a half pound of chloride of lime was added on every other day, and Run No. 5 when one-fourth pound was added each day.

Run No. 1
No Disinfectant Used.

	PARTS PER MILLION OF NITROGEN AS		AVERAGE DAILY NUMBER OF BACTERIA PER C.C.		B. COLI.		
	Free ammonia	Albuminoid ammonia	Agar at 37°C.	Gelatine at 20°C.	0.1 c.c.	1.0 c.c.	10.0 c.c.
First day.....	.....	.....	30	20	0	0	+
Second day.....	.028	.024	110	1,200	0	0	+
Third day.....	.114	.090	12,500	225,000	0	+	+
Fourth day.....	.....	.284	5,500	281,000	0	+	+
Fifth day.....	.220	.086	500	4,250	0	0	+
Sixth day.....	.264	.140	830	3,500	0	0	+

Run No. 4

Using ½ lb. chloride of lime (20 lbs. per million gals.) every other morning

First day A.M.....	.....	.....	17,000	16,500	0	0	0
(After dosing) P.M.....	.034	.060	1	11	0	0	0
Second day P.M.....	.020	.120	210	635	0	0	+
Third day P.M.....	.044	.078	8	6	0	0	0
(After dosing).....	.....	.....	.....	.....	.....	.....	.....
Fourth day P.M.....	.118	.128	105	725	0	0	+
(After dosing).....	.062	.130	25	135	0	0	0
Fifth day P.M.....	.....	.....	.....	.....	.....	.....	.....
*Eighth day A.M.....	.076	.140	1825	105,000	0	0	0
(After dosing) P.M.....	.....	.....	5	45	0	0	0
Ninth day P.M.....	.244	.150	54,000	130,000	0	0	+
Tenth day P.M.....	.130	.166	0	0	0	0	0
(After dosing).....	.....	.....	.....	.....	.....	.....	.....

*Less than 25 bathers between the fifth and eighth days.

Run No. 5

Using ¼ lb. chloride of lime (10 lbs. per million gals.) every morning

First day A.M.....	.056	.054	550	4,000	0	0	+
(After dosing) P.M.....	.074	.078	0	18	0	0	0
Second day P.M.....	.070	.080	65	185	0	0	0
Third day P.M.....	.126	.088	2,800	5,500	0	0	0
Fourth day P.M.....	.130	.112	90	1,350	0	0	0
Fifth day P.M.....	.152	.140	35	1,500	0	0	0

It will be noticed from an inspection of the results of Run No. 1 that the highest number of bacteria developed suddenly on the third and fourth days, falling off perceptibly on the days following. This was not due to any great variation in the number of bathers, which averaged 75 for each day of the test. *B. coli* were always present in 10 c.c. of the water, and on the days of the highest counts were present in 1 c.c.

The choice of chloride of lime as a disinfectant was made because of the many advantages this substance possesses over others. Its action upon bacteria is immediate and fatal. The destructive effect has generally been thought to be due to the action of nascent oxygen released from the water by the chlorine, although there is some opinion that the chlorine acts directly upon the organisms. Excellent results have been obtained by the use of this reagent in the treatment of sewage and the purification of water supplies. Furthermore, small quantities accomplish the desired end, and any excess of chlorine which remains is used up in the oxidation of organic matter or iron, both of which are liable to be present. Another advantage of chloride of lime is its low cost. It was not found practicable to add the disinfectant in dry form owing to the dust created and the amount of fine material which afterward floated upon the surface of the water. It was dissolved in about two gallons of warm water and the solution mixed with the contents of the tank.

*Burridge, Pro. Indiana Acad. Science, 1909.

The effect of adding chloride of lime every other day in the proportion of 20 pounds per 1,000,000 gallons is seen in Run No. 4. In spite of the disadvantage of starting with water containing a large number of bacteria, good conditions were restored and maintained for five days. The strong sterilizing properties of the disinfectant are well illustrated from the results obtained during the latter part of this run, when the accumulation of organic matter allowed rapid bacterial growth after the excess of chlorine disappeared. Reducing the quantity of chloride one-half and adding it upon each day maintained a fairly satisfactory condition of the water, as seen from the table under Run No. 5. This amount, however, could hardly be considered sufficient to hold in check any sudden increase in bacteria which might occur from unusual contamination; nor did it maintain the generally low average of the first five days of the previous run.

Tests were also made using 2 pounds and ½ pound weekly but the efficiency of these quantities was lower, and there was the added disadvantage, in the case of the larger quantity, of a distinct odor and taste of chlorine, which remained in the water for three days. The application of ½ pound on every other day, that is in the proportion of 20 pounds per 1,000,000 gallons of water, of which 35 per cent was available chlorine gave rise to a very slight odor, which was not objectionable and which disappeared in a very few hours.

A general consideration of this subject, based upon the results obtained, offers substantial evidence that a swimming pool operated under the conditions described, without the aid of disinfecting agents, and subject to the contamination incident to general use, has the hygienic qualities of its water imperilled and provides an environment favorable to a sudden and rapid growth of bacteria. Many of the forms ordinarily regarded as the index of dangerous pollution of water were shown to flourish in these surroundings. *B. coli* and other gas producing organisms were constantly found to be present in Run No. 1, which involved no chemical treatment. Their reappearance after sterilization had been accomplished aptly illustrates how they are introduced by bathers. The degree of efficiency of chloride of lime in moderate doses to check these growths is quite evident from the figures presented. As regards the possibility of harmful effects arising from the use of this substance as a disinfectant, it may be stated that there is no authority available to show that chloride of lime in the quantity used has any physiological action.

There are often economical as well as sanitary advantages to be derived from the disinfection of a swimming pool. As the body of water within the tank can be used for a longer period of time with safety and without deterioration in general attractiveness, a direct saving in water is brought about, and the incidental expenses in connection with the withdrawal of water and subsequent operations of cleaning are eliminated. To demonstrate with a concrete case, that of the tank used in connection with these experiments, it was found that the water remained in a satisfactory condition for a week, if a half-pound of disinfectant was added on every other morning. Previous to its use the water was changed twice a week. Besides maintaining the bathing privilege at all times, there was an actual money saving in dispensing with one change a week which was estimated as follows:

Power for pump in discharging tank contents to sewer..	\$.
Cleaning of tile (labor, etc.) .....	. . . . .
Coal for heating fresh body of water.....	5 .
Fresh water to fill tank.....	3 .

Total

The expense of treatment is represented by the cost of 10 pounds of chloride of lime, obtainable in packages for ten cents a pound, and by the item of a few minutes' labor in applying the solution. The protection afforded is obtained so simply and cheaply that the practice ought to be more prevalent; and there is every evidence that it will be in the future, as serious interest is being very generally aroused on the subject.

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APRIL 26, 1911.

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City Information Bureau

In every city where the public officials exceed in number
 the mayor, council, and superintendents of roads, sewers and
 water works, there is in the minds of most of the citizens an
 uncertainty just whom to consult concerning municipal matters,
 either for information or for filing complaints. In the largest
 cities, even a considerable number of the officials themselves
 are ignorant as to just what responsibilities and duties come
 within the scope of the several municipal departments. This
 uncertainty not only causes considerable inconvenience to the
 citizens themselves and interferes with their obtaining the
 remedy of abuses or the information to which they are justly
 entitled, but it is an annoyance to the municipal officials them-
 selves in that they are being continually called up by citizens
 with reference to matters which are not within the scope of
 their duties.

A remedy for this condition in the Borough of Manhattan,
 New York city, is recommended by Borough President Mc-
 Aneny, who proposes a city information bureau, to which

citizens may apply for information of any kind concerning
 municipal business or affairs, and to which also would be sub-
 mitted all complaints. The clerks in this bureau, if they could
 not at once answer the questions, would be supposed to know
 what department to apply to for such information, and would
 obtain the same and forward it to the inquirer. Complaints also
 received by this bureau would be forwarded to the official
 whose duty it is to investigate or remedy them.

We believe that a bureau, or in the case of a small city, an
 official, to perform such services is needed in all cities. In
 villages and other small communities the mayor or village
 president generally acts in this capacity, and probably this
 should be considered as a part of his duties. In larger cities,
 however, the mayor personally should not have his time occu-
 pied with inquiries concerning all sorts of minor affairs, al-
 though his clerk might well be given this as one of his duties.
 As the city becomes still larger, however, it is probable that
 a number of clerks, such as is contemplated for New York
 city, would find their time well occupied in receiving inquiries
 and complaints and attending to the same.

Waste in Public Water Consumption

We have had occasion several times to call attention to the
 fact that no class of consumers waste more water than schools
 and other municipal buildings and that consequently meters or
 other methods of restricting waste are fully as important here
 as on any other services in the city, in spite of the seeming
 anomaly of a city's measuring the water which it delivers to
 itself.

An illustration of this is furnished by the city of New Bed-
 ford, Mass. During the year 1910 there was metered and
 charged to the schools, engine houses, police stations, city hall,
 library, almshouse, city stables, cemeteries, parks, wharfs and
 electric car sprinklers 88,809,000 gallons. In addition, metered
 water was supplied for drinking fountains, extinguishing fires,
 flushing sewers, puddling trenches, street operations and water
 department work which is estimated by the superintendent to
 have amounted to 200,000,000 gallons. This total of 288,000,000
 gallons is about one-tenth of the total consumption of the city.

How much water was being wasted previous to the use of
 meters is not known; but all departments now watch their
 meter records and if an abnormal amount is registered they
 quickly locate and remove the cause, while hitherto they have
 concerned themselves very little with leaky fixtures. The school
 department, previous to the installment of meters, had several
 very large motors operating ventilating machines. One of
 these was metered and found to use over 27,000,000 gallons a
 year, and it is fair to presume an equal amount was being used
 by each of the others. When meters were installed at the end
 of 1909, these motors were all discontinued and electricity was
 substituted as a motive power.

The school department now requires all janitors to record
 the meter readings daily on cards, which are sent at the end
 of each month to the superintendent's office. We presume also
 that the janitors are instructed to report at once any abnormal
 increase in consumption continuing for two or three days.

It is apparent that the saving in the water used by the school
 motors alone is more than ample to pay all expenses of meter-
 ing the school buildings. We believe that in practically every
 city where the matter has been investigated it has been found
 that schools are the most flagrant wasters of city water to be
 found.

Steel Pipes for Water Mains

At the monthly meeting of the Birmingham (England) As-
 sociation of Mechanical Engineers, held on March 4, a paper
 was read on welded steel pipes for water mains, etc., of which
 the following is a synopsis:

The most important requirement of a pipe was reliability, by
 which was meant not merely that the pipe must be strong, but
 that the engineer should have a reasonably good idea of just
 how strong it was. Mild steel pipes were at once the strongest
 and most reliable, and were gradually but surely taking the

place of cast iron, not only for water but for sewage and gas mains. Another advantage which the lapwelded steel pipe claimed over cast iron was its increased carrying capacity, the smoothness of the bore reducing the friction, known as "skin friction," between the fluid and the surface of the pipe. This was an important point frequently overlooked or often underrated, but seeing that the capacity of a pipe of a given bore may be more than doubled by substituting a smooth for a rough interior surface, it would be understood that it was a matter worth careful consideration. The smoother rolled surface of the lapwelded pipe took an excellent coating or protective solution having a hard glossy surface. Added to this the pipe was a smooth cylinder from end to end, as there was a complete absence of anything in the nature of rivets, butt straps, or lapped plates. In consequence, the frictional resistance was less, and the velocity and carrying capacity greater with lapwelded than with any other form of pipe. The question of the life of steel pipes had long been the subject of much conjecture, owing to the fact that there were no data on which to base a rule. All that could be said was that the oldest and best-known steel pipe lines were, as far as could be ascertained, in as good condition and as free from corrosion now as when they were laid.

TARRING ROADS AND EYE TROUBLES

By ALBERT SCHEIBLE

One of the reasons for the already widespread use of tar on roads has been the annoyance and the interference with normal vision caused by the dust, which is so much more freely raised by a fast automobile than by a slow vehicle. While such a use of tar and allied compounds has unquestionably been a success in laying the dust, the claim has been occasionally made that the dust raised on the tarred streets was more injurious to the eyes than that free from tar. To test the validity of such claims two French investigators, H. Hruc and C. Fleig, recently made a long series of tests with dust blown into the eyes of rabbits and dogs, using both the dust of untreated roads and that of tarred ones.

They first found that the dust of ordinary roads, no matter whether brushed off the surface of the street or gathered from the air, would not produce eye troubles in rabbits unless its injection was frequently repeated. However, if this dust was rubbed over the eye, it produced a strong secretion of tears and inflamed the eye for a short time. Repeated tests only produced a new inflammation of the eyelids, but in every case this passed away rapidly.

When the same tests were made with dust from tar-treated streets in which the surface already showed wear as the result of long service, the eye inflammation was slightly increased, but otherwise just as with the non-tarry dust. However, on freshly tarred streets or those still in good condition, the eye trouble proved more serious. To ascertain whether the difference was due to the tar, fresh tar was ground up with chalk, pumice or talcum in various proportions and the resulting dust tried on the eyes of the animals. In this case it was found that the seriousness of the inflammation increased with the amount of tar in the mixture. Coal tar alone, when applied to the cornea of the eye, produced much less irritation than if mixed with solid matter; but even such mixture proved less troublesome than the dust from the tarred streets. The reason for this difference was found in the higher bacterial content of the dust off the roads, with which dust such foul matter as the excretions of horses is apt to be mixed.

Tar alone, if applied in sufficient quantity, was found to have an almost etching action on the membranes of the eye, but in the common use of roads the amount of tar getting into the eye would be very small. Under ordinary circumstances the inflammation of the eye would be due to the mechanical grating action of the solid particles in the tar-laden as well as the untarred dust, together with the bacterial action. The latter seemed to be somewhat favored by the chemical action of the tar, but of course the total dust raised from the roads and liable to affect the eyes is very much smaller with the tarred roads than with the untreated ones. Even when ignoring this tremendous difference in the amount of obnoxious dust, the experimenters failed to trace any increase in eye troubles to the use of tar on the roads or streets.

GRANITE BLOCK SPECIFICATIONS

Standard of Association for Standardizing Paving Specifications
—Coal Tar, Asphalt or Cement Grout Filler—
One Year Guarantee

The committee on stone block pavements of the Association for Standardizing Paving Specifications did not complete the preparation of a set of specifications until after the adjournment of the convention, and then but four members could get together. It may be said, therefore, that these specifications are approved by their authors only: B. T. Fendall, city engineer of Baltimore, Md.; M. R. Sherrerd, chief engineer Department of Public Works, Newark, N. J.; S. W. Hoag, Jr., deputy chief engineer Department of Docks and Ferries, New York City; and W. A. Hogue, city engineer, Charleston, W. Va.; although the nature of the stone blocks was passed upon by the convention of 1910. No stone blocks other than granite were included in the specifications, although the committee recognized that other kinds should be provided for.

The committee expressed the opinion that the period of guarantee for granite block pavement "need not exceed one year." "By permission of the association these extracts are reprinted from the copyrighted proceedings of the Association Standardizing Paving Specifications. John B. Hittell, secretary, 5917 Winthrop avenue, Chicago."

SPECIFICATIONS FOR GRANITE BLOCK PAVING

The paving blocks, which shall be of medium grained granite showing an even distribution of constituent material, shall be of uniform quality and texture, without seams, scales or colorations showing disintegration, free from an excess of mica or feldspar, and equal in every respect to the sample in the office of the engineer.

Blocks shall be of the following dimensions, viz.: not more than 8 nor more than 12 inches long on top, not less than 3½ nor more than 4½ inches wide on top, not less than 5 nor more than 5½ inches deep.

The blocks shall be so dressed that after laying a measurement of the individual joint shall show a width of not more than ⅓ inch at top and for a depth of 1 inch and a width of more than 1 inch in any other part of the joint. The head of the block shall be so cut that it shall not have more than ⅓ inch depression from a straight edge laid in any direction across the head and held parallel to the general surface of the block.

Care shall be exercised in handling the blocks so that edges and corners shall not be chipped or broken, as blocks otherwise acceptable may be rejected on account of spalling.

The blocks shall be sorted and laid in courses of uniform width except in special cases, as may be ordered.

Sub-foundation.—Any soft and spongy material below sub-grade shall be removed and filled, as directed by the engineer, with sand, gravel or other material satisfactory to the engineer, and thoroughly rammed or rolled. In excavation care shall be taken not to disturb the sub-foundation, except where necessary to remove the soft and spongy material.

The entire sub-foundation shall be compact and hard and the contractor will be required to thoroughly ram or roll with a roller satisfactory to the engineer unless the latter shall be satisfied that the sub-foundation is sufficiently hard without it.

Concrete Base.—After the sub-foundation has been prepared to the satisfaction of the engineer a concrete foundation of uniform thickness shall be laid on it. The concrete shall conform with the standard specification for concrete for paving foundations as determined by the Association for Standardizing Paving Specifications.

The grading and sub-foundation shall be completed at least 50 feet in advance of the laying of the concrete.

Cushion Course.—A cushion course of dry, clean sand shall be laid on the concrete base, not less than two inches thick to insure a uniform bearing and prevent the possibility of any part of any block resting directly on the concrete base.

On this cushion the blocks shall be laid as closely as possible, each block touching the adjoining block on sides and ends, in courses of uniform width. All joints shall be broken with a lap of at least three inches.

Filling Joints.—Depending upon the kind of filler to be used in the joints, the following specifications, A, B or C, shall govern the use of coal tar pitch (A), bituminous asphalt (B) or cement grout (C).

(1) *Coal Tar Filler*.—Immediately after the blocks are laid sufficient coarse, hot gravel shall be spread over the surface and swept into the joints so as to fill the space between the blocks to a depth of about one inch from the bottom.

The blocks shall then be rammed to thoroughly settle and compact the first layer of gravel in the joints and so as to leave no blocks above or below the general surface of the finished pavement.

The joints shall then be poured one-half full with a coal pitch filler as hereinafter described and then filled to within one-half inch of the surface with hot gravel and again poured with the filler, this last pouring shall be flush with the tops of the blocks at the joints. The final pouring of the filler shall be immediately followed with a sufficient amount of hot gravel, applied at the joints, to conceal the filler.

The gravel shall be clean, washed gravel between $\frac{3}{4}$ and $\frac{1}{2}$ inch in its largest dimensions, not over 25 per cent of which shall be of the $\frac{1}{2}$ inch size.

The filler shall also comply with the following test requirements:

(1) It shall have a specific gravity between 1.23 and 1.33 at 60° F.

(2) It shall have a melting point between 120 and 130° F.

(3) It shall contain between 25 and 40 per cent of free carbon.

In applying the gravel and pitch care shall be taken that the pavers are closely followed by the filler gang, and in no case shall the paving be left over night (or when work is stopped) without the filler being completed. In case of rain stopping the filler gang before its work is finished the joints shall be protected by the use of tarpaulins or other means so as to keep out water, and under no circumstances shall the filler be poured into wet joints.

(B) *Bituminous Asphalt Filler*.—Immediately after the blocks are laid sufficient coarse, hot gravel shall be spread over the surface and swept into the joints so as to fill the space between the blocks to a depth of about one inch from the bottom.

The blocks shall then be rammed to thoroughly settle and compact the first layer of gravel in the joints and so as to leave no blocks above or below the general surface of the finished pavement.

The joints shall then be poured one-half full with a bituminous filler as hereinafter described and then filled to within $\frac{1}{2}$ inch of the surface with hot gravel and again poured with the filler; this last pouring shall be flush with the surface of the blocks at the joints. This final pouring of the filler shall be immediately followed with a sufficient amount of hot gravel applied at the joints to cover the filler.

The gravel shall be clean, washed gravel, between $\frac{3}{4}$ and $\frac{1}{2}$ inch in its largest dimension, not over 25 per cent of which shall be of $\frac{1}{2}$ inch size.

The paving cement to be used in filling the joints between and around the paving blocks and bridge stones shall be a bituminous material, either natural or artificial, entirely free from coal tar or any product of coal tar distillation.

It shall be waterproof, free from water or decomposition products, shall adhere firmly to the paving stones, and shall remain ductile and pliable at all climatic temperatures to which it may be subjected in actual use, and shall not run in the joints in the hottest temperature of summer, nor become hard or brittle through the action of frost.

It shall conform with the following requirements:

Not less than 99 per cent by weight shall be soluble in carbon bisulphide.

Its specific gravity at 66° F. shall not be more than 1.00.

One hundred grams of this cement shall not lose more than 10 per cent weight upon being maintained at a uniform temperature of 400° F. for seven hours in a cylindrical vessel $\frac{3}{8}$ inches in diameter and 1 inch in height. Its amount of fixed carbon shall not be more than 12 per cent and it shall show a flashing point, with the open oil tester, of more than 310° F., and shall not contain more than 2½ per cent of paraffine scale.

If obtained by a mixture of bituminous materials it shall be a thorough homogeneous mixture free from water and light oils, obtained by agitation with hot air at a temperature of not more than 400° until all the mass is blended completely, and shall be entirely free from any granular accumulation.

At 32° F. with No. 2 needle and 100 grams weight during five seconds the penetration shall not be less than one millimeter.

At 115° F. with No. 2 needle and 50 grams weight during five seconds the penetration shall not be less than eight nor more than fifteen millimeters.

One-half gram of the material when made into a ball shall not melt and drip through an aperture one millimeter in diameter at less than 220° F.

The paving cement shall be heated on the work to a temperature of not less than 400° F., nor more than 450° F., in such quantities as will allow of this temperature being main-

tained in the kettle during progress of the pouring, and no cement the temperature of which is less than 400° F. shall be used.

It shall then be put into a conical can and poured into the joints as hereinbefore described.

It shall be delivered on the work at least one week before being used and in sufficient quantities to allow of suitable samples for examination and analysis, and such samples shall conform with the above requirements.

All the joints between the stones shall be filled with this hot paving cement, continuing the pouring until the joints are entirely filled, but no flushing of the pavement shall be permitted.

In applying the gravel and bitumen care shall be taken that the pavers are closely followed by the filler gang, and in no case shall the paving be left over night (or when work is stopped) without the filler being completed. In case of rain stopping the filler gang before its work is finished the joints shall be so protected by tarpaulin or other means as to keep out water, and under no circumstances shall the filler be poured into wet joints.

(C) *Cement Grout Filler*.—Immediately after the blocks are laid sufficient gravel shall be spread over the surface and swept into the joints so as to fill the space between the blocks to a depth of about one inch from the bottom.

The blocks shall then be rammed to thoroughly settle and compact this layer of gravel in the joints and so as to leave no blocks above or below the general surface of the finished pavement.

After the pavement has been brought to a uniform surface Portland cement grout shall be poured into the joints until it appears on the surface. The grout shall be broomed into the joints, if necessary, to fill the same, and the operation shall be continued as the grout settles until the joints are thoroughly filled flush with the surface of the blocks, immediately after which the entire pavement shall be broomed to a smooth surface, sufficient grout being applied to bring said surface even with the highest part of any of the blocks. The blocks shall be wet by sprinkling immediately before applying the grout if the condition of the atmosphere requires this precaution to be taken.

The cement grout shall be composed of one measure of the best quality of freshly burned Portland cement to one measure of clean, sharp sand. In the mixing of the cement and the sand clean, fresh water shall be used to give the proper consistency.

The grout shall be mixed for this purpose, either in a machine mixer to be approved by the engineer or in a box about 4 feet 8 inches long, 30 inches wide and 14 inches deep, resting on legs of different lengths, so that the mixture will readily flow to one corner of the box, the bottom of which shall be 6 inches above the pavement. The mixture shall be removed from this box to the street surface with scoop shovels, all the while being stirred in the box as the same is being emptied. One such box shall be provided for each ten feet in width of the roadway. The work of filling shall be carried forward until an advance of fifteen or twenty yards has been laid, when the same force and appliances shall be used to re-grout the same space in a like manner, excepting that the proportion of the mixture for this second application shall be two parts of Portland cement to one part sand. The work shall be kept lightly sprinkled with water on the surface ahead of the sweepers by means of a sprinkling can or other suitable device to avoid the possibility of causing the grouting to become too thick at any point. To insure the penetration of the grout into the joints of the pavement there shall be used, in addition to the brooms, a squeegee scraper 15 to 18 inches in length on the last application of the grout.

Within one-half to three-quarters of an hour after the last coat has been applied and the grout between the joints has fully subsided, and the initial set is taking place, the whole surface shall be lightly sprinkled and all surplus mixture left on the top shall be swept into the joints, bringing them up flush and full. After the grouting is done and a sufficient time for hardening has elapsed, so that the coating of sand will not absorb any moisture from the cement mixture, one-half inch of sand shall be spread over the whole surface, and in case the work is subjected to a hot summer's sun an occasional sprinkling to dampen the sand shall be made for two or three days.

After the grouting is completed the streets shall be kept closed and no carting or traffic allowed until at least seven days have elapsed on any portion of the streets grouted, and the face of the pavement shall be kept moist if the condition of the weather requires this precaution, as may be directed by the engineer. Should the bond between the blocks become broken for any reason during the progress of the work the joints shall be cleaned out, even if it is necessary to take up and relaid the blocks, and such parts so taken up and relaid shall be re-grouted and rebarricaded.

NEWS OF THE MUNICIPALITIES

Current Subjects of General Interest, Under Consideration by City Councils and Department Heads—Street Water Works, Lighting and Sanitary Matters—Fire and Police Items—Government and Finance

ROADS AND PAVEMENTS

Will Use Oil on Unpaved Streets

Niagara Falls, Ont.—Merchants and residents living in the unpaved streets will not be bothered with dust the coming summer, it being decided by Works Committee of the Council to again use oil, as it has been found to give better results than water, and at a lower cost. City Clerk Seymour was instructed to obtain samples and estimates on the cost of street oil, and to report to the Council.

Mayor Favors Paving Plant

Portland, Ore.—Mayor Simon thinks the establishment of a municipal paving plant as contemplated under the proposed charter amendment to be submitted to the voters at the coming municipal election would result in great good. Not only could such a plant be used by the city in repairing old pavements, but he believes that many new pavements could be laid, and by competing with the private paving companies in this manner keep the cost of paving low.

Narrower Streets Find Much Favor

Los Angeles, Cal.—Narrower roadways on residence streets, as advocated for Los Angeles by W. M. Humphreys, inspector for the Board of Public Works, are finding much favor with citizens. The principal advantages of the plan claimed by Mr. Humphreys are that streets 25 feet wide or less are amply able to care for the usual traffic on residence thoroughfares, cost less to pave and maintain and afford better opportunities for planting trees and otherwise beautifying the parkways. The sidewalks are out to the curb line and the parkways are added to the lot area, without the municipality surrendering any rights. This method adds greatly to the appearance and privacy of residence property by throwing the residence farther from the traffic on the sidewalk. With the old way, six to eight feet of the street was lost in a cobblestone gutter, but with the smooth surface from curb to curb such gutters are not needed.

Will Use Oil on Park Roads

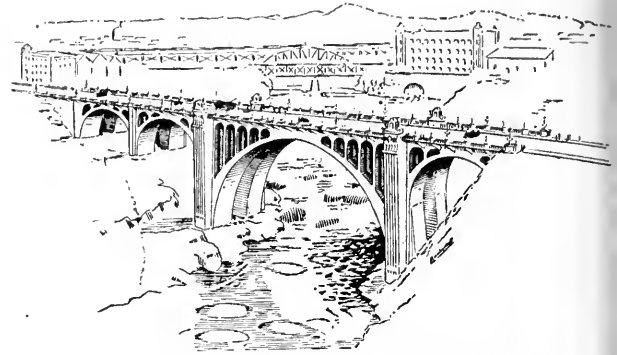
Cincinnati, O.—Water will no longer be used for sprinkling the park roads, as City Engineer Shipley is of the opinion that sprinkling is "medieval" as a method of getting rid of dust. His recommendation was concurred in by Director Sundmaker, and City Solicitor Ballard holds that the Service Director may provide that oil be used to keep down the dust.

Organized Plans for Repair of Roads

Los Angeles, Cal.—A repair force to look after keeping of the new good roads system and preventing damage to it will be immediately organized by the Board of Supervisors in conformity to recommendations by F. H. Joyner, Highway Maintenance Engineer. A motor truck for repairing the highways has been advertised for, and the force will be in charge of Oliver T. Georges, now a chauffeur for the county. Engineer Joyner's recommendations for the upkeep of the highway system are as follows: For the repair and maintenance of roads constructed by the Los Angeles County Highway Commission, it appears best to have two organizations—one to take care of the small repairs, such as patching macadam and shoulders, maintaining small waterways, slopes, etc., and the other to do the larger repairs, such as a general oiling, sanding or resurfacing of the roads and also the rebuilding of certain sections of roads where this method of treatment seems to be necessary. These two organizations had best be started in a small way and as a nucleus around which can be built a force and equipment necessary to properly and economically maintain all the highways the county may construct.

Rapid Progress on Bridge Built by Day Labor

Spokane, Wash.—Work is being rushed on the new Monroe street bridge, which City Engineer Macartney is building by day labor and expects to have completed this summer.



CONCRETE BRIDGE UNDER CONSTRUCTION BY DAY LABOR

The illustration shows the structure as it will look from the west when completed. The falsework for the main span is now being erected. The bridge is estimated to cost about \$500,000.

Improving Towns' Streets

Hartford, Ala.—The Town Council is having all the main streets of town graded and prepared with a hard clay surface which will add materially to the beauty and convenience of the town.

Make Property Owners Pay for Paving

Toledo, O.—By a tie vote Council Committee on Public Improvements last week refused to approve the proposition to have the city pay 25 per cent of the cost of improving University Boulevard in Harvard Terrace. The city accepted the central parkway on the boulevard, a Service Director Cowell was of the opinion that this obligated the city to pay half the cost of the abutting macadam pavement. Assistant City Solicitor Duer expressed the opinion that the whole cost can be assessed to the property owners, the city to pay for the curb line along the parkway.

For Road Improvements

San Antonio, Tex.—For the purpose of raising money for keeping up the county roads and building new ones the County Commissioners are considering the feasibility of placing a slight increase on all property valuations in the county and thus with the same old rate accomplishing the purpose of getting larger revenues. Whatever sum realized over and above the budget allowance can be transferred from the general fund to the road and bridge fund and the roads in the county thus given more attention. With the increase in the use of automobiles the demand for good roads is imperative.

Oil Will Be Used on Streets

Norwich, Conn.—It has been decided that the use of water on the streets will be curtailed this year as it will last and that oil, which proved so effective in keeping down the dust, will again be used on all but the block and brick pavement, which cover but a small section of the city. After the streets have been oiled early in May they will be oiled again in August, which it is thought will carry them through the season and keep the dust down. It is probable it will take 24 tank cars and the cost will be practically as much as by the use of the water, but it has proved more satisfactory and millions of gallons of water are saved.

SEWERAGE AND SANITATION

Town to Have Sewer System

Attalla, Ala.—Wilburn Hill, who has been connected with Hazleton and Anderson, engineers of Atlanta, will have charge of the laying of the sewer system of the city of Attalla. The work will be commenced almost immediately and will be completed within two or three months. The rapid growth of Attalla has made the sewer system necessary in order to preserve the health of the town.

Health Department Urges Reforms

Duluth, Minn.—A recent bulletin issued by the Health Department deals with a wide variety of subjects and urges many reforms and improvements. Among the recommendations made are the following: Push the lodging house ordinance; insist upon sanitary delivery of bread; boost municipal collection of garbage; war against the fly; individual towels in public schools; individual towels and sanitary drinking fountains in public buildings.

Sanitary Drinking Fountains in Schools

Woonsocket, R. I.—Sanitary drinking fountains are to be installed in the public schools of the city, arrangements having been made for the work by the property committee of the school committee. Between 80 and 90 fountains will be installed, with at least one in every building. This improvement in behalf of the health of school children follows the vigorous plea made for fountains as preventives of scarlet fever and diphtheria by Joseph T. Roswell.

Bar Sewage from Channel

Toledo, Ohio.—The city has been asked to take steps toward the protection of the channel of the Maumee River in the vicinity of the new city water works by preventing sewage and other material from going into the river at this point in a letter received by Mayor Whitlock from the United States Engineer's office at Cleveland. It is pointed out that an investigation of conditions was made by the local inspector, following complaints received recently, and that delay in correcting the injury to the channel, already produced, may result in damage to the channel at other points. The matter was referred to Service Director Cowell, who will take action.

Citizens Hastily Build Road to Frustrate Sewer Plans

Plainfield, N. J.—In disregard of the Sunday laws, the Citizens' Committee of Bound Brook, with a gang comprising 46 laborers, assisted by a number of property owners, worked all day opening up the new road through North Plainfield township, whereby they hope to defeat the borough's plans of locating sewage disposal beds on the Zvolnck farm. Henry G. Opdycke, chairman of the committee, himself an engineer, directed the operations, which attracted a large number of spectators from Bound Brook and the surrounding towns. It was an interesting sight to witness the property owners working alongside of the laborers, but they were so anxious to push the improvement that the social inequality cut no figure. During the day bridges were built, drains placed in position and trees were cut down. The new road has several angles to it and it is doubted very much whether the Board of Freeholders will accept the thoroughfare. A prominent citizen of the borough, in speaking of the project, said that any one can see the purpose for which the road was built; that the original stakes have not been followed and that it is plain to all that it was opened to block the sewer scheme. In view of these facts, it is the opinion of North Plainfielders that neither the State Board of Health nor the courts will sustain Bound Brook. The improvement is being paid for by the property owners, who have also given the right of way for the thoroughfare. Mr. Opdycke says that the townships of Bridgewater, Warren and Piscataway, the Bound Brook Council and Board of Trade are organized under the head of the Citizens' Committee and will go to the limit to defeat the sewer scheme. The State Board of Health will meet to-morrow, when it is expected that a decision favorable to North Plainfield will be given and the borough will then go ahead with its project, condemning the land needed for sewage disposal beds.

WATER SUPPLY

Consulting Chemist Finds City's Water Pure

Bangor, Me.—Prof. J. M. Caird, of Troy, N. Y., who is engaged as consulting chemist by the Water Department of the city of Bangor, has submitted his annual report on the city's water supply. Much of the document is given to tables and results of analyses made from time to time. He speaks in the highest terms of the new filter plant, and closes his report with the statement that Bangor has the best water supply in the State.

Increasing Capacity of Reservoir

Ogden, Utah.—Work has been commenced concreting the old city reservoir and increasing its capacity. The Moran Construction Company has a large force of men engaged in deepening and widening the big receptacle, so that it will conform in sanitary perfection with the new reservoir No. 2. The capacity of the reservoir will be increased nearly 2,000,000 gallons. Its present capacity is a little over 5,000,000 gallons, but by deepening it about four feet and widening it by extending the sides 30 feet outward a capacity will be gained of 7,000,000 gallons.

Town Drills Wells for Pure Water

Moorhead, N. D.—The new well which the city has just finished is only the beginning of a plan that has been adopted by the Moorhead City Council for giving the people of the city the best water available in their mains. The engineers who have gone over the ground declare that at the depth of the present well lies an underground lake which is large in its extent and will furnish the city consumers with the best and purest water that could be wished for. The present well is 12 inches in diameter inside its casing and is the first of a series of test wells which, if it proves a success, will be drilled. It is the plan of the city to fill the city water mains with this water, thus cutting out the supply from the river. The plan also includes a large reservoir up the river, which will be turned into the city mains in case of extreme necessity.

Gorge Dammed for Pure Water

Lawton, Okla.—In a narrow gorge of the Wichita Mountains, 14 miles distant, the city of Lawton is building of granite and cement a dam which will impound a supply of water for municipal purposes unexcelled for purity and clearness. This water will come from the watershed of the Wichita National Forest reserve into Medicine Creek, a mountain stream, and thence to the reservoir basin, without the slightest chance of pollution. The drainage area embraces 150 square miles, in which there is not a town nor a homestead. For all time there will be a water supply far in excess of the needs of a city four or five times the size of Lawton. The reservoir is 12 miles from town by pipe line, and the base of the dam 115 feet above the highest point in Lawton, where the average pressure will be about 90 pounds to the square inch. The plant is one of magnitude, but its construction is attended with few serious engineering problems. The location for the dam was chosen at a point where Medicine Creek barely squeezes its way through a cleft in the Wichitas. United States Army engineers at Fort Sill were asked to apply their knowledge to the situation. They drilled to a depth of 30 feet in the foundation, made estimates of the amount of water that would flow from the watershed and of the amount that could be impounded by the proposed dam, after which they approved the undertaking. For basin purposes 2,200 acres of land were purchased, the land touching the forest reserve. The present capacity of the reservoir will be 16,000 feet, equivalent to a foot of water on 16,000 acres, or a total of 5,500,000,000 gallons. The actual water area will be about 1,200 acres, with an average depth of 14 feet. The runoff of the watershed is estimated at 1,632,000 acre feet a year, a supply sufficient for a town with a population of 100,000, after deducting all wastage. Without a drop of rainfall a full reservoir would serve a town of 20,000 inhabitants for three and a half years, allowing 100 gallons per capita every 24 hours. The cost of construction is covered by a city bond issue. The contractors have been at work about seven months, and it is expected the work will be finished in July.

Town Improves Water System

Phoenix, Ariz.—Superintendent Avery Thompson of the city water department, assisted by Engineer Frank J. Ambull of Los Angeles, submitted the new pump installed at the city plant to a series of tests, found it satisfactory and recommended its acceptance.

Canadians Inspect Our Water Works

Toledo, Ohio.—Superintendent Wisler of the municipal water works has received word that a commission from Toronto, Canada, would visit Toledo to secure information regarding water intakes.

Sandbar in River Endangers City's Water Supply

La Crosse, Wis.—Unless one of the vagaries of the upper Mississippi's current sweeps away the sandbar that has formed over the mouth of a 24-inch intake pipe that supplies this city with water it will be necessary to move the pipe in about 30 feet. Expert divers have examined the river bed and report that the city may soon be without a water supply.

Advocate Free Water for Factories

Fort Worth, Tex.—Free water for Fort Worth factories for a term of 10 years—that is the text of a recommendation sent to the City Commission by Mayor Davis, who suggests that the city adopt the slogan of the Board of Trade, "We're for Smoke," and assist in making Fort Worth the greatest manufacturing center in the Southwest. According to the plan outlined the free water is to begin when the big \$1,350,000 reservoir is in operation. This will probably be in the fall of 1912, when Fort Worth will be able to boast of the largest supply of water of any city in the South.

Water Supply the Problem

Elizabeth, N. J.—The finding of a water supply is the puzzle that now confronts the Elizabeth committee on a municipal water plant. Men who are the most anxious that such a plant be secured, and who declare that Elizabeth and every other city should own its own water plant, shake their heads in doubt when asked where a water supply is to be obtained. It is pointed out that the Elizabeth-town Water Company, already long in the water business, is having difficulty in getting enough water, although it has several good sources at its command. This company intends to tap the springs and water sources away up in Ridgewood, so that this municipality will not suffer a water famine.

City Commission Personally Investigates Water Situation

Moline, Ill.—A peep into the "water problem" was taken last week by the City Commission, which visited the water works plant in a body and spent an hour viewing the filter beds, inspecting the boilers and hearing explanations from Engineer Magnus Olson. During the informal discussion that was carried on during the inspection tour water meters were suggested as a solution of the problem before the new Council. The Commissioners—or some of them at least—admitted water meters have their good points, but it was pointed out that installation of the meters would result in great opposition.

Helena Will Hold Water Bond Sale

Helena, Mont.—Three courts having rendered decisions affecting the right of the city of Helena to sell \$600,000 of water bonds, the city will proceed with the sale. The most important decision was that rendered by United States Judge Gilbert, at Portland, in the application of Receiver C. E. Bockus of the Helena Water Works Company, for an injunction to prevent the city from selling the bonds and installing a municipal water plant. This case was heard in Portland by reason of the fact that Federal Judge Carl Rasch, of this district, was formerly attorney for the water company and was disqualified. The city officials declare that the victories won mean the end of the long legal fight which has been waged between the city and the water company for the past 15 years. The receiver for the Helena Waterworks Company has announced that he would offer the plant to the city for \$400,000, to be paid for by 20-year 5 per cent. bonds. This price is \$190,000 less than an offer made by the company a month ago.

STREET LIGHTING AND POWER

City's Lights Famed

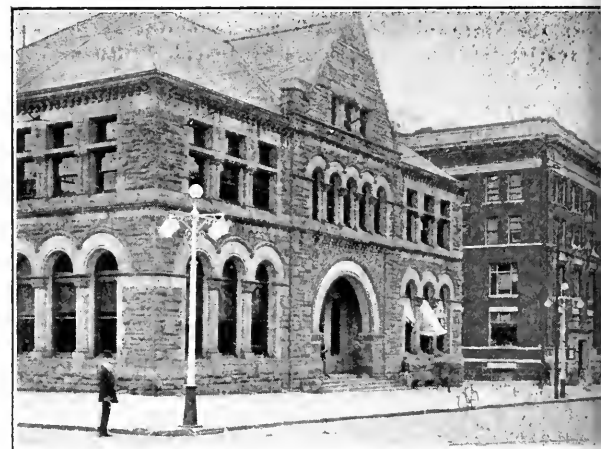
Baltimore, Md.—Boston City Councilmen will visit this city within the next ten days to inspect the lighting system. They will also study the local method of disposing of garbage. Boston is about to renew a contract involving the expenditure of several millions for lighting the streets. Walter Collins, President of the Council, is quoted as saying that aside from Milwaukee, Baltimore is the best lighted city in the world.

New Lighting System

Washington, D. C.—Work of installing the new lighting system in Vermont avenue, Connecticut avenue, Massachusetts avenue, Lafayette Square and Seventeenth street was commenced last week. Some street repairs have been planned, which will necessitate the tearing up of part of the pavement in front of the White House, and the lighting company planned to take advantage of that to begin the work of installing its cables.

Committee Reports on Lighting System

Lansing, Mich.—The committee of the Saginaw Board of Trade, which recently visited Lansing, has reported to the board that Lansing has 320 electroliers or poles bearing one, three and five light clusters of tungsten burners. The cost last year of a total of 803 separate lights and clusters



Courtesy Saginaw Daily News.

5-LIGHT STANDARD USED AT LANSING, MICH.

or a total of 1,503 lights, was \$22,000. The current is furnished by a municipal plant which now has \$40,000 in the bank to its credit. As a rule five-light clusters are placed at the corners of streets and three-light clusters in the intervening space. The standards are made by the Michigan Brass and Iron Works, a local manufacturer.

Novel Concrete Lamp Posts Placed in Park

Pasadena, Cal.—The city lighting department has just completed installing fourteen concrete lamp posts in Library Park. These lamp posts are unique in that the base being separate is set first and the tapering columns are afterward cemented into same. Building them in two pieces greatly reduces the first cost as well as effecting a great saving in transportation. All the wire connections are underground, and work of erection as well as design of holders for the ground-glass globes was done by the municipal lighting plant.

New Electrical Plant Rises in Record Time

Cleveland, O.—The Cleveland Electric Illuminating Company expects to have the first unit in its new plant at the foot of East Seventy-first street in operation between July 15 and 20. The entire plant of six units will be completed before September 1. Each unit will supply 14,000 kilowatts. The plant, which will be one of the largest and finest of its kind in the country, is being built more rapidly than any similar institution ever erected. Structural work was started last December and brick work on February 22. The plant will cost in the neighborhood of \$2,500,000. "It has been designed to take care of Cleveland and Cleveland's growth," General Superintendent Robert Lindsay states.

FIRE AND POLICE

Auto Fire Truck Tried

Milwaukee, Wis.—A modern auto fire truck which was put out one day last week is to be given 30 days' trial in Milwaukee, and if it proves satisfactory to the department will be recommended to the Common Council for purchase. The powerful red machine, a combination chemical truck and hose cart, carries 1,000 feet of hose, 250 feet of chemical hose, a chemical tank holding 30 gallons and 7 men.

Auto Engine Kills Two

Passaic, N. J.—One of the Passaic Fire Department's automobile fire apparatus skidded and crashed into an iron trolley line pole one night last week, wrecking the machine and killing two men. The dead are Charles F. Cowley, secretary to the Passaic Board of Education, and Lieutenant James A. Delaney, of the Fire Department.

Auto Chemical Engine Found Economical

Middletown, Conn.—In a recent report of the Fire Chief to his department the statement was made that from April 15, 1910, to April 15, 1911, the actual expense of Middletown's combination auto-chemical was exactly \$39.61. A year before the auto was purchased the expense of maintaining a pair of horses on Hose 1's wagon was \$350.02, leaving the snug balance of \$310.41 in favor of the auto.

New Signal System

Buffalo, N. Y.—The new police signal system has been put into operation at the Pearl street station, and was operated throughout the precinct, being watched by Inspector Martin and Captain Gilligan, who pronounced it successful. It consists of a number of call boxes on each man's post attached to telegraph poles. Above the box is a red light used to call men to the box. A bell will ring the daytime to notify men they are wanted at the box.

Motor Fire Apparatus Installed

Lansing, Mich.—The new motor fire engine apparatus has been installed in Central Fire Station, where it is ready for future emergencies.

More Police Equipment

Alexandria, Ind.—In addition to the Luger automatic pistols which the city recently purchased to arm the police are another supply of police paraphernalia, in the way of truncheons and handcuffs, has been received. This makes the equipment of the department first class in every respect, and as the officers have recently donned their new summer light uniforms the force is in excellent condition.

Fire Truck for Racine

Racine, Wis.—Racine's first automobile fire truck arrived last week from New York in charge of an expert, who will teach the fire fighters how to run the \$5,000 machine.

Fire Loss Is Small

Richmond, Ind.—Because of the efficiency of the Richmond Fire Department the Board of Works will make an effort to have lowered the insurance rates as assessed by companies doing business here. The city's fire loss in the last three years has been far below that of other cities in the State where the fire insurance rates are the same in comparison with those effective here, and the city officials believe that property owners are entitled to a lower premium because of these facts. The total fire loss in 1910 was less than \$4,000, in 1909 less than \$7,000 and in 1908 about \$50,000. The city regularly employs 30 firemen and has a reserve of equally as many more.

Expect Auto Fire Apparatus Will Lower Insurance Rates

Great Falls, Mont.—A demonstration of the auto chemical hose wagon was given last week before J. H. Branscomb, district secretary of the Board of Fire Underwriters of the Pacific. The apparatus was bought in accordance with the recommendation made by him in 1909, which recommendation was also embodied in the report made by engineers of the National Board of Fire Underwriters last year. A re-inspection of property coming under the protection of the Great Falls department is now being made for the purpose of ascertaining if a lower rate of fire insurance can be established here.

GOVERNMENT AND FINANCE

Mayor Elected by Close Margin

Norfolk, Neb.—At the biennial city election held on April 4 Mayor John Friday was re-elected by a majority of one vote out of a total of 1,151 votes cast.

Plans for National Municipal Accounting Bureau

New York, N. Y.—The Bureau of Municipal Research announces that it has engaged U. L. Leonhauser as accountant for the national fund established by ex-Comptroller Metz for "promoting efficient municipal accounting and reporting." Mr. Leonhauser will have charge of the co-operative investigations conducted with the City Comptrollers and Mayors of other cities by that fund, and of the correspondence which Mr. Metz hopes will "make available to American cities the best principles and practice worked out in municipal accounting and reporting." With him will be associated George L. Bergen.

Women Not Allowed to Vote May Invalidate Election

Traverse City, Mich.—According to a ruling made by Assistant City Attorney Higbee, of Grand Rapids, the recent city election in Traverse City may be entirely invalidated and all because the female voters there were accidentally disfranchised. It developed that in Traverse City the school office candidates were placed upon the regular city ballot and no separate ballot for the women was supplied. Naturally the women could not vote for any but the school officers, and so were not allowed to vote at all. In Grand Rapids the charter distinctly provides that separate ballots must be prepared for the women who wish to vote at school elections or upon bonding propositions, but the provision merely carries out the broader provisions of the State law. The authorities of Traverse City decided they would not prepare special ballots for the women because there was no specific charter provision requiring it. Therefore Traverse City women were denied a vote, while in Grand Rapids, Detroit and elsewhere women were allowed to vote for school trustees.

Commission Government Elections

Winston-Salem, N. C.—Commission form of government for the city of Winston was defeated by a majority of 106.

Montgomery, Ala.—Two of Alabama's chief cities have dropped the Aldermanic form of municipal administration for a system of commission government. In Birmingham three City Commissioners were sworn. Mayor Culpepper Exum is one of the Commission. Montgomery has five Commissioners appointed by the Governor. Mayor W. A. Gunter, Jr., is one of them.

Taylor, Tex.—The election on the special city charter enacted by the recent Legislature providing for a commission form of government for Taylor resulted in its rejection by a vote of 290 to 357, a majority of 67 votes against the measure. A total of 647 votes were polled.

Marshalltown, Iowa.—This city has passed from under the old municipal form of government with a Mayor and seven Councilmen to the commission form. Mayor Jones and Councilman Herman were installed, the seat of Councilman Derby being contested.

Faribault, Minn.—The commission form of government was chosen here by an overwhelming majority at a recent election.

Parkersburg, W. Va.—At a special election called for the purpose the voters of Parkersburg adopted a new charter providing for the commission form of government, the initiative, referendum and recall. The vote was 1,831 for the new charter and 1,622 against it.

Paola, Kan.—Commission form of government lost in Paola at a recent election by 24 votes.

Raleigh, N. C.—Raleigh voters defeated the commission form of government by a vote of 886 to 437, only one ward, the second, having given the majority for the measure provided by the recent Legislature and subject to adoption by the people of Raleigh.

STREET CLEANING AND REFUSE DISPOSAL

Garbage Reduction Plant Ready for Use

Bridgeport, Conn.—The work of rebuilding the garbage plant has been practically completed, and the owner, Charles Fischer, expects to begin receiving garbage for reduction next week. Four digesters have been installed so that the capacity of the plant will be 60 tons of garbage during every eight hours. The Mayor and members of the Board of Health will thoroughly inspect the plant before it is opened. Practically the entire equipment of old apparatus has been discarded.

Engineer to Inspect Electrolytic Disposal

Atlanta, Ga.—For the purpose of sending an engineer to examine and inspect the electrolytic sewage disposal plant recently installed at Oklahoma City, Okla., City Council last week adopted a resolution appropriating \$100. W. A. Hansel, the engineer in the Chief of Construction's office, who has charge of the bond issue work, will be the man to go at the city's expense. He is a competent engineer and a thoroughly reliable expert, and whatever he brings back the City Council will be willing to accept as authoritative.

Tests Being Made with Uniform Pressure Street Flusher

Peoria, Ill.—Projecting a long blade-like stream of water from a front nozzle on either side, a new device known as the Studebaker uniform pressure street flusher, is being given a series of tests on the downtown streets under the direction of the Commissioner of Public Works. The thin blade of water sweeps over the surface like a broom, throwing the dirt toward the curb and leaving the pavement as clean as if it had been scrubbed by hand. The flusher, when loaded, weighs 11,460 pounds, and the cost of the machine is \$1,000. Thus far the tests made have been eminently satisfactory.

Cost of Operating Crematory Greatly Reduced

Tampa, Fla.—The report for the second month's operation of the garbage crematory has been issued. The first month's operation gave a cost of \$0.405 per ton, the second \$0.231. The material consumed totaled 1,267.2 tons, or 3,168 loads, an average of 47 tons a day.

Street Sprinkling in Utica

Utica, N. Y.—In some cities contracts are let for sprinkling the streets to lay the dust during that portion of the year when such service is desirable, and in former years the business men of Utica had an arrangement by which the principal business streets were sprinkled. Of late, however, the only street sprinkling done in this city is that which the Utica Sweeping and Contracting Company does in connection with the regular work of sweeping. The city has an agreement with the company that whenever sprinkling is needed to keep the dust down prior to sweeping the streets the company is to do it. The company has had its sprinklers in use for some time.

Midnight Refuse Removal

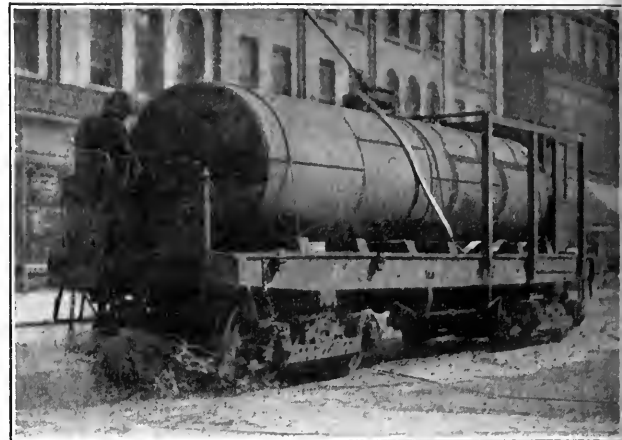
New York, N. Y.—Street Cleaning Commissioner Edwards has announced that he is going to try the experiment of removing ashes and garbage in the night. The test will be made in Manhattan, Brooklyn and the Bronx. Mr. Edwards says it is the intention of the department to give this method a careful tryout, and the instructions are, if possible, to make it a success. It is believed that this method will lead to the use of vehicles which will better accommodate the collection than those at present in use—that is, trucks of larger capacity, manned by three men instead of one and drawn by three horses.

Oil and Water Sprinkler Purchased by Citizens

Texarkana, Ark.—The combination oil and water sprinkler recently purchased by public spirited men of the East Side has arrived, been put together and is in readiness. The tank has a capacity of 600 gallons, and when filled the apparatus will weigh something more than four tons. The machine is strongly built, and is equipped with wheels having tires $4\frac{1}{4}$ inches wide, which are expected to be a benefit to the streets.

Home-Made Trolley Sprinkler

Milwaukee, Wis.—Pending the arrival of eight new trolley street sprinklers the Milwaukee Electric Railway and Light Company rigged up a home-made affair. The ma



Courtesy Milwaukee Sentinel.

HOME-MADE STREET CAR SPRINKLER

chine made good beyond expectations. The apparatus consisted merely of a horizontal cylindrical tank mounted on a platform car with proper pipe connections and an ordinary sprinkling valve at the rear.

New Plan for Garbage Disposal

Cleveland, O.—A revolution in the system of handling garbage at the municipal reduction plant may result, if experiments now being conducted work out as expected. The system of cooking the portion of the garbage left after the grease has been extracted and selling it as fertilizer will be abolished should the scheme prove successful. Instead of expending power in the manufacture of the fertilizer, the portion of the garbage will be sold as horse feed after a certain mixing process is followed. The material will be used in the city's own stables and will be sold to other horse owners as well. "The city has 350 horses," said Director Lea recently. "The feed bill is something like \$100 a day. It is the cooking of the garbage after the grease has been extracted that causes the smell. If a new system is adopted there will be no odor at the plant. In addition the power cost will be reduced. The cost of power at the present time is \$2,000 a month."

New System of Street Cleaning Will Be Tried

Rochester, N. Y.—Announcement has been made by Commissioner of Public Works F. T. Elwood that the flushing of the thoroughfares in the central part of the city and the streets near the entrances to the parks will be commenced by the city employees the latter part of next week. It is expected that the winter's accumulation of dirt and debris will have been disposed of by the contractor on the sweeping and cleaning of the streets by the middle of the week. Owing to the long winter an unusually large amount of dirt and debris had accumulated on the streets. After the general cleaning now in progress the contractor will be held responsible for the condition of the thoroughfares and will begin to do the cleaning and sweeping under the new system inaugurated by Commissioner Elwood. There will be 123 men and carts employed on the work, a certain amount of street space being assigned to each cleaner, who will be held responsible for its condition by the contractor. The cleaners on the downtown streets where the traffic is heaviest, will necessarily have less ground to cover than those detailed to work on the outlying streets. Instead of leaving piles of dirt on the streets as has heretofore been the custom, the cleaners will be required to dispose of their refuse in their little black carts. In the past the dirt piles were allowed to stand until night when the refuse was removed in wagons. Pending the arrival of the wagons the refuse was frequently blown a

RAPID TRANSIT

Street Cars for Emporia

Emporia, Kan.—Emporia is going to have street cars, the franchise carrying by a majority of more than 500 in the city election. The franchise also carries with it the leasing of the municipal light plant to a Dayton syndicate. There was a strong fight against leasing the plant, but municipal ownership has proven a failure and the citizens voted for the franchise, hoping that the street cars will prove a benefit to the city. The provisions of the contract call for the payment of 5 per cent interest on the valuation of the plant by the Dayton syndicate. The plant has been valued at \$68,000. The franchise gives the syndicate the privilege of operating a car line and the plant for 10 years and fixes the rates to be charged for electricity.

Street Railway Company Gets Two Franchises

Salt Lake City, Utah.—The city has granted a franchise allowing the Utah Light and Railway Company to extend its line on Eleventh East from Twelfth South in a southeasterly direction to the city limits. The county has granted a franchise for a continuation of this line on to Holiday and an extension of the West Temple line from Tenth to Twelfth South streets. It is the intention of the company to complete both extensions during the present year.

Trolley Franchise Granted

Chester, Pa.—The ordinance adopted by the Lansdowne Borough Council several weeks ago, giving the Terminal Street Railway Company the right to build a trolley line through the borough to connect with the Lansdowne and Darby "short line," has been approved by Burgess Carscadon. The franchise calls for swift and businesslike action in construction. If the corporation accepts it and lives up to the terms laid down Lansdowne will have direct access to the city by way of the Market street "L" within nine months. If the company does not begin construction within three months the franchise will lapse.

MISCELLANEOUS

Cities to Build Conduits

Columbus, O.—A bill by Representative Reynolds of Columbus, introduced in the House, proposes to give cities power to build conduits and compel the burying of corporation wires. Representative Donson introduced a measure to make more rigid requirements for the erection of fire escapes on mercantile buildings. The bill is taken from the general code prepared by the State Board of Health, State Fire Marshal and State Factory Inspector.

Segregation Ordinance Adopted

Newport News, Va.—The Board of Aldermen last week adopted the so-called "dead line" ordinance fixing a line in East End for the separation of the white and negro residential sections. The measure provides that hereafter no white person may move into the section bounded by the "dead line" and no negroes may hereafter move into the white section.

Citizen Donates Playground

San Antonio, Tex.—A public playground one mile long, 200 feet wide for its entire length, bordered on each side with four rows of shade trees, containing many beautiful flower beds, a long swimming pool in the center, with two bath houses, will be deeded in perpetuity to the people of San Antonio by F. F. Collins. This announcement was made by Mr. Collins, a director in the Civic Improvement League. Collins Gardens, where the playground is being laid out, is a famous show place with its wonderful artesian wells and highly productive 10 and 20-acre truck farms. The beauty of the landscape will be continued and added to in the playground at an expense of \$50,000 by Mr. Collins. He has been quietly proceeding with his plan for some time, having had landscape gardeners at work, walks laid out, plans for miniature lakes and swimming pool all completed.

City Considers Underwriting Own Insurance

Scranton, Pa.—A resolution has been adopted by the Common Council providing that a committee of six, three from each branch of Council, be appointed to consider legislation for the creation of a sinking fund to be substituted for the present system of fire insurance for city buildings. The city averages in three years in the neighborhood of \$5,000 in fire insurance premiums. The payments generally are \$1,000 a year for two years and \$2,000 for the third year.

Stock Park Lakes with Fish

Fort Worth, Tex.—Superintendent Vennedge has made a requisition on the United States fish hatchery at San Marcos for fish to stock the ponds at Marine and Trinity parks. The lake at the former park has an 8,000,000-gallon capacity and it is well filled with water. The Trinity Pond is of 1,500,000 gallons capacity. The allotment of fish will be in proportion to the capacity of the ponds or lakes.

Planting a Thousand Trees Along Streets

Syracuse, N. Y.—More than 1,000 shade trees will be planted along the city streets this spring under the direction of the Bureau of Parks. Hundreds of applications for trees have been made by property owners, and where possible they will be complied with. The chief varieties are American elm and soft maple, which are regarded the most hardy and practical for street purposes. More ornamental kinds are used for parks and lawns. Poplars are not permitted because of the lint they shed, and the fact that their long roots penetrate sewer pipe connections, causing obstruction and damages. Lindens and basswoods are used to some extent. The Bureau of Parks is keeping a close watch for pests which attack park and shade trees. The tussock moth is regarded as the worst to deal with, but it will be some weeks before the larvae appear. Many of the cocoons are now on the tree trunks in different parts of the city, and it is planned to destroy as many as possible before they develop.

City to Have Department of Automobiles.

Spokane, Wash.—A new city department will be created to be known as the "Department of Automobiles" and probably placed under Commissioner D. C. Coats. To solve the problem of maintaining and caring for the machines of the various departments the City Commissioners have requested Commissioner Fairley and the Corporation Counsel to prepare an ordinance for passage creating the department mentioned. While the city has its own garage and mechanic in charge, there is no way of taking care of the salaries of chauffeurs, bills for supplies, etc., except for each department to take care of these expenses out of the department funds.

Pass Ordinance as to Theaters

Janesville, Wis.—Janesville's new theater ordinance, drawn up by the City Attorney, was given its third reading last night and placed on passage by a unanimous vote of all the Aldermen. The principal features of the ordinance are against the crowding of theaters and allowing people to stand in the aisles and entrances; it requires each place to have a fireproof room provided for the motion picture machinery, sheathed with galvanized iron and asbestos lined.

Systematic Plan to Beautify City Will Be Carried Out

Houston, Tex.—A new policy involving a systematic plan for beautifying Houston has been announced by the Chamber of Commerce co-operating with the city through Mayor Rice. It involves the appropriation and expenditure of sufficient funds to obtain results desired. The work is to be done with absolute system, having in view a definite purpose. F. H. Pottinger has been employed to take charge of the work and will rank as the Chief Forester of Houston. He will have an office in the rooms of the Chamber of Commerce, and his services will be available to the public. A committee from the Chamber of Commerce called on Mayor Rice in regard to the proposed plans of beautification, especially the work dealing with the ship channel. At the conclusion of the conference he pledged the city to appropriate half of whatever fund may be necessary in the work of bayou beautification. It is estimated by Secretary Boldt of the Chamber of Commerce that \$10,000 will be adequate for the bayou work.

LEGAL NEWS

A Summary and Notes of Recent Decisions—Rulings of Interest to Municipalities

Sidewalk Obstructions—Injuries—Instructions

City of Harrodsburg vs. Sallee.—In an action for injuries to a pedestrian who stumbled over an obstruction on a sidewalk the court charged that if the obstruction had been there an unreasonable length of time, and the municipal authorities knew or might have known by reasonable diligence of the existence of the obstruction, and it was of a form and character ordinarily calculated to cause persons walking and exercising reasonable watchfulness for their own safety to stumble and fall, and plaintiff was reasonably watchful for her own safety, the verdict should be for plaintiff, otherwise for defendant. Held, that the instruction was not erroneous as failing to present defendant's theory of contributory negligence.—Court of Appeals of Kentucky, 130 S. W. R., 405.

Removal of Policeman—Compensation

Kammerer vs. City of Louisville.—Where a policeman is dismissed, without charges being preferred, and without notice and a trial, the city is liable for his salary until the entire number of policemen authorized has been appointed, without a determination of the rightfulness of his dismissal; but when the full complement is appointed, the right of such policeman to recover his salary ceases until he establishes his title to the office in a direct action.—Court of Appeals of Kentucky, 135 S. W. R., 411.

Franchises—Indeterminate Permit

City of La Crosse vs. La Crosse Gas and Electric Company.—The feature of the public utility law rendering non-enforceable existing contracts relating to any charge of service regulated thereby in case of conversion of an old into a new franchise by a surrender of the former, by necessary implication, renders non-enforceable obligations of the corporation incurred as a condition of the old franchise and substitutes therefor the obligations and conditions of such law.—Supreme Court of Wisconsin, 130 N. W. R., 530.

Bonds—Municipal Purposes

Brown vs. City of Lakeland et al.—The power given the Legislature to prescribe the "powers" of municipalities and to authorize cities and towns to assess and impose taxes for "municipal purposes" does not permit the giving to municipalities as such authority to issue bonds and to levy a municipal tax to pay the bonds, when the proceeds are to be used "for the purpose of erecting schoolhouses and maintaining a system of public education in the municipality."—Supreme Court of Florida, 54 S. R., 716.

Ordinances—Prosecution—Appeal

McKinstry vs. City of Tuscaloosa.—While one accused of a violation of a municipal ordinance is entitled in the municipal court to be apprised by written complaint of the nature and character of the proceeding instituted against him, he by proceeding to trial without demanding in such court such a complaint waives the right thereto; and cannot for the first time avail of it on appeal.—Supreme Court of Alabama, 54 S. R., 629.

Validity of Tax—Presumptions

Hanley vs. City of Elkins.—In order to entitle a plaintiff to recover from a municipality a tax alleged to have been levied by it without authority of law and paid under compulsion, he must prove that the tax was illegal and void. If it appears from the charter of such municipality that it had the right in any event to levy the tax which is sought to be recovered, it will be presumed, in the absence of proof, that the tax was lawful.—Supreme Court of Appeals of West Virginia, 70 S. E. R., 698.

Sewer Ordinance—Compliance with Statute.

Platt vs. City of Payette.—Revised Codes, providing for what shall be contained in an ordinance giving notice of intention to construct a sewer system, must be liberally construed, and a substantial compliance with the provisions of the statute is all that is required of the council, in view of the fact that its passage constitutes merely a preliminary

step leading up to the final issue of the bonds, in case the voters should decide at the special election in favor of such improvement being undertaken.—Supreme Court of Idaho, 114 P. R., 25.

Sidewalk Obstructions—Snow and Ice.

Schneider vs. City of New York.—A municipality is liable to persons who, without negligence on their part, are injured through its failure to remove obstructions from a sidewalk, including snow and ice, but need not do what is practically impossible to avoid accidents. The city of New York was not negligent in failing to remove snow and ice from the sidewalk on which a pedestrian was injured, where scarcely twenty-four hours had elapsed since the obstruction accumulated; the city being entitled to wait a reasonable time for freezing weather to moderate.—New York Supreme Court, 128 N. Y. S., 45.

Defective Sidewalk—Liability.

McCoy vs. City of Utica.—That a pedestrian is injured by some slight defect in a street from which danger was not reasonably to be foreseen, e. g., a depression in a sidewalk to the depth of the thickness of surrounding flagging, right-triangular in shape with base and sides about two feet long, caused by the removal of a broken piece, does not show negligence of the city.—New York Supreme Court, 128 N. Y. S., 60.

Water Bond Election—Illegality.

Blaine et al. vs. City of Seattle et al.—Constitution, Section 6, prohibited cities from becoming indebted to an amount exceeding 1½ per cent. of the taxable property without the assent of three-fifths of the voters therein voting at an election to be held for that purpose. The Seattle city charter provided for bonds for corporate purposes and authorized submission of an intended debt to voters as prescribed by ordinance and another section provided that every ordinance should contain but one subject. The city desiring to issue bonds for eight distinct improvements in no manner related to each other, the aggregate of which, if adopted, would make the city's indebtedness exceed the constitutional limitation, passed an ordinance submitting the proposition so as to require the taxpayers to vote for or against all of them. Held, the ordinance must prescribe a scheme not inconsistent with the Constitution and laws, and that the submission in question did not permit free action on the part of the voters and that the election was therefore void.—Supreme Court of Washington, 114 P. R., 164.

Water Supply—Submission to Vote.

Carlson vs. City of Helena.—An ordinance, submitting for the determination of the voters the question of the propriety of producing a water supply from a certain creek, was not misleading as to the question to be determined, because the city had already purchased and paid for water rights from such creek, since the water supply had not been procured by the city in the sense that it had been made available for use; the propriety of doing so being the real question submitted.—Supreme Court of Montana, 114 P. R., 110.

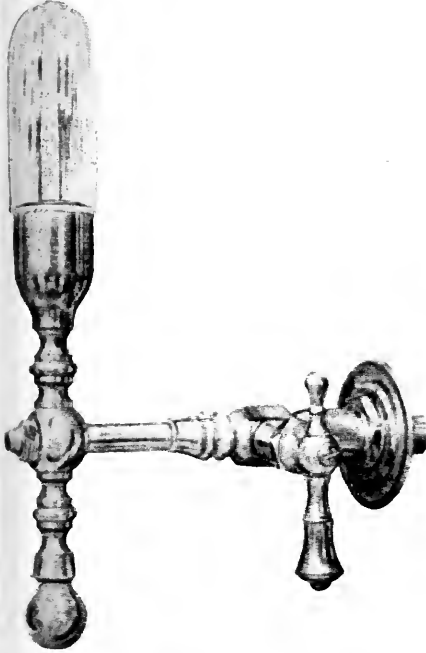
Discharge of Sewage into Water Course

Fonda vs. Village of Sharon Springs.—The discharge by a village of sewage into a natural water course, rendering the waters thereof unfit for cattle to drink, and causing quantities of filth to stand in pools at times of low water, from which a noxious stench arises, is a public nuisance, the right to maintain which could not be given by grant or acquired by prescription. Statutes expressly authorizing the construction of sewer systems with the approval of the State Board of Health give no authority for maintenance of a nuisance involving consequent injuries to private property. The owner of land injured from the discharge of sewage into a stream by a village may have such village restrained, though others contribute to the injury, and may recover from the village such damages as its acts have occasioned up to the time of trial, but such village should be given a reasonable time before enforcing the injunction in which to provide for a different disposal of its sewage, the village in the meantime to pay the injured land owner his damages suffered during such period of suspension.—Supreme Court of New York, 128 N. Y. S., 147.

MUNICIPAL APPLIANCES

Sanitary Drinking Faucets

THE M. H. Foundry and Manufacturing Company, Inc., Belleville, Ill., manufactures a line of sanitary drinking faucets called the Twentieth Century. Of these the Gem is shown in the accompanying illustration. This faucet



GEM SANITARY FAUCET

may be inverted and used in the old way for filling pails or for other purposes. The faucet is furnished of the compression or self-closing type.

Gasoline Trench Excavator of the Wheel Type

THE American Ditching Machine Company, Minneapolis, Minn., manufactures an excavator of the wheel type shown in the illustration. The machine is propelled and the excavator operated by a 40-horsepower gasoline engine. The makers state that under ordinary conditions it will dig a ditch 6 feet

deep and 2 feet wide at a minimum rate of 180 feet per hour, handling 80 cubic yards of excavation. One man operates the machine. The digging and elevating portion of the excavating wheel consists of an inner and an outer 22-inch rim separated by a 6-inch I-beam in the center. The outer rim is cut into segments and equipped with digging knives, forming continuous earth passages on both sides of the I-beam center. At the top of the wheel the dirt is pushed onto rotating discs by plows and discharged from the discs by means of other plows.

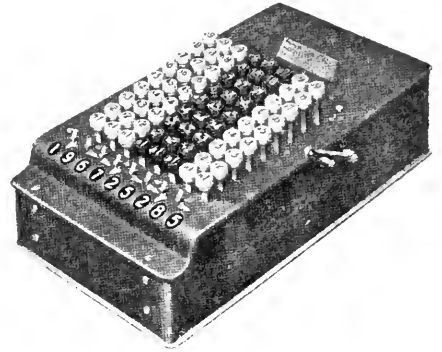
Comptometer Suitable for Engineering Calculations

THE Comptometer, made by the Felt & Tarrant Manufacturing Company Chicago, Ill., is a calculating machine, suitable for the use of engineering and contracting firms, as it does division, multiplication and subtraction with equal facility. The operation is exceedingly simple and can be learned, it is said, in a few hours. Experience, however, greatly increases proficiency.

The Comptometer is light, strong, yet so compact that it can be placed on an open book, desk or drafting table—anywhere convenient to the work. It is operated solely by keys like a typewriter. The operator simply touches the keys and reads the answer. There are no buttons to push, no operating lever to pull. The "touch" system of operation is just as practical as with a typewriter, thus enabling the operator to concentrate his attention on the work before him and so minimizing the danger of misreading figures. The duplex feature of the Comptometer, which permits the keys to be struck in any order or all together in any column at the same time, gives a speed in multiplication and division said to be three to four times as fast as that of a non-duplex machine. One machine will handle the figure work of several men in any drafting room.

The Comptometer may be used in making up a payroll as follows: Each day the timekeepers turn in the occupation of every man on the job and the number of hours he has worked.

The accounting department posts from the timekeepers' books to loose leaf sheets. The extensions and postings of these, it is claimed, are made on the Comptometer in one-half the time re-



COMPTOMETER

quired to do the work mentally. The usual great rush in the accounting department just prior to pay day is thus eliminated. The distribution of the labor charges, as well as charges for materials, supplies, administration and other expenses, is said to be greatly facilitated by the use of the machine.

Fire Alarm Box

THE Lannert Company 3915 Bonna avenue northeast, Cleveland, O., manufacture a fire alarm box which they state can be used in connection with any other make of boxes in the same circuit. The outer box A consists of a large heavy iron box which is furnished with a door B supplied with a good brass spring lock and key and so constructed that after unlocking the outer door this key cannot be taken out of the lock except with a release key, which is inserted in the keyhole C.

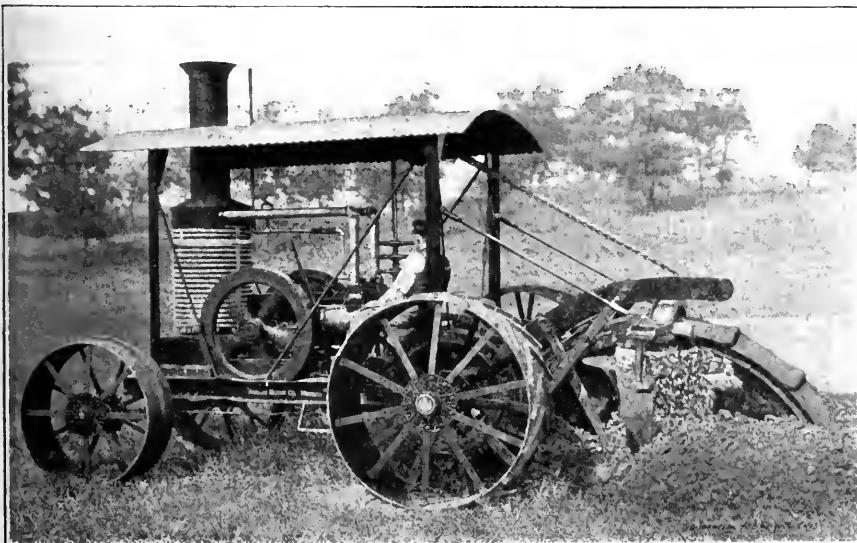
The release key remains in the charge of the fire department, while the unlocking keys are either furnished to people living near the box or a key is placed in a small iron box provided with a glass door so that if the key is desired the glass front is broken and the key, which is attached to the box by a chain, is taken out to unlock the door.

Within the large case and insulated therefrom the smaller square case D is secured, which is also provided with a door E and a brass lock F and is opened by means of the same release key.

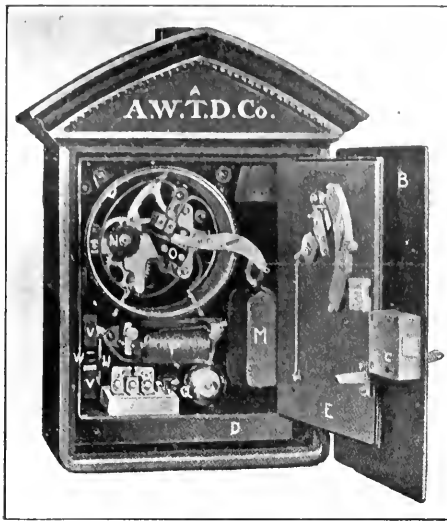
To the inside of the inner door E a lever is pivoted at G, which extends sideways across the inside of the door under the dog H and plate I and projects through the slotted arc of a circle to permit the lever to be pulled down from the outside of the inner door so as to permit of sending in an alarm.

The lever engages the dog H after it is pulled down so as to prevent it being pulled down a second time and thus interfering with the alarm being sent until after the box has completed sending in the alarm, which then disengages itself so as to be in position to turn in another alarm.

Inside of the square case is secured the round case J, having a glass front which encloses a train of gears driven by the segment of gear K, whose shaft extends through the glass front and is secured at its outer end to the lever L, to one end of which is connected the weight M, which moves the clockwork, and the other end of the lever engages with the lever on the door so as to raise



AMERICAN DITCHER—GASOLINE DRIVEN



LANNERT FIRE ALARM BOX

the weight when the lever is pulled down.

The shaft of one of the gears extends through the brass frame underneath the glass and has secured to it the hard rubber wheel N, provided with teeth to correspond to the number of the box.

To the frame is also secured the hard rubber plate O provided with two phosphor bronze springs, one of which extends over the wheel and is provided with a roller at its extreme end so that on the rotation of the wheel its projection will engage the roller and raise the platinum point of the upper spring away from the platinum point of the lower spring, first, however, producing a sliding motion of the contacts to keep them clean before breaking the circuit so that the circuit is broken and closed the proper number of times to correspond to the number of the box, and finally the last action of the movement short circuits the box so that the current does not pass through the platinum points, but goes through the shunt. An electromagnet P under the round case is provided with a hammer, bell and armature to be used for signaling. A porcelain base is secured to the inside of the square case and is provided with the three parts of a plug switch so that in testing the line on either side of the box can be grounded by taking out of the hole the plug Q and placing it in either of the holes between plate R and plate S or between plate R and plate T, but it is imperative that the plug should not remain in either of these holes and consequently is made sufficiently long to prevent the door from closing, thus notifying the operator to take out the plug. By placing the plug between plates T and S the box itself is out of service. The line wires are connected to the plates S and T, respectively, and the ground wire is connected to R. The wires are brought into the box through a conduit pipe which is screwed into the outer box either at the top or at the bottom. The Morse key is mounted on the same base for signaling.

To the left of the porcelain base is a cut-out switch U which consists of two hard rubber blocks V and V, on which are mounted the two levers of the switch. These two levers slide over two sets of contacts and are connected by a hard rubber handle, which normally extends to the inside of the door.

Two phosphor bronze springs W are shown between the rubber blocks V and V. These are so connected to the

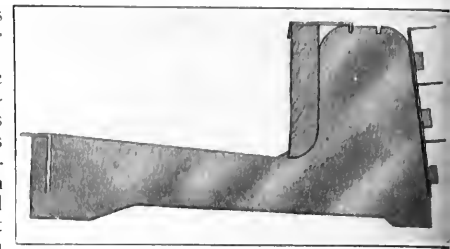
switch that when the inner door is closed the plug X slides in between the springs W and shunts the springs.

The object of the switch is to test the box and for which purpose a hard rubber switch plug is provided, the wires of which are connected to two cells of dry battery and then the plug is inserted between the spring W; then on pulling out the switch handle it will shift the levers on two other contact points and short circuits the fire alarm box from the line circuit; the box will then be on a local circuit. After putting the plug Q between the two plates T and S and pulling down the lever L the box will operate the bell P.

The taps of the bell should correspond to the number of the box to prove that the box is in condition.

The switch lever is then pressed down, the plug withdrawn and the plug Q taken out from between the plates T and S and inserted into a hole from which it had originally been taken and the doors locked.

It is impossible for the operator to close the door while the plug is in circuit and should he take out the plug and omit pushing in the switch handle, the closing of the door will press the switch handle back into proper posi-

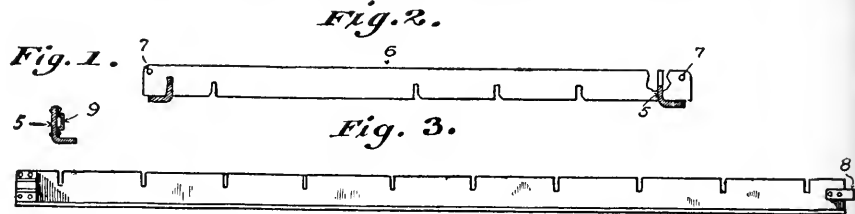


DIVIDING PLATE FOR CURBING

Reference to the illustration of the dividing plate for the curb and gutter forms will show the simple method of fastening the plank to the face of the curb. A short lug at the bottom and a hook over the top holds the plank rigidly in place. The manufacturers do not recommend steel for the face of the curb. The side rails at the back of the curbing fit into lugs on the dividing plate, as shown. The company also makes straight curbing forms of similar construction.

Service Pipe Cleaner

THE Staples cleaner, made by J. Fred Staples, 20 Ashland street, West



SIDE RAIL AND DIVIDING PLATE FOR SIDEWALK WORK

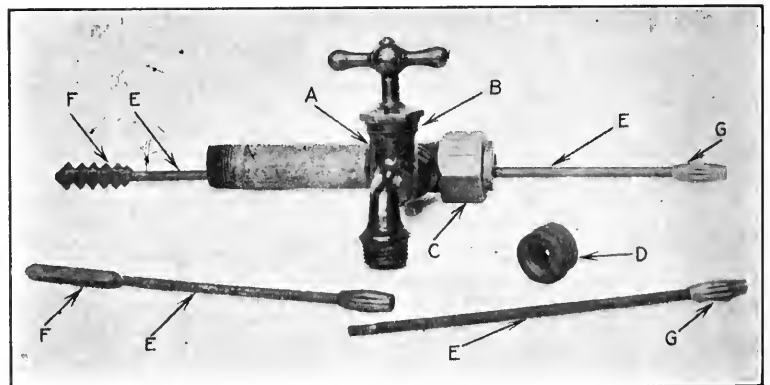
tion to cut in the line at the same time as the insulated plug X short circuits the springs W.

Steel Curb and Gutter Forms

JOS. UBBINK, Port Washington, Wis., manufactures steel forms for cement sidewalk and curb and gutter construction. The illustrations show the dividing plates and side rails. Fig. 2 shows a crosspiece or dividing plate showing the notches cut, making it adjustable at 6-inch intervals. Fig. 3 shows a rigid sidepiece showing cuts making expansion joints adjustable at one-foot intervals. Fig. 1 shows an end section with the socket into which the tongue fits. The rigid sidepieces are made of No. 10 gauge steel, which are bent to place in a hydraulic press. The crosspieces are made of No. 8 gauge steel, and the flexible sidepieces (for curves) are made of No. 12 gauge spring steel.

Somerville, Mass., meets a long-felt want in thoroughly cleaning the inside of water and gas service pipes of any size and length, removing rust and other obstructions without disturbing the pipes, thus saving much trouble and expense. A hundred feet can be cleaned in less than an hour. The set of tools consists of (a) cleaner, (b) faucet outlet for hose connection, (c) stuffing box, (d) stuffing box diaphragm rubber washer, (e) jointed rod, (f) cutter, (g) couplings on rod.

To use the cleaner shut off the water at cellar wall; put cutter (f) in cleaner, screw cleaner in stop and waste cock in cellar; turn on the water and open faucet at (b); push rod (e) forward and back, always turning to the right. Add on another section of rod and coupling until the entire length of pipe is cleaned. Always leave the water running at the faucet to carry off the rusty water and facilitate the cleaning of the pipe.



STAPLES SERVICE PIPE CLEANER

NEWS OF THE SOCIETIES

New England Water Works Association.—About one hundred members attended the meeting at the Hotel Kimball, Springfield, Mass., April 12, to listen to papers and discuss the subject of "Fire Protection." In the opening of the meeting President Allen Hazen introduced Mayor Lathrop, who described the conditions in Springfield previous to the recent increase in water pressure. E. V. French, Boston, presented a paper on "Desirable Pressure of Hydrants." He stated that the standard fire stream to-day is that discharged by a 1½-inch smooth nozzle, with a pressure at the base of the nozzle of 45 pounds, giving 250 gallons per minute. This, of course, means a much greater pressure at the hydrant. Even where hydrants are spaced at reasonable close intervals hose lengths of from 250 to 350 feet are necessary. The friction loss in the best hose, he said, is 14 pounds per hundred feet. Hence the hydrant pressure which best meets the conditions of business and manufacturing sections of cities of medium size or less is 80 to 100 pounds and for cities above medium size 100 pounds. Pipe sizes, the speaker said, should be such that the maximum amount of water needed in any section can be supplied without reducing the pressures at the hydrants more than about 10 pounds below the static pressures existing with everyday drafts.

Morris Knowles, Chief Engineer Bureau of Filtration, Pittsburg, Pa., spoke of the false economy in some small cities supplied by private companies in maintaining a small number of hydrants in order to reduce expense. Walter M. Richards, superintendent New London water works, spoke of insurance rates, and expressed the opinion that insurance companies should stand part of the expense of that portion of the water works maintained for fire protection. George W. Stacy, Marlboro, spoke of the improvement in pressure and number of hydrants in Marlboro, and said that they had no effect in reducing insurance.

National Association of Fire Engineers.—The annual convention of the National Association of Fire Engineers will take place in Racine, Wis., on September 19-22, inclusive. At a meeting of the board of directors in Milwaukee the following subjects for papers to be discussed were selected and chiefs designated to prepare them: "Fire Colleges," Chief Croker, of New York; "Fire Protection by Education Rather Than by Legislation," H. C. Henley, of St. Louis, Mo., and A. V. Bennett, of Birmingham, Ala.; "Electrical Propelled Fire Apparatus," W. H. Daggett, of Springfield, Mass.; "Motor and Gasoline Fire Apparatus," Arthur Aungst, of Alliance, O., and Thomas Ballentyne, of Savannah, Ga.; "Caliber of Fire Streams and Their Relative Value," Charles H. Fox, of Cincinnati, O.; "Compulsory Sprinkling of Basements," W. H. Loller, of Youngstown, O.; "Duties of State Vice-Presidents at International Conventions," John I. Hawk, of Moline, Ill.; "Rubber Tires—Solid vs. Pneumatic," Charles Swingley, of St. Louis, Mo.; "Best Method of Selecting Fire Hose," Harry Creamer, of Chicago, Ill.; "Equipment and Efficiency of Volunteer Fire Service," J. H. Runyon, of Morristown, N. J.; "Standard for Drills and Discipline," Terrence Owens, of Denver, Col.

National Good Roads Congress.—Commissioner Exum has received assurances from the following Mayors that they will be in attendance at the Congress, Birmingham, Ala., May 23-26: Mayor Frederick H. Kreismann, of St. Louis; Mayor Courtland S. Winn, of Atlanta, Ga.; Hilary E. House, Mayor of Nashville; Edward E. Burkhardt, Mayor of Dayton, O.; Martin Behrman, of New Orleans, La.; W. A. Gunter, Mayor of Montgomery, Ala.; T. O. Thompson, Mayor of Knoxville, Tenn.; George S. Marshall, of Columbus, O.; W. S. Gordon, Mayor of Jacksonville, Fla.

Citizens' Committee on Safety, New York City.—A Fire Prevention Bureau has been opened in the Charities Organization Building, 105 East Twenty-second street, New York. The bureau is planned to be a permanent contribution to the city's civic bodies, as a result of the Asch Building fire disaster. The purpose is to create a general clearing house on fire-trap information, on the ways to prevent fires and on the manner in which public officials are carrying out the fire protection laws. The following officers were elected: Henry L. Stimpson, president; Peter J. Brady, vice-president; John A. Kingsbury, secretary, and George W. Perkins, treasurer. It is the intention of the Bureau to make a recurrence of the conditions at the Asch fire impossible.

Southwestern Electrical and Gas Association.—The convention will be held in the Municipal Auditorium, Houston, Tex., April 27-29. The meeting will be called to order by President W. B. Tuttle, San Antonio, and the welcoming address will be made by Mayor Baldwin Rice. A new feature of the Houston meeting is the inauguration of the first electrical show in the Southwest, which will be participated in by the manufacturers of the United States who are members of this association. Exhibits will be more numerous and interesting than ever before, including the latest devices in departments of electric lighting, street railway and gas. Among the papers to be presented will be one on the "Investigation and Care of Return Currents," by George H. Clifford, general manager Northern Texas Traction Company, Fort Worth, Tex.

American Society of Mechanical Engineers.—The local committee of the American Society of Mechanical Engineers—E. M. Herr, chairman; Elmer K. Hiles, secretary—having in charge the preparations for the convention of the society, which will be held in Pittsburg, Pa., May 30 to June 2, inclusive, has nearly completed the work of arranging the programme for each day during the meeting. Professional sessions will be held in the Lecture Hall of the Carnegie Institute, near the headquarters, Wednesday morning and evening, Thursday and Friday morning. In the meantime there will be a number of inspection trips to various industrial plants in the vicinity, a boat excursion for the members and ladies up the Monongahela River, a reception and ball at the Hotel Schenley on Thursday evening, and finally, on Friday evening a smoker and entertainment, given by the Engineers' Society of Western Pennsylvania in their rooms in the Oliver Building. A carefully prepared programme for the entertainment of the lady visitors has been arranged by a committee of ladies from Pittsburg and vicinity, which includes a number of social functions.

Virginia Avenue Improvement Association.—Articles of association were recently filed for a unique association formed of 38 residents of Virginia avenue, Detroit, Mich. The total subscribed capital is \$30,550, the amount authorized \$45,000. The money is to be used for the buying of property on which the association holds options for beautifying the approaches to the avenue and for taking general care of the street, its alleys, trees, shrubbery, etc. The avenue already has the reputation of being one of the handsomest in the city. It is proposed to widen the street to about 120 feet at both approaches, and to build an attractive red brick wall of Virginia colonial design, 80 feet in width, in the center, having driveways curve into the roadway proper on either side of the wall, through a garden of plants and shrubbery, which will effectually conceal the thoroughfares from view. Walls will also be continued beyond the sidewalks. On each side of the approaches, 50 feet deep at the Woodward avenue entrance and 42 feet deep at the Hamilton Boulevard entrance, will be reserved and transformed into parks, and when these have been beautified they will be dedicated to the city. The plans for the improvements have been prepared by the architect, George V. Pottle, who is a member of the association. Application will also be made for a change in name for the three blocks reaching from Woodward avenue to Hamilton Boulevard from Virginia avenue to Virginia Park.

Pennsylvania Gas Association.—The third annual convention was held in the Auditorium, Philadelphia, April 12-14. The following officers were elected: President, C. W. Butterworth, Milton; first vice-president, Herbert Ganser, Norristown; second vice-president, W. R. Rhoades, Williamsport; secretary and treasurer, William H. Meritt, Lebanon; council, C. B. Bains, Ardmore; L. S. Williams, Harrisburg; John A. Frick, Allentown.

City Club, St. Paul, Minn.—A popular meeting arranged by the club to sound public sentiment on the proposed city plan prepared under the club's direction by John Nolen aroused a great deal of enthusiasm and brought out an attendance of about 500 citizens. Louis Betz, president of the City Club, presided. Mr. Betz said the idea of beautifying the city proposed by the city plan does not contemplate tying pink ribbons to the lamp posts and petitioning the Park Board to plant a few flowers in Rice Park. It means rather the enhancing of real estate values and making the city attractive to the traveler, so it will not be necessary to go abroad to spend his money. He said no one would build a house without a plan, and in building a city it also was necessary to have a comprehensive plan. He referred to the civic improvement being made in Washington, D. C., the purpose of which is to make a city reflecting the character of the country. He thought St. Paul should be made a city which would reflect the character of the great State of Minnesota. President Betz also read a paper by John Nolen, the city plan expert, covering the idea of regulating the city by districting it, thus providing for industries, retail stores, jobbing houses, public buildings and residences according to their respective needs. Mr. Nolen showed this plan in some cities has more than doubled the value of property in the various districts.

Calendar of Meetings

- April 27-28.
Good Roads Association of Florida.—Annual Meeting, Tallahassee. C. L. Bittinger, Secretary, Ocala, Fla.
- May 15-17.
National Conference on City Planning.—Philadelphia, Pa.—Flavel Shurtleff, Secretary, 19 Congress street, Boston, Mass.
- May 17.
Massachusetts Highway Association.—Quarterly Meeting in conjunction with the New England Conference on Street Cleaning, Springfield, Mass.
- May 17.
New England Conference on Street Cleaning.—Springfield, Mass.—Corresponding Officer, Carol Aronovici, 55 Eddy street, Providence, R. I.
- May 18-19.
Ohio Society of Mechanical Steam and Electrical Engineers.—Annual Convention, Youngstown.—F. E. Sanborn, Secretary, Ohio State University, Columbus.
- May 23-25.
National Fire Protection Association.—Annual Meeting, New York City.—F. H. Wentworth, Secretary, 87 Milk St., Boston.
- May 23-26.
National Good Roads Association.—Fourth National Good Roads Congress, Birmingham, Ala.—J. A. Rountree, Secretary, Birmingham, Ala.
- May 25-26.
League of Second and Third Class Cities of New York.—Poughkeepsie, N. Y.
- May 29-June 2.
National Electric Light Association.—New York City.—T. C. Martin, Secretary, 31 West 39th St.
- June 5-14.
National Probation Officers' Association.—Boston, Mass.—Roger N. Baldwin, Secretary, 903 Security Building, St. Louis, Mo.
- June 6-10.
American Water Works Association.—Thirty-first Annual Convention, Powers Hotel, Rochester, N. Y.—John M. Diven, Secretary, 14 George street, Charleston, S. C.
- June 7-14.
National Conference of Charities and Correction.—Boston, Mass.—Alexander Johnson, Secretary, Ft. Wayne, Ind.
- June 7.
National Association for the Study and Prevention of Tuberculosis.—Denver, Col.—Dr. Livingston Farrand, Executive Secretary, 105 East Twenty-second street, New York City.
- June 11-16.
International Association of Chiefs of Police.—Eighteenth Annual Convention, Rochester, N. Y.—Major Richard Sylvester, Superintendent of Police, Washington, D. C., President.
- June 13-18.
New York State Association of Chiefs of Police.—Annual Convention, Rochester, N. Y.
- June 13-16.
American Society of Civil Engineers.—Annual Convention, Chattanooga, Tennessee.—Charles Warren Hunt, Secretary, 220 West 57th St., New York.
- June 21-22.
National Conference of Poor Law Officials.—Boston, Mass.—Dr. Robert W. Hill, President State Board of Charities, 105 East Twenty-second street, New York City.
- August 15-18.
Firemen's Association of the State of New York.—Watertown, N. Y.—A. H. Otto, Secretary.
- September 19-22.
International Association of Fire Engineers.—Annual Convention, Racine, Wis.
- September 19-22.
American Hospital Association.—New York City. J. N. E. Brown, M.D., Secretary, Toronto General Hospital, Can.
- September 24-30.
International Congress on Tuberculosis.—Rome, Italy.—Professor Ascoli, Secretary-General, Via Lucina, Rome, Italy.
- September 26-29.
American Society of Municipal Improvements.—Grand Rapids, Mich.—A. Prescott Folwell, Secretary, 239 West Thirtieth street, New York City.
- October 4-6.
League of American Municipalities.—Annual Convention, Atlanta, Ga.—John MacVicar, Secretary, Des Moines, Ia.

PERSONALS

- BERGER, F. J., has been elected Mayor of Eugene, Ore.
- BLOOMQUIST, H. T., has been elected City Engineer of Mankato, Minn.
- DYER, A. E., County Surveyor of St. Louis County, Minnesota, is also City Engineer of Hibbing.
- H. J. HANDLE has been elected Mayor of Denver, Colo.
- KELSEY, LOUIS C., civil and hydraulic engineer, of Salt Lake City, has been engaged in an investigation for the Mayor and City Council of Burley, Idaho, of a water supply and to make recommendations as to a water works system.
- LADOMUS, B. G., has been re-elected City Engineer of Chester, Pa.
- MESIROFF, J. A., has been appointed City Engineer to succeed Chas. J. Poetsch.
- MYERS, DR. GEO. T., has been appointed City Physician of Norfolk, Va.
- PALMER, W. K., & Co., Engineers, of Kansas City, Mo., have been engaged to remodel the water works systems and install electric lighting plants at Vermillion, S. D., and Anita, Ia.
- RETTIG, GEO., landscape architect of Cleveland, Ohio, gave a lecture recently, at Youngstown, on trees. Mr. Rettig spoke of the municipal regulation of tree care and tree planting in Cleveland.
- RODNEY RICHARD S., an attorney of New Castle, Del., has been elected Mayor.
- SCHROTH, JULIUS R., has been elected Mayor of Winona, Minn.
- SCOTT, J. P., was the successful candidate for Mayor of Cumberland, Md., on the Citizens' ticket.
- THUM, WM., is the new Mayor of Pasadena, Cal.
- WADHAM, JAMES E., has been elected Mayor of San Diego, Cal.

MAYORALTY ELECTIONS

ILLINOIS

- Chicago—Carter H. Harrison.
East St. Louis—Chas. S. Lambert.
Peoria—Edward Woodruff.
Springfield—John S. Schnepf.
Galesburg—K. Sanderson.
Moline—Martin Carlson.
Geneseo—John H. O'Brien.
Macomb—John M. Keefer.
Oncida—G. L. Burt.
Freeport—C. J. Dittmar.
Quincy—John F. Garner.
Rock Island—Harry M. Schriver.
Belleville—Fred J. Kern.

KANSAS

- Fort Scott—W. E. Brooks.
Kansas City—J. E. Porter.
Tonga—Joseph H. Dreisbach.
Mapleton—C. C. Goss.
Wichita—J. X. Graham.
Topeka—Mayor Billard, re-elected.
Ottawa—W. E. Wood.
Leavenworth—Albert Doeg.
Emporia—Frank McCain.
Salina—C. B. Kirtland.
Hutchinson—Frank Vincent.
Atchison—C. D. Walker.

WISCONSIN

- Appleton—Dr. J. V. Canavan.
Janesville—John C. Nichols.
Fond du Lac—Frank J. Wolff.
Ashland—Dr. J. M. Dodd.
Whitewater—David Zuill.
Oshkosh—John Banderob.
La Crosse—John Deugler.
Racine—W. S. Goodland.
Bay City—Dr. Roy O. Woodruff.

MISSOURI

- Palmyra—James W. Owsley.
Canton—Frank C. Millsbaugh.
Jefferson City—Cecil W. Thomas.
Wellsville—Dr. S. S. Cox.
Joplin—Guy T. Hume.

TRADE NOTES

Cast Iron Pipe.—Chicago: Business has not been quite as active as for several weeks. Quotations: 4-inch, \$25.50; 6 to 12-inch, \$24.50; 16-inch and up, \$24. San Francisco: The tonnage since April 1 has been moderate, but conditions are considered favorable for an active summer. Many Coast cities are making preliminary preparations for auxiliary systems for fire protection. Quotations: 4-inch, \$35; 6 to 12-inch, \$34. Birmingham: Plants now running are well supplied with orders, and it is believed that prices will be higher. Quotations: 4 to 6-inch, \$23; 8 to 12-inch, \$22; over 12-inch, average \$21. New York: Trade is dull, with only small lettings in sight. Quotations: 6-inch, carloads, \$22.

Lead.—Market is dull. New York, 4.30c.; St. Louis, 4.45c.

Fire Prevention Company.—The Croker National Fire Prevention Engineering Company, 562 Fifth avenue, New York City, is a new corporation organized by former Chief Croker of the New York Fire Department. Mr. Croker purposes to provide for owners and lessees of property a system under which an inspection can be made by trained experts. He expects to have 300 men connected with the bureau by the end of a year, for he believes that the idea is capable of development on many lines. The inspectors will be drawn from retired officers of the Fire Department. It is the plan of the new company to provide patrols who will take charge of theaters, hotels, apartment and tenement houses, asylums and institutions in which numbers of persons may be gathered for employment, worship or amusement. There will also be a division assigned to private houses. Written reports will be made to owners and occupants, in which will be pointed out the dangers of fire from defective heating apparatus, electric light wiring and other conditions which have been the cause of fires. Large private estates are to be inspected along the same lines, and their employees organized into fire brigades and drilled for emergencies. The services of the organization will be at the disposal of any city or town that may be about to organize a municipal fire department, or where a reorganization may be found to be desirable.

Use of Cement.—The Chicago Portland Cement Company, 108 La Salle street, Chicago, Ill., publishes a handsomely illustrated booklet called "Chicago AA" Facts. The illustrations show many uses of cement, among them some steps and walls in Lake Park, Milwaukee, Wis., designed by A. C. Clas, of the Milwaukee Park Board.

Reinforced Concrete Sewers.—Walter C. Parmley, member American Society Civil Engineers, announces that the business hitherto carried on by him as consulting engineer and engineer for designing, constructing and manufacturing reinforced concrete sewers and other structures, will hereafter be conducted under the firm name of Parmley & Nethercut. Edgar S. Nethercut, member American Society of Civil Engineers, will have his headquarters in the Monadnock Block, Chicago, Ill., while Mr. Parmley will remain as hitherto at the Everett Building, 45 East Seventeenth street, New York City.

Traction Engines.—The Joshua Hendy Iron Works, San Francisco, Cal., has taken over the plant of the Johnson Tractor Company's plant, with the intention of manufacturing traction engines. The machine work will be done at the large plant of the Joshua Hendy Iron Works at Sunnyvale, Cal., the Johnson shop being used as an assembling plant. F. D. Calkins will have charge of the traction engine department.

Water Works Company.—At a meeting of the stockholders of the Port Jervis Water Works Company, Port Jervis, N. Y., April 13, the following directors were elected: Dr. W. L. Cuddeback, Dr. Henry Hardenbergh, Dr. Charles N. Skinner and Messrs. Jacob Kalmbach, Charles W. Snyder, Jacob F. Pobe and Peter E. Farnum. The directors met and elected officers as follows: President, Dr. W. L. Cuddeback; vice-president, Dr. H. Hardenbergh; treasurer, Alfred Marvin; secretary, Christoph Graebner.

Fort Wayne.—Ralph E. Avery, Concordia, Kan., has published a handsome booklet of illustrations of scenes in Fort Wayne, Ind., together with some descriptive matter. The illustrations are of public buildings, industrial plants, outdoor scenes and private residences. On the cover is a blank space in which is to be inserted an illustration of the plant of the company which distributes the booklet among its customers and friends; our copy was the plant of the Fort Wayne Electric Works.

Steel Flumes.—T. C. Egleston, sales manager, 714 Ideal Building, Denver, Col., has issued a booklet describing the Maginnis galvanized steel flume and illustrating a number of installations. The flume is made by a flat sheet of galvanized steel 30 inches wide and as long as required for the perimeter of the flume and passing it through a forming machine that leaves the sheet in a semi-circular form with a bead rolled in each edge of the sheet. A steel rod of the proper size to carry the weight of the flume, and of the right length, is threaded at both ends for a nut, formed in semi-circle, passed around the outside of the flume and lies in the bead when the flume is in place. A steel channel of the proper size and length is also formed in a semi-circle and rests over the bead on the inside of the flume when the flume is in place. When the flume is assembled and the nuts tightened, the rod draws tight in the hollow of the bead and the channel presses with the same force on the two edges of the bead, thus forming a water-tight joint. No rivets or solder are used.

Blueprint Machine.—The Shaw Blueprint Company, 9 Campbell street, Newark, N. J., has placed a continuous blueprint machine on the market which is claimed to operate at a low cost for current. The Shaw operates by a single arc lamp, which uses 15 amperes at 110 volts, or 7½ amperes at 220 volts, traveling up and down continuously in the center of a half cylinder of glass, while the paper and tracing are carried around by an endless canvas band. All that is necessary is to insert the ends of the paper and the tracing between the guide rollers and the machine does the rest. The printing speed of the 42-inch machine is said to be 2 feet per minute, using rapid paper. The machine only requires a space of 2 feet 6 inches square and head room of 8 feet.

Quality or Price?—Under this caption the H. Mueller Manufacturing Company, Decatur, Ill., manufacturer of water works supplies, has published a little pamphlet containing extracts from an address presented and discussed at a gathering of big buyers. It met with almost unanimous approval as representing the growing prevalent conviction that quality and not price is entitled to first consideration. The argument stated briefly is axiomatic, though often forgotten, that the cost of installation of a good article is no more than that of a poor one and the cost of maintenance is less.

Road Asphalt.—The Indian Refining Company, whose headquarters have heretofore been in Cincinnati, has decided to move its executive department to New York. A branch office, to take care of Western business, will be maintained in the First National Bank Building, Cincinnati.

Gasoline Rock Drill.—The Scott Gasoline Rock Drill Manufacturing Company, St. Louis, Mo., has filed articles of incorporation, with \$500,000 capital stock. It is the intention of the company to establish a factory in St. Louis for the manufacture of a drill invented by Louis L. Scott. The drill is attached directly to the cylinder of a gasoline engine, doing away with the use of a steam plant, air compressor and hose in drilling rock and other substances. The machine is being manufactured under contract at present. The incorporators are: Louis L. Scott, John R. Williams, Samuel D. Martin and others.

Cast Iron Pipe.—The United States Cast Iron Pipe and Foundry Company has moved its Chicago office from the Rookery Building, where it has been located for many years, to the People's Gas Building, rooms 923-927, where much more desirable quarters have been engaged.

Ornamental Lamp Standards.—The Flour City Ornamental Iron Works, Minneapolis, Minn., has in press a new catalogue de luxe of its lamp standard department. The brochure will contain a detailed account of the various designs manufactured by the company—Corinthian, Egyptian, Capital and Boulevard. Reproductions of these on a scale of half an inch to the foot will appear. The text will contain the detailed specifications for the standard.

Appliances for Fire Prevention and Protection.—The Chief of the Fire Department of a European city, who is also an official of an international competition for firemen and appliances adapted for fire prevention and protection to be held in connection with an international exposition that opens April 29, has asked an American Consul for the names of the leading American Fire Chiefs and the most important American manufacturers producing appliances that have to do in any way with fire prevention and protection. The information is desired in order that printed matter and notices regarding the competition in question may be forwarded to them. Address No. 6540, Bureau of Manufactures, Washington, D. C.

Cotton Waste Substitute.—The Sanitary Rag Company, Kalamazoo, Mich., packs washed wiping cloths in bales of from 100 to 500 pounds, to be used about machinery as a substitute for cotton waste. The rags are light in weight, running five to seven pieces to the pound, free from buttons, hooks, eyelets, starchy parts, etc.

Auto Engine Tested.—The new auto pumping engine purchased for the Lansing (Mich.) Fire Department from the Webb Motor Fire Apparatus Company was tested recently. After one of the tests it was found that the suction pipe contained about a pound of oakum, which had presumably been used at some time in packing the hydrant. With two lines of hose, each 200 feet long, 740 gallons of water were thrown per minute. President John Bohner and other members of the Board of Police and Fire Commissioners were very much pleased with the engine.

Mexican Gas Plant.—The large gas plant and distributing system of the Guadalupe Gas Company, Guadalupe, Mexico, will be finished and placed in commission some time next month. The mains have been laid in all of the principal business and residence streets and many buildings have already been equipped for using the new fuel. The plant is modern in every respect. The company is composed of San Francisco (Cal.) men, and the concession from the State and Federal Governments under which it is operating is unusually liberal. The installation of the plant was done under the direction of W. A. Aldrich, of Grand Rapids, Mich.

Small Engine and Generator Sets.—The Crocker-Wheeler Company, Amherst, N. J., has placed on the market a small steam engine and direct current generator in one unit. This generating set is advocated for the production of electric current for illumination in districts where kerosene lamps would otherwise have to be used. The steam engines are Giles Type E, made by the United States Rapid Fire Gun and Power Company, Derby, Conn. The generators vary in capacity from 1.75 to 21 kilowatts.

Creosoting Plant.—The Atlantic Coast Line Railroad has decided to build a creosoting plant at Gainesville, Fla., of sufficient size for treating all of the timber used on the system. Citizens subscribed \$5,000 to purchase the land. It is stated that 100 men will be employed on the work.

Contracting Engineers.—Frederick L. Cranford, James C. Meem and H. P. Moran have opened offices at 177 Montague street, Brooklyn, and will continue their business of contracting engineers at that address.

Granite Paving Blocks.—The granite paving blocks quarried by the Harris Granite Quarries Company, Salisbury, N. C., are claimed to be the strongest, as well as the best shaped of any made in the United States. Six samples from the company's Balfour quarry, Rowan County, North Carolina, recently tested at the United States Arsenal, Watertown, Mass., showed an ultimate crushing strength per square inch of from 43,670 to 51,990 pounds. The next strongest samples from other quarries broke at from 27,279 to 29,347 pounds per square inch.

Delivery of Pumps Delayed.—Application for an extension of the time for delivery of two 20,000-gallon electrically driven centrifugal pumps, for which they were awarded contracts by the Minneapolis, Minn., water works department, has been received from Henry R. Worthington, of New York, by City Engineer Andrew Rinker. The contract provides for a delivery before June 1 and imposes a penalty for each day of delay after that date. The contractor now asks an extension until August 15.

NEW CORPORATIONS

The Acme Hoisting Machine Company, St. Louis, Mo.; capital \$50,000. Incorporators: F. R. McCune, Geo. S. Cornell and John M. Patke. The company will manufacture hoisting and power, illuminating, excavating and carrying machinery.

The C. A. Wood Preserver Company, St. Louis, Mo.; capital \$10,000. Incorporators: M. F. Gerhard, H. H. Gerhard, H. A. Giesen and others. The company will manufacture wood preservers and wood preserving processes.

Hopeman Engineering and Construction Company, Moorhead, Minn.; capital \$25,000. Incorporators: A. M. Hopeman; vice-president, Ralph Pederson; treasurer, A. H. Erickson; secretary, P. H. Pederson. It will be capitalized for \$25,000.

Bald Mountain Portland Cement Company, Rome, Ga.; capital \$1,000,000. Incorporators: J. L. Bass, J. N. King, B. T. Haynes, W. J. Griffin and E. A. Heard, of Rome; M. M. Jack, of Dalton; S. W. Palmer, of Millen, and E. C. Lester, of Atlanta.

The Farmington Light & Power Company, Farmington, Ill., has been incorporated with a capital stock of \$30,000. The incorporators are Theo. Bass, M. M. Anderson, H. E. Worden and A. L. Thompson.

Swatard Electric Light, Heat & Power Company, Scranton, Pa.; capital \$5,000.

Auburn Light, Heat & Power Company, Auburn, N. Y.; capital \$900,000; to manufacture gas and electricity for supplying the municipalities of Auburn, Aurelius, Cayuga, Owasco, Sennett, Fleming, Skaneateles, Seneca Falls, Fayette, Waterloo and Geneva. Incorporators: J. Alward Seymour, Dr. Frederick Sefton, D. Edwin French, Geo. W. Bowen and Henry L. Coleman, Auburn, and Irving Rouse, Rochester; E. H. Palmer, Lansing; G. Hoskins and Henry O. Palmer, Geneva.

Croker National Fire Protection Engineering Company, 562 Fifth avenue, New York City; capital \$10,000. Incorporators: Edward F. Croker, Charles Thorley and David M. Neuberger, all of New York.

The Red Oak Deep Well Company, Red Oak, Tex.; capital \$3,500. Incorporators: G. L. Ligon, F. F. Beddo, H. Harrison and others.

The Green Deep Well Co., Sherman, Tex.; capital \$3,000. Incorporators: Dupon B. Lyon, R. A. Chapman, Jr., W. L. Green and others.

William P. McDonald Construction Company, Manhattan, N. Y.; construction work of all kinds; capital \$25,000. Incorporators: A. Forhay, 13-21 Park Row; Russell Goldman, 1200 Madison avenue, both of New York City; John I. McDonald, 728 Marcy avenue, Brooklyn.

Bibb Sewer Pipe Company, Macon, Ga.; capital \$50,000. Incorporators: O. J. Massee, Jr., J. P. Stetson and A. S. Bates.

The Honey Grove Sewer Company, Honey Grove, Tex.; capital \$10,000. Incorporators: J. H. Whattley, Sam G. Duff, F. M. Kemp.

The Kerbaugh-Empire Company, Valhalla, N. Y.; capital \$4,000,000. Incorporators: Edward D. Adams, William Barclay Parsons, William R. Coade, Alfred Skitt, Eugene Klapp and Lamar Hardy, of New York City; N. S. Kerbaugh, Robert Cassatt, G. Dallas Dixon, Jr., of Philadelphia.

The Baltimore-Schub Concrete Corporation, Thomas G. Frame, Jr., Dover, Del.; capital \$600,000. Incorporators: S. H. Moore, Harry M. Lindsay, N. E. Stubbs, all of Baltimore, Md.

The Paintsville Water & Light Company, Paintsville, Ky.; capital \$20,000. Incorporators: H. M. Stafford and John E. Buckingham.

Hansen Continuous Chemical Fire Apparatus Company, St. Louis, Mo.; capital \$50,000. Incorporators: F. William Runde, Edward E. M. Hansen, L. A. Ragan.

The Central Construction Company, Lexington, Ky.; capital \$10,000. Incorporators: John M. Kelley, Howard K. Bell and others.

The Warner Construction Company, Muskogee, Okla.; capital \$50,000. Incorporators: C. C. Goodman, Fort Smith; Fred E. Turner, Muskogee, and Campbell Russell, Warner.

The Fogleman & Turner Company, Oxford, N. C.; capital \$25,000. Incorporators: W. H. Fogleman, L. B. Turner and Leha F. Wyatt.

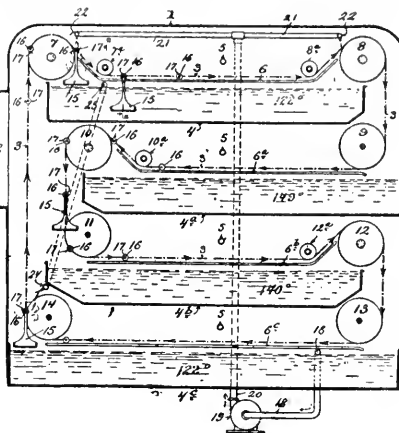
Western States Gas and Electric Company, Chicago, Ill.; capital \$15,000,000; Delaware corporation.

The Federal Engineering Co., Muskogee, Okla.; capital \$25,000. Incorporators: Chas. E. Creager, Thos. F. Murdock and Walter G. Humphrey.

PATENT CLAIMS

989,235. **AUTOMATIC WATER-PURIFIER.** George F. Day, San Francisco, Cal. Serial No. 565,248.

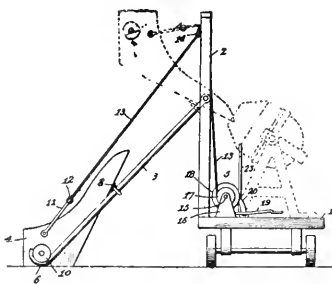
The combination in a water-purifying apparatus, of tanks adapted to independently contain unpurified water and chemicals, independent valve chambers through which the water and chemicals may flow, valves contained within the chambers designed to



deliver a proportional mixture, a unitary connection common to both valves, a purifier and filter through which the mixed liquids are caused to pass, a purified water-container, means to deliver the water thereto, and means by which the valves are automatically simultaneously opened and closed.

990,194. **LOADER FOR CONCRETE-MIXERS.** James DuShane, South Bend, Ind. Serial No. 556,084.

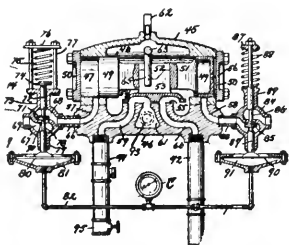
A loader comprising an elevating bucket, a hoisting mechanism therefor, and pivoted



tracks, said tracks being movable independently of each other and having their free ends held in parallel relation by the bucket.

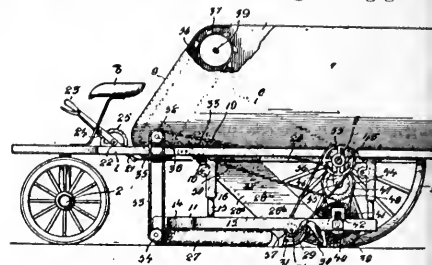
990,085. **SUBTERRANEAN PUMPING SYSTEM.** Frederick C. Weber, New York, N. Y. Serial No. 473,516.

In a pumping system, the combination of a source of fluid pressure supply, with a liquid chamber, a pipe connection between said supply and said chamber, a reversing valve in said pipe connection for alternately admitting pressure to and exhausting the same from said chamber, means for shifting said valve comprising a duplex



piston, a casing therefor, a bypass in each head of said piston to permit the slow accumulation of pressure on each side thereof and thereby balance said piston, means controlled by the degree of pressure or vacuum in said chamber and pipe connection for releasing said accumulated pressure alternately from opposite ends of said duplex piston.

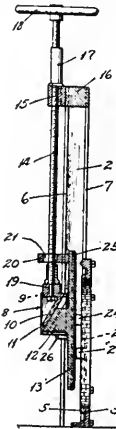
989,377. **STREET-SWEEPER.** Albert S. Machen, Norfolk, Va. Serial No. 541,320. A street sweeper embodying a main frame carrying a receptacle, a carrier frame arranged below and vertically adjustable on said main frame, a pair of rearwardly converging front brushes mounted on the carrier frame, a transverse brush disposed in rear of said front brushes and also mounted on the carrier frame, a casing having gath-



ering trays extending forwardly and rearwardly between the front and transverse brushes to take up the dirt gathered thereby, said casing comprising relatively adjustable sections mounted respectively on the main and carrier frames, gearing for driving the brushes and a conveyor movable through said casing for elevating the dirt gathered by both trays into said receptacle.

989,201. **VALVE OR GATE.** Frank P. Snow, Los Angeles, Cal., assignor to Kellar-Thomson Manufacturing Company, Covina, Cal., a Corporation of California. Serial No. 570,245.

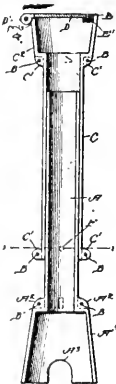
A valve plate having an opening, a member guided transversely with respect to said



opening and having an inclined slide, a disk adapted to close said opening and guided in said slide, a means for arresting the transverse movement of said disk to enable said slide to force said disk laterally toward said opening.

988,974. **STOP-COCK BOX, HYDRANT AND STREET-WASHER.** Frederick Chapman, Brooklyn, N. Y. Serial No. 562,867.

A device of the kind described, comprising an upper section having an expanded top, said top having an interior lug provided with a threaded aperture, a cover hinged to said top, a screw carried by said



cover and adapted to engage the threaded lug, a lower section having an expanded base, said upper and lower sections telescoping, and a set screw for securing said sections in any desired adjustment, each section consisting of two longitudinal halves bolted together.

THE WEEK'S CONTRACT NEWS

Relating to Municipal and Public Work—Street Improvements—Paving, Road Making, Cleaning and Sprinkling—Sewerage, Water Supply and Public Lighting—Fire Equipment and Supplies—Bridges and Concrete Work—Sanitation, Garbage and Waste Disposal—Police, Parks and Miscellaneous—Proposals and Awards

To be of value this matter must be printed in the number immediately following its receipt, which makes it impossible for us to verify it all. Our sources of information are believed to be reliable, but we cannot guarantee the correctness of all items. Parties in charge of proposed work are requested to send us information concerning it as early as possible; also corrections of any errors discovered.

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREET IMPROVEMENTS				
Florida	Jacksonville	Apr. 28, 10 a.m.	Resurfacing St. Johns ave. about 27,000 sq. yds. with as. mac.	Gail L. Barnard, County Engr.
Ohio	Cincinnati	Apr. 28, noon	Improving the Eight Mile road in Anderson township	Stanley Struble, Pres. Bd. Co. Comrs.
Ohio	Geneva	Apr. 28, noon	Improving streets by grading, draining, curbing and paving with brick on concrete foundation and laying storm sewers.	W. E. Morgan, Clk. Village Council.
Missouri	St. Louis	Apr. 28, noon	Installing a municipal asphalt plant.	W. B. Dryden, Secy. B. P. Imp.
Ohio	Cincinnati	Apr. 28, noon	Grading, setting cement curbs, paving roadway with brick and constructing drains and inlets in portion of Ludlow ave.	John J. Wenner, Clk. B. P. Serv.
Ohio	Toledo	Apr. 28, noon	Grading portion of Albert street and paving central 20 ft. with tar mac, together with nec. curb, retain. walls, drainage, etc	Fred. Shane, Secy. Bd. Pub. Serv.
Manitoba, Can.	Brandon	Apr. 28, noon	Paving various streets with wood block, asphalt block, sheet asphalt, bitulithic or vitr. brick.	R. E. Speakman, City Engr.
Minnesota	Minneapolis	Apr. 28, 7:30 p.m.	Furnishing a stone crushing plant.	Henry N. Knott, City Clerk.
Connecticut	New Haven	Apr. 28	Laying sidewalks of Portland cement in various streets.	C. W. Kelly, City Engr.
Ohio	Springfield	Apr. 29	Construct. sidewalks and gut., and mac. portion of College ave	Jacob Klein, Dir. Pub. Serv.
Indiana	Terre Haute	Apr. 29, 11 a.m.	Grad. and pav. with gravel various roads in Vigo County.	Nathan G. Wallace, Audr. Vigo Co.
Pennsylvania	York	Apr. 29	Lay. about 4,000 ft. conc. curbing and guttering at Penn Park.	City Clerk.
Ohio	Marysville	Apr. 29	Constructing 2½ miles of road in Union Township.	Bert J. Shelton, County Audr.
Ohio	Marvina	May 1	Grad. and pav. with brick 2.12 miles of county road.	Commissioners Portage County
Indiana	Greencastle	May 1	Improv. 13,333 ½ ft. of macadam road in Madison township.	D. V. Moffett, Aud. Putnam Co.
Indiana	Versailles	May 1, 1 p.m.	Constructing 11,370 ft. of macadam road in Adams township.	Nicholas Volz, Aud. Ripley County.
Indiana	Williamsport	May 1, 1 p.m.	Constructing a gravel road in Kent township.	David H. Moffit, Aud. Warren Co.
New York	Albany	May 1, 1 p.m.	Paving about 8,500 mi. of roads in various counties.	S. Percy Hooker, Chm. Hwy. Com.
Indiana	Fowler	May 1, 1 p.m.	Constructing free stone roads in Benton County of crushed blue stone, together with bridges and drainage.	Lemuel Shipman, Audr. Benton Co.
Pennsylvania	Springdale	May 1, 8 p.m.	Constructing a system of water lines about 36,660 lin. ft.; constr. a 350,000 gal. reservoir; grading about 30,000 cu. yds.	R. J. Campbell, Chm. Com. Council.
Minnesota	Everdell	May 1, 2 p.m.	Grading 2 miles in Nelson township.	Herman G. Fruetel, Town clerk.
Pennsylvania	Bradford	May 1, 5 p.m.	Paving one street and building two bridges.	E. C. Charlton, City Clerk.
New York	New York	May 1, noon	Furnishing 12 street sweeping machines.	Wm. A. Edwards, Comr. St. Clean.
Pennsylvania	Plymouth	May 1, 7:30 p.m.	Repairing Main Street with vitrified brick.	John Lynch, Chm. Street Committee.
Washington	Hoquiam	May 1	Constructing a plank roadway 20 mi. long, est. cost \$60,000.	Board County Commissioners.
New York	Pittsfield	May 1	Paving various streets with vitrified brick.	Paving Com., City Council.
Pennsylvania	Olyphant	May 2, 8:30 p.m.	Paving with vit. brick and curbing with stone one street about 9,105 sq. yds. paving; 6,455 lin. ft. curbing.	Thos. F. O'Hara, Boro. Secy.
Minnesota	Two Harbors	May 2, 10 a.m.	Grading two miles of State road.	John P. Paulson, County Auditor.
Indiana	Bedford	May 2	Constructing roads Nos. 1 and 2.	County Comrs.
New York	Hudson	May 2, 10:30 p.m.	Repairing portion of Warren Street with vitrified brick.	Commissioners Public Works.
New York	Niagara Falls	May 2	Repairing and repaving various streets.	City Clerk.
Delaware	Wilmington	May 2	Constr. water-bound mac. road about 3 mi. long, and resur. 4 mi.	F. A. Price, State Hwy. Comr.
Mississippi	Columbus	May 2	Constr. about 6,000 lin. ft. concrete curb and gutter, or granite curb and concrete gutter.	E. S. Donnell, Mayor.
Iowa	New Hampton	May 3	Constr. 12,000 sq. yds. Portland cement paving; and 1,600 ft. cement curb.	F. B. Stuike, City Clerk.
Florida	Jacksonville	May 3, 10 a.m.	Constructing about 13,000 sq. yds. asphalt macadam resurfac.	Gail L. Barnard, County Engr.
New York	Binghamton	May 3	Paving portion of Water street with vitrified brick.	S. W. Murray, City Clerk.
Missouri	Fulton	May 4	Construct. 9,000 yds. brick pavement on 5-in. concrete foundation; 12,000 yds. mac. with binder and 10,000 ft. con. curb.	P. D. Thurmond, City Engineer.
Ontario, Can.	Ft. William	May 4, 5 p.m.	Paving with asph. blk., sheet asph. or bit. about 14,100 sq. yds.	John Wilson, City Engr.
New York	Seneca Falls	May 4, 2 p.m.	Paving Main and Bayard sts., including 12,500 cu. yds. of excavation; 17,000 lin. ft. of curbing; 15,000 lin. ft. of 3-in. drain tile; 5,000 lin. ft. vitrified pipe; 42 catch basins; 25,000 sq. yds. brick or macadam pavement.	J. W. Brennan, Village Engr.
New York	New Rochelle	May 4	Paving with macadam and constructing curb, gutter and sidewalks on various streets.	Richard Lathers, Jr., Chm. B. P. W.
Ohio	Cleveland	May 4, noon	Grad., drain., curb., paving with brick and imp. var. streets.	A. B. Lea, Dir. Pub. Serv.
New Jersey	New Brunswick	May 4, 11 a.m.	Resurfacing portion of street, 3,000 ft. long and 60 ft. wide, with asphaltic concrete.	Peter Hendricks, D. B. C. Freehold-rs Board Public Improvements.
Missouri	St. Louis	May 5, noon	Reconstructing various streets.	Chas. A. Johnson, County Auditor.
Indiana	Crown Point	May 5, 10 a.m.	Constructing various gravel roads in Lake County.	Stanley Struble, Pres. Bd. Co. Comrs.
Ohio	Cincinnati	May 5, noon	Improving Carthage avenue in Columbia township.	Edgar A. Stagg, Audr. Clay County
Indiana	Brazil	May 5, 11:30 a.m.	Constructing two gravel roads in Clay township.	
Dist. Col.	Washington	May 6, 2 p.m.	Furn. sheet asphalt for use on streets during year ending June 30, 1912.	Cuno H. Randolph, Commissioner.
Ohio	Elyria	May 8	Constructing brick pavements.	R. Moriarty, City Clerk.
Ohio	Barnesville	May 8	Paving Lincoln Street.	F. Waldo Hillis, City Clerk.
Indiana	Brookville	May 9, 1 p.m.	Constructing gravel roads in Franklin County.	Chas. A. Miller, County Auditor.
Florida	Jacksonville	May 12, 2:30 p.m.	Grading, curbing and paving with vitrified blocks of some standard brand various streets.	Philip Prioleau, City Engr.
Indiana	Rushville	May 13	Constructing gravel road 36,830 ft. long.	Joint Board Commissioners.
Kentucky	Cattlettsburg	May 15, 6 p.m.	Improving portions of various streets, including 14,555 lin. ft. curb and gutter and 20,305 sq. yds. paving.	H. Chatfield, City Clerk.
New York	Lackawanna	May 15, 8 p.m.	Paving with vitrified brick portion of Ridge Road.	John J. Monaghan, City Clerk
Tennessee	Memphis	May 16	Constructing 5.1 mi. gravel paving, 3.9 mi. tar macadam, 1.4 vitrified brick, 2.9 wood block or bit. and ½ mi. old stone.	Geo. C. Love, Comr. Dept. Sts. City Clerk.
Ohio	New Philadelphia	May 22	Paving the New Cumberland Road with brick.	The George Company, Ran. Bldg. Memphis, Tenn.
Mississippi	Hazelhurst	June 1	Constructing 58 miles of gravel roads in Copiah County.	
SEWERAGE				
Ohio	Cincinnati	Apr. 28, noon	Constructing main and lateral sewers.	John J. Wenner.
Ohio	Geneva	Apr. 28	Constructing storm sewers.	W. E. Morgan, Village Clerk.
Pennsylvania	N. Braddock	Apr. 28	Constructing sewers in portion of Jones ave. and 2 alleys.	C. A. Stewart, Boro. Engr.
Ohio	Fremont	May 1	Constructing 700 ft. of tile sewer in Linden street.	C. F. Bell, City Auditor.
Wyoming	Lusk	May 1, 8 p.m.	Constructing sewer system.	D. E. Goddard, Town Clerk
Minnesota	Clouquet	May 1	Constructing sewers and water mains, including 13,600 cu. yds. excavation, 10,300 lin. ft. of 8-in. and 10-in. sewers, 12,000 lin. ft. 6-in. and 4-in. water mains.	City Clerk.
Indiana	Kokomo	May 1	Constructing about 12,935 ft. of intercepting sewer, from 10 to 48 inches diam.; with appurtenances and connections.	Ben. Havens, City Clk.
New Jersey	Elizabeth	May 1, 8:30 p.m.	Construct. 350 lin. ft. 10-in. sewer; 14 8x10-in. connec.; 3 manh.	N. K. Thompson, Street Comr.
Tennessee	Park City	May 1	Constructing sanitary sewers.	A. J. Queener, Recorder.
Pennsylvania	Springdale	May 1, 8 p.m.	Constructing a system of sewers, about 36,660 lin. ft.	R. J. Campbell, Chm. Com. Council
Alberta, Can.	Edmonton	May 2, 3 p.m.	Constructing 3,290 ft. of concrete sewer 10 ft. 6 in. in diameter.	A. J. Latoinell, City Engr.
Florida	Pensacola	May 2	Constructing 15,060 lin. ft. storm water drains from 10 to 66-in. in diam.; and 23,880 lin. ft. of san. sewers from 6 to 24-in.	John A. Merritt, Chm. B1 Bon1 Tr.

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
SEWERAGE (Continued)				
South Dakota	Canton	May 2	Extending the sewer system at the Canton Insane Asylum	Dr. Harry R. Hummer, Supt.
Pennsylvania	Doylstown	May 5	Reconstr. the sewage disp. beds of the Doylstown Sewer Com.	Wm. Bishop, Supt.
West Virginia	Huntington	May 8, 1 p.m.	Constructing lateral 12-in. sewers in various streets	John Coon, Comr. Streets.
Kansas	Humboldt	May 8	Constructing 8, 10 and 12-in. vitrified pipe sewers	The J. L. Worley Co. Engrs., K. C.
Ohio	Elyria	May 8, noon	Constructing sanitary sewers, estimated cost \$27,000	C. S. Bath, Engr.
Ontario, Can.	Toronto	May 9, noon	Constructing about 13,196 lin. ft. low level interceptor	G. B. Geary, Mayor.
New York	Batavia	May 15, 10 a.m.	Constructing sewage disposal plant	K. B. Mathes, Chm. Bd. Sew. Com.
Oregon	The Dalles	May 15	Construct. a section of Dist. No. 1 sewer system, cost about \$225,000	L. T. Boyle, City Engineer.
South Dakota	Aberdeen	May 15, 8 p.m.	Construct. 1,860 ft. of 8 and 12-in. pipe sewers	F. W. Raymond, City Auditor.
Wisconsin	Baraboo	May 17	Constructing trunk sewers, 3,000 lin. ft. 30 and 27-in. pipe	A. H. Huebing, City Clerk.
California	San Jose	July 3	Construct septic tank for County hospital	City Clerk.
WATER SUPPLY				
Illinois	Toulon	Apr. 28, 7:30 p.m.	Constructing concrete storage reservoir for water supply system; deep well and force pumps with appurtenances and connect.	Arthur Shinn, City Clerk.
Oklahoma	Oklahoma City	Apr. 28	Sinking nine artesian wells in Tex., Cimarron & Beaver Counties	O. A. Brewer, Chm. S. B. Agr.
Florida	Fort Dale	Apr. 29, 10 a.m.	Constructing extension of water system	Construct. Quartermaster, U.S.N.
New Jersey	Skillman	May 1, 10:15 a.m.	Extending water system, together with necessary hydrants, gates, valves, etc., at Village for Epileptics	Jonas A. Fuld, Secy. Bd. Managers.
Sask., Can.	Scott	May 1	Drilling a deep well	Geo. M. Phillips, Sec'y.
Minnesota	Slayton	May 1, 8 p.m.	Constructing an extension to the water works system	B. H. Whitney, Village Recorder.
Minnesota	Cloquet	May 1, 8 p.m.	Furn. 9,200 ft. 6-in. and 3,000 ft. 4-in. c. i. water pipe & 43 manh	J. A. E. Grenier, City Clerk.
W. Virginia	Romney	May 1, noon	Installing system of water works. Est. cost \$15,000	A. N. McKeever, Mayor.
Minnesota	Mankato	May 1	Removing old boiler and furn. new boiler at pumping station	A. H. Sherer, City Clerk.
North Dakota	Grafton	May 1	Sinking a 6-in. artesian well	J. H. Johnson, City Auditor.
Ohio	Mansfield	May 2	Improv. w. w. by install. add. pumping equipment	Board Control.
California	Corning	May 2	Constructing w. w. and sewer system, cost about \$46,000	E. L. Randall, City Clerk.
New Jersey	Rahway	May 3, 8 p.m.	Furn. one 5,000,000 gal. horizontal, high-duty, cross-compound, crank and fly-wheel pumping engine	A. F. Kirstein, Supt. Bd. W. Comrs.
Ohio	Lakewood	May 9	Erecting an elevated steel tower on concrete base	E. R. Lieblein, Clk. Bd. Pub. Aff.
Ohio	Rockport	May 12	Constructing water mains	F. Feuchter, Clerk.
New York	New York	May 16, 11 a.m.	Construct. portions of the city tunnel of the Catskill aqueduct	Chas. Strauss, Pres. Bd. W. Sup.
Brit. Col., Can.	Vancouver	May 31, 4 p.m.	Furn. steel pipe, i. pipe; also 18-in. flexible joint c. i. pipe	Wm. McQueen, City Clerk.
BRIDGES				
New Jersey	Rutherford	Apr. 28, 2:30 p.m.	Constructing a steel and concrete bridge over Passaic river	John H. Burke, Chm. Bd. Chos. Fh.
Ohio	Cleveland	Apr. 29, 11 a.m.	Elimination of grade crossings and building bridge over tracks	John F. Goldenbogen, Clk. B. C. C.
Pennsylvania	Danville	Apr. 29, 2 p.m.	Construct a reinforced conc. bridge near Washingtonville, 50-ft. clear span	Horace Blue, Clerk Co. Comrs.
Pennsylvania	Bradford	May 1, 5 p.m.	Construct. bridges and abut., repav. and construct. sidewalks	E. C. Charlton, City Clerk.
Oklahoma	Muskogee	May 1	Constructing 35 county bridges	County Clerk.
Indiana	Lebanon	May 2, 1 p.m.	Constructing and repairing 32 bridges	B. F. Hendricks, County Auditor.
Pennsylvania	Lancaster	May 9	Constructing a concrete dam across Conestoga river at pumping station of water works	J. A. Leinbach, Clk. Water. Com.
LIGHTING AND POWER				
Manitoba, Can.	Winnipeg	May 1, 11 a.m.	Furnishing ornamental lighting standards	Magnus Peterson Secy. Civic B. Com.
California	Benicia	May 1	Furn. elec. supplies for year ending June 30	Lieut.-Col. J. W. Benet, Com. Officer.
Texas	Fort Bliss	May 1, 11 a.m.	Installing electric lighting system	G. C. S. Quackenbush, Constr. Q.M.
Dist. of Col.	Washington	May 1, 2 p.m.	Furn. 830 more or less c. i. lamp posts and acces., special design	Cuno H. Randolph, Comrs.
Texas	Galveston	May 3	Installing 2 centrifugal pumping units of not less than 3,000,000 gals per day	W. D. Masterson, City Supt. Elec.
Tennessee	Gallatin	May 5, noon	Furn. Corliss engine; 2 gen.; 2 switchb.; 2 elec. oper. pumps	E. L. Anderson, Chm. W. & L. Com.
Illinois	Yorkville	May 10, noon	Constr. a dam across Fox river; a power house with wheel pits, etc., complete	Fred W. Simpson, Secy.
California	Riverside	May 24	Franchise to run poles and line for conveying electric power on all roads of county	County Supervisors.
FIRE EQUIPMENT				
New York	Rensselaer	May 8	Furn. 500 ft. 2½-in. fire hose	Salt, City Clerk.
New Jersey	Princeton	July 5	Furn. auto pumping engine	E. M. Updike, Chm. F. & W. Com.
MISCELLANEOUS				
Michigan	Grand Rapids	Apr. 29, 3 p.m.	Repairing and construct. piers at various harbors in Michigan	C. S. Riche, Lieut. Col. Engrs.
Ohio	Cleveland	Apr. 29	Furnishing lubricants to Water Department	I. O. Hoffman, Secy. B. P. Serv.
Massachusetts	Gloucester	May 1, 4 p.m.	Building sea wall at Stage Fort Park	Asa G. Andrews, Chm. B. P. Comr.
Dist. Col.	Washington	May 1, 2 p.m.	Furnishing one two-passenger roadster motor car, gasoline type for use in Fire Dept.	Cuno H. Randolph, Comr.
Connecticut	Hartford	May 2, noon	Constructing new fire station	Geo. W. Sanford, Bldg. C. B. F. C.
New Jersey	Haledon	May 2, 8 p.m.	Collecting garbage for one year	Lawrence L. Hines, Boro. Clerk.
Pennsylvania	Reading	May 3	Furn. sup. for fiscal year; clean, paved sts. and catch basins	Caleb Steidner, City Clerk.
Pennsylvania	Erie	May 8, 8 p.m.	Constructing an incinerator plant complete	B. E. Briggs, City Engr.
Ohio	Cincinnati	May 10, noon	Constructing hospital buildings	Hannafor & Sons, Arch.
California	Oakland	May 11	Constructing city hall, value of contract \$1,000,000	Frank R. Thompson, City Clerk.

STREET IMPROVEMENTS

Florence, Ala.—Council is considering improvement of Tombigbee, Tennessee and Court sts.

Marianna, Ark.—Bids will be received May 1 for \$100,000 road improvement bonds.—R. L. Mixon, Chairman County Road Commissioners.

Phoenix, Ariz.—Bids will soon be asked for constructing portions of territorial highways.—J. B. Girard, Territorial Engineer.

Colton, Cal.—Plans are being considered for paving business streets.

San Luis Obispo, Cal.—City has rejected only bid received Apr. 10 for paving Osos st.; new bids will be received May 1.

Washington, D. C.—American consular officer in European country has reported that firm in his district which crushes gravel for roads would like to learn of American crushers. Address No. 6554, Bureau of Manufactures.

Arcadia, Fla.—Citizens will vote May 16 on \$10,000 bonds for street improvements.

Jasper, Fla.—Citizens will vote on \$17,500 bonds for street and sidewalk improvements.

Atlanta, Ga.—Council has decided to reject all bids for paving North blvd.

Cedartown, Ga.—City is considering paving

ing of Main st. from city hall to Gibson st. **Talbotton, Ga.**—Talbot County will vote on \$12,000 bonds for road construction.—R. A. Mizell, J. B. Matthews and J. D. Daniel, Commissioners of Roads and Revenues.

Taylorville, Ill.—Board of Local Improvements has ordered paving of 2d st. with vit. blocks, \$11,595; also West Main Cross st., \$6,519, and Webster st.—Jas. W. Dappert, Engineer.

Farmland, Ind.—Paving of Main st. with brick is being urged.

Hartford City, Ind.—Jones gravel road bonds in sum of \$11,000 have been sold to Fletcher National Bank of Indianapolis.

Michigan City, Ind.—Board of Public Works has approved Engineer H. M. Miles' plans and specifications for pavements in number of streets.

New Castle, Ind.—Council has passed ordinances to pave eight different streets; total 28 miles.

Rushville, Ind.—County Commissioners are considering building of seven roads at cost of \$150,000.

Valparaiso, Ind.—Taxpayers of Pleasant Township have voted to construct 16 miles of gravel road to cost about \$77,000.

Burlington, Ia.—Council has instructed the City Engineer to prepare estimates for

paving contracts on Arch, Spring and Smith sts.

Baltimore, Md.—Eastern Railway Supply Co., 413 American Bldg., desires 10-ton steam road roller.

Baltimore, Md.—City Engineer Fendall with consent of the Board of Estimate will begin within few weeks work of paving 31st st., Maryland Ave. to St. Paul St. with macadam over the cobblestones; after being subjected to traffic the experiment proves satisfactory. Mr. Fendall will recommend that all residential streets be paved with macadam over cobbles.

Cumberland, Md.—Council has passed ordinances for paving four streets.

South Cumberland, Md.—Residents of Springvale st. are urging paving of that thoroughfare.

Holyoke, Mass.—Aldermen have voted \$89,000 loan for permanent highway work.

Whitinsville, Mass.—Macadamizing of Church st. is being considered.

Benson, Minn.—Swift County Commissioners have appropriated \$2,000 for extension of State highway.

Kearney, Neb.—Mayor J. W. Paterson has recommended need of good roads and clean, graded streets.

Atlantic City, N. J.—Council has decided to pave portions of 13 streets and nine

Reno, Nev.—Commissioners of Washoe and Ormsby counties have decided to build a road from Reno to Carson City, and hence to Lake Tahoe.

New Brunswick, N. J.—Board of Freeholders has rejected bids received for stone on the following roads: State st., Perth Amboy; St. George's ave., Perth Amboy; Woodbridge to Iselin, Menlo Park to Union County line.

Paterson, N. J.—Board of Works has passed ordinances for grading, curbing and guttering certain streets.

Perth Amboy, N. J.—Board of Aldermen has decided to pave Smith st., High to State st., with asphalt blocks; is also considering paving of three streets with bituthic.

Vincentown, N. J.—Taxpayers have decided to expend about \$4,500 in curbing and macadamizing full width of main thoroughfare.

Albany, N. Y.—Board of Contract and Supply has decided to ask for bids for improvement of three streets.

Herkimer, N. Y.—Engineer Wilbur has been instructed to prepare plans and specifications for pavement of South Washington st. between Eastern ave. and Smith st.

Ithaca, N. Y.—Tompkins County Board of Supervisors has decided to construct Freeville-Groton road, 4.49 miles, at cost of \$1,200.—E. C. Evans, Superintendent.

Little Falls, N. Y.—State Highway Commission has signified its intention of paving center of East Main st. with asphalt macadam from Gulf bridge to Alexander st.

New York, N. Y.—Board of Estimate has adopted final plans for tunneling street under Fort George Hill to connect Broadway with 191st st. station of subway.

Niagara Falls, N. Y.—City Engineer F. S. Parkhurst, Jr., has prepared bids for paving of Portage road from Buffalo ave. to Main st.; seven different kinds of paving are specified; estimated cost about \$70,000.

Kings Mountain, N. C.—Kings Mountain precinct, Cleveland County, will vote May 6 on \$25,000 bonds for road construction.

Pittsboro, N. C.—Bids will be received May 5 for \$5,000 street improvement bonds.—E. Nooe, Mayor.

Rich Square, N. C.—Rich Square Township will issue \$30,000 bonds for road improvements.—Andrew J. Conner, Chairman Road Commissioners.

Washington, N. C.—New Hanover County will vote May 31 on \$50,000 bonds for road and bridge construction.

Joliette, N. D.—Joliette Township is considering purchase of 24-wheel scrapers.—Frank Emerson, Clerk.

Akron, O.—Board of Control has rejected 11 bids for construction of city sidewalks.

Bellefontaine, O.—Council has passed resolutions for construction of seven miles of sidewalk.—L. E. Pettit, Mayor.

Cincinnati, O.—County Commissioners have ordered plans and specifications for improvement of Country Club road, from leading pike to Ohio pike, Silverton, at estimated cost of \$5,011; also adopted Surveyor Cowan's plans and specifications for improvement of Bond road, Montgomery rd to Camargo pike, at estimated cost of \$7,510, and for macadamizing of extension of Struble road, from Pippin road to Hamilton pike, at estimated cost of \$4,588.

Cincinnati, O.—Council has passed ordinance authorizing following bond issues: \$7,700 for improvement of Terrace ave., \$3,000 for Charlton st., \$8,000 for Melrose ave., \$7,500 for opening of 3d ave. and \$6,000 for paving of Hoff ave.

Millersburg, O.—Bids will be received in about a month for paving 6,000 sq. yds. of streets.

Oklahoma City, Okla.—Because contractors' bidding for contracts for \$400,000 worth of paving failed to file analysis of the material they intended using Council has rejected the bids of seven firms; specifications will be readvertised and bids asked for.

Baker, Ore.—Citizens have voted \$45,000 bonds for paving streets.

Johnstown, Pa.—Councils are considering paving resolutions amounting to \$115,985.

Marysville, Tenn.—Bids will be received May 15 by Blount County Commissioners for bond issue for pike roads.

Georgetown, Tex.—Williamson County has voted \$100,000 of bonds for road construction.

Itasco, Tex.—City will issue \$5,000 street improvement bonds.

Normanna, Tex.—Normanna and Tuleta districts of Bee County have issued \$25,000 bonds for road construction.

Norfolk, Va.—Board of Control has recommended the paving of Fairfax ave., Dunaff st. and Pembroke ave. at a cost of \$5,842.—W. T. Brooke, City Engineer.

Richmond, Va.—Plans, specifications and estimates for proposed boulevard from William Byrd Park to Joseph Bryan Park are now in course of preparation by State Highway Commissioner P. St. Julien Wilson.

Olympia, Wash.—Council has passed ordinance for paving Main st.

Seattle, Wash.—Board of Public Works has approved plans for grading and curbing West Alaska and Hudson sts. and paving 4th ave. South and 36th st.

Seattle, Wash.—Board of Public Works has approved plans and specifications for brick paving on Terry ave. and East Olive st. and relaying plankings on Maynard ave.

Spokane, Wash.—Petition for the paving of Washington st. from river, north to Waverly pl., at estimated cost of \$71,500, has been filed with the City Clerk.

Huntington, W. Va.—Citizens will vote May 27 on \$300,000 bonds to improve county roads.

CONTRACTS AWARDED

Decatur, Ala.—Paving streets, to Leitch & Co., \$7,781.

Mobile, Ala.—Paving Water st., to Jamison & Halowell, Montgomery, \$31,457.

Hermosa Beach, Cal.—Improving Santa Fé ave., to P. S. Venable, Redondo Beach, \$7,000.

Los Angeles, Cal.—Improving Commercial St., Alameda st. to the Los Angeles River, to Withers & Crites, \$21,717; improving Jefferson st., Vermont ave. to Western ave., to Fairchild-Gilmore-Wilton Co., \$31,003.

Long Beach, Cal.—To the Fairchild-Gilmore-Wilton Co., Pacific Electric Bldg., Los Angeles, for paving portion of Pine ave., \$14,000.

Hartford, Conn.—Paving, to Southern New England Paving Co.; Farmington ave., 4,000 sq. yds., \$1.35; Sheldon st., 4,300 sq. yds., \$1.31, and Capitol ave., 6,150 sq. yds., \$1.27; all with Bermudez asphalt; excavation, 2,450 cu. yds., 75c.—R. N. Clark, City Engineer.

New Britain, Conn.—Building concrete walks and curbs, to Nicola Bellini, 65c. and 35c. per lin. ft.

East St. Louis, Ill.—Paving 7,175 sq. yds. on 38th st. with brick, to Myers Construction Co., \$1.72; other bidders: Gaynard & Sweeney, \$1,371.25; Meyers & Thomas, \$1,688.06; Walter Conan, \$1,740.4; Engineer's estimate, \$15,811.50; setting 4,675 lin. ft. curbing, to same, \$3,272.50; other bidders: Gaynard & Sweeney, \$2,506.25; Meyers & Thomas, \$3,412.75, and Walter Conan, \$3,459.50; improvement of alley, Collinsville ave. to Main st., to C. A. Horn Construction Co., \$1,299.80; Engineer's estimate, \$1,400.—Jas. F. Parr, Assistant City Engineer.

Oak Park, Ill.—Constructing 7,480 sq. yds. of asphaltic concrete pavement and 3,990 lin. ft. of granite concrete combined curb and gutter on Linden ave., between Chicago ave. and Augusta st., and on Iowa st., between Oak Park and East aves., to Standard Paving Co., 145 La Salle st., Chicago.

Lafayette, Ind.—To D. H. Falout, Indianapolis, for construction of Gaylord road in Wabash Township, \$3,225, and for two gravel roads, to Mahoney & Allen, Green Castle, \$6,740.

Rushville, Ind.—Building two county roads, to O'Connor Bros., city; one road, to Colter Bros.; total about \$31,803.

Centerville, Ia.—Brick and concrete paving, to Beebe Bros., Omaha, Neb., \$1.49 per sq. yd. for complete paving, \$1,925 per sq. yd. for brick paving, and 38c. per lin. ft. for cement curbing; total \$12,364.

Cresco, Ia.—Constructing 11,500 sq. yds. of cement concrete paving, to Concrete Construction Co., Cedar Rapids, \$1,358 per sq. yd.; other bidders: Fraser & Dausfalt, Rochester, Minn., \$1.44; Dearborn & Jackson, Cedar Rapids, \$1.495; St. James Tile Mfg. Co., St. James, Minn., \$1.42; C. B. McNamara Co., Dubuque, \$1.44; Keruty & Co., Dubuque, \$1.48; Decorah Cement Sidewalk Co., Decorah, \$1.43; building 5,500 lin. ft. cement curbing, to Decorah Cement Sidewalk Co., 23c.

Ft. Scott, Kan.—Constructing 2½ miles rock road to Midland Construction Co., \$4,050 per mile.

Baltimore, Md.—Paving Gough st. and Highland ave., to the George Long Contracting Co., 1st st. and 1st ave., \$4,812 and \$17,933, respectively; other bidders: F. E. Schneider, \$5,261 and \$18,721; P. Redding & Sons, \$5,146 and \$17,385; Hines & Hayman, \$5,438 and \$18,494; D. M. Andrew Co., \$5,127 and \$18,256.

Cambridge, Md.—Improving streets, using Mack block, to Field, Barker & Underwood, Arcade Bldg., Philadelphia, Pa., at \$47,208; other bidders: Ambler Davis Co., Harrison Bldg., Philadelphia, \$51,027; Martin J. Beach, American Bldg., Baltimore, \$56,073; W. M. Elder, Low Bldg., Baltimore, \$49,771; David M. Andrews, 26th st. and Mt. Vernon ave., Baltimore, \$45,996; United Paving Co., Bartlett Bldg., Atlantic City, N. J., \$52,620; Thomas S. Holt, Federalburg, Md., bidding on curb and gutter only, \$7,370; Rock Paving Co., Easton, \$10,430.

Boston, Mass.—Repairing artificial stone sidewalks in any street within city limits, to C. W. Dolloff & Co.

Boston, Mass.—Constructing 8,000 ft. of macadam road in Granby, extending the 1908 highway toward Belchertown, to C. E. Horne, Millbury, \$8,322; other bidders: R. F. Hudson, Wilmington, \$8,458; Lane Construction Corporation, Meriden, Conn., \$8,768; F. J. Mague, West Newton, \$8,791; F. E. Ellis, Melrose, \$8,793, and Michael L. Carmaro, Lee, \$8,865; building 4,300 ft. of oil macadam road in Tyngsboro, northwesterly from the section built in 1910, to H. W. Tarbell, \$7,006; other bidders: Frank Williams, \$5,191; F. E. Ellis, Melrose, \$7,257; P. J. Mague, West Newton, \$7,402; R. F. Hudson, Wilmington, \$7,461, and Martin & Condon, Watertown, \$7,975; building macadam roadway in Greenwood st., Dorchester District, to J. C. Coleman & Sons Co., \$13,261; other bidders: Connolly & Diamond, \$13,501 with local stone, and \$13,770 with trap rock; James Doherty, \$13,859 and \$13,901; William J. Rafferty Co., \$14,116 and \$11,295; John F. O'Connell, \$11,369 and \$14,548; D. M. Biggs & Co., \$15,510 and \$15,953; John McCourt & Co., \$13,756 and \$13,801; John Kelly & Co., \$13,651 and \$13,987; Daniel E. Lynch, \$16,788 and \$17,236.

Hastings, Neb.—Paving Hastings and Burlington aves., to E. R. Bing, \$1.88 per sq. yd.; Hastings brick will be used.

Jersey City, N. J.—By Hudson Boulevard Commissioners, to Buffalo Steam Roller Co. for furnishing 15-ton Buffalo-Pitts standard steam macadam roller, bidding \$3,500, less allowance of \$600 for two condemned rollers; Austin Western Co., Ltd., bid \$2,900 for 12-ton roller, and Henry Frank, Jr., \$3,500 for 15-ton Monarch roller, allowing only \$300 for two condemned rollers.

Metuchen, N. J.—Resurfacing Main st. to Liddle & Pfeiffer, Perth Amboy.

New Brunswick, N. J.—Furnishing rock by Freeholders, to Delaware River Quarry and Construction Co.; Iselin and Oak Tree road, \$1.48 per ton; Livingston ave. to Livingston Park, \$1.40; New Brunswick to the Three Mile Run, \$1.65; Monmouth Junction to Kingston, \$1.85; Monmouth Junction to Dayton, \$1.85; New Brunswick, \$1.85; Dayton to the Mercer County line, \$1.90; Cranbury road, the Union Valley line, \$1.85; South River to South Amboy, \$1.65; Highland Park to Metuchen, \$1.54; Adequet to Plainsboro, \$1.90; Bridge st., Stevens ave., South Amboy and Morgan road, \$1.90; Landing Bridge to New Market, \$1.60; East Highway to the county line, \$1.65; to F. R. Upton Co., for stone to be supplied on Dunellen and Bound Brook road.

Paterson, N. J.—Repairing asphalt streets, to Geo. Bracket, \$1.15 per sq. yd.; concrete work, \$7 per yd.

Trenton, N. J.—Paving 2d st., to the Filbert Paving and Construction Co., \$87,691.10; to the McGovern Co. was awarded the following contracts: Hoffman st., \$2,512; Genesee st., \$41,433.75; Mercer st., \$3,121.75; Whittier ave., \$3,835.20; Prospect st., \$2,031.60; Charles st., \$2,334.90; Ferry st., \$8,820; all to be paved with Filbertine; Allen st. job, to Filbert Co., \$2,835.91.

Washington, N. J.—Macadamizing Washington, Asbury and Imlaydale roads, to Salmon Bros., Netcong, \$49,507.

Brooklyn, N. Y.—Regulating and repaving with granite Myrtle ave., to J. J. Durkin, 1 Madison ave., New York City, as follows: 6,660 sq. yds. granite pavement, with tar and gravel joints, outside railroad area, one year's maintenance, \$2.25; 1,380 sq. yds. granite pavement, within railroad area, no maintenance, \$2.55; 30 sq. yds. old stone pavement, relaid, 60c.; 1,150 cu. yds. concrete for pavement foundation outside railroad area, \$1.40; 235 cu. yds. concrete for pavement foundation within railroad area, \$1.40; 5,210 lin. ft. new curb set in concrete, 90c.; 180 lin. ft. old curb reset in concrete, 20c.; 1,310 sq. ft. new granite bridgestone, outside railroad area, 75c.; 300 sq. ft. new granite bridgestone, within railroad area, 75c.; 250 sq. ft. old bridgestone relaid, 22c.; total \$32,601; totals of other bids: R. L. Russell, 186 Rensselaer st., Brooklyn, \$36,293; M. J. O'Hara, 557 3d st., Brooklyn, \$35,406; MacFarlane Contracting Co., 165 9th ave., Brooklyn, \$34,530; M. J. Meagher, 15 Orient ave., Brooklyn, \$37,031; H. P. George, 49 Washington ave., Richmond Hill, L. I., \$35,925; H. J. Mullen, 289 Fulton st., Jamaica, \$35,886; Modern Pavement Co., 206 Broadway, New York City, \$33,886; Norton & Gorman, 301 Douglass st., Brooklyn, \$35,200; regulating and repaving with asphalt on a concrete foundation roadway of Fulton st., to Brooklyn Alcatraz Co., 407 Hamilton ave., as follows: 16,730 sq. yds. asphalt pavement, outside railroad area, five years' maintenance, 83c.; 2,825 sq. yds. asphalt pavement within railroad area, no maintenance, 85c.; 30 sq. yds. old stone pavement to be relaid, 40c.; 2,325 cu. yds. concrete for pavement foundation outside railroad area, \$4.65; 395 cu. yds. concrete for pavement, foundation within railroad area, \$1.65; 9,230 lin. ft. new curb set in concrete, 55c.; 1,600 lin. ft. old curb reset in concrete, 55c.; 119 noiseless covers and

heads complete for sewer manholes, \$13; total, \$40,181; totals of other bids: Barber Asphalt Paving Co., 30 Church st., New York City, \$41,109; Cranford Co., 52 9th st., Brooklyn, \$40,340; Uvalde Contracting Co., 1 Broadway, New York City, \$44,487; regulating and repaving with granite on a concrete foundation 5th ave., 6,210 sq. yds., to J. J. Durkin, 1 Madison ave., New York City, \$27,832.

Poughkeepsie, N. Y.—Wood block pavement on Washington st., to Jersey Paving Co., represented by J. M. Scheffer; wood block, Barber asphalt, \$2.74, and for the United States Wood Preserving Co.'s block, \$3.01; type of block will be decided by City Engineer Harding.

Rochester, N. Y.—Brick pavement on Sheridan st., to Wm. H. Sours, Second, \$4,499.

Utica, N. Y.—To Harry W. Roberts & Co. for repairs to asphalt paved streets as follows: For sheet asphalt, including excavation, grading, concrete foundation, binder and top coat and all incidental work, \$2.25 per sq. yd.; for resurfacing sheet asphalt, including top coat, \$1.30 per sq. yd.; for extra binder in place, \$8 per cu. yd.

Grand Forks, N. D.—Laying paving in District No. 15, to Blome Paving Co.

Canton, O.—Improvement of streets: Hartford st., to Turnbull & Son, \$5,489; to same contractor for Winfield ave., \$6,689; to Downs & Campbell for E. 4th st. and Georgetown road, \$5,481, and to John Skeels, E. 10th st., \$8,705.

Caldwell, O.—Improving county road, to Nixon & Juniper, Nelsonville, O., \$10,302.

Cleveland, O.—Constructing Wooster Pike No. 3, to Baldwin Bros., Rose Bldg., Cleveland, \$30,105; other bidders: Gould & Maybach, \$31,265; Enterprise Paving and Construction Co., \$31,166; Cleveland Trinidad Paving Co., \$34,809.

Steubenville, O.—Paving, grading and curbing portions of Wilson ave., Wells and Stack sts., to John O. Bates, \$6,257.

Youngstown, O.—Paving as follows: Duquesne st., to Youngstown Construction Co., \$5,411; Breaden st., to Mullin & Quinn, \$10,522; Superior st., to A. Colucci, \$12,558; Oak st., to A. O'Haro, \$27,441; Logan ave., to S. H. De Groodt, \$35,766.

York, Pa.—County Commissioners have approved contract awarded by State Highway Department to Reilly, Fritz & Co., Lancaster, for construction of about six miles of good roads in Springfield Township at cost of \$40,921.41.

Dallas, Tex.—Paving Pennsylvania ave. with bitulithic material, to Texas Bitulithic Co., \$2.30 per sq. yd.; McKinney and Cochran aves. with creosoted wood block, to Creosote Wood Block Paving Co., \$2.85 per sq. yd.

Fairfax, Va.—Juniata Paving Co. has been authorized to begin construction of a highway from Fairfax Courthouse to District line by Board of Supervisors of Fairfax County.

Fredericksburg, Va.—By Road Commissioners of Spotsylvania County for two miles of macadam road from Gayles' Run to the court house, to L. R. Colbert.

Centralia, Wash.—Grading and constructing hard surface pavements, to the Lister Construction Co., Tacoma, \$56,242.

North Yakima, Wash.—To Warren Construction Co., Portland, for laying of bitulithic pavement and construction of concrete sidewalks, curbs and gutters in the West Yakima improvement district and the Pleasant ave. improvement district; cost about \$15,000.

Seattle, Wash.—Grading North 82d st., to J. Kaberg, 5204 10th ave., N. E., \$15,416; planking Western ave., to Hansen & Co., 4102 25th ave., S. W., \$9,248.50.

Spokane, Wash.—For 1,600 bbls. of cement, to F. T. Crowe & Co. and the Union Fuel and Ice Co., \$2.40 per bbl.; for approximately 175,000 ft. of lumber, to McGoldrick Lumber Co., \$1,986; 150 bbls. of asphalt, to the Union Oil Co. of California, \$23 a ton; 80,000 lbs. of pig lead, to Crane & Co., \$6.02½ per 100 lbs.

Monroe, Wis.—Paving Jefferson st. with Barr block, vit. brick and cement filler, to T. W. Quinn, Madison, \$1.79 per sq. yd.

Racine, Wis.—Gravelling streets, to T. H. Gharitty, \$4,410.20.

Renfrew, Ont., Can.—Season's supply of cement, to E. J. McGarry, \$1.55 in cotton bags to be returned.

BIDS RECEIVED

Los Angeles, Cal.—Rife, Cane & Frenzell are lowest bidders for highway work on San Fernando road from Burbank to the vicinity of Newhall tunnel, a distance of 13 miles; \$80,201.42 if crushed rock is delivered on cars or \$82,806.92 if rock is delivered on wagons; for construction of a section of Foothill hwy. in the vicinity of Azusa, Pete Walker bid \$21,682.12, which was nearly \$2,000 under the bid of Bent & Pennebaker.

San Diego, Cal.—Paving with asphalt portions of (a) D and (b) F sts.: Barber As-

phalt Paving Co., 7th and Hooper sts., San Francisco, (a) 17c., (b) 19c.; Fairchild, Gilmore & Wilton Co., Pacific Electric Bldg., Los Angeles, (a) 15 9-10c., (b) 18 4-10c.

Fort Wayne, Ind.—Clay st., Columbia to Berry, per lin. ft., Barber Asphalt Co., \$8.93; Centra. Paving Co., Boston block, \$8.60; Moellering Construction Co., \$8.98; preliminary order for asphalt; Clay st., Berry to Washington, Barber Asphalt Co., \$8.24; Central Paving Co., \$7.70; Moellering Construction Co., \$8.29; preliminary order for asphalt entered; Clinton st., Wallace to Pontiac, Barber Asphalt Co., \$7.73; Moellering Construction Co., brick, \$7.79; Asphalt Block Co., 3-in. block \$9.13, 2½-in. block \$8.81, 2-in. block, \$8.51; preliminary order for asphalt entered; John st., Creighton ave. to Pontiac st., Barber Asphalt Co., \$7.16; Central Paving Co., brick, \$7.50; Moellering Construction Co., brick, \$7.20; Asphalt Block Co., \$8.66, \$8.34, \$8.04; preliminary order for asphalt entered; Park ave., Broadway to Thompson, Barber Asphalt Co., \$6.80; Central Paving Co., brick, \$6.77; Moellering Construction Co., brick, \$6.95; Asphalt Block Co., \$8.30, \$8.01, \$7.74; preliminary order for asphalt; Runkon ave., Main to High, Barber Asphalt Co., \$8.28; Central Paving Co., brick, \$7.80; Moellering Construction Co., brick, \$8.40; F. D. Kruse, Metropolitan block, \$8.07; preliminary order for shale brick; Schick st., Wayne to Maumee, Barber Asphalt Co., \$6.58; Central Paving Co., brick, \$6.90; Moellering Construction Co., brick, \$6.66; Asphalt Block Paving Co., \$7.90, \$7.63, \$7.28; preliminary order for asphalt; Spy Run, St. Mary's River to Elizabeth st., per sq. yd., Barber Asphalt Co., \$1.76; Central Paving Co., brick, \$1.72; Moellering Construction Co., brick, \$1.79; Asphalt Block Paving Co., \$2.44; preliminary order for shale brick; Spy Run ave., from Elizabeth st. to State st., per sq. yd., all bids same as previous contract except Central Paving Co., which bid \$1.74; Spy Run, State st. to Feeder Canal bridge, all bids same as previous contract; preliminary order for shale brick.

Lexington, Ky.—Improvements of paving on College View ave., Central Construction Co., only bidder, \$2,797.50; macadam street with asphalt binder, \$1.35 per sq. yd., with the same price for excavation; total cost with the binder, \$3,642.50.

Newark, N. J.—Granite paving: Ogden st., Jersey Paving Corp., lowest bidder, \$18,346, and Malvern st., Delancy st. and Tyler st., J. F. Shanley Co., lowest bidder, \$47,248, \$42,041 and \$34,792, respectively; brick paving: South 17th st. and 14th ave., Newark Paving Co., \$40,718 and \$22,224, respectively; Vincent st., Jersey Paving Corp., \$9,762; Bigelow st., McMahon Construction Co., \$7,961, and S. 14th st., Van Keuren & Son, \$36,930; bitulithic: Clifton ave., Madison ave., Mapes ave. and Sherman ave., Standard Bitulithic Co., \$15,039, \$30,813, \$13,500 and \$31,938, respectively.

Brooklyn, N. Y.—Regulating and paving with asphalt on concrete foundation the roadway of 52d st., from 13th to 16th aves., Barber Asphalt Paving Co., \$12,572; Brooklyn Alcatraz Asphalt Co., \$11,138; Cranford Co., \$11,175; Uvalde Contracting Co., \$11,462; regulating, grading, curbing and laying sidewalks on 8th ave., from 62d st. to Bay Ridge ave., M. J. O'Hara, \$15,821; J. J. Schneider, \$15,018; Napola Caponi, \$21,077; Seaboard Construction Co., \$19,657; Chas. J. Vofri, \$14,685; P. S. Hickey, \$12,003; McCauley & Manton Co., Inc., \$14,986; regulating and paving with asphalt on a concrete foundation roadway of Caton ave., from Cauley & Manton Co., Inc., \$14,986; regulat-Asphalt Paving Co., \$12,160; Brooklyn Alcatraz Asphalt Co., \$10,467; Uvalde Contract-

ing Co., \$12,278; Cranford Co., \$10,714; regulating, grading, curbing and laying side walks on 68th st., from 4th to Fort Hamilton ave., W. W. Gorman, \$19,885; J. Schneider, \$17,239; Charles J. Vofri, \$16,130; P. S. Hickey, \$17,566; Seaboard Construction Co., \$23,265; McCauley & Manton, \$18,867.

Mt. Vernon, N. Y.—Regulating, grading and improving of Prospect ave.: James Piro, new curb 65c., old curb 35c., brick pavement on 4-in. concrete \$2.20, brick pavement 50c., macadam \$1, new flag 70c. old flag 10c., brick pavement on 6-in. concrete \$2.35; Guarino & Covino, new curb 75c., old curb 35c., brick pavement on 4-in. concrete \$2.20; brick pavement 50c., macadam \$1, new flag 65c., old flag 9c., brick pavement on 6-in. concrete \$2.35; Frank Nordone, new curb 68c., old curb 45c., brick pavement on 4-in. concrete \$2.20, brick pavement \$1.29, macadam 95c., new flag 62c., old flag 10c., brick pavement on 6-in. concrete \$2.30; Louis Petrillo, new curb 78c., old curb 35c., brick pavement on 4-in. concrete \$2.25, brick pavement 78c., macadam 95c., new flag 63c., old flag 9c., brick pavt. on 6-in. concrete \$2.30; J. A. Siller, new curb 70c., old curb 35c., brick pavement on 4-in. concrete \$2.25, brick pavement \$1.10, macadam \$1.05, new flag 65c., old flag 8c., brick paving on 6-in. concrete \$2.4

Utica, N. Y.—Paving Mary st., 3d ave., Mohawk st., asphalt, with artificial stone curb, \$6,071.10; with natural stone curb, \$6,726.30; Knox st., West ave. to City st., asphalt, with artificial curb, \$1,731.90; with natural stone curb, \$1,918.20; Hickory st., West ave. to York st., asphalt, with artificial curb, \$9,246, with natural stone curb, \$10,212; Kirkland st., State to Sunset ave., asphalt, with artificial curb, \$10,881.10; with natural curb, \$12,034.30; Humbert ave., Mohawk st. to George pl., asphalt, with artificial curb, \$5,226.50; with natural curb, \$5,807; Young pl., Humbert ave. to South st., asphalt, with artificial curb, \$2,434.50; with natural curb, \$2,703; Fay st., Lafayette Columbia st., asphalt, with artificial curb, \$2,509.10; with natural curb, \$2,730.80; Can st., Breese to Schuyler st., asphalt, with natural stone curb, \$8,599.30.

Dayton, O.—Furnishing 10 car loads asphalt to be used in repair of streets this spring and summer: Barbour Asphalt Co. submitted low bid of \$23 per ton on Trinidad asphalt; bids of the other concern were all upon refined asphalt and were as follows: American Asphalt and Rubber Co., Chicago, \$25.81; the Union Oil Co., California, \$26.90; Warren Bros., \$28.50, and Globe Asphalt Co., Pittsburg, \$28.50.

Philadelphia, Pa.—Paving portions of streets, recently opened in various sections of the city with asphalt; streets require foundations and asphalt covering, and provide for guarantee for five years: Filby Co., \$1.65 per sq. yd.; Barber Co.'s ranged from \$1.71 to \$1.99; repairs to other than asphalt streets, bids on granite block are Filbert Co., 22c. per sq. yd.; R. Bennis, 23c.; American Paving and Construction Co., 27c.; Mack Paving and Construction Co., 32c.; Cunningham Paving and Construction Co., 25c.; vit. brick, Bennis, 28c.; American Co., 37c.; Mack Co., 42c.; Cunningham Co., 27c.; cobble rubble paving, Bennis, 25c.; American, 50c.; Filbert, 25c.; Mack, 30c.; Cunningham, 27c. per sq. yd.

Austin, Tex.—Paving (a) 45,000 sq. yd. (b) rock excavation, (c) dirt excavation Texas Bitulithic Co., (a) \$2.21, (b) \$3.35c.; Turner & McDonald, granitoid, \$1.85, (b) \$2, (c) 45c.; creosoted wood block paving, (a) \$2.45, (b) \$1.50, (c) 45c.; Tex Grading Co., wood blocks, (a) \$2.44,

Lawton, Okla.—Bids received Apr. 10 for paving: (A) C. N. Shaw & Co., city, award contract, \$156,319.39; other bidders: (B) E. K. Kerby, city, \$165,180.46; (C) C. I. De Oklahoma City, \$173,643; (D) Mayfield, Shaw & Resman, city, \$158,294.99; (E) Engineer estimate, \$179,002.17.

	A	B	C	D	E
21,036 cu. yds. excavation, 2,000 ft. free haul.....	\$0.23	\$0.30	\$0.32	\$0.32	\$0.32
75,489 sq. yds., Oklahoma Nat. Rock Asphalt Paving.....	1.69	1.74	1.82	1.68	1.68
20,936 lin. ft. straight comb. curb and gutter, stone cushion.....	.70	.90	.90	.75	.75
20,936 lin. ft. straight comb. curb and gutter, gravel cushion.....	.70	.88	.90	.75	.75
3,115 lin. ft. radius comb. curb and gutter, stone cushion.....	.72	.90	1.00	.75	.75
3,115 lin. ft. radius comb. curb and gutter, gravel cushion.....	.70	.88	1.00	.75	.75
2,236 lin. ft. straight curb, stone cushion.....	.60	.50	.60	.50	.50
2,236 lin. ft. straight curb, gravel cushion.....	.58	.48	.60	.50	.50
7,652 lin. ft. straight gutter, stone cushion.....	.55	.50	.60	.50	.50
7,652 lin. ft. straight gutter, gravel cushion.....	.55	.48	.60	.50	.50
333 lin. ft. radius gutter, gravel cushion.....	.60	.50	.70	.50	.50
3,982 lin. ft. marginal curb, 3 x 12 oak header.....	.10	.20	.10	.10	.10
39 catch basins.....	17.50	20.00	20.00	25.00	25.00
440 lin. ft. 8-in. vitrified sewer pipe.....	.40	.40	.50	.50	.50
10-in. sewer pipe, if substituted.....	.40	.50	.60	.60	.60
12-in. sewer pipe, if substituted.....	.40	.60	.70	.70	.70
Number of days for completion.....	200	180	180	200	200

50, (c) 45c.; vit. brick, (a) \$2.57, (b) \$2.50, (c) 45c.; J. O. Polhemus, wood blocks, (a) \$2.46, (b) \$2, (c) 40c.; vit. brick, (a) \$1.15, (b) \$2, (c) 40c.; Knox T. Johnson, oak blocks, (a) \$2.20, (b) \$1.50, (c) 50c.; vit. brick, (a) \$1.05, (b) \$1.50, (c) 50c.; concrete, (a) \$1.75, (b) \$1.50, (c) 50c.—John O. Johnson, City Clerk.

Portsmouth, Va.—Construction of the county's portion of proposed new macadam pavers through Lafayette Residence Park, James Creek District, from limits of City of Norfolk to Cottage Toll Bridge road; Parke Lindsay, Portsmouth, lowest bidder, 74 1/2c. per sq. yd.; road is about three-quarters of a mile in length; Ft. P. Denby, Norfolk, bid 81c. per sq. yd., and Dalby, Nottingham & Co., Portsmouth, 77c. per sq. yd.

Platteville, Wis.—Constructing 8,880 sq. ds. of paving; Thomas W. Quinn, \$1.82 per sq. yd. for brick, total bid \$19,030; Thomas E. Woolley, reinforced concrete, 1.39 per sq. yd., total \$14,354; asphalt macadam, \$1.82 per sq. yd., total \$18,153; sarcotithic \$1.82 per sq. yd., total \$18,153.

SEWERAGE

Fayette, Ala.—City is considering construction of sewer system.

Oxford, Ala.—Citizens will vote April 22 on \$12,000 bonds for sewerage system.

Bakersfield, Cal.—City Engineer C. Greey has prepared plans for construction of public sewer in District No. 15, estimated to cost \$27,500; also plans for similar sewer in District No. 16, cost \$27,500.

Santa Barbara, Cal.—Council has ordered construction of vit. pipe sewer in Carrillo and Anacapa sts.

New Britain, Conn.—Council is considering \$40,000 bond issue for proposed sewer work.

Arcadia, Fla.—Citizens will vote May 16 on \$20,000 bonds for construction of sewer system.

Jasper, Fla.—Citizens will vote on \$10,000 bonds for construction of sewer system.

Fort Valley, Ga.—Citizens will vote April 9 on \$35,000 bonds to lay sewerage system and make other improvements.

New Iberia, La.—Establishment of sewer system is being considered.

Holyoke, Mass.—Board of Aldermen has voted \$13,000 loan for permanent sewer work.

Quincy, Mass.—City has sold \$30,000 sewer bonds to Parkinson & Burr.

St. Paul, Minn.—Board of Public Works has rejected all bids for Dearborn st. sewer.

Kearney, Neb.—Mayor J. W. Paterson has recommended formation of sewer district.

Garwood, N. J.—Council is considering ordinances for extension of sewer system.

Haledon, N. J.—H. J. Harder, Paterson, is completing plans for sewers and sewage disposal plant; cost about \$40,000.

Monmouth Beach, N. J.—Borough Council has decided to construct sewer system. —J. P. Manahan, Mayor.

Paterson, N. J.—Board of Works has passed ordinance for constructing number of lateral sewers in various sections of city.

Plainfield, N. J.—State Board of Health has decided against North Plainfield's plans for sewage disposal plant which called for location of sewage beds in North Plainfield Township.

Syracuse, N. Y.—Council is considering installation of system of sewers for Huntley tract and parts of Third and Fourth wards.

Marion, O.—Council has passed ordinance for constructing sanitary sewer and cellar drain: 1,300 lin. ft. of 6-in. and 8-in. vit. pipe and five manholes needed.—Pearl R. Sears, City Engineer.

Tiffin, O.—Council has ordered City Engineer to prepare plans for sewers on 2d, 1st, Washington and Grand aves.

Drain, Ore.—Citizens have voted \$5,000 bonds for sewers.

Portland, Ore.—Council has adopted resolution authorizing the City Engineer to prepare and file plans for proposed Columbia trunk sewer to drain Woodlawn, Vernon and other thickly settled districts.

Chester, Pa.—Installation of sewers and disposal plant is being urged.

Masontown, Pa.—Chester & Fleming, Union Bank Bldg., Pittsburg, are preparing plans in connection with City Engineer E. C. Baker for sewage disposal plant.

York, Pa.—Bids will be asked by Highway Committee of Council for storm water sewers on Vine st. and extension of Jackson st. sewer.

Aberdeen, S. D.—Citizens have voted \$200,000 bonds for sewerage extension purposes.

Madison, S. D.—Citizens have voted \$65,000 sewerage bonds.

Newport, Tenn.—Citizens will vote April 29 on \$50,000 bonds to build system of sewerage and water works.

Groveton, Tex.—Trinity County is considering election on \$150,000 road bonds.

Longview, Tex.—Citizens have voted \$90,000 bonds for paving streets and purchasing sewer system.

Tazewell, Va.—Tazewell County has voted \$625,000 bonds for good roads.

Seattle, Wash.—Board of Public Works has approved plans for sewerage Meridian ave.

Seattle, Wash.—Board of Public Works has adopted plans for sewerage East 71st st.

South Bend, Wash.—Contract will be let in about 30 days for pipe and concrete trunk sewers; cost about \$20,000.—Chas. H. Mills, City Clerk.

CONTRACTS AWARDED

Attalla, Ala.—To J. L. O'Conner, Knoxville, Tenn., to construct sewers costing about \$30,000; Wilburn Hill, of Hazlehurst & Gadsden, Atlanta, Ga., will supervise work.

Los Angeles, Cal.—To S. M. Kerns for constructing vit. pipe sewer on Wilshire Blvd., \$5,375, and to Peter Grbovach for storm sewer in Humboldt and other streets, \$15,500.

Freeport, Ill.—Building sewers: West Freeport sewer, to J. W. Turner, of Des Moines, Ia., \$29,979, or \$777.56 below the estimate; East Freeport, to Frank Komanski, Watertown, Wis., \$14,967, or \$1103 above the estimate.

Indianapolis, Ind.—To the American Construction Co. for sewer in Jackson pl., about \$70,000.

Fort Leavenworth, Kan.—Sewer improvements at the fort, to A. J. Taussig Construction Co., St. Louis, \$48,928.40; other bidders: McGuire & Stanton, \$52,523.18; E. W. Geiger, city, \$53,045; Boyd Construction Co., Kansas City, Kan., \$52,000; John Barnes, Leavenworth, \$56,987.

Hutchinson, Kan.—Building lateral sewer in District 38, to O. F. Davis.

Boston, Mass.—Building sewer in Morrison st., to Antony Cefalo, \$1,490.01; other bidders: West Roxbury Trap Rock Co., \$1,714.45; Murphy & Dolan, \$2,069.49; McCarthy & Walsh, \$2,288.05; Raffeale Cartullo, \$2,314.75; R. J. Young & Co., \$3,913.20.

Northampton, Mass.—Furnishing sewer pipe to the city for the coming year, to W. H. Riley & Co., Boston, at \$1.50 per cent. of list price.

Albert Lea, Minn.—To J. J. Connolly, St. Paul, for construction of sewer, \$3,143; other bidders: Lars Overn, St. Peter, \$5,250; Frazier & Danforth, Rochester, \$4,250; Greene Bros., city, \$4,315.48; Pastoret, Lawrence Co., Duluth, \$4,522.18; Illstrup & Olson, Minneapolis, \$3,910; Roberts & Few, Brookings, S. D., \$4,581; detail bid of lowest bidder is as follows: 100 ft. 8-in. vit. pipe, 6 to 8 ft. trench, 70c.; 1,124.24 ft. 8 to 10 ft. trench, 80c.; 1,048 ft. 10 to 12 ft. trench, 88c.; 340 ft. 12 to 14 ft., \$1.05; 698.12 ft. 14 to 16 ft., \$1.15, and 155.88 ft., 16 to 18 ft., \$1.45.—Wm. Barneck, City Engineer.

Brainerd, Minn.—Building sewers in northeast part of city and on Laurel st., to Pastoret-Lawrence Co., Duluth.

South Orange, N. J.—Construction of sewers for Hilton District, to J. J. Fusco, Montclair, \$18,246; other bidders: Antonio Costa, Orange, \$20,734; H. Spinach Construction Co., Waterbury, Conn., \$21,511; Martin & Miller, Roselle Park, \$22,471; Chas. Ippolito, Orange, \$23,287; Pas. Cestone, Montclair, \$23,803; J. F. Callahan, Elizabeth, \$25,407; John Dorer, Irvington, N. Y., \$28,108; Mason Hilton & Co., New York, N. Y., \$31,951; Pas. Mauriello, Orange, \$32,984.

Gastonia, N. C.—To P. R. Huffsietler and H. F. Oakley, city, to build sewer in Western part of city, \$4,090.

Niles, O.—Building sewers in Sewer District No. 6, to Frank Mannella, 6941 Chaucer st., East End, Pittsburg, Pa., 18,551 cu. yds. earth excavation, 55c.; 188 cu. yds. brick masonry, \$10; 2 3-10 tons of iron pipe \$50; 750 lin. ft. 15-in. pipe, double strength, 42c.; 710 lin. ft. 15-in. pipe, 37c.; 384 lin. ft. 12-in. 25c.; 1,300 lin. ft. 10-in., 20c.; 11,750 lin. ft. 8-in., 14c.; 6,353 lin. ft. 6-in., 10c.; 1,500 lin. ft. 4-in. 70c.; total \$15,496.89; other bidders: Kimbrough & Elder, New Castle, Pa., \$19,063.17; Burns Bros., New Castle, Pa., \$16,224.98; C. L. Allen, Marion, \$17,909.90; Jas. McCracken & E. W. Masters, Warren, \$20,395.98; V. Mango & G. A. Giardini, city, \$19,302.09.

Chambersburg, Pa.—Building complete sewer system in town, about 16 miles of it to James Ferry & Son, Pittsburg, \$160,154.43; to Cantrell Construction Co., Philadelphia, trunk line from disposal plant to Wolf ave., \$22,953.85; disposal plant, to Pitt Construction Co., Pittsburg, \$58,170.70.

York, Pa.—Building storm water sewer on South Richland ave., to General Supply and Construction Co., \$3,606.20.

Seattle, Wash.—Laying sewers on Woodlawn ave., to Wm. Kopta, 1422 27th ave., \$16,997.

Appleton, Wis.—Building sewer on three streets, to J. H. Wait, \$2,885.

BIDS RECEIVED

Easton, Md.—Eleven bids for building proposed sewerage system were opened April 15; lowest was that of Hines & Hayman, Baltimore, \$37,601.78, and the highest, William C. Evans, Ambler, Pa., \$51,867.17.

Mt. Vernon, N. Y.—Construction of the lateral sewer on Cedar st.: J. A. Sillery, \$1,700; James Charci, \$2,325; Frank Nordone, \$1,625; Sabino Guarino, \$1,540; Tony Longo, \$2,400; Louis Petrillo, \$1,425; Sidney ave. sewer: Louis Petrillo, \$488; J. A. Sillery, \$275; Tony Longo, \$400; James Charci, \$110; Frank Nordone, \$445; Sabino Guarino, \$375.

Grandview Heights, O.—Construction of sewer system from plans of E. G. Bradbury, Columbus; John C. Beasley, Columbus, lowest bidder, as follows: 18,045 cu. yd. earth excav. in trench, 50c.; 18,045 cu. yd. rock excav. in trench, \$2.50; 173 cu. yd. brick masonry, \$9; 42 cu. yd. concrete masonry, \$10; laying 24,462 lin. ft. sewer pipe, 6c.; 81 c-i. manhole tops, each, \$9; 400 manhole steps, each, 30c.; M ft. sheeting left in, \$16; sewer pipe, 81 per cent discount, \$19,329; 336 Y poles, each 5c., 17 tons c-i. pipe, laid, \$40; 15 flushing gates, each \$1, 56 manhole pans, each \$2; excav. (lump sum), river, \$850; total, \$18,708. Totals of other bids: Jas. Westwater Co., Columbus, \$23,253, and C. T. McCracken & Co., Columbus, \$19,508.

Niles, O.—Construction of the south side sewers; specifications, earth excavation, 18,551 cu. yds.; brick masonry, 188 cu. yds.; iron pipe 2 3-10 tons, 15-in. pipe, double strength, 700 lin. ft.; 15-in. pipe, 710 lin. ft.; 12-in. pipe, 384 lin. ft.; 8-in. pipe, 11,756 lin. ft.; 6-in. pipe, 6,353 lin. ft.; 4-in. pipe, 1,500 lin. ft.; Kembrough & Elder, New Castle, Pa., excavation 73c. per yd., brick masonry \$11 per yd., iron pipe \$45 per ton, 15-in. d. s. pipe 31c. per lin. ft., 15-in. pipe 25c. per lin. ft., 12-in. pipe 21c., per lin. ft., 8-in. 14c. per lin. ft., 6-in. 12c., 4-in. 15c., total \$19,063.17; Frank Manella, Pittsburg, excavation 55c. per yd., brick masonry \$10 per yd., iron pipe \$50 per ton, 15-in. pipe, d. s. 42c. per lin. ft., 8-in. pipe 20c. per lin. ft., 6-in. 14c. per lin. ft., 4-in. 7c. per lin. ft., total \$15,496.89; Burns Bros., New Castle, excavation 54c. per cu. yd., brick masonry \$13 per cu. yd., iron pipe \$45 per ton, 15-in. d. s. pipe 35c. per ft., 15-in. pipe 27c. per ft., 12-in. 22c., 8-in. 19c., 6-in. 12c., 4-in. 6c. per ft., total \$16,324.98; C. L. Allen, Marion, O., excavation 64c. per yd., brick masonry \$10 per cu. yd., iron pipe \$50 per ton, 15-in. d. s. pipe, 45c. per ft., 15-in. pipe 38c. per ft., 12-in. pipe 28c., 8-in. pipe 17c., 6-in. pipe 14c., 4-in. pipe 10c., total \$17,909.90; James McCracken and E. W. Masters, Warren, excavation 75c. per cu. yd., brick masonry \$10 per cu. yd., iron pipe \$38 per ton, 15-in. d. s. pipe, 40c. per ft., 15-in. 36c., 12-in. 28c., 8-in. 22c., 6-in. 13c., 4-in. 9c. per ft., total, \$20,395.98; V. Mango and G. A. Giardini, Niles, excavation 71c. per cu. yd., brick masonry \$9.50 per cu. yd., iron pipe \$37 per ton, 15-in. d. s. pipe 50c. per ft., 15-in. pipe 44c. per ft., 12-in. pipe 32c. per ft., 8-in. 18c., 6-in. 14c., 4-in. 7c. per ft., total \$19,302.09.

Moose Jaw, Sask., Can.—Pumps, sewer and water extension, sewerage disposal plant, etc.: Sewage disposal works, Manders Bros., Edmonton, \$124,023; Geo. H. Archibald & Co., Winnipeg, \$129,500; Flanigan & Murphy, \$134,585; Navin Bros., Moose Jaw, \$143,713; Moose Jaw Construction Co., \$143,641; City Engineer, \$146,306; Simple Concrete Piling and Construction Co., \$139,000; sewage pumps, Canada Foundry Co., Toronto, \$1,960; John Macdonnell Iron Works, Montreal, \$2,281; the Canada Land Co., Ltd., Montreal, No. 1, \$1,615.24; the Canada Land Co. Ltd., Montreal, No. 2, \$1,249.74; Canada Ford Co., Montreal, \$4,825; supplying c-i. pipe, Stanley Brock, Ltd., Winnipeg, (a) 6-in., \$39.25, (b) 4-in., \$39.25; Thompson Pipe Foundry (a) \$40, (b) \$40; Francis Hankia & Co., Montreal, (a) \$41.40, (b) \$41.95; H. A. Drury & Co., Ltd., Montreal, (a) \$43, (b) \$44.05; Moose Jaw Machine Works (a) \$45.77, (b) \$47.31; Whitlock & Marlatt, (a) \$45.50, (b) \$45.50; Chas. Miller & Co., (a) \$45.60, (b) \$45.60; S. D. Wood & Co., (a) \$18.25, (b) \$21; R. Cunningham (a) \$50.47, (b) \$50.47; Canada Foundry Co., (a) \$42.50, (b) \$42.50; Bissett & Loucks, (a) \$15, (b) \$15.60; sewer and water extensions, Navin Bros., Moose Jaw, \$51,113; L. W. Scruth, Fargo, N. D., \$56,519; C. J. Robinson, Moose Jaw, \$52,774; H. G. McVean, Moose Jaw, \$54,740; Flanigan & Murphy, Moose Jaw, \$58,800; Ransom & Kilkenny, Moose Jaw, \$63,000; C. J. Townsend, Toronto, \$60,000; Audies Bros., Edmonton, \$66,917.75; City Eng., \$55,713; sewer pipe, Dominion Sewer Pipe Co., \$12,937.70; Saskatchewan Glass and Supply Co., \$13,832.12; Whitlock & Marlatt, \$13,531.18; Macomb Sewer Pipe Co., \$14,597.24; Hamilton and Toronto Sewer Pipe Co., unit prices: D. F. Lee, \$13,592.17; R. Cunningham, \$14,890.28.

WATER SUPPLY

Aliceville, Ala.—City will grant franchise to City Water Co. for construction of water works; cost \$10,000; A. S. Murphy can be addressed.—J. B. Cunningham, Mayor.

Mena, Ark.—City will improve water works at cost of about \$60,000.—John Thompson, Chairman Board of improvements.

Lindsay, Cal.—Haviland & Tibbetts, Alaska Commercial Bldg., San Francisco, have been selected to prepare plans for water works and sewers.

Ontario, Cal.—Erection of three reservoirs for the city's water system, to Simmons & Hayden, for the cement work, and to Oscar Coih for roofing of reservoirs; combined bid, \$20,074.92.

San Diego, Cal.—Water Department will install about 15 miles of new mains; c.-i. pipe will be used, from 36-in. down.—H. R. Fay, Superintendent.

Fort Lupton, Col.—Citizens have voted \$25,000 bonds to construct water system.

Norwood, Col.—Citizens have voted \$12,000 bonds to install water works.

Olathe, Col.—Citizens have voted \$50,000 bonds to install water system.

Arcadia, Fla.—Citizens will vote May 16 on \$20,000 bonds for construction of water works.

Fort Valley, Ga.—Citizens will vote April 29 on \$35,000 bonds to complete water works and make other improvements.

Preston, Ida.—Citizens have voted bonds for installation of water works.

Moline, Ill.—Plans for \$30,000 filtration plant to supply arsenal with its supply of water are now being drawn by Captain H. B. Jordan and bids will be advertised for as soon as specifications are completed.

Peru, Ind.—A. T. Maltby, Consulting Engineer, Great Northern Bldg., Chicago, Ill., will take charge of providing a new and increased water supply and rebuild water works plant.

Glen Rock, Ia.—Citizens will vote on \$8,000 bonds to increase water supply.

Gilmore City, Ia.—Citizens have voted bonds for water works; cost about \$12,000; engineer not yet selected.—H. C. Mormon, Town Clerk.

Elk City, Kan.—City will soon receive bids for installation of water works; L. Y. McFarland has prepared plans; cost about \$25,000.

Emporia, Kan.—City is considering changing pumping from steam to electricity; will need about 2½ miles of transmission line, two 3,000,000-gal. pumps, also booster pump; bids will be asked early in May.—Matthew Brown, City Engineer; F. H. Smith, City Clerk.

Leavenworth, Kan.—Auxiliary water main from pumping station on the reservation to system of water mains in city is to be installed by Leavenworth City and Fort Leavenworth Water Co.; main will be 18-in. iron pipe.

Waterville, Kan.—Citizens have voted \$30,000 bonds for installation of water works and an electric light plant.

Madisonville, Ky.—Articles of incorporation have been filed by the City Water Co.; capital stock \$50,000; company will install water works system.

Baltimore, Md.—Baltimore County Water and Electric Co. will issue \$111,000 of bonds for extension to water mains.—J. G. MacDonald, 100 W. Fayette st., Secretary.

Frostburg, Md.—Council will take up matter of larger water supply.

Athol, Mass.—City will expend about \$20,000 to \$30,000 on water works.—Jas. L. Tighe, Holyoke, Engineer; H. L. Heapgood, Chairman Water Works Commission.

Marquette, Mich.—Citizens will vote May 5 on \$75,000 bonds for extension of intake pipe of water works.

Eveleth, Minn.—Council will advertise for bids for 2,500,000-gal. crank and flywheel shape pump.

North Mankato, Minn.—John Wilson, Mankato, has been selected to prepare plans for water works; cost about \$20,000.

Shakopee, Minn.—Citizens have voted \$10,000 bonds for water works improvements.

Tylertown, Miss.—Citizens have decided for private ownership of water and electric light plant; Board will let franchise to best bidder.

Cole Camp, Mo.—Citizens have voted \$10,000 bonds for water works.—E. Schwarz, Mayor.

Bridgeton, N. J.—Council has decided that city utilize water from Tumbling Dam Park lakes and streams as approved by State Board of Health for city water supply; also passed ordinance providing for issuing of \$75,000 bonds for installation of the new system, pumping station and filtration plant.

Stanhope, N. J.—Council has decided to build municipal water plant.

Trenton, N. J.—E. C. Hutchinson Water Co. has been organized to supply water to

residents of Hamilton Township.—E. C. Hutchinson, 1214 Hutchinson and S. T. Atchley, Incorporators.

New York, N. Y.—Water Commissioner Thompson is urging \$2,500,000 appropriation for installation of filtration plant.

Massillon, O.—Citizens will vote in November on \$150,000 bonds to build water works plant.

Braggs, Okla.—Plans are being prepared by Winters & Dove, 810 First National Bank Bldg., Fort Smith, Ark., for installation of water works.

Conveta, Okla.—City will extend water works system, including two miles of pipe line, auxiliary pumping plant and other improvements.—Winters & Dove, 810 First National Bank Bldg., Fort Smith, Ark., Engineers.

Kingfisher, Okla.—Citizens have voted \$28,000 bonds for water works extension and for changing electric system from a single-phase to 3-phase system; the electric plant will also be enlarged.—V. H. Francis, Superintendent.

Waynoka, Okla.—Wm. Haviland, Alva, is preparing plans for water works and electric light plant.—C. D. Willard, Town Clerk.

Baker, Ore.—Citizens have voted \$25,000 bonds for installation of 3,000,000-gal. reservoir and \$90,000 for replacement of wooden flume from Salmon Creek to settling tank; bids will soon be asked for work.

Drain, Ore.—Citizens have voted \$15,000 bonds for water works.

Springfield, Ore.—Council is considering construction of reservoir on Willamette Heights.

Blairsville, Pa.—Engineer O'Brien, Latrobe, is preparing plans for reservoir.

Bristol, Pa.—Council has rejected all bids received for furnishing materials and constructing complete water works, system and filtration plant.

Catasauqua, Pa.—Town is considering construction of municipal water works system.

Oil City, Pa.—Water Commission has recommended that city expend \$18,000 in improving pumping station.

Womelsdorf, Pa.—Womelsdorf Consolidated Water Co. will construct reservoir at foot of South Mountain, with a capacity of over 3,000,000 gals.

Dyersburg, Tenn.—Citizens will vote May 9 on \$30,000 water and light bond.

Manchester, Tenn.—Citizens have voted \$25,000 water works and electric light bonds.

Newport, Tenn.—Citizens will vote April 29 on \$50,000 bonds to build system of water works and sewerage.

Obion, Tenn.—City is considering election on \$25,000 bonds for construction of water works.

Terrell, Tex.—City Commission is considering bond issue for drilling artesian well.

Lehi, Utah.—Citizens have voted \$20,000 bonds to complete water system.

Seattle, Wash.—Board of Public Works has approved plans for water mains on North 50th st. and 12th ave. N. W.

Seattle, Wash.—Board of Public Works has adopted plans for laying water mains on 25th ave. North.

New Lisbon, Wis.—Langstead & Myers, Appleton, are preparing plans for water works and electric light plant; cost \$20,000.

Superior, Wis.—Council now has on hand proposition looking toward construction of water works plant by the city unless some favorable proposition is obtained on purchase of the plant of Superior Water, Light and Power Co.

Vancouver, B. C., Can.—City Engineer Burwell has estimated cost of installing water mains at Fort Grey at \$10,500.

CONTRACTS AWARDED

Atlanta, Ga.—Fire hydrants, to Columbian Iron Works, of Chattanooga, Tenn.; filter house on Hemphill ave., to Geo. A. Clayton, \$5,810.

Chicago, Ill.—To the Jas. A. Brady Foundry Co., 35th st. and Ashland ave., for furnishing and delivering to various pipe yards 200 tons of special castings, 4-in. to 12-in. diameter, and others, not to exceed 48-in.; furnishing water department 250 tons of valves from 4-in. to 24-in. and 2½ and 4-in. double flue hydrants; furnishing and delivering valve basins and five cistern covers to the various pipe yards of water department, to T. A. Cummings Foundry Co., 1338 Clybourne pl.

Lewiston, Ill.—Improving water works, consisting of furnishing and laying c.-i. pipe, furnishing and setting hydrants and valves, installing new pumping engine and constructing large shallow well from plans of Fuller-Coult Co., Chemical Bldg., St. Louis, Mo., to the Cook Construction Co., Des Moines, Ia., \$6,801.

Lewiston, Ill.—Constructing the water works system, to the Cook Construction Co., Des Moines, Ia., \$6,801.

Boston, Mass.—To Charles M. Callahan for laying water pipes in May st. and Geneva ave., Dorchester, and Old Colony av. South Boston, \$1,096.05; other bidders: Michael Russo, \$1,967.25; William J. Rafferty & Co., \$1,478.75; Daniel E. Lynch, \$712.50; R. J. Young & Co., \$2,057.50; Hu McNulty, \$1,490.05; Charles J. Jacobs Co., \$1,570; John A. Costello & Co., \$1,411.10; Louis Balboni, \$1,384.50; Antony Cefalo, \$632.50; Michael DeSisto & Co., \$1,308.20; Murphy & Dolan, \$1,436; Rafelle Cartul, \$1,422.25; Engineer's estimate, \$1,535.50. Laying water pipes in Electric ave. at Garden st., Brighton; Ardale, Guernsey at South Fairview sts., West Roxbury; Greenwood and Normandy sts., Rosemont rd. N. W. and Wales st., Dorchester, to same company, \$1,061.90; other bidders: Michael DeSisto & Co., \$1,204.15; Murphy & Dolan, \$1,335; Antony Cefalo, \$1,385.90; Thom Burke, \$1,194.50; R. P. Cushing, \$1,881.10; John A. Costello & Co., \$1,319.90; Charles J. Jacobs Co., \$1,636.90; William J. Rafferty & Co., \$1,513.75; Michael Russo, \$1,939; Engineer's estimate, \$1,502.50.

Boston, Mass.—Furnishing 500 Post hydrant boxes, 100 Lowry hydrant boxes, 7 gate boxes, 600 meter boxes and 50 blow-off boxes, to White & Kennelly, at \$4 each for all kinds; other bidders: J. H. Ferguson, \$4.65; Peter W. Hill, \$4.80; D. Biggs & Co., \$4.99; Jacobs & Eager, \$5.00; J. C. Coleman & Sons, \$5.37; Chas. M. Cahalan, \$5.40; W. L. Waples Co., \$6.30, \$6.36, \$6.70, \$6.25 and \$7.25; Simpson Bros. Corporation, \$7.48; 750,000 lbs. of No. 1 castings and 200,000 lbs. of No. 2 castings, to the Davis & Farnum Mfg. Co. for No. 2, 2.63c. and 2.2c., respectively; other bidders: Mechanics Iron Foundry Co., 2.7c. 1, No. 1; Davis & Farnum Mfg. Co., 2.33c. for No. 2; Trenton Foundry and Mach. Co., 2.47c. and 2.19c., respectively; Foxbox Foundry Co., 2.69c. and 2.24c.; Lunsden Van Stone Co., 3c. and 2.5c.

Uxbridge, Mass.—Water pipe, hydrant and other material used in the proposed extensions of water mains, to Standish Cast Iron and Foundry Co., for pipe, 8-1/2" \$22.70 f. o. b. Uxbridge; to Kennedy Valve Mfg. Co., for six 8-in. and 10 1/2-in. valves, \$165; for 14 Walker hydrants, to Norwood Engineering Co., \$22 each; hydrant, to Eastern Metal and Refining Co., for lead to be used, \$4.62 1/2 per cwt.

Holland, Mich.—To Platt Iron Works two 1,100-gal. per minute centrifugal pumps, connected to 2,200-volt motors; total \$2,158.

Troy, Mo.—Building water system, to Jager, Bold Hill, Mo., \$10,500.

Eastwood, N. Y.—Erection of standpipe 80 ft. high and 42 1/2 ft. in diameter which will hold about 100,000 gals. of water, Leonard J. Darrow, Eastwood, by Syracuse and Suburban Water Co.; standpipe will be placed at the junction of Blust st. and J. ave.

Geneva, N. Y.—By Board of Public Works, to the Snow Steam Pump Co., Buffalo, N. Y., for furnishing pump to Water Department, about \$14,000.

Cincinnati, O.—Furnishing fire plugs 1 year, to Bourbon Brass and Copper Works.

Ada, Okla.—Furnishing materials for water works extension, to A. Wyckoff Son, Alexandria, La., \$248.87 per 100 for 4,000 ft. of 30-in. wood pipe; to same \$4c. per ft. for 33,000 ft. of 12-in. wood pipe; to National Tube Co., St. Louis, Mo., 99 1/2c. per ft. for 33,000 ft. of steel pipe; Builders' Material and Supply Co., Kansas City, Mo., \$4,548 for pumping machinery.

Yale, Okla.—Installing water works, W. C. Swanwick Co., Joplin, Mo., about \$25,000.

Lebanon, Pa.—Furnishing pumping engine for Hammer Creek plant, to Snow Co., Buffalo, N. Y., \$14,070, foundation included, or \$12,500 without foundation; other bidders: Platt Works Co., Philadelphia, \$14,140 with foundation, \$13,518 without foundation; Allis Chalmers Co., Milwaukee, Wis., \$16,600, foundation included, and \$13,100 without foundation.

Seattle, Wash.—Laying water mains on Cheilan ave., to Ferguson-Coit Co., Arcata, Annex, \$11,605.

Spokane, Wash.—Furnishing 100 valves for water department, to Crane & Co., \$10,267.00.

BIDS RECEIVED

Long Island City, L. I., N. Y.—Furnishing, delivering and erecting pumping station near the existing driven well plant at Whitestone; Paul J. Exher, 55 East 20th st., New York, \$21,850; Masonry Construction Co., \$23,889; Concord Construction Co., \$25,547; McHarg-Barton Co., \$27,870; Mitchell Construction Co., \$22,200; Kelly & Kelly, Inc., \$25,541; L. J. Wadsworth Construction Co., \$23,477; Delaney Roberts Co., \$29,413; John T. Woodruff & Son, \$25,241; J. N. Knopp, \$35,874; Thomas McKeown Inc., \$27,737.

LIGHTING AND POWER

Auburn, Cal.—Board of Supervisors has granted franchise to Great Western Power to construct pole line along Rocklinson road and other roads in county, for distribution of electricity for light and power.

Longmont, Col.—Citizens have voted \$46,000 bonds for the construction of municipal electric light plant.

Washington, D. C.—American Consul has reported that certain city in his district is planning to erect plant for manufacture of gas for lighting, heating and cooking; plants to produce at least 100,000 cubic feet of gas per day and cost about \$1,000,000. Address No. 6556, Bureau of Manufacturers.

Bridgeville, Del.—South Delaware Gas Co. has been granted franchise to extend lines to this city.

Miami, Fla.—Miami Gas Co. is preparing to spend \$60,000 on enlargement of plant.—M. Van Court, Central Trust and Savings Co., Philadelphia, Pa., President.

Cartersville, Ga.—Blue Ridge Power Co. considering construction of 150-ft. dam to develop 30,000 h. p. for transmission by electricity. Wm. A. Carlisle, Gainesville, interested.

Swainsboro, Ga.—Citizens have voted 10,000 bonds to install electric lights and water works.

Roland, Ia.—Citizens have voted \$8,000 bonds for installation of electric light plant.

Watterville, Kan.—Citizens have voted 10,000 bonds for installation of electric light plant and water works.

Lancaster, Ky.—Electric light plant has been destroyed by fire; loss \$10,000; plant will be rebuilt at once.

Shreveport, La.—City is considering construction of electric light plant.

Crystal Falls, Minn.—City is planning to improve electric light plant.

Katonah, N. Y.—Public Service Commission has authorized Katonah Lighting Co. to spend \$45,000 for extensions and improvements to plant; lighting service will be extended to town of Lewisboro.

Syracuse, N. Y.—Syracuse Lighting Co. has asked Public Service Commission for permission to issue \$470,000 bonds to improve plant and lay about 33,000 ft. of gas pipe.

Jamestown, N. D.—Installation of addition to the White Way for the business streets is being considered.

Velva, N. D.—Town Council has granted franchise for lighting streets and business and private houses to John I. Moore.

Barberton, O.—Council has passed ordinance granting Barberton Light and Power Co. right and privilege to occupy and construct poles on certain defined districts and streets.

Sentinel, Okla.—Citizens have voted \$12,000 bonds for electric light plant and \$3,000 for water works extensions; bids for bonds will be received until April 28.—F. Church, Clinton, Engineer; J. M. Terry, Town Clerk.

Baker, Ore.—Citizens have voted \$25,000 bonds for installation of electric light plant.

Elgin, Ore.—McCully-Rumble Power Co. has secured site for electric power plant on the Wallowa River; company will supply light and power to local towns. About 1,000 h. p. will be developed.—J. R. Thompson, Portland, Engineer.

Newport, Ore.—Henry Hewitt and Seymour H. Bell have purchased franchise and power plant owned by Newport Power Co. and will make improvements.

Pittsburg, Pa.—Contemplating expenditure of about \$3,000,000 for construction of an immense dam on Clarion River in Clarion County, application will be made for a charter for the Clarion River Power Co.; separate charters will be asked for as many townships.—Joseph R. Paul, H. W. Douglass and J. P. Fife, all of Pittsburg, Incorporators.

Royersford, Pa.—Borough is considering expending \$25,000 on proposed municipal electric light plant.—Fred W. Keeley, Burdett.

Chesterfield, S. C.—Chesterfield Light and Power Co. will receive bids at once for construction and installation of machinery for electric light plant. W. D. Craig can be addressed.

Dyersburg, Tenn.—Citizens will vote May on \$30,000 light and water bonds.

Manchester, Tenn.—Citizens have voted 25,000 electric light and water works bonds.

Alice, Tex.—Council has granted franchise to T. H. Stevens to construct electric light and power plant.

Alto, Tex.—L. S. Atkins, Center, will erect electric light and power plant; plans approved.

Galveston, Tex.—Authority has been granted to advertise for bids for installation of two new centrifugal pumps to be used in connection with steam turbines now in use in electric light department; total cost, \$3,000.

Fort Stockton, Tex.—W. F. Zarbach and Chas. A. Shroff, Cleveland, O., have been granted 10-year franchise to operate electric light and ice plant; franchise calls for work to commence immediately on \$20,000 plant.

Kerbyville, Tex.—Fleming-Morton Co. will at once install electric light plant.

Port Orchard, Wash.—Bids will probably be received by the State Board of Control, Olympia, about May 20, for construction of power plant from plans of Bullard & Hill, Tacoma; cost about \$35,000.

Wheeling, W. Va.—Board of Control will secure bids on work of remodeling gas plant for the manufacture of water gas, as planned by Consulting Engineer Baehr.

Mosinee, Wis.—Mosinee Electric Light and Power Co. has been incorporated by Arden Paronto, J. P. Kanter and others, capital \$6,000, to install plant.

CONTRACTS AWARDED

Auburn, N. Y.—Extension of five years from Oct. 1, 1911, for lighting city streets has been granted to Auburn Light, Heat and Power Co.; also contract for 10 years for ornamental lights in business section.

Riverhead, L. I., N. Y.—By Riverhead Electric Light Co., to Overton & Tutill, local electricians, to install street lighting system.

Coleman, Tex.—To the Briggs-Weaver Machinery Co., of Dallas, for construction of electric light station.

Colorado, Tex.—Council has closed a contract with the Colorado Electric Light Co. to light up all street crossings in the city; extra large lights are to be used in the business district and 25-watt tungsten lamps in the residence parts; contract is for two years and the rate \$75 per month.

Spokane, Wash.—To J. A. Roebling Sons Co., Trenton, N. J., 100 miles of No. 10 copper-clad steel wire, \$3,335; four miles No. 10 copper wire, \$150; 5,000 ft. of No. 12 duplex solid copper wire, \$107; to Washington Electric Co., 500 two-piece insulators, \$56.58.

FIRE EQUIPMENT

Pelham, Ga.—Citizens have voted \$6,000 for fire station.

Danbury, Conn.—Erection of fire house is being considered.

Freeport, Ill.—Mayor C. J. Dittmar has recommended modern equipment for fire department, including aerial truck.

Indianapolis, Ind.—Council has passed ordinance authorizing \$200,000 bond issue for improving fire department.

Marion, Ind.—Fire Chief Crearer has recommended enlargement and improvement of fire alarm system.

Waterloo, Ind.—Fire Chief Mungovan is urging need of new fire apparatus.

Covington, La.—Chemical Co., No. 1 is considering purchase of auto hose cart.

Baltimore, Md.—Architect Robert C. Ulrich is preparing plans for erection of \$25,000 engine house at Fulton ave. and Baker st.

Fitchburg, Mass.—Town is considering erection of fire station.

Holyoke, Mass.—Board of Aldermen has voted \$10,000 loan for five auto trucks.

Englewood, N. J.—Council has empowered Fire Committee to obtain estimates and costs on modern fire apparatus.

Paterson, N. J.—Proposed West Paterson fire house will be erected at New Grand and West 12th sts.

Albany, N. Y.—Board of Contract and Supply has directed Architect A. W. Fuller to prepare plans and specifications for additions and alterations to Steamer No. 6.

New York, N. Y.—Board of Estimate has approved plans and specifications for erection of 11 engine houses; auto steam fire engines will be installed in most houses; also plans for erection of 10 houses in Brooklyn.

Syracuse, N. Y.—Another ordinance calling for installation of a new central office fire alarm system is being considered by Council.

Winston-Salem, N. C.—Mayor Bellenger has recommended purchase of 2,000 ft. of hose, one hose wagon and erection of station.

Connellsville, Pa.—Following recommendations have been made by Underwriters' Association: Purchase of chemical wagon, aerial truck and hook and ladder truck. Improvement of fire alarm system and erection of central fire station.

Easton, Pa.—Council is considering purchase of new apparatus.

Harrisburg, Pa.—Finance Committee has approved ordinance for purchase of 2,500 ft. of fire hose.

Central Falls, R. I.—Chief Engineer Lees has recommended purchase of 1,000 ft. of hose, steam fire engine, city truck, fully equipped with long ladders, and two fire alarm boxes.

Ipswich, S. D.—Volunteer fire department has been organized.—W. E. Herrick, Chief.

Bountiful, Utah.—Erection of hose house on Main st. is being urged.—John Ledingham, Chief.

Montpelier, Vt.—City is considering purchase of auto fire truck.

Clifton Forge, Va.—J. A. Gleason desires information and prices on automatic fire apparatus, including motor trucks or fire engines with ladder attachment and adapted to hose carrying.

CONTRACTS AWARDED

Gadsden, Ala.—To American-La France Co. for 2,000 ft. of fire hose, ladder and four nozzles.

Brynard, Minn.—Furnishing 500 ft. of fire hose, to Nott Hose Co., Minneapolis.

New York, N. Y.—To the Fisk Rubber Co., of Chicopee Falls, Mass., for equipping the New York City Fire Department apparatus with pneumatic tires.

Cincinnati, O.—Building engine house for Co. No. 11, to Cotterell Building Co.

Seattle, Wash.—Electric chassis for hose wagon to operate from station No. 5, to Northwestern Supply Co., \$3,800.

Seattle, Wash.—Laying fire alarm and police telegraph cable, to Standard Underground Cable Co., \$1,441.

BRIDGES

Pasadena, Cal.—Citizens will vote Apr. 28 on \$100,000 bridge bonds.

Sacramento, Cal.—Plans will be prepared by the County Surveyor for construction of a bridge over American River; cost \$30,000.

Topeka, Kan.—Commissioners of Shawnee and Jefferson counties are considering formal plans for erection of \$30,000 bridge at Grantville.

Georgetown, Ky.—Scott County Fiscal Court has determined to build seven new bridges in this county.

Preston, Md.—County Commissioners of Caroline and Dorchester counties have decided to construct bridge over Linchester River at Black Landing.

Holyoke, Mass.—Board of Aldermen has voted \$35,000 loan for South Main and Cabot st. bridges.

Hoboken, N. J.—Governor Wilson has signed bill which permits the Hudson County Board of Freeholders, upon request of Hoboken and Weehawken, to construct viaduct at Wi low ave. over tracks of the Erie and New Jersey Junction Railroads.

Camden, N. Y.—Town will build steel bridge over Fish Creek.—Paul Schultze, County Engineer.

Washington, N. C.—New Hanover County will vote May 31 on \$50,000 of bonds for bridge and road construction.

Bellefontaine, O.—Plans are being prepared for construction of an arch bridge over Bluejacket River on Main st.—John R. Fawcett, City Clerk.

Cincinnati, O.—City Engineer F. H. Shipley has estimated cost of constructing foundations and substructure of the Gilbert ave. viaduct at \$71,500.

Bethlehem, Pa.—Modern bridge, costing \$250,000, will be erected over Lehigh River between this place and South Bethlehem.

Meadville, Pa.—Need of bridge over French Creek in Mead ave. is being urged.

West Chester, Pa.—Committee appointed by Chester County Court has approved application for erection of bridge over White Clay Creek in New London Township.

Galveston, Tex.—Board of County Commissioners will ask new bids for erecting bridge over Todd's Bayou.

CONTRACTS AWARDED

Batavia, Ill.—Building Wilson st. cast bridge, bids opened April 20, to Carl J. Erman and John MacKimmie, \$30,500; other bidders, Cornelius Collins, city, \$14,000; Souber & Paulson Construction Co., Lockport, \$37,200; Cullen & Friedstedt Co., Chicago, \$45,000; Pitts & Dougherty, Lockport, \$41,700; Joliet Bridge and Iron Co., Joliet, \$37,800; John J. O'Heron & Co., \$38,100; the Gould Construction Co., Davenport, Ia., \$36,750; Wolcott-Jones Construction Co., city, \$33,150.

Petersburg, Ind.—To Harley Kimman, city, for construction and repair of 26 bridges in Warrick County, and for construction and repair of 11 bridges in Spencer County.

Clinton, Ia.—Building bridges across 4th st., Lyons, to P. V. Clarke, \$2,073.30; estimate, \$2,244.10.

Kansas City, Kan.—To Western Bridge Co., Harrisonville, for improvements to 5th ave. bridge, \$9,400; other bidders were: A. E. Harper, \$10,250; Missouri Bridge and Iron Co., \$11,421; Indiana Bridge Co., \$12,618; Missouri Valley Bridge and Iron Co., \$13,790; Illinois Steel Bridge Co., \$16,744; Kansas City Bridge Co., \$14,700; A. M. Blodgett Construction Co., \$14,500.

Lawrence, Kan.—Building two bridges, to Jos. Cox, by County Commissioners.

Jersey City, N. J.—By Hudson Boulevard Commissioners for Boulevard bridge over Central Railroad of New Jersey, to Joseph Murphy & Son, Inc.; bridge to be constructed of concrete and steel, \$69,999; next two lowest bidders were Hellman, Delahanty & Ferris, \$86,300, and H. H. Itolmes, \$87,000; to Vulcan Rail and Construction Co., Brooklyn, repairing of Pennsylvania Railroad bridge, \$6,612; Snares & Triest Co. bid \$7,651, and Oltmer-Schback Co., \$8,115.

Trenton, N. J.—Rebuilding South Stockton st. bridge and repairing of the Titusville bridge, to McGovern Contracting Co., \$2,960 and \$1,835.

Columbus, O.—By County Commissioners, to construct approaches to Eberly bridge over Alum Creek, to H. E. Barthman, city.

Altoona, Pa.—Construction and repairs to number of bridges: Bridge across the Juniata River, connecting Hollidaysburg and Gaysport, to B. J. Carothers, \$12,730.29; bridge across Brush Run at South Lakemont, to Fogle & Co., \$3,405.95; bridge across Frankstown Townships, to Meyer, Gable & Richards, Duncansville, \$1,143.81; abutment and reinforced concrete wing wall over Old Town Run, Frankstown Township, to Farris Bridge Co., \$1,065; abutment and concrete bridge over Bald Eagle Creek, Tyrone, to Farris Bridge Co., \$615.

Easton, Pa.—By Northampton County Commissioners for concrete bridge across Lehigh, to Ferro Concrete Co., Harrisburg, \$109,950.

Galveston, Tex.—Construction of reinforced concrete bridge across Weyer's Bayou down the island, to John Eggert, \$1,922.60.

Owen Sound, Ont., Can.—Building two bridges, one of concrete and one of wood at 9th and 10th sts., to Clarke & Green. Owen Sound, \$19,111.

BIDS RECEIVED

Pittsfield, Mass.—Building Elm st. bridge, H. C. Wood & Co., Westfield, lowest bidder, \$12,875.

Altoona, Pa.—Building bridges, Blair

County; Gaysport bridge, Ferro Concrete Co., \$14,537; C. J. Carothers, \$12,720.79; Fogle & Co., 12,917.07; McLaughlin & Trefall, \$12,987; C. D. Hughes, \$16,220; Nelson-Merydith Co., \$13,832; Lanier Bros., \$23,964; Vipond Construction Co., \$13,096.75; South Lakemont, Fogle & Co., \$3,403.95; Murphy & Appleby, \$1,125; Nelson-Merydith Co., \$4,732; Myers, Gable & Ritchey, \$3,529.19; Farris Bridge Co., \$1,300; Near Guy Linga-fell's, Fogle & Co., \$1,158.56; Murphy & Appleby, \$1,397; Nelson-Merydith Co., \$1,382; Geo. J. Thompson & Co., \$1,382; Farris Bridge Co., \$1,381; Near John Brua's, Geo. J. Thompson & Co., \$1,257; Myers, Gable & Ritchey, \$1,189.21; Farris Bridge Co., \$1,065; A. Buchanan, \$1,948; Herald st., Tyrone, Geo. J. Thompson & Co., \$925; Myers, Gable & Ritchey, \$787.38; Lanier Bros., \$974; Farris Bridge Co., \$615; C. Irwin Lewis, a Hollidaysburg contractor, had a bid prepared on Gaysport bridge of \$12,300, but was too late to have it submitted.

MISCELLANEOUS

Georgetown, Del.—Architect C. R. Jones, city, has been selected by County Almshouse Trustees as Supervising Architect for modern poor farm.

Jasper, Fla.—Citizens will vote on \$2,500 bonds to erect city hall.

Indianapolis, Ind.—Council has passed ordinance authorizing \$110,000 bond issue for erection of two buildings at City Hospital; also appropriated \$5,000 for purchase of auto patrol wagon.

Wells, Me.—Citizens have voted to erect town hall.

Holyoke, Mass.—Board of Aldermen has voted \$4,000 loan for auto police patrol.

Crystal Falls, Minn.—City is considering erection of municipal building.

Minneapolis, Minn.—Bids will be received May 14, 2 p. m., for \$50,000 park bonds.—D. C. Brown, City Comptroller.

Jersey City, N. J.—The Shade Tree Commission has approved design of new City Park in the Fifth Ward submitted by John T. Withers, Landscape Architect.

Cincinnati, O.—Council has passed resolution authorizing \$13,000 bond issue for

purchase of site for branch library to be erected on West 8th st.

Brookings, S. D.—Citizens have voted \$20,000 bonds to erect city hall.

Matthews, S. C.—Calhoun County has voted \$20,000 bonds to erect court house and jail.

Snyder, Tex.—Scurry County has voted \$16,000 bonds to erect jail.

Salt Lake City, Utah.—Council has adopted report recommending that \$6,000 be appropriated for installation of adequate patrol signal system.

Prescott, Wash.—City is planning to park; Park Commission will be named once to take charge of details.

Seattle, Wash.—Board of Public Works has received following report from the City Engineer on probable cost of approaches and scales for the garbage dumps: Distr. No. 2, \$1,500; No. 3, \$360; No. 4, \$710; No. \$2,400; No. 6, \$1,500; No. 7, \$2,000; No. \$430; No. 9, \$1,600.

Milwaukee, Wis.—Council will consider purchase of auto for Department of Public Works.

Bogota, Columbia.—Luis Maria Terán interested in installation of disposal plant capable of disposing of garbage of city 100,000; literature desired.

CONTRACTS AWARDED

San Francisco, Cal.—Furnishing and delivering steel trolley poles for Geary municipal railway, to the National Trolley Co., \$28.16 each for poles 28 ft. long, a \$29.90 each for poles 30 ft. long.

New York, N. Y.—To Kindling Machine Co., Milwaukee, Wis., for furnishing patented kindling street sprinklers of the squeegee type.

Saranac Lake, N. Y.—Cleaning pavement of village, by Board of Trustees, to F. Williams, \$169 per month.

York, Pa.—Installing 1,620 street signs to Wm. J. Hartman, -8c. each.

Rotan, Tex.—Building city hall, to R. Holden, \$9,600.

Racine, Wis.—Collecting garbage throughout city, to Henry Devine.

TOO LATE FOR CLASSIFICATION

BIDS ASKED FOR


STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREET IMPROVEMENTS				
New York	Albany	May 1, 3 p.m.	Grading, setting granite curbs, and paving with repressed vitrified shale paving blocks on portions of various streets, laying concrete sidewalks, building receiving basins and lay. vitrified pipe sewers and appurtenances.	Isidore Wachsman, Secy. Bd. C. & Geo. M. Adair, Street Comr.
New Jersey	Perth Amboy	May 1, 8:30 p.m.	Constructing bitulithic pavement on two streets.	J. E. Reyburn, Mayor.
Pennsylvania	Philadelphia	May 1	Repairing asphalt pavements in various streets.	
New Jersey	Avalon	May 1, 8 p.m.	Grading, graveling and curbing about 4,600 lin. ft.; sand filling by hydraulic dredge 45,000 cu. yds.	Gilbert S. Smith, Peermont, Mayor
Mississippi	Grenada	May 1	Constructing about 150,000 ft. granolithic sidewalks.	L. B. James, City Recorder.
Indiana	Logansport	May 2, 10 a.m.	Constructing gravel roads in Jefferson township.	John E. Wallace, County Auditor.
Michigan	Charlevoix	May 2	Paving 3 streets with macadam, bitulithic, creosoted wood block, concrete or other material; constr. curbs and gutters.	E. J. Hiller, City Clerk.
Pennsylvania	McKeesport	May 2, 8 p.m.	Repaving with vitrified brick various streets and laying brick and concrete sidewalks.	C. E. Soles, City Comptroller
Kansas	Pittsburg	May 3, 4 p.m.	Pav. about 4,500 sq. yds. with vit. brick on concrete base.	L. E. Curfman, City Eng'r.
Maryland	Baltimore	May 3, 11 a.m.	Grading, constructing storm drains, concrete catch basins, laying fibre conduit, constructing lamp-post foundations, bitumen macadam work, concrete curbs, etc., in Swan Avenue and Druid Hill Park and Riverside Park.	
Indiana	Rockville	May 3, 1:30 p.m.	Constructing gravel road in Howard township.	J. Barry Mahool, Pres. Bd. Award
Ohio	Cleveland	May 3, 11 a.m.	Grading and improving portion of Harvard road.	James E. Elder, County Auditor.
Indiana	Ft. Wayne	May 9, 10 a.m.	Furn. crushed gravel for roads in Allen County.	Frank R. Lander, County Surveyor
Maryland	Baltimore	May 10, noon	Constr. 37.10 miles of State Hwy. in twenty counties.	Calvin H. Brown, County Auditor
Ohio	Cincinnati	May 19, noon	Constr. Compton rd. in Hamilton Co.; mac. exten. of Struble rd.	John M. Tucker, Chm. S. R. Com.
California	Lodi	May 15	Macadamizing streets, cost of work about \$42,432.65.	Stanley Struble, Pres. Co. Comrs.
Ohio	Cincinnati	May 22, noon	Grade, cement park lot surrounding Public School.	City Clerk.
Minnesota	Minneapolis	Apr. 28, 7:30 p.m.	Furn. 5,000 sq. yds. of granite blocks; also lumber for use during year ending May 1, 1912.	C. W. Handman, Business Jan
SEWERAGE				
New Jersey	Trenton	May 2, 8 p.m.	Constructing sewer with house connections.	Harry B. Salter, City Clerk.
New Mexico	East Las Vegas	May 17, 4 p.m.	Constr. 19,750 lin. ft. 8-in. vitrified sewer; 3,350 lin. ft. 10-in. and 100 lin. ft. 15-in.; 50 manholes; 12 single flush tanks com.	Chas. Tamme, City Clerk.
Ohio	E Youngstown	May 22, noon	Constructing sanitary sewer.	J. P. Carney, Village Clerk.
WATER SUPPLY				
New York	Albany	May 1, 3 p.m.	Furn. iron body, bronze mounted fire hydrants.	Isidore Wachsman, Secy. Bd. C. & F. B. Knoff, Village Clerk.
Minnesota	Madison Lake	May 1, 6 p.m.	Installing a water works system.	M. E. Kenny, Pres. Bd. Trustees.
California	Corning	May 2, 8 p.m.	Constructing a water works system complete.	Board Water Supply.
New York	New York	May 4, 11 a.m.	Construct. a conc. and c. i. pipe cond. for the Wakefield ave bluff	
Nebraska	Chappell	May 8, noon	Constr. w. w. and an electric light plant.	W. E. Donner, Engr. Grant Is. Nel
BRIDGES				
Indiana	Bloomfield	May 1, 2 p.m.	Constr. 3 bridges of 70, 60 and 40-ft. spans, respectively.	C. H. Jennings, County Auditor.
Indiana	Decatur	May 2, 10 a.m.	Constr. 4 bridges and 6 arches, and the repair of 3 bridges.	H. S. Michaud, County Auditor.
Indiana	Mt. Vernon	May 3	Constructing 4 bridges in Black twp. and 2 in Robb twp.	County Commissioners.
Pennsylvania	Hollidaysburg	May 5, noon	Repairing 5 bridges in Blair County.	W. S. Hostler, Clk. Co. Com
Indiana	Shelbyville	May 8, 10 a.m.	Constr. a bridge in Sugar Creek township and constructing concrete abutments and the repair of St. Paul bridge.	G. B. Huntington, County Auditor
Maryland	Baltimore	May 10, noon	Constructing one concrete bridge in Calvert County.	John M. Tucker, Chm. S. R. Com.
MISCELLANEOUS				
Minnesota	Duluth	Apr. 27, 4 p.m.	Furn. 1 automobile wagon, 30 H.P., carrying 2,000 lbs.	L. N. Case, Mgr. B. W. & L. Com
New Jersey	Perth Amboy	May 1, 8:30 p.m.	Making repairs to the fire houses of the city.	Wilbur Laroe, City Clerk.
Maryland	Baltimore	May 3, 11 a.m.	Furnishing a preparation for laying dust and preserving macadam roads; with the use of three sprinklers to Oct. 15, 1911.	J. Barry Mahool, Pres. Bd. Awar

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STREET IMPROVEMENTS

Los Angeles, Cal.—Widening of portion of Fifth st. is being considered.

Seaford, Del.—County Commissioners are considering plans for extensive improvements on county road leading to Seaford.

Washington, D. C.—Report from American consular officer in Canada states that taxpayers in one of the towns of his district have decided to borrow \$10,000 to improve streets and to purchase steam road roller.—Address No. 6578, Bureau of Manufactures.

East St. Louis, Ill.—Board of Local Improvements has decided to improve 35th st. between Market and State st.

Fort Wayne, Ind.—Establishment of 30 miles of stone roads in Lafayette Township at cost of \$150,000 is being considered.

Fort Wayne, Ind.—Board of Public Works has ordered plans for paving number of streets.

Duluth, Minn.—Cost of grading, graveling and guttering Getchell road has been estimated by the City Engineer at \$22,667.40.

North Wildwood, N. J.—Citizens will vote May 9 on \$60,000 bonds to improve streets.—Geo. A. Hedding, Borough Clerk.

Williamstown, N. J.—Monroe Township Committee is considering its first ordinance for paving streets.

Fredonia, N. Y.—The Chautauqua County Board of Supervisors has approved plans for an improved road from Fredonia to Cassadaga.

Marion, O.—Council has passed ordinance for paving Vine st. with brick, 816 sq. yds.; Campbell st. with brick, 820 sq. yds.; tar macadam alley paving, 320 sq. yds.; and sidewalks on two streets, 2,000 lin. ft.; bids will soon be asked.—Pearl R. Mears, City Engineer.

Toledo, O.—County Commissioners will sell \$173,850 county bonds May 12 for purpose of raising money with which to make road repairs throughout county during 1911 and 1912.

Belleville, Tex.—First Precinct, Austin County, has voted \$50,000 600% road bonds.

Brady, Tex.—McCullough County has voted \$75,000 bonds for improvement of roads.

El Paso, Tex.—Council has decided to pave portion of East San Antonio st.

Janesville, Wis.—Rock County will spend about \$32,000 in improvement of roads.

Coquitlam, B. C., Can.—Citizens have passed \$150,000 by-law for new roads and \$50,000 for sidewalks.

Moncton, B. C., Can.—Bids will soon be asked for construction of sidewalks at cost of \$9,000.

CONTRACT AWARDED

Rochester, N. Y.—Street improvements: Basin st. asphalt pavement, to Whitmore, Rauber & Vicinus, \$1,080.40; Lime st. asphalt pavement, to Rochester Vulcanite Pavement Company, \$15,504; Kenwood ave. asphalt pavement, to Whitmore, Rauber & Vicinus, \$2,196.40; Rugby ave. macadam pavement, to Brayer & Albaugh, \$1,877.50; Normandy ave. macadam pavement, to Brayer & Albaugh, \$1,900; Warwick ave. asphalt pavement, to Whitmore, Rauber & Vicinus, \$2,090.50; Post st. macadam pavement, to Thomas Holahan, \$374; Sherwood ave. asphalt pavement, to Whitmore, Rauber & Vicinus, \$3,452.50; Vose st. brick pavement, to Julius Friedrich Company, \$7,199.50; Woodbine ave. macadam pavement, to Brayer & Albaugh, \$1,883.75.

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FIRE EQUIPMENT

Kaysville, Utah.—Council will be asked to purchase adequate fire fighting equipment.—E. C. Blood, Chief.

Portsmouth, Va.—Council has decided to ask for bids for 2,500 ft. of fire hose.

Salt Lake City, Utah.—Council is considering resolution calling for expenditure of not less than \$50,000 for replacing of present horse-drawn fire equipment with complete motor-propelled apparatus.

CONTRACTS AWARDED

Kinney, Minn.—Erecting chemical engine house, to Chas. Wilson.

Galveston, Tex.—John Egert, for complete overhauling and repair of engine house No. 6 on Broadway.

MISCELLANEOUS

Pomona, Cal.—J. M. Paige, Park Superintendent, has completed plans for five-acre park to be constructed at North Pomona.

Boston, Mass.—Architect Edw. T. P. Graham, 20 Beacon st., will prepare plans for erection of proposed city hall annex.

Clarkfield, Minn.—Bids will be received May 12, 8 p. m., for \$6,000 bonds for village hall.—Alfred Hulteen, Village Recorder.

Salt Lake City, Utah.—Council has voted in favor of proposed new \$38,752 city stables, wagon sheds, warehouse, workshop and garage, to be established between Sixth and Seventh South and State and Second East sts.

Janesville, Wis.—Mayor John C. Nichols has recommended purchase and immediate installation of street signs.

CONTRACT AWARDED

Rochester, N. Y.—Furnishing 10,000 ft. of armored cable for police and fire alarm telegraph system, to the Standard Underground Cable Company, \$970; furnishing of 100 street monuments, to Whitmore, Rauber & Vicinus, \$145.

PROPOSALS

GRADING, SEWER, WATER MAINS,
RESERVOIR.

Springdale, Pa.

Sealed proposals will be received by the Council of the Borough of Springdale, Pa., until 8 o'clock P. M., on Monday, the 1st day of May, 1911, for the grading of certain streets, the construction of a system of sewers, a system of water lines and the building of a reservoir.

Approximate quantities are 30,000 cubic yards of grading, 36,660 lineal feet of sewers, 35,660 lineal feet of cast-iron water lines and one 350,000-gallon capacity reservoir.

A certified check for \$1,000, payable to the Treasurer of the Borough of Springdale, must accompany each proposal. All proposals must be sealed and addressed to H. J. Barnes, Clerk of Council, Springdale, Pa., and have the words "Grading, Sewer and Water Proposal" marked on the outside of the envelope.

Plans and specifications may be seen and bidding blanks and all necessary information may be had at the office of the Borough Engineers, Douglass & McKnight, 1709 Union Bank Bldg., Pittsburg, Pa. Council reserves the right to reject any or all bids.

R. J. CAMPBELL,
J. A. STEVENSON,
C. G. PORTER,

Committee of Council.

(19-26)

PROPOSALS

NOTICE TO CONTRACTORS

Police Signal, Fire Alarm and Telephone System

Passaic, N. J.

By direction of the City Council proposals will be received by the City of Passaic, New Jersey, from contractors for the manufacture, delivery and installation of a Police Signalling System, Fire Alarm Equipment and Municipal Telephone Exchange for the City of Passaic, in accordance with the conditions and specifications and drawings on file in the office of the City Clerk, from whom blank form of proposal may be obtained.

All proposals must be for the entire work, as no separate bids will be received for any part of the work.

All proposals must be accompanied by a surety bond or a certified check payable to the City of Passaic in a sum equal to at least 2 per cent of the amount of the bid.

The successful bidder will be required to give a surety bond in a responsible surety company for the full amount of the contract for the faithful performance of the contract and for indemnity against suits or claims for infringement of patents and as security that he will guarantee all workmanship and materials for a period of five years.

Every bidder must furnish satisfactory evidence of his experience and equipment, together with list of similar systems installed.

All bidders must state number of working days required to complete work, and damages of ten dollars per day will be stipulated in the contract for every day's delay over the time agreed upon for the completion of the work.

No bid will be considered unless samples of the following are submitted therewith: One multiple circuit puncturing register.

One automatic time and date stamp.

One take-up reel.

One central station flash light equipment.

One police box.

One flash light.

One flash light controller.

One fire alarm box.

One automatic fire alarm repeater.

All bids must be enclosed in a sealed envelope endorsed on the outside "Proposal for Police Signaling System, Fire Alarm Equipment and Municipal Telephone Exchange," and must be delivered to the City Clerk or his deputy on or before Friday, May 19, 1911. No bid will be received after 8:00 p. m.

The City of Passaic reserves the right to reject any or all bids.

M. B. MATTHEWS,

Chairman Committee on Public Safety.

THOMAS R. WATSON,

City Clerk.

(26-3-10)

BRICK PAVING

Hudson, N. Y.

Sealed bids will be received until 10:30 a. m., May 2, 1911, by the Secretary of the Commission of Public Works of the City of Hudson, N. Y., for furnishing material and labor necessary to relay approximately 5400 lin. ft. of curbstone and to pave about 13,800 square yards of street with vitrified brick.

Plans and specifications may be seen at the office of the City Clerk or the City Engineer.

The Commission of Public Works reserves the right to reject any and all bids

WILLIAM WORTMAN,

City Clerk.

M. J. O'HARA,

City Engineer.

MERIWETHER SYSTEM

CONTINUOUS CONCRETE PIPE (REINFORCED)
SEWERS, CULVERTS, CONDUITS

The only concrete pipe having continuous and uniform reinforcement throughout entire line of pipe when it is laid in the trench.

Sizes, 24 inches to 84 inches. Write for additional information

LOCK JOINT PIPE COMPANY, 165 Broadway, New York

Pacific Lock Joint Pipe Company, Seattle, Wash.

Agents: H. Eggleston, James Building, Chattanooga, Tenn.

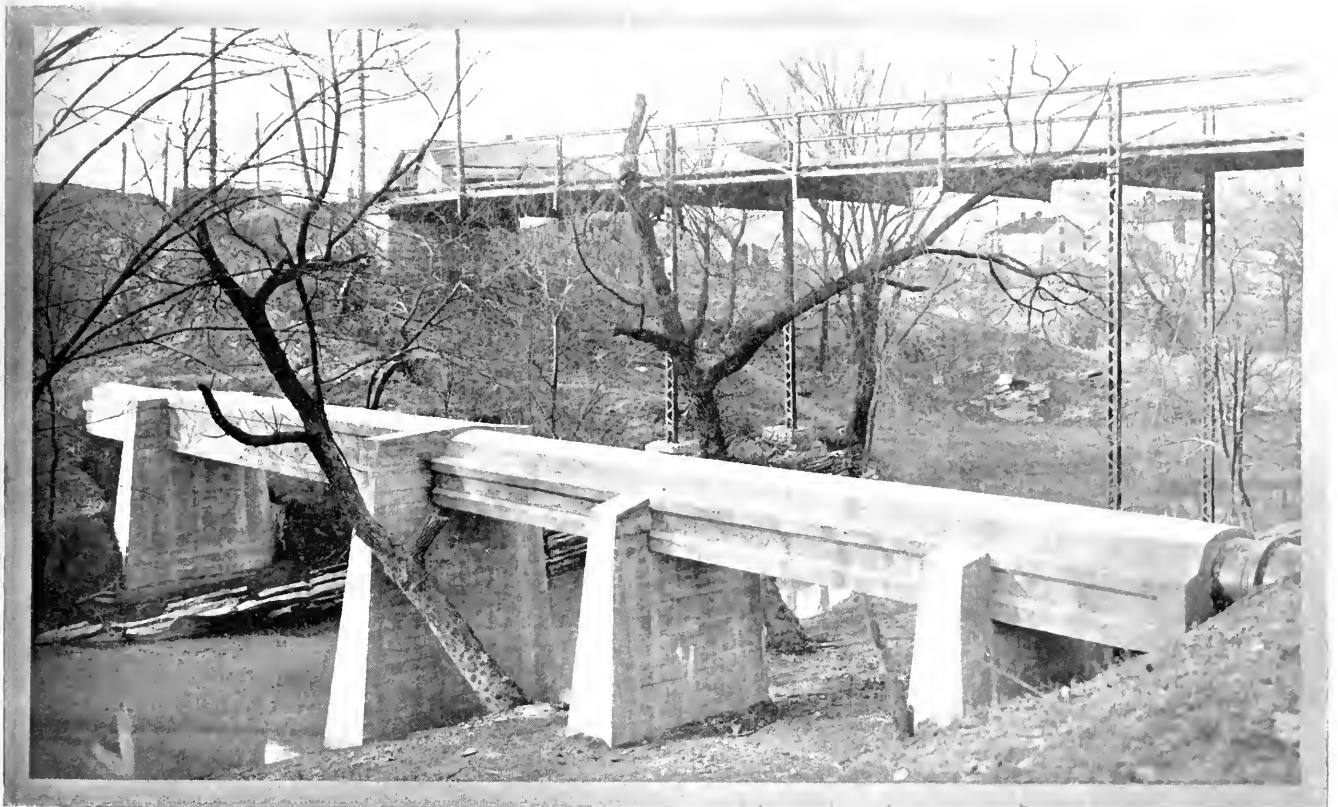
Harris Engineering Co., Paul Jones Building, Louisville, Ky.

Municipal Journal

VOLUME XXX

NEW YORK, MAY 3, 1911

No. 18



HIGH LEVEL INTERCEPTING SEWER CREEK CROSSING, COMPLETED

INTERCEPTING SEWER AND SEWAGE PUMPING STATION

Carrying Large Pipe Sewers Across Creeks at Hydraulic Gradient—Reinforced Concrete Pipe in Tunnel—
Pump Well Forty-Seven Feet Deep—Motors Sixty Feet Above Pumps.

By ROBERT HOOKE, City Engineer

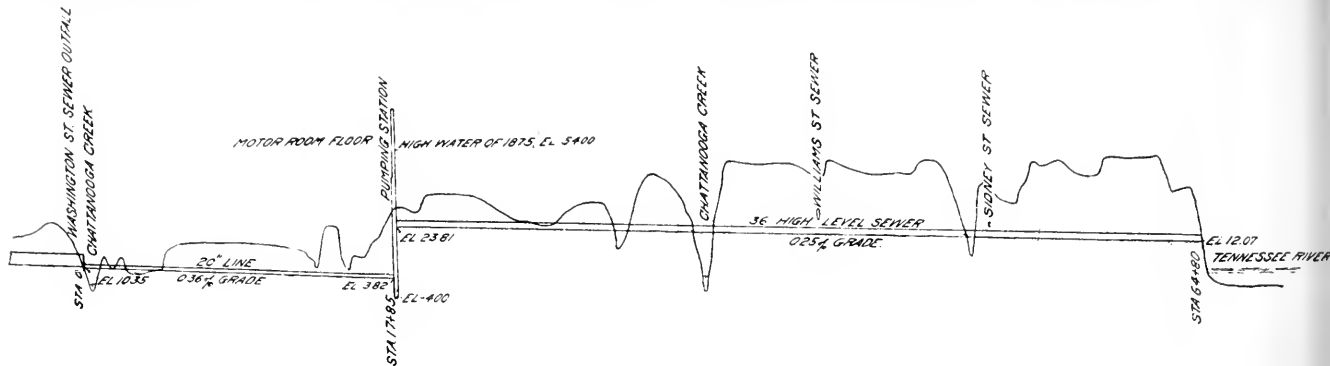
The city of Chattanooga, Tennessee, lies partly in a bend of the Tennessee river, having the latter as its northern and western boundary. Passing through the southern portion of the city is a small stream, known as Chattanooga creek, which discharges into the Tennessee river at the base of Lookout Mountain, about a mile below the city's southern limit. The sewage of Chattanooga, like that of other American cities similarly situated, is discharged directly or indirectly into the river which skirts its borders. Ten of the main sewers of the combined and one of the separate system of sewerage have their outlets into the river, while three

main of the former and two of the latter system have their outlets into Chattanooga creek.

The low water discharge of the Tennessee river at Chattanooga is estimated at 8,000, and the maximum high water discharge 700,000 cubic feet per second. During the low water season the creek discharge may get as low as 20 cubic feet per second, but heavy local rains within a few hours bring it to a flood stage and, when the river itself is not at flood stage, develop a strong current. During protracted dry periods the odor from Chattanooga creek, arising from decomposing sewage, has on a few occasions proved offensive

to some of the residents who lived on its banks, which condition was rendered acute in the summer of 1907, owing to the partial damming of the creek near its mouth by debris, which had been dumped into it by a railroad contractor operating in that vicinity and which has never been entirely removed. It was pointed out at the time that the sluggish condition of the creek brought about by this obstruction would be intensified and made permanent by the construction of the proposed dam across the Tennessee river at Hale's

ing surface water. This sewer is 36 inches in diameter and 4,680 feet long. The line consists of two tangents with an angle of 17° 32' between them, this change in alignment being made by means of a curved invert in a special manhole. It is laid at a grade of 0.25 per cent from the pumping station to its outlet at the river, which outlet has an elevation of 12.07 above city datum. City datum is the zero of the U. S. river gauge on the north side of the city. This was approximately the low-level of the river, but a new and



PROFILE OF 20-INCH LOW LEVEL SEWER AND OF HIGH LEVEL SEWER

Bar, thirty-three miles below the city, as the back-water from that dam would raise the low water level twelve feet at the mouth of the creek and would extend up-stream some distance above all the sewers having their outlets in the creek. The completion of this dam is still a year or more away.

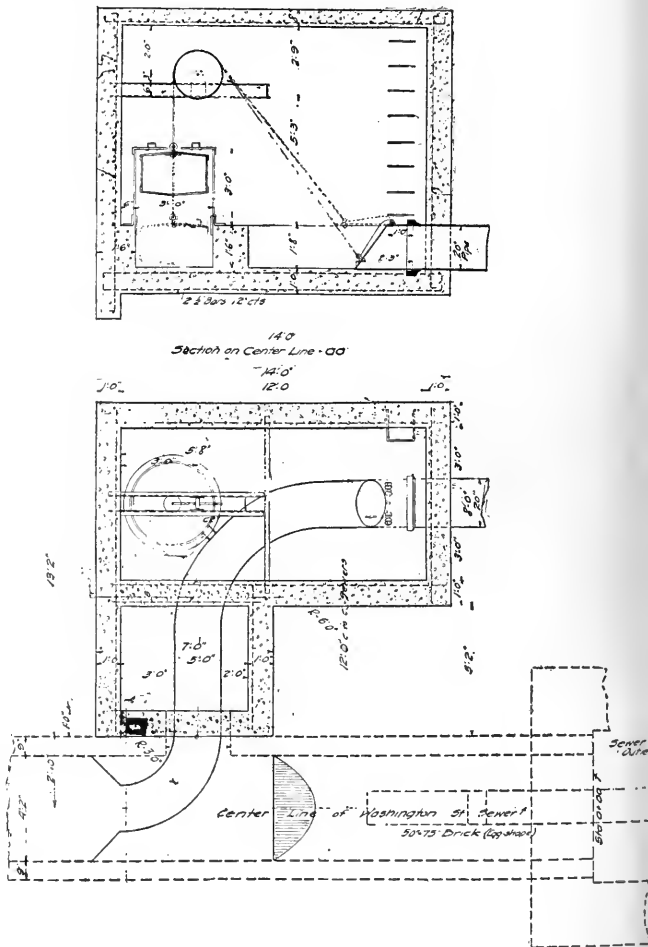
To eliminate the nuisance caused by the odors arising from decomposing sewage in the creek, an intercepting sewer was designed, and has now been partially completed, which provides for the interception, during certain stages of the creek, of the entire discharge from the two sanitary sewers and the dry-weather flow from the three sewers of the combined system, and to conduct the same by the shortest practicable route to the Tennessee river. All of the sewage so intercepted had previously been discharged into the creek.

It was not practical to carry all of this intercepted sewage to the Tennessee river by gravity alone, because the three outlets most remote from the river were but little higher than its low-water stage. It was therefore necessary to pump the sewage, and for this purpose it is led to a pumping station near their junction and there lifted to a high-level sewer having sufficient initial elevation to conduct the sewage to the river by gravity. The three sewers whose flow is thus pumped formerly discharged into the creek at two points about one-third of a mile apart on the north side of the creek. Owing to the tortuous course of the latter, it was impracticable to construct the sewer entirely along one bank, and three creek crossings were made. One is for the combined flow of the District No. 12 18-inch sewer and the Ninth Ward 24-inch sewer, the combined flow of which is carried by a 24-inch low-level interceptor to the pumping station. The second crossing carries the dry-weather flow from the Washington street 50 x 75-inch brick sewer in a 20-inch line, which also continues to the pumping station. Between the pumping station and the river the high-level intercepting sewer again crosses the creek. The 24-inch low-level sewer is 1,830 feet long to the pumping station and is laid on a 0.25 per cent grade. The 20-inch sewer is 1,767 feet long and is laid on a 0.36 per cent grade.

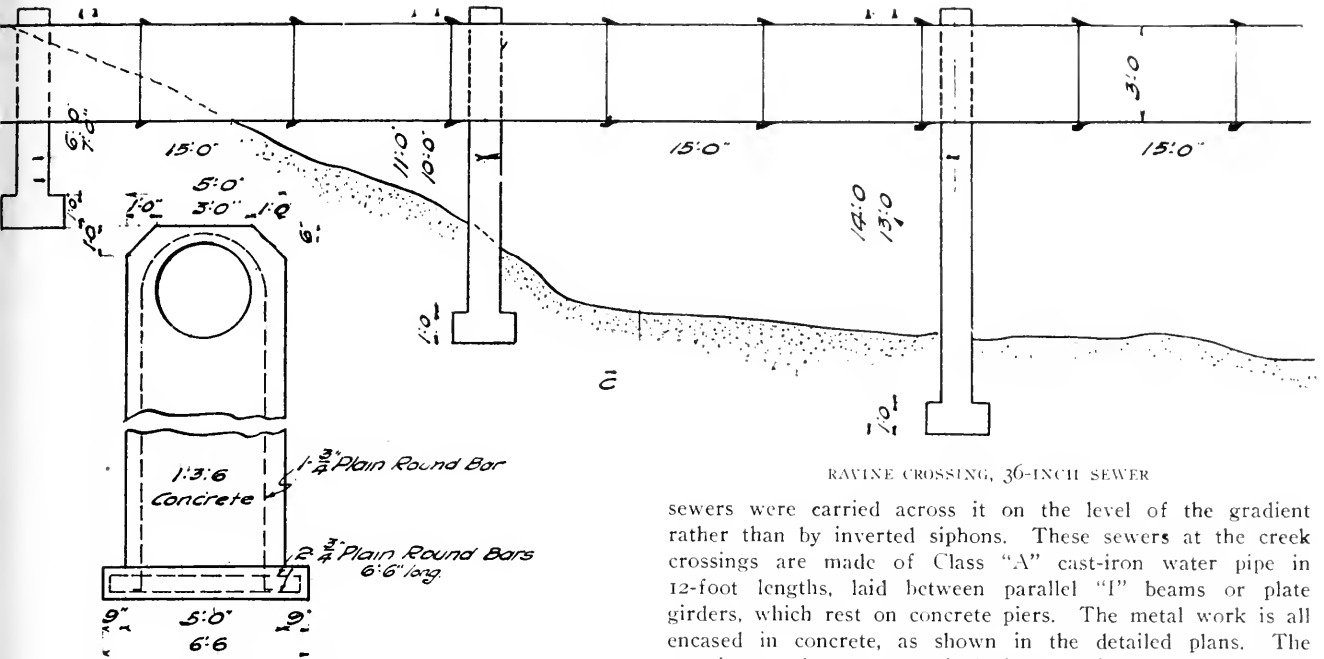
Provision is made at the pumping station for receiving an additional 20-inch sewer whenever it may be found necessary to construct this in order to provide sanitary sewerage for the territory lying southeastward from the pumping station.

On the way to the river from the pumping station the high-level intercepting sewer passes under the Williams street and Sidney street main sewers, the former being a 36 x 54-inch brick sewer and the latter a 24-inch pipe sewer, and receives from these the dry-weather flow, combined with a certain percentage of rainfall when these sewers are receiv-

higher one will soon be established on account of the Hale's bar dam, 33 miles below Chattanooga. By computing the back-water curve from the crest of this dam it is found that the low-water level at the Chattanooga gauge will be raised between 8 and 9 feet. When this dam is completed, therefore, the bottom of the intercepting sewer at its outlet will be only 3 or 4 feet above the computed low-water level. This, however, will not seriously affect the working of the sewer.



WASHINGTON STREET SEWER OUTLET
Connection with 20-inch intercepting sewer and automatic closing device

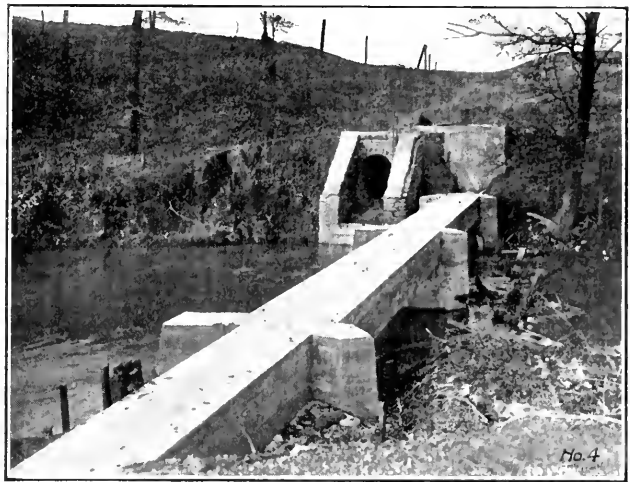


RAVINE CROSSING, 36-INCH SEWER

sewers were carried across it on the level of the gradient rather than by inverted siphons. These sewers at the creek crossings are made of Class "A" cast-iron water pipe in 12-foot lengths, laid between parallel "I" beams or plate girders, which rest on concrete piers. The metal work is all encased in concrete, as shown in the detailed plans. The crossing on the 20 and 24-inch lines consists of two spans of 30 feet each, 18-inch "I" beams 60 feet in length being used in each case. At the crossing of the 36-inch sewer there are three 20-foot spans and one 40-foot span, 36-inch plate girders being used in the latter and 18-inch "I" beams in the former. By using a low-unit stress for the flanges of the girders, say

The high-level intercepting sewer has been completed, and is now receiving the sewage from the Sidney street and Williams street sewers, except when the latter are inundated by back water from the creek. The pumping plant has not yet been completed, and consequently the discharge from the three sewers further up the creek is not being conducted to this plant, although the low-level interceptors for doing so have been completed. The present maximum dry-weather flow from the Washington street sewer is 2.2 cubic feet per second, and that from the two sanitary sewers which drain into the 24 inch line is about 0.3 cubic feet per second, these two latter draining a territory which is as yet but sparsely inhabited.

Back water from the creek will frequently enter the Washington street sewer. As it is not desirable to have this water flow to the pumping station, the 20-inch intercepting sewer will at such times be closed automatically until the back water recedes. This automatic closing of the 20-inch sewer will also take place when the Washington street sewer is discharging more than a certain volume of storm water. The automatic



CREEK CROSSING OF 20-INCH INTERCEPTING SEWER, AND OLD OUTLET OF WASHINGTON STREET SEWER



HIGH LEVEL INTERCEPTING SEWER AT CREEK CROSSING

closing device consists of a flap valve at the end of the 20-inch pipe, which is opened and closed by means of a float as the water in the sewer falls and rises.

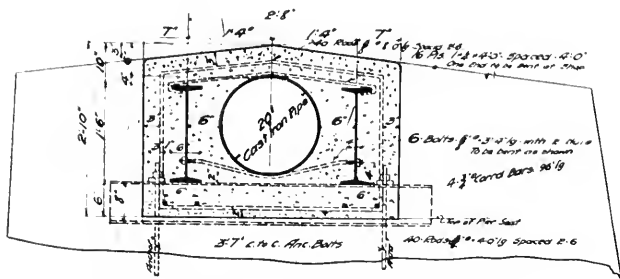
The low-level sewers are constructed of vitrified pipe except at the creek crossings, which are described further on. Reinforced concrete pipe 36 inches in diameter was used for the high-level interceptor except where this was carried across the creek or through depressions below subgrade, in which cases cast-iron pipe was used. This 36-inch sewer was carried under a number of railroad tracks and 600 feet of it was constructed in tunnel.

As the creek was not in any sense a navigable stream, the



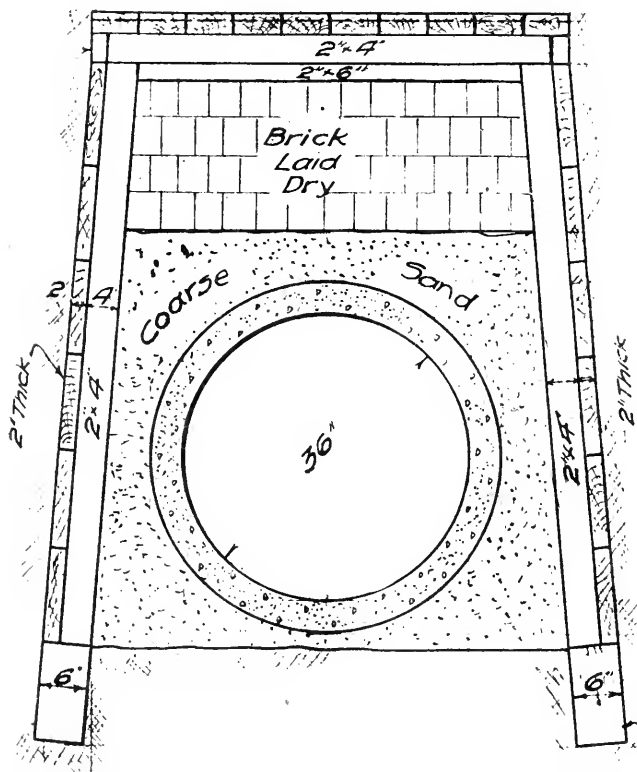
SAME AS ABOVE, DURING CONSTRUCTION

10,000 or 12,000 pounds per square inch, and not too great a ratio of length to depth of girder, the deflection will be of little consequence as affecting the grade of the pipe. By using shorter lengths of pipe than 12 feet it would have been quite practicable to so place the pipe before the concrete is deposited around it as to allow for the deflection due to the weight of the latter.



CROSS-SECTION OF CREEK CROSSING, 20-IN. PIPE

This design for carrying sewers across creeks was introduced by the writer some three years ago with such satisfactory results that he adopted it in the present instance as the one which, if not the least expensive, would be the most effective in withstanding flood and weather conditions with a minimum amount of care and attention. These crossings have been submerged by floods four times this year and without injury.



REINFORCED CONCRETE PIPE IN TUNNEL UNDER RAILROAD TRACKS

SEWAGE PUMPING STATION

This is located on the south bank of Chattanooga creek near the southern boundary of the city in a section not yet built up. The pump well is circular in form, 36-feet interior diameter at the bottom, and is divided into four separate chambers, consisting of a receiving chamber and three pump chambers. The sewage will first enter the receiving chamber, from which it may be diverted at will into either of the three pump chambers by means of 20-inch Coffin sewer shear gates, operated by hand. The bottom of the pump well has an elevation of -4.0 referred to the city datum. The roof of the pump well has an elevation of 43.0. From this roof, or rather from the plate girders supporting the roof, is erected a steel frame for supporting the rectangular motor room, the floor of

which is to have an elevation of 55.25 or 59.25 above the bottom of the well. The object in placing the motors at this height was to have them above the level of all but one of the three greatest floods which have occurred in the Tennessee river at Chattanooga. The pump well will be entered by means of a concrete stairway anchored to the circular concrete wall of the well, which stairway is reached from a door at the north side of the well at an elevation of 30. The motor room will be made accessible by means of reinforced concrete stairway erected on the roof of the pump well.

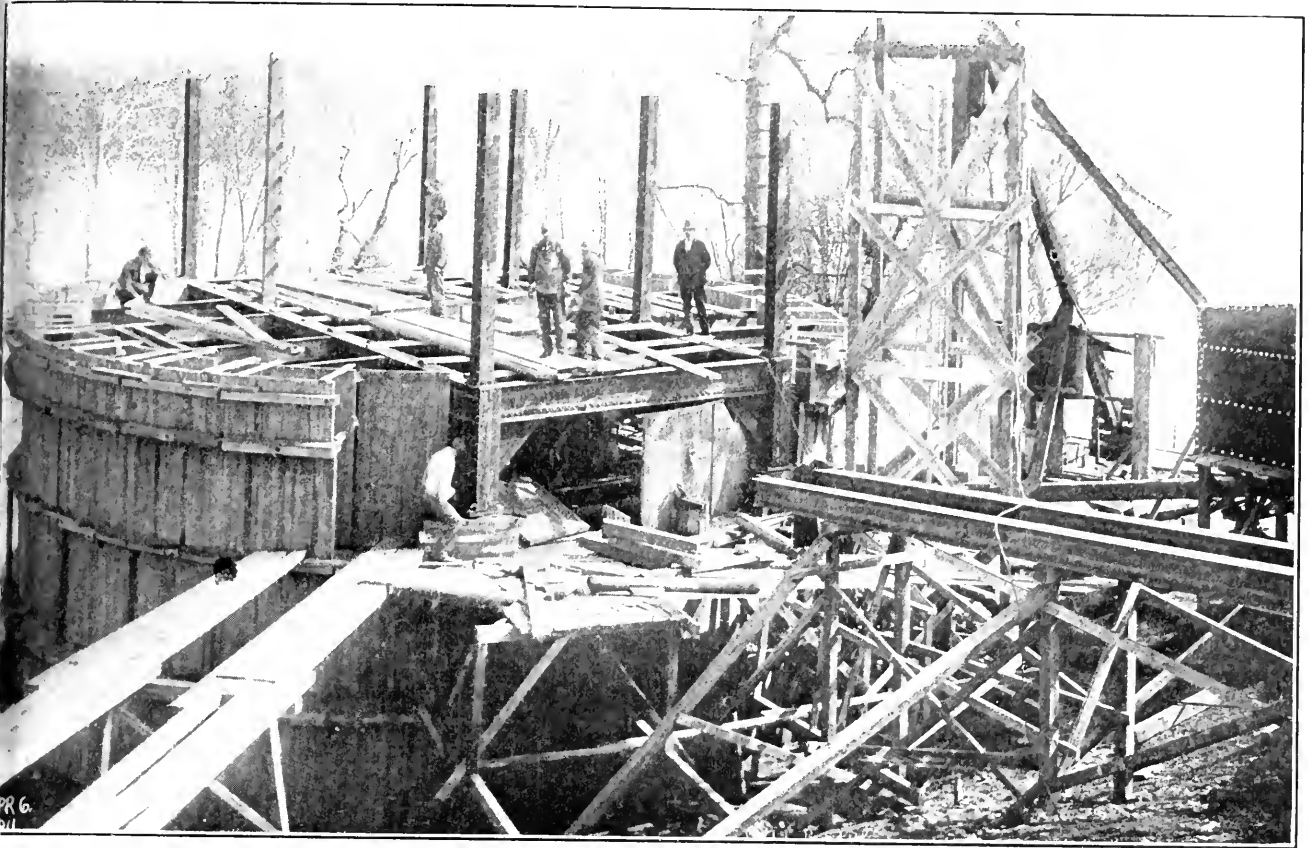
The pump well will at present be supplied with two 12-inch centrifugal pumps, each direct connected by means of a vertical shaft to a 75-horsepower electric motor, provision being made for the future installation of a third pump, to be located in the middle pump chamber whenever—by reason of the construction of the proposed additional low-level sewer to this pumping station—increased pumping capacity becomes necessary. The capacity of each of the two 12-inch pumps is designed to be 10 cubic feet per second against a mean actual head of 26.25 feet. The pump shaft, which is of somewhat unusual length (about 60 feet) on account of the great elevation of the motor-room floor above the bottom of the well will be carried on a ball-bearing located just below the motor.

To prevent the possibility of the motors being subjected to overload when working under a reduced head for a considerable period, they have been made of higher power than would otherwise have been required. The present combined dry-weather flow of sewage from the two sewers discharged into the pump well during the morning hours, when at maximum, is 2.5 cubic feet per second. The combined capacity of the two sewers when flowing full would be 20.0 cubic feet per second. Provision is therefore made for a large future increase in the volume of sewage to be carried to this pumping station. At present it is intended to admit rainfall into these two sewers to the limit of their capacity when working under head, when 18 to 20 cubic feet will be delivered to the pumps.

Ordinarily a single pump, working intermittently, will handle all the dry-weather flow, pumping the sewage from a height



INTERIOR OF PUMP WELL Showing steel reinforcement of partition walls



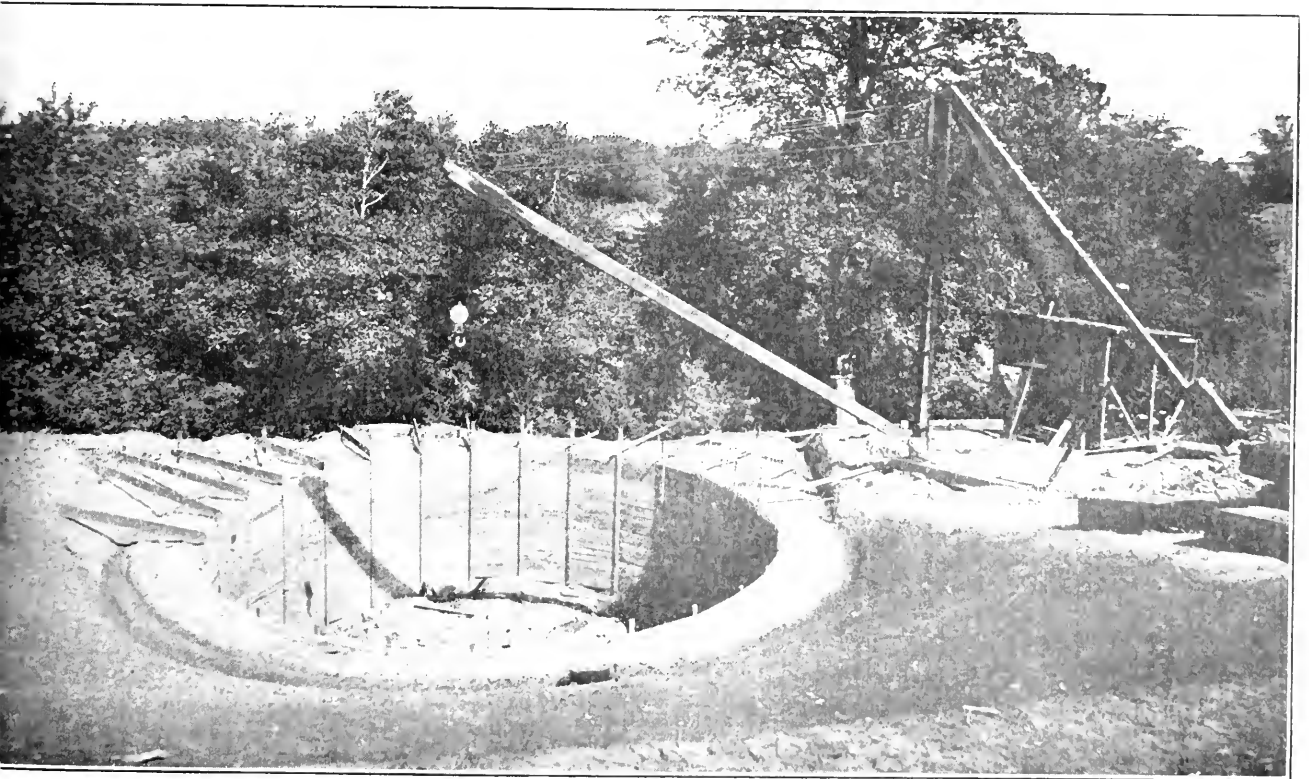
PUMP WELL OF SEWAGE PUMPING STATION

Portion of steel framework which is to support motor room is in place.

6 feet above the floor of the well down to a level with the surface thereof (the pump itself being placed in a pit pressed below the floor level), when the pump will be automatically stopped. It will be automatically started again when the sewage level has again reached the height of 6 feet above the bottom of the well. When the volume discharged to the first well is, by reason of rainfall, increased beyond 10 cubic feet per second, the single pump working will not be

able to prevent the rise of the sewage level until it flows through the 18-inch iron pipe into the chamber where the other pump is located, which also will be started automatically when the sewage has attained a certain depth around it, and the second pump will be automatically stopped when the discharge into the well is reduced to 10 cubic feet per second.

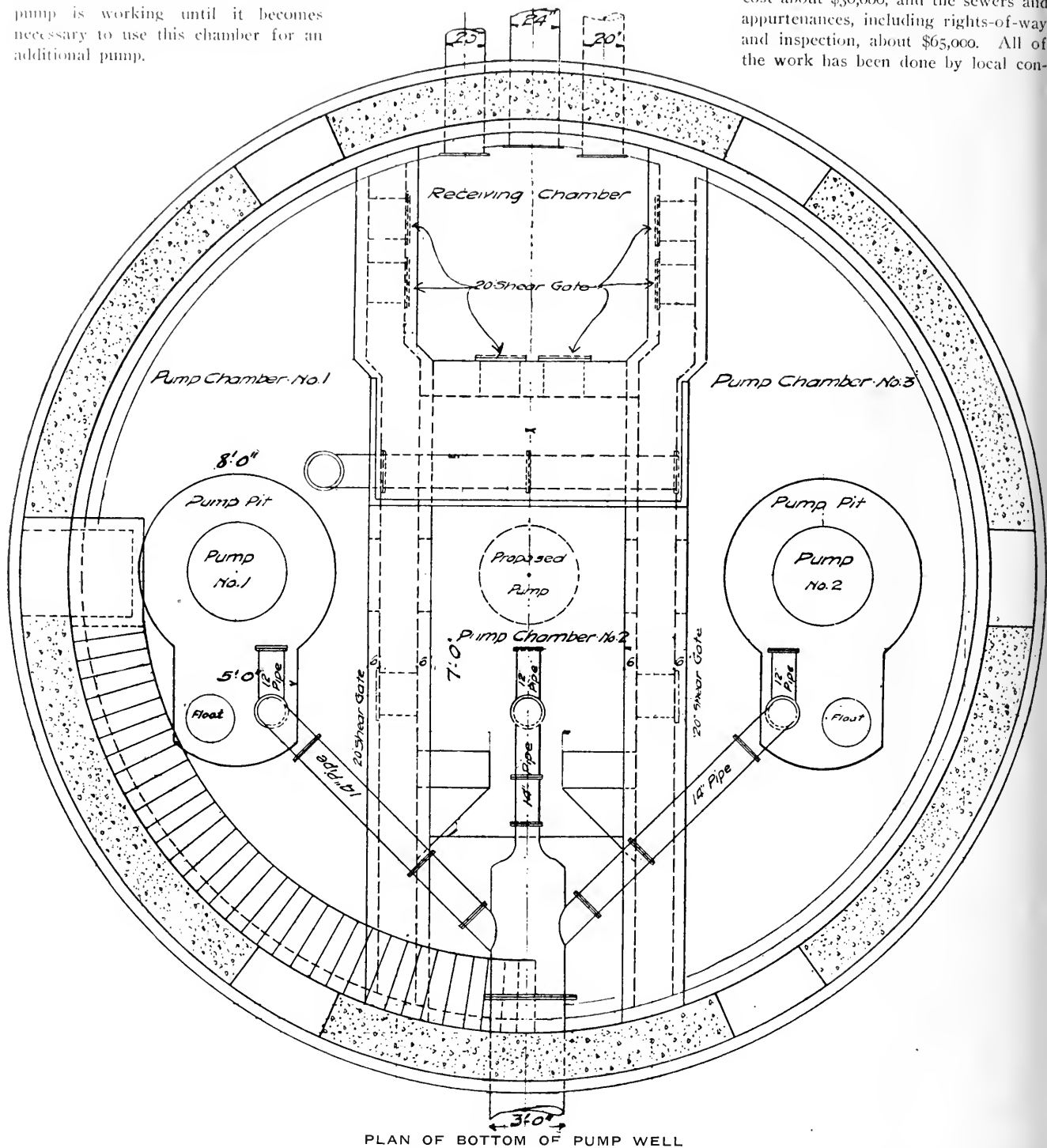
In order to increase the capacity of the storage reservoir



VIEW OF PUMP WELL OF SEWAGE PUMPING STATION, SHOWING SOLID ROCK IN BOTTOM

for sewage, and thus increase the length of the working periods of the pump, the middle chamber will be used in conjunction with the one in which the pump is working until it becomes necessary to use this chamber for an additional pump.

tion and machinery equipment and the two-acre lot on which the station is erected, including residence of attendant, will cost about \$30,000, and the sewers and appurtenances, including rights-of-way and inspection, about \$65,000. All of the work has been done by local con-



PLAN OF BOTTOM OF PUMP WELL

R. D. Wood & Company, of Philadelphia, Pa., will furnish the pumps and the General Electric Company the electric motors and automatic starters. The pumps and motors have for some months been ready for shipment, but on account of the delay in the completion of the building, owing largely to floods, the contractor is not yet ready to begin their erection. It is hoped that the pumps will be in operation by the middle of June.

COST OF THE WORK

The original estimate of the cost of the intercepting sewer, pumping station and machinery, including site, rights-of-way and inspection, was \$95,000, and the general council provided for this work the sum of \$100,000. It now seems that the final cost will not exceed the original estimate. The pumping sta-

tractors—the sewer work by the Noll Construction Company and the pumping station by H. S. Bosler.

ADDITIONAL SEWERAGE STATISTICS.

Since making out the table of sewerage statistics we have received an additional report from Seattle, Wash., stating as follows:

Construction is in charge of the city engineering department, and maintenance of the street and sewer department. There are 8,382 inlets with catch basins, none without, of which 1,511 were built during the year. There were 60,183 cleanings of catch basins, by which 30,520 cubic yards of material were removed, spoon shovels being used. There are 314.17 miles of combined sewers in the city, of which 57.72 were built by contract during the year. There are 4,633 manholes and 382 flush tanks in the system. In addition, sewers are flushed by hose attached to fire hydrants. Ventilation is through manholes.

VALUE OF NEW YORK'S GARBAGE

Method of Treating It at Barren Island — Amounts Treated — Sums Received by Company from City and for Salable Products

THE commercial value of New York's garbage to the contractors who dispose of it, the New York Sanitary Utilization Company, is about \$400,000 a year (when delivered to them at the docks), in addition to the \$200,000 a year which the city pays the company under the terms of a contract which will expire in 1912. The cost to the city of collecting the garbage and delivering it to the docks (after which the company bears all expense) exceeds by about \$50,000 the actual commercial value.

The figures given in this article, taken from various official reports and other reliable sources, show that in the year 1908 the total amount of garbage handled was 328,646 tons. According to the estimate here presented the value of this garbage, that is, the net revenue derived from the reduction process, was \$369,216. In addition to this, the company received the sum of \$192,444 from the city, under the terms of the contract. The cost to the city of collecting the garbage and hauling it to the docks was \$420,422.

A brief sketch of the process of reducing the garbage and extracting the valuable ingredients which is now in use was given by Edward D. Very in 1908, in a paper before the New York Section of the Society of Chemical Industry. The figures quoted in this article are taken from records for the year 1908, and refer to the process and machinery then in use, but we believe that many of them have not heretofore been published. Since that time machinery for extracting grease by the use of naphtha has been installed.

Mr. Very described the operations as follows:

At Barren Island the garbage is packed onto an outboard conveyor and is then conveyed to the second story of the plant and passes through chutes to the digesters. Its reduction is then accomplished by the Arnold-Edgerton process, which is performed purely by mechanical means. The digesters are large tanks holding approximately eight tons. When filled, they are sealed by a cap which is held on by bolts. Steam is introduced into the digesters at 80 pounds pressure and the mass is cooked for a variable time, depending on the material, which varies from season to season. The vapor escaping through the vent is condensed by a jet condenser and thence passes to a sewer.

From the digester the material, which is now a pulpy mass, is removed to a tank, which has a capacity of four digesters, for the purpose of facilitating the work. From the tank it is run into forms made of sacking and racks and then put under an hydraulic press. Pressure is then applied and the water and grease are expressed. The water and grease go to a perforated trough, and thence by pipes to a settling basin, where, by flotation, the grease is separated and then taken off and barreled. The residue from the press, known as tankage, is carried by conveyor to a direct heat dryer, where the remaining moisture is driven off; and from the dryer passes to a screen, where the material is ground and screened. From the screen the material falls through chutes into hoppers and thence to bags for shipment.

The average garbage received at the plant contains: Water, 71 per cent; rubbish, 6 per cent; tankage, 20 per cent; grease, 3 per cent. The grease is of low grade and dark brown color. It is largely used in making soap and candles. The greater portion is shipped abroad. Tankage is the solid, fibrous matter, and is used as a fertilizer base or filler. It contains a small percentage of nitrogen, ammonia, phosphoric acid and potash. The liquid from the grease has no value, as it contains a very small percentage of ammonia.

The following is an estimate of the receipts and expenses of the Utilization Company in 1908, made as the result of an official investigation:

Receipts

Garbage, 3 per cent of total garbage, 9,859 tons, at \$60.	\$591,540
Tankage, used for fertilizer, 65,729 tons, at \$5.....	328,646
Cash from Department of Street Cleaning.....	192,444
Total receipts	\$1,112,630

Disbursements

Transportation, from docks to works, by scows, 328,646 tons, at 12c. per ton.....	\$39,437.52
Unloading, 5c. per ton.....	16,432.30
Coal, 22c. per ton of green garbage reduced.....	72,800.00
Labor, 14c. per ton.....	46,800.00
Repairs and supplies, 5 per cent.....	50,000.00
Depreciation, 10 per cent.....	100,000.00
Administration and legal expenses.....	225,500.00
Balance, gross profit.....	561,660.18

Total\$1,112,630.00

The capital stock of the company is \$1,300,000; for a 6 per cent dividend \$78,000 would be required. The sum of \$192,444 paid by the Department of Street Cleaning is also included in the gross profit as stated above. The net value of the garbage delivered at the docks in 1908 was than \$369,216, or if dividends are deducted \$291,216.

In order to fully understand these figures some further information regarding the items follows:

Tons.—A cart load is assumed to weigh one ton. This estimate was confirmed by exhaustive tests made by Messrs. Parsons, Hering and Whinery in connection with a report to the Board of Aldermen December 31, 1907. The number of cart loads delivered by the city at the docks to the company in 1908 was 328,646.

Grease and Tankage.—The percentage of grease recovered from New York garbage by the process employed has been reported to be 3 per cent. The average price for grease in 1908 was \$60 per ton. The tankage, which is used for manufacturing fertilizers, has been stated to be 20 per cent, and its value is put at \$5 per ton.

Transportation.—The estimate of 12 cents per ton for transportation by scows is based on the city's contract for disposing of ashes and rubbish in a somewhat similar manner. The price which it pays for this is 17 cents for transporting and unloading, but the nature of the work is considerably more expensive than that involved in the handling of garbage. The following estimate of cost of unloading alone is submitted. The average scow carries 300 tons. Ten men at \$1.50 per day easily unload one scow in a day, making the cost 5 cents per ton.

Coal.—The total annual consumption of coal at the reduction plant is reported to be 18,200 tons, estimated to cost \$4 per ton, or \$72,800 = 22 cents per ton of garbage.

Labor.—The estimate of labor is obtained from observation. The average number of men employed is about 70. The average weekly payroll is \$900; the annual payroll \$46,800, making the labor cost per ton of green garbage handled 14 cents.

Repairs and Supplies.—The figure of \$50,000 is assumed arbitrarily.

Depreciation.—The value of the plant is assumed to be within \$300,000 of the capitalization of the company, and 10 per cent is allowed for depreciation, permitting renewal every ten years. The allowance for depreciation is \$100,000.

Administration and Legal Expenses.—These are assumed to be \$225,000. (Probably covers expenses which will not bear too close inspection.)

Interest or Dividend.—This is figured at 6 per cent on the capitalization of \$1,300,000. The profits over and above the amount paid by the city appear to be \$291,216.18, or 22 per cent on the capital stock.

Regarding the cost to the city of collecting the garbage and delivering it to the company at the docks, the following figures are reported for 1908:

Boroughs	Cart Loads	Cost per Load
Manhattan	195,439	\$1.32
Brooklyn	27,839	1.43
Bronx	105,368	1.18
Total	328,646	

The sums paid by each borough to the company under the terms of the contract for disposing of the garbage after delivery are as follows:

Manhattan	\$148,000
Brooklyn	19,444
Bronx	25,000
Total	\$192,444

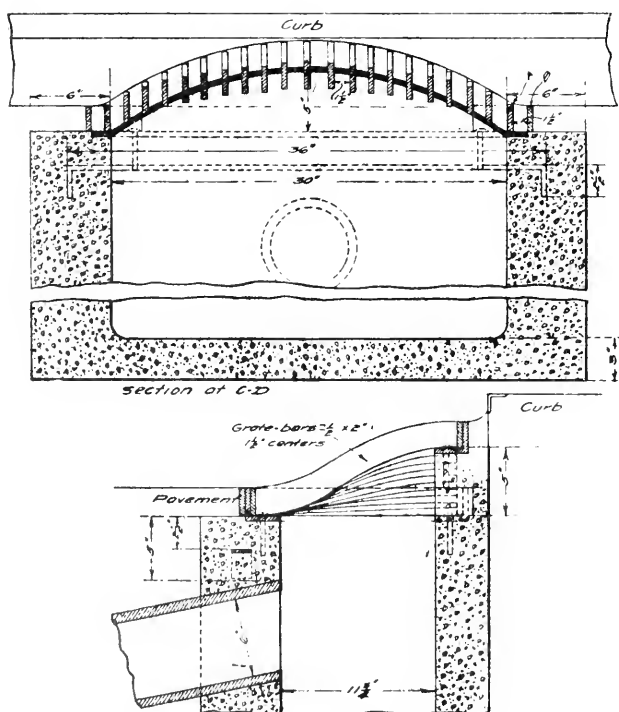
CATCH BASIN DESIGNS

Gratings and Special Forms of Gutters—Gratings or Bars For Curb Openings—Connection to Sewer

The standard catch basins of Portland, Ore., are simple rectangular wells about 5 feet deep below the roadway surface and about 12 by 30 inches inside dimensions, with walls 6 inches thick. The pipe connecting this with the sewer is placed with its top about 10 inches below the roadway, thus leaving about 3 feet of basin below the pipe. No traps are provided in the basin. The peculiar feature of the basin is the grating in the gutter. This grating extends 16 inches out from the curb, and is composed of wrought iron bars $\frac{1}{2}$ by 2 inches in section spaced 1 inch apart in the clear. These bars, however, are not flat but are so curved that while the outer ends are flush with the pavement those next to the curb rise in a curve which brings the center bar 5 inches higher than the level of the pavement, or within 1 inch of the top of the curb. The object of this probably is to form a sort of dam in the gutter which will prevent the water from flowing over the bars rather than passing through them, when the gutters are flowing unusually full. The projection in the gutter, of course, interferes with the wheels of a vehicle which might be following close to the curb, but it is not ordinarily necessary that vehicles should do so.

Where we have seen such gratings used we have found, as might be expected, that they did not always act as intended, since the gutter water can easily flow out around the bars, providing any obstruction, such as a piece of heavy paper or twigs and leaves, should collect over the grating.

A better construction, it appears to us, is to form a depression in the gutter at the inlet, this depression being approached by a comparatively long slope from above, and by a much more rapid one immediately below. The depression then serves as



PORTLAND, ORE., CATCH BASIN

a pocket to catch the water coming down the gutter, which can not flow around by way of the pavement. Also, if a paper or other comparatively weak obstacle should spread itself over the grating a head of several inches of water would be formed which would tend to force it through the opening. This depression would form no more objectionable obstacle to wheeled traffic than the Portland grating. It has the additional advantage that it is equally advantageous for use with an opening in the face of the curb, directing the water into such opening and preventing its flowing by. On a steep grade even this depression with a vertical curb opening may not suffice to direct all the water into the catch basin, and in such cases a flat grating of bars placed in front of the curb opening at the bottom of such a depressed gutter will generally be effective. The chief disadvantage of this, perhaps, is the break which it makes in the general appearance of the curb, which may by some be considered objectionable. It does not seem to us, however, that this objection can at all outweigh the practical advantages.

Undoubtedly the gutter grating is more objectionable than the curb opening, and the latter will generally serve the purpose except on quite steep grades, providing it is sufficiently large and not so obstructed by bars or in other ways as to cause paper, leaves, twigs and other matters, such as may be washed from the street surface, to collect in front of and contract the opening. Where a large opening is necessary—and we believe that with modern waterproof pavements these openings are more often too small than too large—some kind of bar is necessary to prevent animals and even small children from falling into the inlet. For this purpose we believe that one or at most two horizontal wrought iron bars set into the masonry at the ends of the opening are better than anything else. These seem less likely to collect such floating materials as we have referred to than do the vertical bars; and should they collect them the water will itself remove them more readily than in the case of the vertical bars. Probably the chief objection is the fact that a comparatively long stick, such as a lath, floating upon the water may be carried into the inlet; but this is possible in the case of the vertical bars also should the stick approach the opening at an angle of 30 degrees or more with the line of the curb.

This matter of storm water inlets is a most important one, and in our opinion has not received anything like the attention which it deserves in most cities. We do not believe that there are any greater absurdities to be found in any of the public works in the city of New York than the catch basin inlets in the Borough of Manhattan. Most of these have curb openings of ample size, but instead of horizontal wrought iron bars many of these openings are provided with heavy horizontal cast-iron bars which carry vertical teeth both above and below, the toothed bar occupying about one-third of the entire area of the opening, but the spaces between the teeth being so small that the effective area of the opening is probably reduced at least 75 per cent and the space between the bottom of the lower teeth and the bottom of the opening being so narrow that it is frequently found stopped with such small articles as apple cores, banana skins, handbills and the like. Other New York inlets are provided with the gutter grating, but instead of having the opening of the basin extend under the grating there is merely a depression cut in the lip of the stone which forms the bottom of the inlet opening, so as to leave a space about one inch deep between the grating and the bottom of this depression. This space is ordinarily found entirely filled with compacted street mud so that it serves no useful purpose whatever. The result is what might be expected, and every storm results in flooded gutters and streets around a considerable percentage of these inlets.

It is of little avail to build sewers of ample capacity if the openings which receive the street water and the pipes which conduct it from the openings to the sewer are not sufficient to remove the water from the streets. This suggests another point in connection with inlets where a great many cities have made mistakes. Because a six- or eight-inch pipe at even a minimum

grade is theoretically of ample capacity as a sewer to carry off all the water which will reach the inlet is not a sufficient reason for using such size of pipe as an inlet connection. When water drops from the gutter into an inlet it has no velocity in the direction of the connection pipe, but is a seething mass having more motion vertically than in any one horizontal direction. Under these conditions the opening which removes the water from the basin must be several times larger than that required for carrying a similar amount under normal flow, since the initial velocity through the outlet is very low and is largely diagonal to the axis of the pipe rather than parallel with it. Theoretically the best form of outlet from the basin would be a flat bell mouth, which might be given the same height as the diameter of the pipe used further out, and a horizontal diameter equal at the opening to the full width of the basin. It would be desirable to have at this opening a grating with vertical bars to prevent sticks and other obstacles from wedging themselves in this bell mouth. Instead of such a bell mouth it would perhaps be more practical to approximate it by a flaring opening made in the masonry, and a pipe capable of carrying the maximum runoff at a velocity of not more than one foot per second. In addition, if there is no catch basin at the bottom of the inlet—as in the majority of cases there should not be—it would be well to round the bottom up from the opening toward the back of the basin in the form of a quadrant of sphere or spheroid.

FUNCTIONS OF HEALTH BOARDS

Non-Sanitary Duties Imposed Upon Them—Garbage Disposal a Matter of Housekeeping, Not Sanitation— Plumbing Inspection.

ON April 10 and 11 there was held at the Massachusetts Institute of Technology in Boston a celebration of the fiftieth anniversary of the granting of the charter of the Institute, a part of which celebration took the form of the presentation of a great number of papers upon technical subjects by graduates of the Institute. Among these was one by Edwin O. Jordan, Professor of Bacteriology of the University of Chicago, in which he enumerated a number of lines of endeavor in public health work which he considered to be fruitless and uneconomical. The reason for this, in his opinion, is the continuance in the public mind of the ideas of a few decades ago concerning the origin and transference of contagious diseases. "Two instances of this confusion," he said, "are found in the demand for garbage disposal and plumbing inspection. Sanitarians do not admit that even a grossly improper method of garbage disposal can have much to do with the spread of disease in a large city, nor that diphtheria or typhoid fever or any other disease is properly attributable to the entrance of sewer air into dwelling houses. So firmly imbedded in public belief, however, is the connection of piles of decaying garbage with outbreaks of infectious disease and of 'defective plumbing' with all sorts of maladies that to the average citizen 'garbage disposal' and 'plumbing inspection' bulk largely as the chief, if not the only, activities of a municipal health department."

According to bacteriology disease germs do not breed in garbage heaps, nor can they continue to exist there. It is true that house flies breed in garbage piles and in manure, and that they may carry disease germs to food in the kitchen or on the table. But in order to do so they must obtain the germs from some source, and this source is not the garbage pile. Therefore, in his opinion, it is the source of the germs which should be looked after by the Health Department and not the breeding of flies. Consequently, garbage disposal is in his opinion a matter of municipal housekeeping rather than of public health; and improper methods of dealing with garbage should be dealt with by the police department as public nuisances rather than by the Health Department.

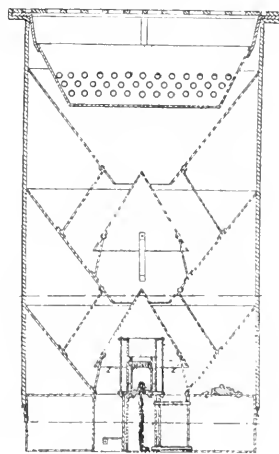
Concerning the danger from sewer gas Professor Jordan said: "If the most recent and searching investigations, such as those of Winslow and others, are to be believed, the actual peril to health involved in the entrance of small quantities of sewer air into houses is so small as to be practically negligible. It may be questioned whether plumbing inspection, as ordinarily admitted, can be shown to have saved a single life or prevented a single case of disease. . . . It might reasonably be maintained that slightly leaky gas fixtures are a much more serious menace to the health of house dwellers than is defective plumbing."

Professor Jordan does not deny that there is a certain amount of value in plumbing inspections nor that it is necessary that garbage be removed and prevented from creating a nuisance; but he maintains that money devoted for health purposes can secure much more adequate returns if used in other ways. Among these he refers at length to safeguarding the milk supply. Now that the public is aroused to the importance of pure water for preventing typhoid, he believes that milk is responsible for much more disease than is the water supply, and he appeals for a more general and adequate control of the milk from and including the milking of the cows to its final distribution to the consumers, recommending general pasteurization where other methods of securing safety are impossible or impracticable. He also strongly urges a more complete and accurate collection and recording of vital statistics, since through these can be learned the efficiency of the methods being employed and in what direction there is the greatest need for further or new endeavors.

DEODORIZING SEWER GAS

While fortunately the majority of American cities do not seem to be troubled with sewer gas, as are so many English cities, there is occasionally one on this side of the ocean which, on account of poor construction or lack of proper maintenance, finds it necessary to adopt some method of diminishing the nuisance from such gas. Among these is the city of Winnipeg, which has been troubled with this question for many years. The latter part of last year a test was made of the Beeman deodorizing machine, ten of these being placed in sewer manholes, where they were operated for three months.

The machine consists of a reservoir containing wood alcohol, the fumes from which impinge upon a disk of platinized porcelain 1½ inches in diameter. This disk, when heated cherry red, remains incandescent so long as the alcohol fumes are supplied to it, which fumes are changed into formaldehyde during their passage over the disk. In addition to the reservoir and disk there are a series of baffles and protectors through which both the formaldehyde and the air from the sewers must pass and which insure a thorough mixing of the two. The whole machine measures about 20 inches in diameter and 40 inches high and is suspended within an air-shaft from the sewer or in the sewer manhole. In the machines used in Winnipeg it was found that one gallon of wood alcohol, costing 62½ cents, lasted nine days. It is suggested that it would not be necessary to place such an appliance in each manhole, but that if one were placed, say, in every fifth manhole the openings in the other four could be closed. City Engineer Ruttan reported that sufficient formaldehyde was produced to deodorize the sewer air that emerged from the manholes. The city of Winnipeg has recently contracted for 50 of these deodorizers at \$75 each.



SEWER CONSTRUCTION IN ST. LOUIS

Large Brick and Concrete Sewers in Tunnel Through Rock and Sand, and in Open Cut—Using Shield and Air Pressure—Eight Miles of Sewer Under Internal Pressure—Tumbling Basin in Tunnel

AMONG the eighteen sewer contracts awarded in St. Louis last year, aggregating \$3,175,000, are several pieces of rather unusual or important work. The River des Peres foul water sewer, two sections of which have cost nearly \$1,000,000, is being constructed for nearly a mile through solid rock in a tunnel, and a third of a mile through a quicksand tunnel. Other large sewers are the Baden public sewer, 23 feet in diameter, and the Harlem creek public sewer, 29 feet in diameter, just completed.

The work laid out by the department for the coming year, while not as costly as that contracted for in the closing year, is more extensive, comprising 26 contracts, aggregating \$2,260,000; while if we add that which is to be started during the next year the total estimate is \$5,435,000. This sum is about one-fourth of the total expenditure for all sewer purposes in the city up to date. Up to a year ago the city had spent \$16,810,593 for the construction, repair and maintenance of sewers. At that time there was 661.61 miles of sewers in the city, divided as follows: Public sewer, 488,193 feet; joint district sewer, 29,481 feet, and district sewer, 2,975,661 feet. The total mileage at the present time is near 700, and the expenditure has probably been raised to nearly \$19,000,000.

The sewers are divided into three classes, one known as public sewers, which are paid for by the city as a whole from public funds by bond issue; another, joint district sewers, paid for jointly by the city and by the property owners in the drainage area effected, and the third, comprising all of the branch sewers and everything but the mains, called district sewers, are paid for by assessment against benefited property.

Of the work now under construction more than 56,000 feet, to cost \$1,640,223, is public sewer; 30,000 feet to cost \$800,166, is joint district sewer, and \$482,879 is the estimated cost of the district sewers. Public sewer for which contracts are soon to be awarded aggregate \$772,000; joint district, \$675,000, and district sewers, \$817,000, estimated cost.

Nearly all of the large sewers have been constructed of reinforced concrete. Not including the sewer constructed last year or that now under contract there is 4,487 feet of concrete sewer. Stone and brick sewer aggregates 74,136 feet, and brick aggregates 1,369,155 feet. There is 2,045,557 feet of pipe sewer, all of small size.

The largest sewer in the city is the Harlem creek main sewer, which is of concrete, 29 feet across and arched to 18.5 feet high at the center. This sewer is 1,016 feet long and is fed by a section 2,100 feet long of 16.3 x 25-foot sewer, besides the smaller sewers that lead into it; and two large branch sewers, North Harlem and South Harlem, connect into it.

The Glaise creek, a 12 foot 6 inch concrete sewer, 3,320 feet long, carries all of Glaise creek and the storm water of its drainage area. Additional sections of this sewer are planned, to cost \$80,000. Baden public sewer (a combined sewer) is the next largest after Harlem, being 23 feet across and of similar construction, the total estimated cost of which is \$876,527.

The River des Peres sewer is the longest yet undertaken; including three sections, 11,563 feet long, in Forest Park known as the Forest Park foul water sewer, it is to be nearly 48,000 feet long. Two sections of 9, 7 and 6-foot sewer extend from the Mississippi river toward the park, a total of 32,600 feet. All of this sewer is of brick. The contract cost so far has been \$987,116, and the other section is estimated at \$283,000, making a total of \$1,270,116. It was planned to tunnel through Forest Park hill, but the Municipal Assembly has refused so far to authorize an election to issue bonds, voting the proposition down

a few weeks ago. It will be necessary to either tunnel through the hill, about a mile, or parallel the river around it, about three or four miles, and it has been estimated by the sewer department that the tunnel would be much the cheaper.

It is also planned to reconstruct as a 7-foot sewer the Ferry street sewer, a 6-foot brick sewer which has failed. The Rocky branch sewer, now 12 x 15 feet, is overtaxed, and an auxiliary sewer is to be constructed parallel to it in the next street, ranging from 7 to 9 feet. This is estimated to cost about \$265,000.

RIVER DES PERES SEWER

The River des Peres sewer is the most unusual in some ways that has been undertaken in St. Louis. It is a 9-foot vitrified brick sewer, intended to carry the surface and house drainage from an area of 110 square miles.

At the outlet into the Mississippi River the sewer is carried 14 feet below mean low water, and extends back on a 0.1 per cent grade, so that 14,000 feet will be below low water level in the river. It is estimated that 44,000 feet will at times be under a head, and this length has been constructed accordingly, manholes as well as sewer being adapted to receive pressure. The last pressure manhole is distant from the outlet 26,500 feet, and this distance is calculated to be great enough to build up a sufficient head to overcome the back pressure of the river at all ordinary times. There is no opening of any kind into the sewer between this and 44,000 feet from the river.

No provision is made for a stage of the river higher than danger point, or 33 feet on the gauge, the reason given being that the river never will be above 33 feet for longer than three or four days at a time and at such long intervals as not to warrant the cost of providing for it. The flow line at the outlet is 8 feet below zero on the gauge, making danger point 41 feet above the outlet.

For about 16 miles the River des Peres winds through a low, swampy section just inside the city limits and empties into the Mississippi river just inside the limits at Catalan street. The first three sections of the sewer, about 8 miles in length, will replace 12 miles of river by making short-cuts across "necks" of the river. Besides about 26 square miles of drainage area around the southwest border of the city, inside the city limits, various branches drain about 84 square miles of St. Louis county, outside the city limits. This sewer is designed to carry all the sewage from this area after it is built up, but only sewage, and the open channel of the river will remain undisturbed. Many sewers discharge into the des Peres sewer, including the 12 foot 6 inch Glaise creek sewer. This latter carries Glaise creek in addition to house drainage, but only the latter will go into the des Peres sewer, the overflow of storm water going into the open des Peres river. The same applies with all other district sewers connecting with the des Peres sewer, except one, which is admitted 800 feet from the river in a tumbling basin, the full storm water flow of which will be provided for.

Provision is made for flushing the pressure sewer with water from the River des Peres when the flow is otherwise insufficient. This is accomplished by means of a check valve in a line connecting the sewer with the river. The latter has a minimum flow of 23 cubic feet a second, and when the amount of sewage passing through the sewer does not produce a pressure greater than the pressure of the river water against the valve the latter will open and allow river water to enter the sewer.

The city boundary line makes a gradual curve through an angle of about 40 degrees, and the river approximately follows this curve. The sewer is to follow the river valley, cutting off most of the sharp bends. It starts at the Mississippi river with

a short outfall section, extending for 214 feet into the river. This section has not been started yet, the contractor choosing to wait for a low stage of the river, next fall. The work, of course, will have to be done in a cofferdam, and the expense of such a dam at high water stage of the river would be very great. This part of the sewer and about 500 feet of the tunnel work beyond is to be on an 8 degree curve, bringing the outlet well out in the river and discharging in the direction of the river flow. This is expected to produce a suction and aid the discharge.

The sewer is now under construction in two sections or contracts, one a tunnel section 6,700 feet long, and the other an open cut section of about five miles. The contractors decided to do part of the tunnel section in an open cut and part of the open cut in tunnel work. In the first section three crews are being used, and the contractor on the second section has eight crews at work.

On the first section work was started first in a shaft 980 feet from the edge of the river or about 1100 feet from the gate at the end of the outfall. Another shaft was put down 2,500 feet from the first. Both tunnel crews worked toward the river to the east. The first has finished its work, stopping the tunnel when all but 6 feet of the rock separating the tunnel from the river had been drilled. The second crew, after going 1300 feet toward the first shaft, struck running sand, which lies between two hills and which is to be worked from the first shaft with a circular shield.

Work started about the middle of April in the running sand tunnel, worked from the first shaft, and about 100 feet (mostly "nigger head" boulders, gravel and coarse river sand) has now been finished and lined.

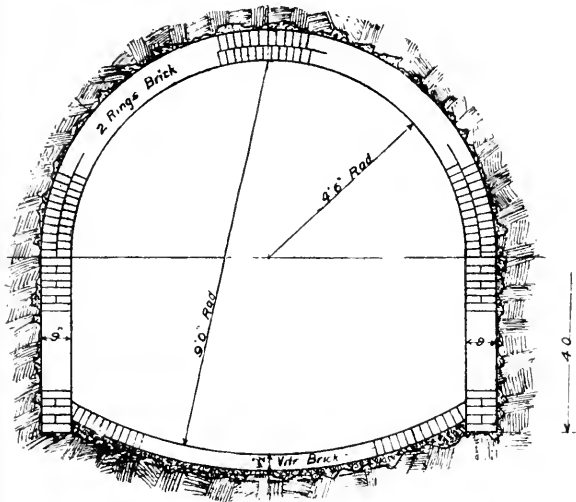
All of the sewer except the running sand tunnel section is

horseshoe shape, constructed of brick. The invert is laid on solid limestone, evened up with concrete. The side walls for a height of 3 feet are 8 inches thick. The upper half is a circular arc, constructed on a center and keyed. The center is of wood, 16 feet long, and consists of four semi-circular ribs well braced. Loose lagging is laid on the ribs as the lining is brought up in horizontal courses from the spring line, and the key course is put in with block lagging in short lengths. All spaces between brick work and rock are filled with concrete.

The lining is laid in Portland cement mortar. All joints are "shoved." The invert and bench walls are built in the morning of each day, the arches in the afternoon and the keying course by the night shift. The longest time the lining stands before the centers are removed is five or six hours after the key course is finished; but since there is no pressure on the lining, barring the concrete filling which is put behind to fill between the lining and the stone, this has proved ample.

Materials, both those for use in construction and that which is excavated, are handled on cars which run on tracks laid in the tunnel. Lifts (cages) raise the cars up the shaft to the surface, where other tracks lead to the dumps and material house.

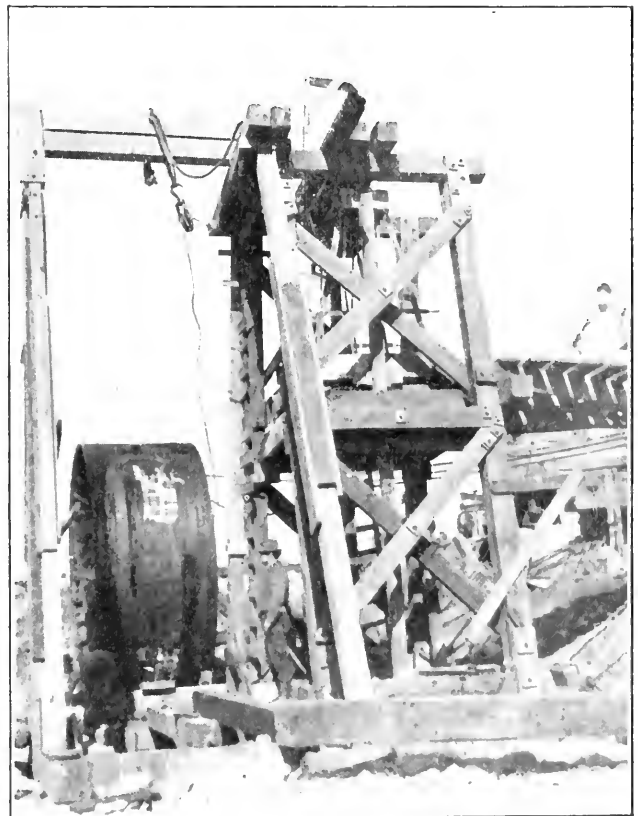
The tunneling is through a good grade of limestone, with a considerable number of mud seams, which are filled with a 1:3:5 concrete mixture. The formation of the rock and earth seems to indicate that at some ancient time the course of the river was along that part of the sewer where the running sand tunnel is, about 1,200 feet from its present channel. Excavation is a little different from ordinary, the whole bore being blasted as a heading, instead of in bench work. Drilling is done in day time and the mucking crew works at night. Smoke and bad air are expelled by opening the cocks on the compressed air line. Compressed air is used for drilling in both the tunnels, and will be used in the working chamber of the quicksand tunnel if it becomes necessary. The air compressor is an Ingersoll-Rand, providing 1,160 cubic feet of free air per minute at 85 pounds pressure. The receiver has about 500 cubic feet capacity and is located just outside the power station. This station is located just off the line of the sewer, midway between the two shafts.



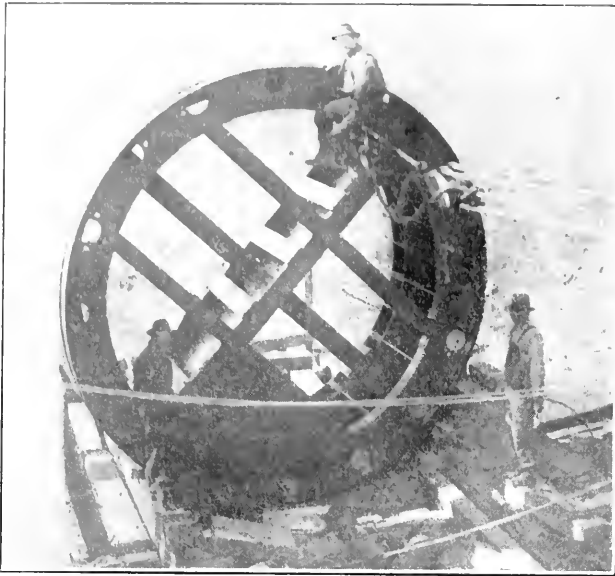
TUNNEL IN COHESIVE GROUND, RIVER DES PERES SEWER



ROCK TUNNEL, RIVER DES PERES SEWER



SIDE VIEW OF SHIELD
Hood and tail are not attached.



REAR VIEW OF SHIELD.

The running sand tunnel, as stated, is the only section of the sewer which is not horseshoe shape. It was made 9-foot circular, as this shape is stronger and much less expensive to construct.

It is being constructed with a steel shield, 13 feet 4 inches outside measurement. The shield is circular, and has two skin plates, $\frac{5}{8}$ inch thick, bolted together the full length (6 feet) of the main shield chamber. One of these plates extends back 4 feet to form the tail and to hold the walls of the tunnel until the lining can be put in. There are two diaphragms, one connected to the cutting edge castings, against which the jacks work, and one to the rear framework of the shield, which supports the circular walls. Sixteen powerful hydraulic jacks, each rated to give 5,000 pounds to the square inch, but tested for 16,000 pounds, rest in the diaphragms. The jacks have a 6-inch plunger and a 30-inch stroke. Two doors of $\frac{5}{8}$ -inch plate steel are provided at the rear of the 6-foot shield to be closed in an emergency, such as the failing of air or a sand run.

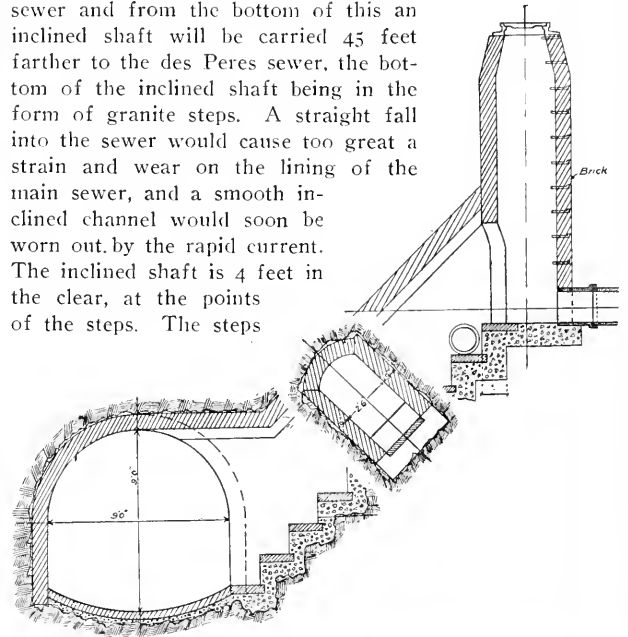
To take the thrust of the jacks when pushing the shield forward, a wood circle is being put in. This is made up of sixteen 30-inch arcs, each cut circular, 6 inches thick and 10 inches wide. One of these cants is put in at a time without removing more than one jack. Under any pressure that has been encountered so far four jacks will propel the shield, but if big boulders or hard formation is struck, the whole sixteen jacks could be used and each could exert its full strength of 16,000 pounds, or a total of more than 100 tons pressure. Similar shields have been used with the jacks working directly against the brick lining, but the wood circle, a fairly good sewer in itself, furnishes a support for the jacks while the brick circle lining is being brought up. The sand closes in and tightens the circle of wood as soon as the tail of the shield moves forward. The wood circle allows half an inch all around for the 18-inch brick lining. This half-inch space is filled with cement mortar, making a close union between the wood and the permanent lining.

After finishing the limestone tunnel east from the second shaft to the running sand, the crew working from the second shaft turned to the west and is now completing a short stretch of 200 feet to connect with the open cut. A third crew has laid a considerable stretch of sewer in open cut westward from the hill.

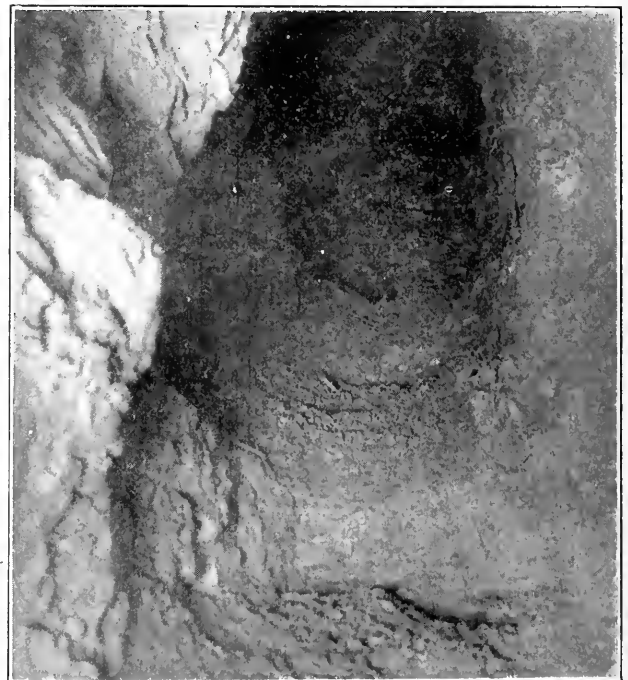
A gate and clean-out shaft, provided for any possible future emergency, is located at the beginning of the open cut, about 4,000 feet from the river, and allows admission to the tunnel without expensive excavation. As the sewer is below low water in the river, another gate will be necessary at the outlet. When both gates are closed this section can be pumped out, permitting any repair or other work.

The gate works perpendicularly in the clean-out shaft and will be nearly balanced with counter weights weighing 3,500 pounds. A windlass will be provided for lifting it. The clean-out shaft is a little over 9 feet across, and is 5 feet 3 inches wide in the direction of the sewer. The total height of the shaft is 38 feet, of which about 8 feet is above the ground. The gate proper is constructed entirely of iron. Two 10-inch I-beams and two 10-inch channels, all vertical, connected by five 5-inch I-beams form the frame work, on which is riveted a $\frac{5}{8}$ -inch iron plate. This gate weighs about 4500 pounds. It slides in grooves built at the west side of the shaft (that farthest from the river) and rises high enough to be entirely clear of the 9-foot sewer. The fit is made as tight as is practicable. When closed the gate can be forced against the seat by long wedges driven into the grooves.

A district sewer is to be connected with the main des Peres sewer through a "tumbling basin" about 800 feet from the river. A vertical manhole 24 feet deep will be built on the district sewer and from the bottom of this an inclined shaft will be carried 45 feet farther to the des Peres sewer, the bottom of the inclined shaft being in the form of granite steps. A straight fall into the sewer would cause too great a strain and wear on the lining of the main sewer, and a smooth inclined channel would soon be worn out by the rapid current. The inclined shaft is 4 feet in the clear, at the points of the steps. The steps



TUMBLING BASIN—LONGITUDINAL AND CROSS-SECTION.



LOOKING UP INTO TUMBLING BASIN, BEFORE PLACING LINING AND STEPS.

have a 20-inch tread and 30-inch rise, the treads being of granite to prevent wear.

Drop manholes on the pressure sewer are provided with a check valve on each branch pipe (the last few feet of which are of iron) opening toward the main sewer. This is intended to prevent the water from backing up into the branch during high water.

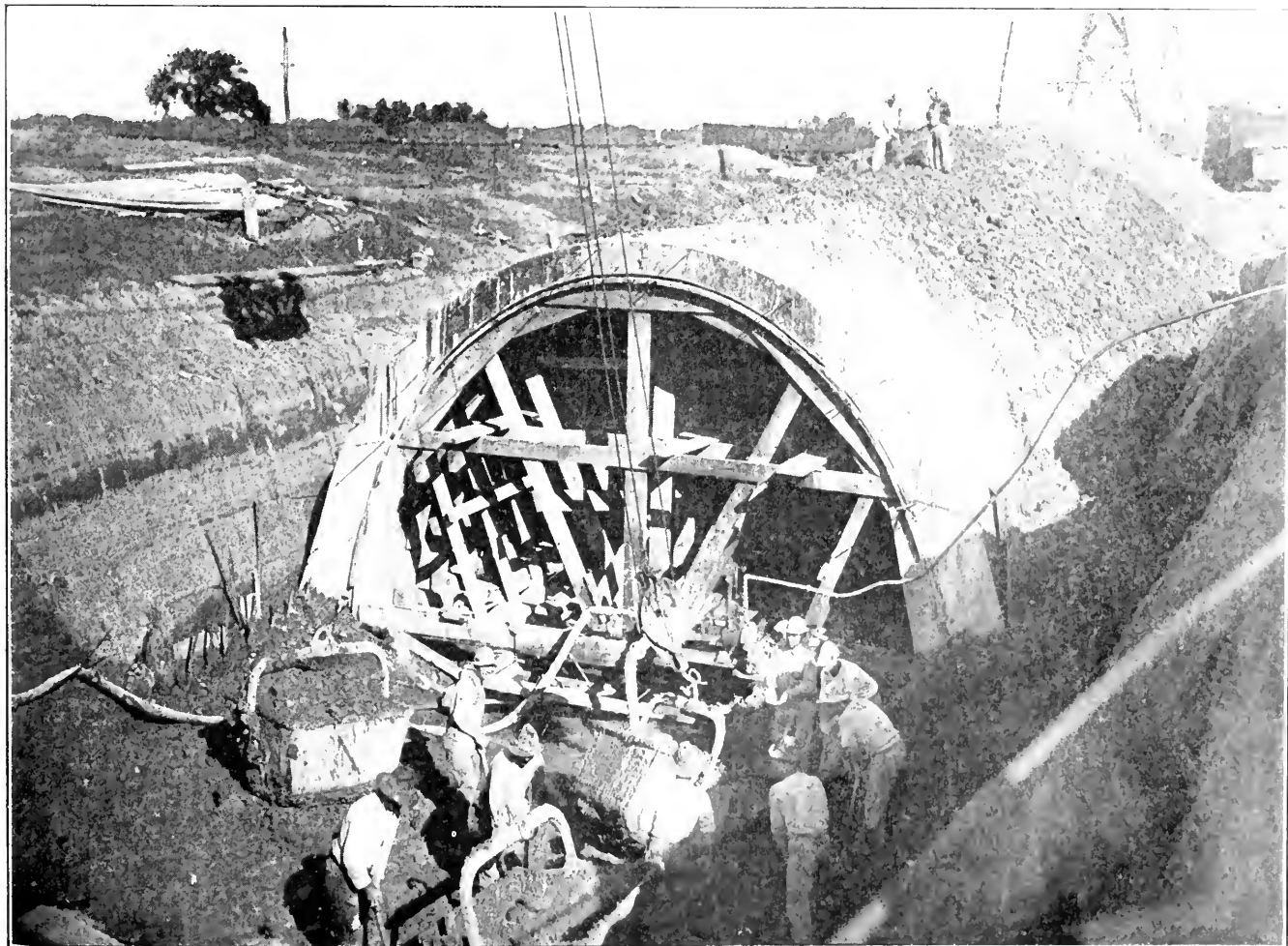
In other drop manholes vertical lines of vitrified pipe are fastened by iron straps to the inside walls, and are provided with an elbow at the bottom to throw the outflow into the current of the main sewer and protect the latter from wear.

The second or open cut section of the des Peres sewer is about five miles long and includes all of the 7-foot and the 6-foot portions. This section is now being worked from eight points, and in almost as many different ways. Two cranes, three Potter trench machines, one cableway (at a creek crossing) and a steam shovel are being used on different parts of the job. In addition, one 600-foot stretch is being worked in a tunnel, although it had been planned as open cut work, but as it is through a hill the contractor thought he could construct it to better advantage as a tunnel. Many cave-ins, however, have made the work so difficult and so expensive that it has probably cost the contractor much more than he will get out of it.

This whole second section has proven more difficult than the tunnel. Many expensive accidents have been encountered, one of the first being in open cut where the material was handled by a crane. This crew struck a number of pockets of running sand about 5 feet thick overlying the rock, which latter had to be blasted, and the blasting tended to tear out the sheeting of the trench above. For a portion of the distance it was necessary to construct cross bulkheads ahead of the work above the rock to hold the running sand. Tongued and grooved flooring lumber was used for sheeting and bulkheads.

The shaft for the tunnel section caved in three times during construction and but 10 feet of the tunnel had been completed at the end of four months. The first cave-in occurred when the shaft, constructed 10 foot square, was almost down to the flow line. It was reconstructed 10 by 20 feet, but a quicksand pocket caused it to cave again before it was completed. The third attempt, making the shaft 10 by 27 feet, was successful. The tunnel, which is from 45 to 60 foot below the surface, is entirely in sand, gravel and other loose material. A peculiar formation closely resembling macadam or crushed rock was found in this tunnel, and in some of the open cut work, imbedded in tough gumbo. It ran in layers about 8 feet thick. In March of this year the tunnel caved in 115 feet west of the shaft, the hole extending entirely to the surface, 49 feet above. The tunnel was worked both ways from the shaft, the day crew excavating about 8 feet and bracing it up for the bricklayers at night. No attempt was made to hold the excavation longer than one day. The 600 feet is now about completed, after seven months' work.

As stated, the sewer follows more or less closely the valley of the river, and much of it is in the river bed. Ground water, of course, interfered to a great extent with the work on the whole sewer because of its being below the low water line of the river, but only in quantities which could easily be handled by pumps. In the short stretches constructed in the river's bed, however, not only the ground water, but the river itself had to be contended with. The ground, particularly along the river banks in the swampy bottoms, is of a treacherous nature, and it was very difficult to hold the banks of the excavation. Early in April the river broke through a flume constructed to carry it across the trench, and this stopped the work of the whole crew for several days. The sewer at this point had been almost finished when the mud fill around the flume washed out



END VIEW OF 23-FOOT BADEN SEWER



WHERE RIVER BROKE INTO TRENCH.

and the trench filled with water. Steel sheet piling had been used to hold the banks and the sewer was being laid as fast as the trench was ready and back filled with the excavation from in front. An effort was made to divert the river around the break, over the end of the completed and covered sewer, by drawing the piling at this point; but this was not successful and it was found necessary to practically construct a puddle cofferdam to finish the remaining 40 feet of sewer in the river bed.

Special construction is used in the sewer which lies in the river bed to afford additional strength against the internal pressure should the filling over the sewer be washed away by the river. After the first ring of brick is laid in the invert it is covered with expanded metal in sheets 5 by 28 feet and this reinforcement is carried up over the arch. Two more rings of

brick are laid on this and these two inner rings are carried over the entire arch. Concrete is filled in between the brick arch and the sheeting for 2 or 3 feet above the spring line, making a thick shoulder, and is carried over the outside of the arch about 4 inches thick on top of the reinforcement.

BADEN SEWER.

The Baden sewer, the largest work now under construction, starts from the Mississippi River at the mouth of Gingrass Creek and Moline Creek, two wild little streams which enter the river together. The public sewer is nearly a mile long, ranging in diameter from 18 feet to 38 feet, the latter size being an open channel with vertical sides, 388 feet long, at the outlet into the river. The largest part of the closed sewer is 23 feet wide by 18 feet 6 inches high.

The open section of the sewer is constructed in a 54-foot trench, and has been the most difficult part of the work. It has been completed, as has also about 1,250 feet of the 23-foot closed section. The bed of the combined streams runs along the right of way chosen for the sewer, and the ground was, of course, very wet and hard to hold. Although a considerable part of the finished sewer at this point is above ground, steel sheet-piling was used, driven down to solid rock where the sewer was near the river channel, the piling being needed to hold the banks and prevent washing. Back from the river bank a hundred feet or so the piling did not need to go entirely to rock.

It was found necessary torevet the river bank at the sewer outlet with rip-rap for about two hundred feet to protect the end of the sewer against washing. This connects the revetment made by the government and by the Burlington railroad at the north and south of the sewer outlet.

At the end of the open sewer, just before it connects with the first section of the closed sewer, special provision had to be made for getting under the railroad tracks of the Burlington



COLLAPSE OF SHEETING, 29-FOOT HARLEM CREEK SEWER
Steam Shovel Protected from Earth by Steel Sheeting.

main line, which crossed the double creek on a long wooden trestle. The concrete sewer walls on either side of the tracks are continued to 18 ft. 6 ins. high to act as retaining walls and are strengthened by buttresses 6 feet 3 inches wide at the base and 15 inches to 2 feet thick. Along the top of the retaining walls, which is 15 inches thick, is a reinforced concrete coping 2 x 2½ feet wide. Under the line of the tracks a third wall is built in mid-channel of the sewer, and on these three walls the railroad company purposes to lay concrete slabs 2 feet 9 inches thick, meeting on the middle wall. It also intends to fill in its trestle, when the embankment will form a levee to hold back the two rivers and force them to enter the sewer. A 40-foot opening has been left in the north side of the sewer to admit Moline Creek. On the south side only a two-foot vertical gap was left, Gingrass Creek being turned into the sewer one-fourth mile from the river. This two-foot gap is to admit the storm water which will collect back of the embankment.

The bottom of the open sewer is vitrified brick four inches thick on a 30-inch reinforced concrete base. The first section of the closed sewer is 23 feet wide and 16 feet 9 inches high, with the arch a flat ellipse and the bottom slightly concave. The bottom is constructed similar to that of the open sewer, while the arch is of concrete, 13 inches thick at the crown and 30 inches at the spring line, and reinforced with one-inch round bars one foot apart, making the full curve in one piece, and half-inch bars running lengthwise of the sewer. This section is 2,680 feet long, and has a fall of 0.2 of one per cent.

At 3,150 feet from the river, where the sewer passes under a stone arched bridge carrying the water works conduit, the diameter of the sewer is reduced to 18 feet, which size is continued for 1,440 feet. All of the work in these three sections is contracted to the Hoffman and Hogan Construction Company for \$280,157.15.

From the end of this third section the sewer continues for 4,400 feet with a diameter of 14 feet. This was let to the Wm. F. Reilly Construction Company for \$162,015.80, making the total cost of the public sewer \$442,172.95. Several miles of district sewers to drain the Gingrass water shed, contracted for by the Fruin and Colnon Construction Company, will cost \$434,354.64 more, paid mostly by property owners in the district. This makes the entire project cost over \$875,000.

OTHER SEWERS.

The recently completed Harlem Creek main sewer offered several difficult problems for the contractor. A heavy cut through the edge of a hill resulted in several slides which buried the machinery. The depth of the trench was a little over 50 feet on the hill side of the cut, and a small ravine running through the toe of the hill, together with many layers of saturated clay, made the job very difficult. The excavation was at first made without sheeting, by sloping the banks, but the slope had to extend so far up the hill that it promised to be very expensive, and the contractor thought to save money by using sheet piling. The latter failed to hold the embankment, however, and was crushed in on the machinery by slides, so the contractor went back to slopes, increasing their length, but many cave-ins continued to add greatly to the expense.

The Forest Park sewer, already mentioned as a part of the River des Peres sewer plans, cannot yet be put to its ultimate use, but is being used for a temporary purpose. From its great drainage area the river has collected much sewage and has become an open sewer. Complaint by resident property owners made it necessary last summer to turn large quantities of water into the river from the city water mains, to give it an occasional washing out in dry weather. A temporary electrical pumping plant has been provided to lift the sewage from this Forest Park sewer into an old five-foot sewer, pumping foul water from the river when it is low enough to be polluted by the sewage. Except in the dry months, the flow of water in the river is expected to be sufficient to so dilute the sewage as to prevent a nuisance. When the balance of the River des Peres sewer is completed, the pumping station will be abandoned. The contract cost of the station was \$4,776.

These sewers were designed by Assistant Sewer Commissioner James A. Hooke, under the direction of Sewer Commissioner

Harry R. Fardwell, and with the assistance of the Department Engineer Walter T. Gray. Mr. Gray, who was particularly interested in the planning of the River des Peres sewer, is now Engineer of Construction on the first, or tunnel, section.

CATCH BASINS IN NEWPORT

The street commissioner of Newport, R. I., J. K. Sullivan, in his report for 1909 stated that 587 catch basins—the average number in use during the year—were cleaned a total of 1,583 times; that is each basin was cleaned an average of nearly three times during the year. There were removed from them 1,525 loads of material. The total cost was \$3,253.30, or \$2.06 per cleaning.

Three cleanings per year does not seem to be a very high average, and yet it is very much higher than is found in many and perhaps most cities; the average in Chicago, for instance, being about one-third of a cleaning per year. The number of cleanings which a given basin should receive depends, of course, upon local conditions. Some basins should be cleaned after every storm of any severity, say at least eight or ten times a year; other basins never require cleaning, never receive it and were therefore a waste of money in the first place and worse than useless throughout their existence. It is probable that a number of the Newport basins receive more than three cleanings a year, this being the average of all the basins. And yet it would appear that certain of them should have been cleaned much more frequently, since we find under the statement concerning the cleaning of sewers that 91 tons of gravel were taken from the sewers during the year and used for various purposes by the street and sewer department, yielding a net saving to the department of \$62.79. At points where such quantities of gravel as this are washed into the sewers it would seem as though special basins of unusual size are required. And if the department really makes a net gain by removing gravel from the sewers the greater gain permitted by the cheaper removal from a basin might in a short time suffice to repay the cost of the basin.

ASSOCIATION OF GEORGIA HEALTH BOARDS

At the invitation of the State Board of Health of Georgia there recently convened at Rome, Ga., representatives from many of the cities and counties of the State for the purpose of combining in an effort to improve sanitary conditions throughout the State. An organization was formed which has taken the title of the "Association of State, County and Municipal Health Boards." The officers elected were Dr. J. C. Bloomfield, of Athens, president; Dr. C. M. Weaver, of Macon, vice-president; Alfred V. Wood, of Brunswick, secretary. Meetings of the association will be held on the day preceding the meetings of the State Medical Association. Through its own publications and the use of the public press of the State, the association hopes to exert an influence toward securing the enactment of better health laws and a more effective carrying out of the same.

BOARD OF HEALTH REPORTS

Beginning in the latter part of 1909 the Board of Health of Cincinnati, Ohio, was reorganized, and the first difficulty it encountered was the absence of adequate records or system of collecting them. Experience in New York indicates that there are about three times as many cases of tuberculosis as deaths, and it has been generally found that the cases of typhoid fever average ten times as many as the deaths; but such returns as had been made by the Cincinnati physicians gave a less number of cases than of deaths from such diseases; the reports of tuberculosis cases for the first eight years of the century averaging two or three hundred per year less than the deaths. This condition is being remedied, and any physician who is now found reporting a death from tuberculosis, typhoid, etc., without having previously reported the case when alive is called upon for an explanation.

SEWERAGE STATISTICS OF AMERICAN CITIES

Reports for the Year 1910 from Sixty Large Cities—Furnished Especially for This Table by Officials in Charge—Sewerage Systems—Pumping and Purifying Sewage—Sewer Assessments

Of the 8,428.65 miles of sewers in the cities reporting, 6,385 are combined sewers, and the remainder are on the separate system, 1,250 being for house sewage and 331 for storm water only. (The remaining mileage was unclassified by the informant.) Of the total amount, 5,627 miles are vitrified pipe and 1,808 are brick sewers. Of the remaining 1,000 miles nearly 500 is under the head of "not designated," the majority of which is probably vitrified pipe. Aside from vitrified pipe and brick, the greatest mileage among house sewers is of plain concrete built in place, while combined brick and concrete, cement pipe, reinforced concrete pipe and iron pipe each amounts to two or three miles. Among the combined sewers cement pipe and combination brick and concrete sewers are nearly tied for third place, following which come plain concrete, reinforced concrete built in place, a combination of brick and stone, and stone sewers, in the order named. Among the storm sewers the amount of stone sewer slightly exceeds that of brick, following which come plain concrete, a combination of brick and concrete, reinforced concrete built in place, cement pipe, a combination of brick and stone and reinforced concrete pipe, in the order named.

A great many of these sewers were built several years ago, and a comparison of the relative amounts of each class in this table and those of the sewers built during the last fiscal year would indicate the change in popularity of the several materials; part of this change being probably due to the change in the system as a whole and in the sizes of sewers built, rather than in the materials adopted for given sizes.

SEWERS BUILT DURING 1910.

During the year 1910, or the fiscal year ending during 1910, there was built in the fifty odd cities included in our table 421 miles of sewers. Of these about 117 miles were for house sewage only, and 286 miles were combined sewers, while only 18 miles were for surface water only. All but six of the cities tabulated have a population of more than 25,000. Had a larger percentage of small cities been included, it is probable that the proportion of house sewers to combined sewers would have been much greater, since combined sewers are not so frequently built at the present time in the small cities as is the practice in the larger ones.

The predominance of vitrified pipe sewers in recent construction appears quite strikingly in this table. Of the house sewers 110 miles were built of vitrified pipe, 0.1 of a mile of cement pipe, 3 miles of reinforced concrete pipe, and 1½ miles were built of brick and one mile of plain concrete, these probably being the larger sizes. Even in the combined systems more than one-half of the construction was of vitrified pipe, one-fifth was built of plain concrete and a little less of brick. Of the surface water sewers over one-half were vitrified pipe, about one-sixth were brick, and there was less than one mile each of stone, plain concrete, reinforced concrete, cement pipe and reinforced concrete pipe.

Twelve of the cities did all of their sewer construction by day's labor, nine of these being in New England. Several others did a part—generally a small part—of last year's construction in this way; but the great majority of the work throughout the country was done by contract.

AREA SERVED BY SEWERS

The proportionate amount of the total city area which is served by the sewer system will naturally depend to a large extent upon the amount of sparsely settled area which has been included within the city limits. For instance, that portion of New York City known as the Bronx has extended its sewer system into only about 25 per cent of its area. Two cities re-

port that all of the city area is sewered. Six cities report about three-fourths the area sewered; nine report between two-thirds and three-fourths of the area sewered; thirteen between one-half and two-thirds, eight between one-fourth and one-half, and three less than one-fourth of the area.

HOUSE CONNECTIONS

The majority of the cities use 6-inch house connections only, although quite a number use 4 and others report 8, 9, 10 and even 12-inch connections; although it seems probable that these largest must be for institutions or factories. One peculiarity noticed is that 5-inch connections are used by five New England cities and by only two cities outside of New England. Of 55 cities reporting the sizes used, 25 use 6-inch exclusively, and 19 others use 6-inch and other sizes as well.

It will doubtless surprise some to learn how large a percentage of houses are not connected to the sewers, even in the largest cities. For instance, Chicago contains about 10,000 houses not connected with the sewers and Terre Haute about the same number, or more than three times as many as are connected. A great many of the cities do not report the number of houses not connected, probably because no record has ever been taken of them. An inspection of the table, however, shows that in quite a number of cities only about one-half of the houses are sewered, and only one city, Newark, N. J., reports every house connected with the sewers. Incidentally, it may be said that in the city of New York (complete reports for which do not seem to be available yet) there are a great many thousand houses for which no sewers are provided, some of these in the well-built-up sections of Brooklyn. Most of them, however, are in the outlying sections of the several boroughs other than Manhattan.

Of the cities reporting, about one-third do not use main traps on the house connections. These cities seem to be pretty well scattered over the country, three of them being in New England and three of them in the Middle Atlantic States, while others are found in Colorado, Arkansas and West Virginia. In addition to the fourteen which report that main traps are not used, one reports them as "sometimes" used, another "very seldom," and still another states that their use is optional. Twenty-nine report that main traps *are* used on the house connections.

HOUSE CONNECTIONS MADE BY WHOM?

In Hartford, Conn., Wilmington, Del.; Springfield, Mass.; Trenton, N. J.; Binghamton, N. Y.; Watertown, N. Y., and Reading, Pa., connections are laid to the curb line by the city and from there on by the property owner. Connections are put in by the city in Rockford and Springfield, Ill.; New Bedford, Newton and North Adams, Mass.; Newark, O., and Erie, Pa. They are put in by the property owner in Little Rock, Ark., Pueblo, Col.; Meriden and New Haven, Conn.; Chicago and Joliet, Ill.; Terre Haute, Ind.; Cedar Rapids and Sioux City, Ia.; Wichita, Kan.; Bangor and Portland, Me.; Haverhill, Lawrence and Lowell, Mass.; Battle Creek, Grand Rapids and Muskegon, Mich.; Butte, Mont.; S. Omaha, Neb.; Elizabeth, N. J. Albany, Buffalo and New York City, N. Y.; Asheville, N. C.; Grand Forks, N. D.; Harrisburg, McKeesport, New Castle Wilkes-Barre, and Williamsport, Pa.; Providence and Woonsocket, R. I.; Aberdeen and Spokane, Wash. Cleveland, O., reports that the city puts in delinquent connections and Columbus, O., that the city makes connections on improved streets and licensed sewer builders on others. We presume that in these cases the cost of the house connection is charged to the property owner; and it seems quite probable that this is also the case in most instances where connections are made by city.

SURFACE WATER INLETS

The majority of the cities report concerning surface water inlets that all of these are provided with catch basins, but still there are a goodly number of cities which have a greater or less percentage of their inlets without catch basins. Wilmington, Del., has 1,700 inlets without catch basins and only 4 with them. Chicago, Ill., on the other hand, has 75,867 inlets with catch basins and none without. (Incidentally, most of Chicago's catch basins are never cleaned out, and so are worse than useless.) Altogether 18 cities report having inlets without catch basins, and 23 that all inlets have catch basins. Two report having no inlets with catch basins, although having a number without catch basins. Altogether the total number of inlets reported having catch basins is about 130,000, and the total without catch basins is about 6,000.

Concerning the cleaning of catch basins, the reports are quite interesting. The number of cleanings vary from practically none to cleaning each basin 100 times a year (twice a week). In the majority of cities, however, the number of cleanings varies from an average of one to six cleanings of each basin a year. In Hartford, Conn., each basin was cleaned an average of four times during the year, and each time there was removed a little less than $\frac{1}{2}$ cubic yard of material. In Chicago the average number of cleanings per basin was $\frac{1}{3}$, and the amount of material taken from each basin was about $1\frac{1}{2}$ yards. A number of cities report cleaning each basin once during the year. Newton, Mass., one of these, removed about 1.9 cubic yards at each cleaning. Buffalo, N. Y., cleaned each basin an average of nearly five times, but removed each time only about one cubic foot of material. In the Borough of the Bronx, New York City, each catch basin was cleaned an average of about twice, and each time there was removed about $2\frac{1}{2}$ cubic yards. In McKeesport, Pa., each basin was cleaned once a month, and $\frac{1}{2}$ a cubic yard removed each time. (The even numbers indicate that these figures were estimated.) In Wheeling, W. Va., each basin was cleaned about six times, and a little more than $\frac{1}{2}$ cubic yard removed each time. In Newark, N. J., each basin was cleaned on an average one and one-half times, and $\frac{3}{4}$ cubic yards was removed each time.

The ordinary method of cleaning is to use scoops and shovels. Pumps are reported used in Pueblo, Col.; New Bedford, Mass., and Battle Creek, Mich. Pails are used in Bangor, Me.; Chicago, Ill.; New Bedford, Mass.; Newton, Mass.; North Adams, Mass.; Butte, Mont.; Newark, N. J.; New York, McKeesport and Williamsport, Pa. In Providence, R. I., the material is removed in buckets by hand and dumped into steel carts.

In removing catch basin material two cities use iron carts similar to those employed in a number of places for collecting garbage. Two use dump carts, five use dump wagons, and one uses a "water wagon" and a pump. In two or three cities the material is removed from the catch basins to the street, and is collected and carted away by the street department. In two cities the catch basins are cleaned by contract with private parties.

PUMPING SEWAGE

Some details of sewage pumping plants were given by Chicago, Ill., Buffalo and Mt. Vernon, N. Y., Columbus, O., Reading, Pa. and Providence and Woonsocket, R. I. All of these report that the sewage receives no preliminary treatment before being pumped, other than coarse screening; except that at Columbus, O., the heavy detritus is removed and the sewage is passed through 1-inch and $\frac{1}{2}$ -inch bar screens before reaching the pumps. The amount of material so removed in Columbus is not determined. In Reading, about 31 cubic feet of material per million gallons pumped is removed before pumping; and in Providence, about one-tenth of a cubic yard per million gallons.

Centrifugal pumps are used for pumping in Chicago (several plants); in Buffalo, an 18-inch, a 24-inch and a 30-inch pump; in Mt. Vernon, two pumps; in Columbus, two 10-inch pumps, two 12-inch pumps and three 20-inch pumps; in Providence,

two 24-inch pumps and in Woonsocket, one 8-inch pump. The only other style reported is at Reading, where there are two duplex, compound, condensing plunger pumps which lift seven million gallons per 24 hours against a head of 35 feet. Steam is used for driving the pumps in Chicago, Buffalo, five of the seven in Columbus, those in Reading and in Providence. The Mt. Vernon pumps are driven by motors and two of the Columbus pumps by gas engines.

The lifts in the various cities are as follows: Buffalo, 15 feet; Mt. Vernon, 25 feet; Columbus, by gas engines 60 feet, and by steam engines 25 feet; Reading, 35 feet; Providence, 27 feet; Woonsocket, $20\frac{1}{2}$ feet. In Chicago about 3.2 per cent of the sewage is pumped; in Buffalo, 7 per cent; in Mt. Vernon, about 25 per cent; in Reading, 100 per cent; in Providence, about 95 per cent. In each of these cases pumping is necessary for draining certain low lying districts; although in Columbus a large part of the pumping is necessary during the high water only, and in Reading a large part of the lift is to produce the required head on the sewage disposal plant.

MISCELLANEOUS

It is somewhat surprising to note the number of cities which have inverted siphons in their pipe lines. Twenty-one cities so report, Hartford, Conn., having ten; Newton, Mass., five; Buffalo, N. Y., sixteen; Harrisburg, Pa., twelve. Twenty-five years ago considerable doubt was generally entertained as to the successful operation of these, but the number now in use would indicate that any difficulties of construction or maintenance have been met, and are no longer considered as serious. Twenty of the cities report having flush tanks, although a number report having only one. Six report having connections between the water mains and manholes for direct flushing of the sewers.

The data concerning flushing of sewers appear to be very scarce. Chicago reports flushing 625 miles of sewer by hand at a cost of a little under \$50 a mile. Lowell, Mass., flushed 2.2 miles of sewer by hand at a cost of \$121 a mile. Buffalo, N. Y., flushed one mile by hand at a cost of \$41, and Providence, R. I., flushed 20.7 miles by hand at a cost of about \$160 a mile.

In cleaning sewers most of the cities report flushing as one of the methods. Rods are used by ten cities; sewer-cleaning machines by five cities. A number use fire hose for washing the material down, the heavier matter probably being removed at the nearest manhole. Chains are used by some, steel buckets dragged from manhole to manhole, hoes and brushes. Cleaning sewers cost the various cities from \$66 to \$500 a mile, the figure in most cases running about \$200 to \$400 a mile.

Concerning ventilation, most of the cities report the use of perforated manhole covers, while a number include the house stacks or soil pipes as assisting or being the chief agent in this. A number which report that main traps are not used on house connections do not report that the house connections assist in ventilating the sewer, although it would seem probable, if not practically certain, that this is the case.

ASSESSMENT FOR SEWER CONSTRUCTION

State laws, city charters and local conditions, as well as diversified views, cause considerable variation in the methods of assessing for sewer construction. In Little Rock, Ark., the law requires sewers to be constructed by improvement districts, and the assessment is made by districts. In Pueblo, Colo., assessment is on the front foot basis. The same method is employed in Hartford, Conn., for local sewers, while for intercepting sewers an appropriation is made from the general tax fund, and storm water sewers are assessed upon the total watershed. In New Haven, Conn., as assessment is made of \$1.75 per front foot of abutting property; 75 feet on one street is exempted for corner lots and odd-shaped lots are adjusted by the Bureau of Compensation. In Wilmington, Del., there is an assessment of 50 cents per front foot plus one cent per square foot of area on lots abutting on the sewer. In Chicago the en-

(Continued on page 628.)

STATISTICS OF CITY SEWERAGE SYSTEMS

TABLE No. 1 COLLECTION SYSTEM—LENGTH IN MILES OF ALL SEWERS (EXCLUSIVE OF HOUSE AND STREET INLET CONNECTIONS) AT THE CLOSE OF THE YEAR

Name of City.	FOR HOUSE SEWAGE ONLY.											Total.
	Stone.	Brick.	Brick and Concrete.	Brick and Stone.	Concrete, Plain, Built in Place.	Concrete, Reinforced in Place.	Vitrified Clay Pipe.	Cement or Plain Concrete Pipe.	Reinforced Concrete Pipe.	Iron Pipe.	All Others and not Designated.	
Little Rock, Ark.	68.0	.....	.....	.....	.....	68.0
Pueblo, Colo.	86.76	.....	.....	.....	.....	86.76
Hartford, Conn.
Meriden, Conn.	2.19	.....	.....	.....	.....	35+	.....	.....	1.17	.....	38.36
New Haven, Conn.
Wilmington, Del.
Chicago, Ill.	10.0	.....	.....	.....	.....	10.0
Decatur, Ill.
Joliet, Ill.
Rockford, Ill.	57.67	.....	.....	.....	.....	57.67
Springfield, Ill.
Terre Haute, Ind.
Cedar Rapids, Iowa	55.86	2.02	.....	.....	.....	57.88
Sioux City, Iowa	0.5	.....	.....	.....	.....	44.2	.....	.....	.....	.....	44.7
Wichita, Kan.	110.6	110.6
New Orleans, La.	352.39	.....	.....	.....	.....	352.39
Bangor, Me.
Portland, Me.	23.48	.....	.....	.....	.....	23.48
Cambridge, Mass.	25.76	25.76
Haverhill, Mass.	4.48	.....	.....	.....	.....	4.48
Lawrence, Mass.	6.66	.....	.....	.....	.....	6.66
Lowell, Mass.	1.19	.....	.....	.....	.....	1.19
New Bedford, Mass.
Newton, Mass.	10.54	.....	.....	1.13	.....	98.68	.....	.....	.....	.....	110.35
North Adams, Mass.	25.91	25.91
Springfield, Mass.	0.2	.....	.....	.....	.....	0.20
Grand Rapids, Mich.	16.08	.....	.....	.....	.....	16.46
Muskegon, Mich.
Butte, Mont.
South Omaha, Neb.
Elizabeth, N. J.
Newark, N. J.	4.19	1.19	.....	.....	.....	60.21	.....	.....	0.96	.....	66.55
Trenton, N. J.	2.72	.....	.....	.....	.....	61.26	.....	.....	.35	.....	69.27
Albany, N. Y.
Binghamton, N. Y.	0.20	.....	.....	.....	0.20
Buffalo, N. Y.
Bronx Borough, New York.	1.4	.....	.....	.....	.....	34.1	.....	.....	.....	.....	35.5
Watertown, N. Y.	6.0	.....	2.0	.....	.....	8.0
Canton, Ohio.62	.....	.....	.....	.....	67.15	.....	.....	.....	.....	67.77
Cleveland, Ohio.
Columbus, Ohio.
Portland, Ore.
Erie, Pa.
Harrisburg, Pa.
McKeesport, Pa.
Newcastle, Pa.	1.0	.....	.....	.....	.....	57.98	.....	.....	.....	.....	58.98
Reading, Pa.	109.0	109.0
Wilkes-Barre, Pa.
Williamsport, Pa.	4.98 ^b	1.38 ^b	.....	.....	.....	33.41	.....	.....	.09 ^b	.....	39.86
Providence, R. I.
Woonsocket, R. I.	1.05	.....	.....	.....	.....	18.06	.....	.....	.....	.....	19.11
Spokane, Wash.
Wheeling, W. Va.
Battle Creek, Mich.	5.69	.....	.....	.....	.....	19.51	.....	.....	.154	.....	25.51
Webb City, Mo.156	.....	14.15	.....	.....	.....	.....	14.15
Asheville, N. C.	40.0	.....	.....	.....	.....	40.0
Grand Forks, N. D.
Newark, Ohio.
Aberdeen, Wash.	7.6	.....	.....	.02	.....	7.62
Totals.	34.88	2.57	.....	6.22	0.20	1,280.08	2.02	2.0	3.12	271.27	1,602.3

Name of City.	FOR HOUSE SEWAGE AND SURFACE WATER.											Total.
	Stone.	Brick.	Brick and Concrete.	Brick and Stone.	Concrete, Plain, Built in Place.	Concrete, Reinforced, Built in Place.	Vitrified Clay Pipe.	Cement or Plain Concrete Pipe.	Reinforced Concrete Pipe.	Iron Pipe.	All Others and not Designated.	
Little Rock, Ark.
Pueblo, Colo.	4.47	.....	.....	.....	.....	.....	.....	.....	.....	.....	4.47
Hartford, Conn.	56.22	.53	.....	3.10	.05	58.05	1.83	.....	2.00	.92	122.7
Meriden, Conn.
New Haven, Conn.	42.16	.17	.22	.34	.87	59.72	14.73	.....	.04	.31	118.56
Wilmington, Del.	16.45	.....	.....	2.43 ^a	.....	69.53	.....	1.5	.68	.....	90.59
Chicago, Ill.	641.0	.....	.....	14.0	.....	1219.0	.....	.....	<i>d</i>	.....	1874.0
Decatur, Ill.	12.0	.....	.....	4.5	4.5	113.5	.....	.....	.....	.....	134.5
Joliet, Ill.	5.0	.....	.....	.....	.....	.....	31.0	.....	.....	.....	.....	36.0
Rockford, Ill.
Springfield, Ill.	40.0	.....	.....	.13	.....	26.0	.....	.....	.....	.....	66.13
Terre Haute, Ind.	16.3	.....	.....	.....	.....	39.7	.....	.....	.....	.....	56.0
Cedar Rapids, Iowa
Sioux City, Iowa
Wichita, Kan.	1.08	.....	.....	.....	.....	17.0	.....	.....	.09	.....	18.67
New Orleans, La.
Bangor, Me.	1.5	20	.....	.....	.....	.....	21	.....	.....	.....	.....	42.5
Portland, Me.	15.90	.....	.....	.....	.....	15.01	16.16	.....	.....	2.98	50.05
Cambridge, Mass.	110.62	110.62
Haverhill, Mass.	7.98	.41	.....	.....	.....	30.87	.....	.....	.....	.....	39.26
Lawrence, Mass.	18.35	1.55	.....	.....	.....	45.67	.....	.....	.....	.20	65.77
Lowell, Mass.	1.16	32.21	.....	.....	.....	.....	67.53	.....	.....	1.55	.....	102.45
New Bedford, Mass.
Newton, Mass.
North Adams, Mass.
Springfield, Mass.	26.24	.13	.....	3.66	.....	68.18	24.01	.....	.....	0.19	122.41
Grand Rapids, Mich.	21.67	.....	.....	10.40	.....	114.78	.10	.71	.....	.....	147.66
Muskegon, Mich.75	.....	.....	.....	.....	35.00	.....	.....	.75	.....	36.50
Butte, Mont.	27.0	.....	.....	.....	27.0

^a Includes reinforced concrete. ^b Includes surface water. ^c Probably includes some house sewers. ^d Fraction of a mile. ^e No record. ^f Brick and vitrified pipe. ^g Part of this (lengths unknown) are for house sewage only. ^h No information as to class of sewer.

TABLE No. 1—COLLECTION SYSTEM—LENGTH IN MILES OF ALL SEWERS (EXCLUSIVE OF HOUSE AND STREET CONNECTIONS) AT THE CLOSE OF THE YEAR—Continued

Name of City.	FOR HOUSE SEWAGE AND SURFACE WATER.											Total.
	Stone.	Brick.	Brick and Concrete	Brick and Stone.	Concrete Plain, Built in Place.	Concrete Reinforced, Built in Place.	Vitri-fied Clay Pipe.	Cement or Plain Concrete Pipe.	Reinforced Concrete Pipe.	Iron Pipe.	All Others and not Designated.	
South Omaha, Neb.	.....	.25	.....	.....	5.0	.25	16.5	.....	.....	.....	.....	22.00
Elizabeth, N. J.	.....	15.17	.....	.....	.....	.....	56.58	.....	.....	.....	.....	71.75
Newark, N. J.	0.32	63.47	0.01	.....	1.17	.....	136.07	.....	0.31	0.01	.....	201.36
Trenton, N. J.	.....	8.25	.....	.....	.62	.....	6.17	.....	.....	.16	.....	15.20
Albany, N. Y.	1.83	16.30	0.37	20.44	0.61	0.11	62.47	0.87	0.11	0.31	.....	103.42
Binghamton, N. Y.	.....	10.10	.....	.....	.....	.....	41.71	.....	.....	0.30	.....	52.11
Buffalo, N. Y.	1.6	163.46	.....	4.0	0.94	.....	345.74	.....	.....	1.60	.....	517.34
Bronx Borough, New York	.....	55.1	.....	.....	.....	.....	192.6	.....	.....	.....	.....	255.9
Watertown, N. Y.	2.0	2.0	.....	.....	.....	.....	27.0	.....	.....	.....	.....	31.0
Canton, Ohio	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cleveland, Ohio	.25	300.0	.....	.....	.....	12.0	270.0	.25	.....	1.50	.....	584.0
Columbus, Ohio	.....	81.0	4.3	.....	.....	.....	165.1	.....	1.7	.....	25.17	277.26
Portland, Ore	.....	19.42	.....	.....	.....	.....	272.46	.....	.....	.....	.....	297.94
Eric, Pa.	.....	11.43 ^c	.....	.....	.....	1.85 ^c	77.6 ^c	.....	.....	.....	.....	90.88
Harrisburg, Pa.	.09	18.0	.15	.....	.....	3.9	35.1	.44	.....	.89	.....	58.57
McKeesport, Pa.	.....	.....	4.34	.....	.....	.....	28.82	.....	.....	.....	.....	33.16
Newcastle, Pa.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Reading, Pa.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Wilkes-Barre, Pa.	.....	3.6	.....	.....	.....	.....	106.1	.....	.....	.....	.....	109.7
Williamsport, Pa.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Providence, R. I.	.....	.....	71.65	.....	.....	.....	151.68	.....	.....	.....	.....	223.33
Woonsocket, R. I.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Spokane, Wash.	.....	.28	.....	.....	.....	.....	91.78	.....	.50	.....	.....	92.56
Wheeling, W. Va.	.....	2.5	.....	.....	.....	.....	45.7	.....	.....	.....	.....	48.2
Battle Creek, Mich.	.....	.....	.....	.....	.....	.....	.41	.....	.....	.....	.....	.41
Webb City, Mo.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Asheville, N. C.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Grand Forks, N. D.	.....	2.4	.....	.....	.....	.....	17.3	1.0	.....	.....	.....	20.7
Newark, O.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Aberdeen, Wash.	.....	.....	.....	.....	2.4	.....	10.3	.....	.....	.....	.....	12.7
Totals	13.75	1,745.51	83.61	24.66	49.30	38.29	4,188.73	86.39	4.83	9.88	140.32	6,385.27

Name of City.	FOR SURFACE WATER ONLY.											Grand Total.
	Stone.	Brick.	Brick and Concrete	Brick and Stone.	Concrete Plain, Built in Place.	Concrete Reinforced, Built in Place.	Vitri-fied Clay Pipe.	Cement or Plain Concrete Pipe.	Reinforced Concrete Pipe.	Iron Pipe.	All Others and not Designated.		Total.
Little Rock, Ark.	68.0
Pueblo, Colo.	91.23
Hartford, Conn.	122.7
Meriden, Conn.	38.36
New Haven, Conn.	118.56
Wilmington, Del.	90.59
Chicago, Ill.	10.0	.....	.....	.....	10.0	1894.0
Decatur, Ill.	134.5
Joliet, Ill.	36.0
Rockford, Ill.09	2.14	.....	.....	.....	2.23	59.9
Springfield, Ill.	e	.....	.....	.....	.....	.....	.....	.....	.....	.....	66.13
Terre Haute, Ind.	56.0
Cedar Rapids, Iowa.	10.83	.....	.....	.....	.....	.....	5.83	0.40	.....	.....	17.06	74.94
Sioux City, Iowa.	4.0	.....	.....	.....	.....	2.0	14.0	.....	.....	20.0	83.37
Wichita, Kan.	41.1	151.7
New Orleans, La.	352.39
Bangor, Me.	42.5
Portland, Me.	73.53
Cambridge, Mass.
Haverhill, Mass.60	.....	.....	.....	.64	.....	.....	.....	6.64	143.02
Lawrence, Mass.73	.....	.....	.....	.....	.56	.....	.....	.....	1.24	44.98
Lowell, Mass.48	.....	.....	.....	1.77	74.20
New Bedford, Mass.	1.97	.....	.....	.....	1.97	105.61
Newton, Mass.	2.89	6.28	.....	.....	.....	.....	.....	.....	.....	.....	.....	91.89 ^h
North Adams, Mass.	3.45	.....	43.95	.....	.....	.....	56.57	166.92
Springfield, Mass.	7.35	7.35	33.26
Grand Rapids, Mich.	0.4	.....	.....	.....	.4	123.01
Muskegon, Mich.	14.42	.....	.....	.....	14.42	178.54
Butte, Mont.	4.60	.....	.....	.....	4.60	41.10
South Omaha, Neb.	1.90	.....	.10	.28	4.0	.....	.80	7.08	34.08
Elizabeth, N. J.	22.0
Newark, N. J.	0.06	2.23	.....	.....	0.70	2.49	2.36	.....	1.10	.....	8.94	276.85
Trenton, N. J.	2.17	.....	.....	1.80	.....	7.46	.....	.....	.....	11.46	95.93
Albany, N. Y.
Binghamton, N. Y.	0.24	2.50	.....	.....	.....	2.74	103.42
Buffalo, N. Y.	55.05
Bronx Borough, New York	0.3	14.8	.....	.....	.....	3.3	34.3
Watertown, N. Y.	1.5	.....	.....	.....	1.5	40.5
Canton, Ohio	9.2	.....	.....	.....	.....	13.16	.....	.....	.....	22.36	90.13
Cleveland, Ohio	584.00
Columbus, Ohio	277.2
Portland, Ore	297.94
Eric, Pa.	90.88
Harrisburg, Pa.	58.57
McKeesport, Pa.	0.10	.....	.....	.....	0.10	33.26
Newcastle, Pa.	3.0	.....	6.34	.....	.....	.....	9.34	68.32
Reading, Pa.	1.11	3.0	.....	.....	3.21	.....	8.68	.....	.....	.....	16.0	125.0
Wilkes-Barre, Pa.	109.7
Williamsport, Pa.	8.41	8.41	48.27
Providence, R. I.	9.27	.....	.....	.....	.....	.....	.....	.....	.....	234.89
Woonsocket, R. I.	e	.....	.....	.....	.....	19.11
Spokane, Wash.	7.5	.....	.....	.....	.....	100.06
Wheeling, W. Va.	48.2
Battle Creek, Mich.19	.....	.....	.53	.11	.95	.....	.....	.....	1.78	27.70
Webb City, Mo.	14.15
Asheville, N. C.	40.0
Grand Forks, N. D.	20.7
Newark, Ohio	18.3 ^h
Aberdeen, Wash.	2.2	.....	.....	.....	2.4	22.72
Totals	30.79	27.80	9.87	1.90	12.89	5.89	168.54	4.40	1.10	.03	67.60	330.81

a Includes reinforced concrete. b Includes surface water. c Probably includes some house sewers. d Fraction of a mile. e No record. f Brick and vitrified pipe. g Part of this (lengths unknown) are for house sewage only. h No information as to class of sewer.

TABLE No. 2 LENGTH IN MILES OF SEWER BUILT DURING FISCAL YEAR (EXCLUSIVE OF HOUSE AND STREET INLET CONNECTIONS)

Name of City.	FOR HOUSE SEWAGE ONLY.							Total.
	Brick.	Concrete Reinforced Built in Place.	Vitrified Clay Pipe.	Cement or Plain Concrete Pipe.	Reinforced Concrete Pipe.	Iron Pipe.	All Others.	
Pueblo, Colo.			2.5					2.5
Hartford, Conn.								
Meriden, Conn.			.741 M					.741
New Haven, Conn.								
Chicago, Ill.								
Decatur, Ill.								
Joliet, Ill.								
Rockford, Ill.			4.22					4.22
Springfield, Ill.								
Cedar Rapids, Iowa.			10.15					10.15
Sioux City, Iowa.			1.2					1.2
Kansas City, Kan.								
Wichita, Kan.			20.6		3.0			23.6
New Orleans, La.			30.77					30.77
Bangor, Me.								
Cambridge, Mass.			2.12 M					2.12
Haverhill, Mass.			.87 M					.87
Lawrence, Mass.			2.16 M					2.16
Lowell, Mass.								
New Bedford, Mass.			1.27 M					1.27
Newton, Mass.			2.53 M					2.53
North Adams, Mass.							0.33	0.33
Grand Rapids, Mich.								
Muskegon, Mich.								
Butte, Mont.				.11				.11
South Omaha, Neb.								
Elizabeth, N. J.	1.51		.91					2.42
Newark, N. J.			4.95			0.64		5.59
Trenton, N. J.			4.44					4.44
Albany, N. Y.								
Binghamton, N. Y.								
Buffalo, N. Y.			0.11					0.11
Bronx Borough, New York.			.33 M					.33
Watertown, N. Y.		1.0	.50					1.83
Cleveland, Ohio.						0.1		0.1
Columbus, Ohio.			6.31					6.31
Portland, Ore.								
Erie, Pa.			1.40					1.40
Harrisburg, Pa.								
McKeesport, Pa.								
New Castle, Pa.			1.03					1.03
Norristown, Pa.			.50					.50
Reading, Pa.								
Wilkes-Barre, Pa.								
Williamsport, Pa.			.472 M					.472
Providence, R. I.								
Woonsocket, R. I.			.67 M					.67
Spokane, Wash.								
Wheeling, W. Va.								
Battle Creek, Mich.			2.7 M					2.7
Webb City, Mo.			2.84 M					2.84
Asheville, N. C.			4.0 M					4.0
Grand Forks, N. D.								
Newark, Ohio.								
Aberdeen, Wash.								
Total.	1.51	1.0	110.29	.11	3.0	.74	.33	116.98

Name of City.	FOR HOUSE SEWAGE AND SURFACE WATER.									Total.
	Stone.	Brick.	Brick and Concrete.	Brick and Stone.	Concrete, Plain Built in Place.	Concrete, Reinforced Built in Place.	Vitrified Clay Pipe.	Reinforced Concrete Pipe.	Iron Pipe.	
Pueblo, Colo.										
Hartford, Conn.					1.19	.06	1.29			2.54
Meriden, Conn.										
New Haven, Conn.		0.06				0.12	2.44			2.62
Chicago, Ill.		15.1			.26		16 M			57.22
Decatur, Ill.							41.7			3.5
Joliet, Ill.							3.5			1.0
Rockford, Ill.							1.0			
Springfield, Ill.		1.05			.13 M		2.81			3.99
Cedar Rapids, Iowa.										
Sioux City, Iowa.						0.5				0.5
Kansas City, Kan.										
Wichita, Kan.										
New Orleans, La.										
Bangor, Me.							.60 M			.60
Cambridge, Mass.							.27 M			.27
Haverhill, Mass.							.72 M			.72
Lawrence, Mass.			.26 M				1.42 M			1.99
Lowell, Mass.							.31			
New Bedford, Mass.		0.06 M					2.0 M			2.06
Newton, Mass.						.45 M	2.89 M			3.34
North Adams, Mass.										
Grand Rapids, Mich.					1.23	.037	6.37			7.64
Muskegon, Mich.							5.5 M		.25	6.5
Butte, Mont.							.75			
South Omaha, Neb.					1.0	.25	1.0			2.5
Elizabeth, N. J.							.33			.33
Newark, N. J.							1.62			1.62

M—Work done by municipality. All other was done by contract.

TABLE No. 2—LENGTH IN MILES OF SEWER BUILT DURING FISCAL YEAR (EXCLUSIVE OF HOUSE AND STREET INLET CONNECTIONS) —Continued

Name of City.	FOR HOUSE SEWAGE AND SURFACE WATER.									Total
	Stone.	Brick.	Brick and Concrete.	Brick and Stone.	Concrete, Plain Built in Place.	Concrete, Reinforced Built in Place.	Vitrified Clay Pipe.	Reinforced Concrete Pipe.	Iron Pipe.	
Trenton, N. J.										
Albany, N. Y.					0.61		1.54			2.15
Binghamton, N. Y.							3.00	.08		3.08
Buffalo, N. Y.	1.6	0.46		4.0	.14		9.73		.003	15.94
Bronx Borough, New York						0.5	7.53			8.03
Watertown, N. Y.										
Cleveland, Ohio		3.0					14.0			17.0
Columbus, Ohio							.14	.16		.30
Portland, Ore.		0.1				6.06	103.12			109.28
Erie, Pa.										
Harrisburg, Pa.							1.4			1.4
McKeesport, Pa.										
New Castle, Pa.										
Norristown, Pa.										
Reading, Pa.										
Wilkes-Barre, Pa.		.29					{ 32 M 82			1.43
Williamsport, Pa.										
Providence, R. I.		2.89					2.63			5.52
Woonsocket, R. I.										
Spokane, Wash.							16.27			16.27
Wheeling, W. Va.							1.34			1.34
Battle Creek, Mich.										
Webb City, Mo.										
Asheville, N. C.										
Grand Forks, N. D.		.90					1.51			2.41
Newark, Ohio							0.5			0.5
Aberdeen, Wash.					1.1		1.4		.005	2.505
Total	1.6	24.16	.26	4.0	5.66	7.98	241.94	.24	.258	286.09

Name of City.	FOR SURFACE WATER ONLY.								Grand Total.	
	Stone.	Brick.	Concrete Plain, Built in Place.	Concrete, Reinforced Built in Place.	Vitrified Clay Pipe	Cement or Plain Concrete Pipe.	Reinforced Concrete Pipe.	All Others.		
Pueblo, Colo.									2.5	
Hartford, Conn.						0.8			0.8	3.34
Meriden, Conn.										.741
New Haven, Conn.										2.62
Chicago, Ill.										57.22
Decatur, Ill.										3.5
Joliet, Ill.										1.0
Rockford, Ill.				.09	.39 M .14				.62	4.84
Springfield, Ill.										3.99
Cedar Rapids, Iowa					0.41 M				0.41	10.56
Sioux City, Iowa										1.7
Kansas City, Kan.										
Wichita, Kan.		2.0			.5				2.5	26.1
New Orleans, La.										30.77
Bangor, Me.										.60
Cambridge, Mass.		.04 M	.18 M		.09 M				.31	2.70
Haverhill, Mass.										1.59
Lawrence, Mass.					.14				.14	4.29
Lowell, Mass.										2.06
New Bedford, Mass.										4.61
Newton, Mass.					.09 M				.09	2.62
North Adams, Mass.								0.17	0.17 M	0.50
Grand Rapids, Mich.					.72				.72	8.36
Muskegon, Mich.					.16				.16	6.66
Butte, Mont.								.06 M	.06 M	.17
South Omaha, Neb.										2.5
Elizabeth, N. J.										2.75
Newark, N. J.		0.03	0.46	0.58	0.14		0.21		1.42	8.63
Trenton, N. J.			.10		0.11				0.21	4.65
Albany, N. Y.										2.15
Binghamton, N. Y.					1.35		.06		1.41	4.49
Buffalo, N. Y.										15.94
Bronx Borough, New York	0.3 M			0.23	0.01 M			0.28 M	0.82	8.96
Watertown, N. Y.					.33				.33	2.16
Cleveland, Ohio										
Columbus, Ohio					.20				.20	6.81
Portland, Ore.										109.28
Erie, Pa.										1.40
Harrisburg, Pa.										1.4
McKeesport, Pa.					0.10				0.10	0.10
New Castle, Pa.					0.68				0.68	1.71
Norristown, Pa.					.25				.25	
Reading, Pa.					.23 M .12				.35	.35
Wilkes-Barre, Pa.										1.43
Williamsport, Pa.										.472
Providence, R. I.		.74			.05				.79	6.32
Woonsocket, R. I.										.67
Spokane, Wash.				.9	5.5				5.5	21.77
Wheeling, W. Va.										1.34
Battle Creek, Mich.										2.7
Webb City, Mo.										2.84
Asheville, N. C.										.1
Grand Forks, N. D.										2.41
Newark, Ohio										0.5
Aberdeen, Wash.										2.505
Total	.3	2.81	.74	0.90	11.71	0.8	.27	.51	18.04	421.11

M—Work done by municipality. All other was done by contract.

TABLE No. 3—HOUSE CONNECTIONS, INLETS AND APPURTENANCES

City.	MADE DURING YEAR.		TOTAL IN USE.		Number of Houses Not Connected.	Average Cost per Foot.	SIZES OF CONNECTIONS:		Main Traps Used.	Number of Stoppages.	NUMBER OF				
	Number.	Feet.	Number.	Miles.			Laid During Year.	In Use.			Inverted Siphons.	Manholes.	Lamp Holes.	Flush Tanks.	Flushing Water Main Connections.
Little Rock, Ark.	241	10,000	68		3,100	\$.45	4	4	No	45	33	8	130	7	
Pueblo, Col.	245	18,000				.35 to .65	4	4	No				None	None	
Hartford, Conn.	256	3,919					6	6	No	3	939	79	None	None	
Menden Conn.	106	3,328				.50	5, 6, 8 & 10	10	Yes	a	3,500b		10	20	
New Haven, Conn.	503	17,000	36		10,000b	.60	6	6	No	a	1,276	572	None	None	
Wilmington, Del.	915	13,315			290,000b	a	6	6	No	20	68,824	None	10	None	
Chicago, Ill.	11,500	a			4,600	.25	6	6	No		700	None	None	None	
Decatur, Ill.	400						6	6	No		543	360	None	None	
Toliet, Ill.	231						6 & 9		No		a		None	36	
Rockford, Ill.	362					.25	6	6	No	120b			None	None	
Springfield, Ill.	200	a			a		Average 6		Yes	10			None	15	
Terre Haute, Ind.	239	a			10,000	.20	6	6	Sometimes	10	686	a	None	None	
Cedar Rapids, Iowa.	293	23,440	76.5		3,000	.60	4	4	No	90	870	145	None	145	
Sioux City, Iowa.	375	a				.35	6	6	Yes	250b	1,050	None	None	None	
Wichita, Kan.	718		110.6		500		4 & 6	4 & 6	Yes	249	450	None	None	137	
Bangor, Me.	75						5	5	Yes				None	None	
Portland, Me.	a						6	6	Yes				None	None	
Cambridge, Mass.	191		15.365				6	6	Yes		767		None	None	
Haverhill, Mass.	200	a				.50	5 & 6		Yes	106	1,414	a	None	None	
Lawrence, Mass.	a						6	6	Yes	46	2,658		None	None	
Lowell, Mass.	168	5,000			620		5 to 8	4 to 12	Yes	337b			None	None	
New Bedford, Mass.	692	24,410				.57	5 & 6	All sizes	Yes	145			None	None	
Newton, Mass.	212	15,827.17	76.76		945	.57	5 & 6	5 & 6	No	200	3,559	None	None	None	
North Adams, Mass.	19	500				.40	4 & 6	4 & 6	Yes	1			None	None	
Springfield, Mass.	495	12,400					6	6	Yes	50b			None	None	
Grand Rapids, Mich.	1,000	a				.30	6 & 8		Optional		3,150	250	None	None	
Muskegon, Mich.	80						6	6	Yes	20b	354	None	None	None	
Butte, Mont.	172	a				1.00	6	6	Yes	10	250	None	None	35	
South Omaha, Neb.	56	3,000±	20		4,000	.40	6, 4 & 8		Yes	25b			None	None	
Elizabeth, N. J.	a					.35	6 & 4	6 & 4	Yes	103			None	None	
Newark, N. J.	1,563	50,994	44.682		None	.82	6	6	Yes	2	7,909	a	104	360	
Trenton, N. J.							6	6	Yes	2	1,507		None	None	
Albany, N. Y.							6	6	Yes				None	None	
Binghamton, N. Y.	200	a				a	6	6	Yes	20b	842	20	None	None	
Buffalo, N. Y.							6	6	Yes	27	14,312	6	None	None	
New York, Borough of Bronx.	1,443	3,000				.60	6	6	Very seld.	100			205		
Watertown, N. Y.	50		6.9				5 & 6	5 & 6	Yes	32	1,305				
Canton, Ohio.	1,489					1.05	6	6							
Columbus, Ohio.							6	6	Yes						
Newark, Ohio.						.39	6	6	Yes	a			None	None	
Portland, Ore.	200	3,164					6	6	Yes	a			None	None	
Erie, Pa.	190	a					6	6	Yes	a			None	None	
Harrisburg, Pa.	74	4,375	41b		2,500		4 to 12	6 to 12	Yes	20	570	300b	None	None	
McKeesport, Pa.	500	15,000					4	4	Yes	3	600		None	None	
New Castle, Pa.	361				3,000±	1.50	6 to 10		Yes				None	None	
Norristown, Pa.	835		35			a	5	5	Yes	10 to 15	1,690	2,683	None	None	
Reading, Pa.	1,311	a					6	6	Yes	2	9,695	None	None	None	
Wilkes-Barre, Pa.	621		21.412			.50b	5 & 6	4, 5 & 6	No	121			None	None	
Williamsport, Pa.	88	5,223	17.13				6	6	Yes	24			None	None	
Providence, R. I.	1,500	90,000	12		6,018	.70	6	6	Yes	73	2,429	534	None	None	
Woonsocket, R. I.	239	2,100	23		937		4, 6, 8, 12	4, 6, 8, 12	No	10	695	42	None	None	
Spokane, Wash.	80	10,000	20		3,000	.85	6 & 8	6 & 10	No	10	170	33	None	None	
White, W. Va.	239	10,000				1.00	4 & 6		Yes	2	825	None	None	None	
Webb City, Mo.	62	3,700b	3.6				6	6	Yes	a			None	None	
Ash Grove, N. C.						.50	6 & 4	4 & 6	Yes				None	None	
Grand Forks, N. D.	128	a				.40	4 & 6	4 & 6	Yes	a			None	None	
Newark, Ohio.	None												None	None	
Aberdeen, Wash.													115		

a Not recorded. b Estimated. c Not stated whether with or without catch basins. d Included in clogging catch basins. e Per catch basin. f Cleaned or repaired.

TABLE NO. 3. HOUSE CONNECTIONS, INLETS AND AFFLUENCES—Continued

City.	NUMBER.		SURFACE WATER INLETS.				FLUSHING BY HAND DURING YEAR.		CLEANING SEWERS DURING YEAR.				
	With Catch Basins.	Without Catch Basins.	Number Built During Year.	Number of Cleanings.	Cubic Yards of Material Removed.	Method of Removing Material.	Miles.	Total Cost.	Method.	Number of Miles.	Total Cost.	Sewer Stoppages.	Method of Ventilation.
Little Rock, Ark.	189	.....	.....	Twice a wk.	.....	Pump and shovel.	.....	.....	Rods and brushes	.....	.....	.....	House stacks
Pueblo, Col.	2,200	.....	.....	8,800	4,000	Scoops.	1.25	.....	Flush tanks and hand flushing.	.....	.....	.....	Perforated manhole covers.
Hartford, Conn.	250	.....	.....	5,000b	a	Shovel, small cars or trucks for largest sewers.	100	.....	Flushing and removing deposit at manholes.	100b	.....	1	Manhole cover, trap.
Meriden, Conn.	2,570	.....	.....	.....	.....	Shovel.	.....	.....	Flushing and by hand.	.....	.....	1	None.
New Haven, Conn.	54	1,700	.....	12	.....	Shovel.	.....	.....	Flushing, rodding and by sewer cleaning machine.	.....	\$ 3,775	.....	Manholes, by stacks.
Chicago, Ill.	75,867	None	2,197	26,281	40,000b	Shovels, buckets, scoops.	625	\$30,693.75	Flushing and scraping.	71	31,212.05	a	House drains and soil pipe.
Decatur, Ill.	756c	.....	.....	756	2	Shovel.	2	.....	Flushing with fire hose.	.....	.....	3	Perf. manhole covers.
Joliet, Ill.	1,800b	.....	.....	422	.....	Shovel and scoop.	10	.....	Rods and hose.	.....	.....	.....	Perforated manhole and lamp hole covers.
Rockford, Ill.	219	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Direct inlet.
Springfield, Ill.	None	a	None	None	None	Scoop.	a	a	Flushing.	a	a	None	None
Terre Haute, Ind.	900	None	None	a	a	.....	.....	.....	Hose	.....	.....	2	None
Cedar Rapids, Iowa.	None	None	None	None	None	.....	.....	.....	Chain	.....	.....	80	Stack.
Sioux City, Ia.	1,000	None	None	a	.....	.....	.....	.....	Flushing.	.....	.....	249	Manhole covers
Wichita, Kan.	1,150	None	8,000	.....	.....	Shovel and scoop	.....	.....	.....	.....	.....	None	Manholes
Pangor, Me.	81	100	.....	1,648	.....	Pails.	.....	.....	.....	.....	.....	.....	.....
Portland, Me.	1,000	.....	.....	1,874	2.21 lts c	.....	.....	.....	.....	.....	.....	.....	.....
Cambridge, Mass.	1,255	.....	.....	700	.....	Shovels and scoops.	.....	.....	Scraping and flushing	.....	1,834.46	a	Perforated manhole covers and catch basins.
Haverhill, Mass.	.....	3	None	62	a	.....	.....	.....	By rods and steel buckets dragged between manholes.	.....	.....	.....	.....
Lawrence, Mass.	1,364	a	93	2,760	a	Shovel.	a	a	Healey sewer machine.	a	.....	72	Perforated manhole covers and open outlets
Lowell, Mass.	3,578	None	109	All	4,200	Shovel and scoop.	2.2	246.78	Scraping with hoses and dragging chain through.	0.83	187.29	.....	Through manholes.
New Bedford, Mass.	1,092	740	63	a	3,571	Shovel, pail and pump.	.....	.....	.....	.....	.....	.....	Perfor. manhole cover.
Newton, Mass.	2,408	Not known	4	2,404	4,568	Shovels and buckets.	.....	8.34	.....	.....	.....	.....	Ventilating pipes and
North Adams, Mass.	.....	10	8	1,000	4,000	Shovel and pail.	.....	140.00	Flushing.	107.87	66.32 per mi.	None	perforated manhole covers.
Springfield, Mass.	.....	.....	.....	.....	.....	Shovel and scoop.	.....	.....	Scrapers and flushing.	.....	\$ 2,438	.....	Manhole covers, inlet basins and house drains.
Grand Rapids, Mich.	5,000	.....	125	10,000	a	Shovel.	a	2,439.36	Machines.	a	4,300.92	125	Manhole ventilation.
Muskegon, Mich.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Perfor. manhole covers.
Butte, Mont.	50	158	None	200	a	Shovel and bucket, scoop.	75	a	Sewer rods and flushing.	.....	.....	.....	Ventilating pipes and
South Omaha, Neb.	200	100	35	150	.....	.....	None	None	Rods, brushes, flushing, pick and shovel.	.....	.....	10	perforated manhole covers.
Elizabeth, N. J.	.....	.....	.....	.....	.....	.....	.....	.....	By hand.	.....	.....	.....	Manholes
Newark, N. J.	3,506	None	63	5,227	8,957	Shovel and pail.	.....	a	.....	48	16,052.68	.....	Perfor. manhole covers
Trenton, N. J.	200	600	12	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Albany, N. Y.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Binghamton, N. Y.	1,312	None	74	1,342	1,100	Scoop.	a	a	Sewer cleaning machine.	1.5	188.40	2	Three manhole tops.
Buffalo, N. Y.	4,927	Few	150	24,418	686	Spoon shovel.	1	41.06	Sewer cleaning machine and root cutter combined.	9.5	2,179.85	30	Perforated manhole covers.
New York (Borough of Bronx)	3,829	.....	204	7,525	18,764	Shovel and buckets into carts.	a	a	Shovels and flushing.	150.8	21,469.61	68	Manholes.
Watertown, N. Y.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Manholes & catch basins.
Canton, Ohio.	660	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Columbus, Ohio.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Newark, Ohio.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Portland, Ore.	.....	.....	.....	.....	.....	Shovel	.....	.....	.....	.....	.....	.....	.....
Eric, Pa.	.....	.....	.....	.....	.....	Shovel	.....	.....	.....	.....	.....	.....	.....
Harrisburg, Pa.	2,040	None	74	10,000b	3,500	Scoops.	a	a	By hand and stream from fire hydrant.	.....	.....	a	Perforated manhole covers.
McKeesport, Pa.	600	.....	.....	7,200	3,600	Buckets	.....	.....	.....	.....	.....	.....	.....

a Not recorded b Estimated c Not stated whether with or without catch basins d Included in cleaning catch basins. e Per catch basin. f Cleaned or repaired.

TABLE No. 3—HOUSE CONNECTIONS, INLETS AND APPURTENANCES—Continued

City.	SURFACE WATER INLETS.				FLUSHING BY HAND DURING YEAR.		CLEANING SEWERS DURING YEAR.					
	NUMBER	Number Built During Year.	Number of Cleanings.	Cubic Yards of Material Removed.	Method of Removing Material.	Miles.	Total Cost.	Method.	Number Miles.	Total Cost.	Sewer Stoppages.	Method of Ventilation.
New Castle, Pa.	350	10	600	.....	.....	.....	.....	.....	.....	.....	10	.....
Norristown, Pa.	.....	.....	650	.....	Shovel.	.....	.....	Special appliances	.....	250	.....	Perforated covers and ventilating traps.
Reading, Pa.	.....	.....	.....	.....	.....	.....	.....	By cable and buckets	.....	.....	.....	Tees and manholes.
Wilkes-Barre, Pa.	a	a	a	a	Shovel and scoop.	.....	.....	Ropes and brushes.	.....	.....	.....	Manholes.
Williamsport, Pa.	1,200b	15	7,058	15,411	Buckets lifted by hand into steel carts.	20.7	3,251.40	Scraping with buckets.	.....	2,104.64	15	Manholes.
Providence, R. I.	5,216	111	.....	.....	.....	.....	.....	Flushing.	.....	.....	.....	Manholes.
Woonsocket, R. I.	2,502c	.....	2,000	2,500	.....	.....	.....	Endless chain scrapers.	10	250	20	Manholes
Spokane, Wash.	.....	.....	.....	.....	.....	.....	.....	Hose.	.....	.....	.....	Perforated manhole and catch basin covers.
Wheeling, W. Va.	119	12	714	360	Shovel and scoop.	5	.....	Rods and scoops worked by derrick.	4.8	130	56	Manholes
Battle Creek, Mich.	10	.....	.....	.....	Shovel, scoop and pump.	209	125	Pipe hose connected to fire hydrants. Rods.	7.5	.....	.....	Manhole covers and house stacks to roof.
Webb City, Mo.	None	.....	.....	.....	.....	.....	.....	.....	.....	.....	10	Soil and vent pipes in houses and perforated manhole covers, lamp holes and flush tanks
Asheville, N. C.	None	.....	.....	.....	.....	.....	.....	Flushing.	.....	.....	.....	Manholes.
Grand Forks, N. D.	751c	.....	751	.....	.....	.....	.....	Sewer cleaning machine.	.....	.....	None	Manholes.
Newark, Ohio.	a	a	a	a	Scoop.	a	a	Flush tanks equipped with Miller Automatic Siphons.	.....	a	1	Manhole covers.
Aberdeen, Wash.	60c	.....	475	594	.....	.....	.....	.....	.....	40	65	Manholes, lamp holes.

tire cost of construction is paid by assessment, on the frontage and area basis. In Springfield, Ill., there is a special assessment for laterals and a general assessment for main sewers. In Terre Haute, Ind., all construction is paid for from the general tax levy. In Sioux City, Ia., sanitary sewers are assessed against adjacent property and storm water sewers against the city at large. In Bangor, Me., abutting owners pay three-fourths of the cost and the city at large one-fourth. In Haverhill, Mass., abutting property pays 20 cents per front foot and 0.4 cent per square foot for a depth of 150 feet. In Lawrence, Mass., abutting property pays 6½ mills per square foot for 100 feet back from the street line, and more remote areas pay \$10 per lot of 5,000 feet area. In Lowell, Mass., the city one-half and the abutting property one-half of the total cost. In New Bedford, Mass., trunk sewers are paid for from the general taxes, and the city and the abutting property each pays one-half of the cost of laterals. In Newton, Mass., abutting property pays 15 cents per lineal foot of frontage and 0.55 cent per square foot of drainable area within 180 feet of the street. In North Adams, Mass., an entrance fee is charged for making house connections—\$15 for dwelling houses, \$10 for each tenement and \$10 per tenant for business blocks. In Springfield, Mass., much the same plan has been adopted, but \$25 is charged for a single tenement house and for other buildings one cent per square foot of building area or 1¼ cents per square foot if of more than two stories. In Battle Creek, Mich., the cost is assessed by the front foot, running from 60 cents to \$1 per foot. In Grand Rapids, Mich., a special assessment is made on the district benefited, and this is the practice in Muskegon also. In Butte, Mont., outlet sewers are paid for from the general fund and district sewers by the abutting owners. In South Omaha, Neb., the practice is the same as in Butte. In Elizabeth and Trenton, N. J., the cost of construction and the "benefit" derived therefrom are assessed against abutting property. In Albany, N. Y., the cost is assessed against the entire drainage area. In Binghamton, N. Y., the assessment is 80 cents per lineal foot, 40 cents per lineal foot for corner lots. In Watertown, N. Y., the property benefited is assessed the entire cost for all sewers up to 10 inches in diameter; sewers larger than this are assessed the estimated cost of a 10-inch sewer, the city at large paying the balance. In Asheville, N. C., abutting property pays for the sewer in three annual installments. In Cleveland, O., assessment is by the front foot up to \$2 and anything over this is paid from bonds. In Columbus, O., the assessment is the "benefit to abutting property." In Newark, O., the assessment is by the front foot. In Erie, Pa., the total cost is assessed by the front foot rule. In Harrisburg, Pa., about \$1.25 per front foot is assessed against the abutting property and the balance out of general revenue or loan funds. In Reading, Pa., the sewers are paid for from a general revenue. In Wilkes-Barre, Pa., the sewer is paid for from the general revenue and the city charges \$10 per family for permits. In Providence, R. I., the assessment is 60 cents per front foot and one cent per square foot for 150 feet back, or to the rear of the lot if less than this.

MAINTAINING SEWERS

In the majority of cities there is no special assessment or tax for maintaining sewers, but this is paid for by the city at large, sometimes by a special appropriation but more commonly out of the regular appropriation for the department. In Grand Rapids, Mich., the maintenance is paid out of the ward highway tax. In Williamsport, Pa., the annual charge of \$2.00 per connection is intended, we believe, to cover maintenance as well as interest on the cost of construction.

SEWAGE TREATMENT

Meriden, Conn., has a natural sand area divided into fourteen beds, two of which are used each twenty-four hours, each bed thus being dosed once a week. The beds are cleaned each week before being dosed. The total cost of this plant was \$10,000. The average amount of sewage fed is about 2¾ mil-

(Continued on page 632.)

TABLE NO. 4 - DEPARTMENT IN CHARGE AND FORCE EMPLOYED

NUMBER OF CITY EMPLOYEES, AVERAGE OF ENTIRE YEAR.

City.	DEPARTMENT, BUREAU OR OFFICIAL IN CHARGE OF		SUPERINTENDENTS		ENGINEERS.		FOREMEN AND INSPECTORS.		MECHANICS AND OTHER SKILLED LABORERS.		TEAMSTERS.		LABORERS, UNSKILLED		ALL OTHERS.	
	Construction.	Maintenance.	No.	Salary.	No.	Salary.	No.	Salary.	No.	Salary.	No.	Salary.	No.	Salary.	No.	Salary.
Little Rock, Ark.	Supt. Public Works	Supt. Public Works	{ 1 C 1 M	{ \$ 150 125	1 C 1 M 1/2 C	{ \$ 50 75	1 1/2 C 2 M 1 C	2 M					2 M	\$36.00		
Pueblo, Colo.	Engineering Dept.	Engineering Dept.														
Hartford, Conn.	Dept. of Engineering	Street Dept.	1 M	1,800	3 C	1,200	6 C	1,160								
Meriden, Conn.	Board of Public Works	Board of Public Works	1													
New Haven, Conn.	Dept. of Public Works	Dept. of Public Works	1 M	1,800	3 C	{ 1,000 2,000	3 C	4.50					2 M	{ \$2.00 to 2.50		
Wilmington, Del.	Street and Sewer Dept.	Street and Sewer Dept.	1 M	11.00	1 M	5.00	5 C & M	3.00					100 C&M	3.50	1 D	2.50
Chicago, Ill.	Board of Local Improvement	Bureau of Sewers	2 a	2,000	17 P	4.13	43 M	4.00					58 M	3.05	11 M	\$3.50
Decatur, Ill.	Water and Sewer Inspector	Water and Sewer Inspector	No regu lar force				2	100					3	2.33		
Joliet, Ill.	City Engineer	Supt. of Streets														
Rockford, Ill.	Supt. of Sewers	Supt. of Sewers	1 C										8 C			
Springfield, Ill.	Dept. of Public Works	Supt. of Sewers											1 M	2.10		
Terre Haute, Ind.	Board of Public Works	Board of Public Works	2 M	100	3 C	100	10 C	2.50					20 M	2.00		
Cedar Rapids, Iowa	B'd of Public Improvements	B'd of Public Improvements	1 M	3.33	2 C	90	8 C	60.00					2 M	2.00		
Wichita, Kan.	City Engineer	Sewer Inspector					1 M & C	125.00					3 M & C	4.00		
Bangor, Me.	Supt. of Sewers	Supt. of Sewers	1 M & C	1,250			4 C	3.00					4 C	4.00		
Haverhill, Mass.	Highway Dept.	Highway Dept.					1 M	2.50					1 M	2.25		
Lawrence, Mass.	Supt. of Streets	Supt. of Streets					4 C	3.75					2 C	2.25		
Lowell, Mass.	Supt. of Streets	Supt. of Streets	1 M & C	1,400			4 C	3.25					4 M	2.25		
Newton, Mass.	Street Commissioner	Street Commissioner	{ 1 C 1 M 1 C	{ 1,200 1,200	2 C 1 P 1/2 tie	{ 2.25 2.25	2 C 1 M	2.25					3 C	2.25		
North Adams, Mass.	Commissioner of Public Works	Commissioner of Public Works	{ 1 M 2 M & C	{ 3,500 2,000	1 C	1,200	2 M	2.50					1 C	1.85		
Springfield, Mass.	Sewer and Engineering Dept.	Sewer Dept.			6		3									
Grand Rapids, Mich.	City Engineer	Board of Public Works	1 M		1 M		3 M	19 wk.					6 M	40c hr.		
Muskegon, Mich.	City Engineer	Supt. Sewers and Water	1 M		2 C		2 C						2 C			
Butte, Mont.	City Engineer	City Engineer	1 M part of time		1 M part of time	5.00	1 M	3.50					1 M	3.50		
South Omaha, Neb.	City Engineer	City Engineer	{ 1 C 1 M	{ 150	4 C	100	4 C	500.00					2 C	50.00		
Elizabeth, N. J.	City Surveyor	Street Commissioner			2 C	1,500	1 C	9.00					2 M			
Newark, N. J.	Dept. of Sewers and Drainage	Supt. of Sewers	1 M		4 M		4 M						8 M			
Trenton, N. J.	City Engineer	City Engineer	1 P		3 to 10 C		3 M						3 M			
Albany, N. Y.	City Engineer	Commissioner of Public Works			1 M		1 M						5 C			
Binghamton, N. Y.	Bureau of Engineering	Bureau of Engineering			3 C	125 mo.	{ 3 C 2 M	\$3.00					5 C	3.50		
Buffalo, N. Y.	Bureau of Engineering	Bureau of Engineering	3 P		{ 1 Asst. Eng. C. 3 P	2,400	1 M	1,200					4 P	2.50	3 P	2.00
Mt. Vernon, N. Y.	Dept. of Public Works	Dept. of Public Works	1 D	5.95		3.50	1 D	2.75					3 D	2.50	2 D	2.50

C—Means employed on construction; M—Employed on Maintenance; D—Employed at disposal plant; P—Employed at pumping plant. a Includes engineers. b During the season. * Firemen. † Inspectors

TABLE No. 4—DEPARTMENT IN CHARGE AND FORCE EMPLOYED—Continued

City	DEPARTMENT, BUREAU OR OFFICIAL IN CHARGE OF		NUMBER OF CITY EMPLOYEES, AVERAGE OF ENTIRE YEAR													
	Construction.	Maintenance.	SUPERINTENDENTS		ENGINEERS.		FOREMEN AND INSPECTORS.		MECHANICS AND OTHER SKILLED LABORERS.		TEAMSTERS.		LABORERS UNSKILLED		ALL OTHERS.	
			No.	Salary.	No.	Salary.	No.	Salary.	No.	Salary.	No.	Salary.	No.	Salary.	No.	Salary.
New York, Bronx.....			{ 1 C 1 M 1 P }	.....	3 C 3 M 2 P	{ 3.00 1,100 2,000 }	14 M 3 C 1 M	.....	5 M	.....	4 M 20 C 4 M	.....	49 M 40 C 20 M	.....	4 M	.....
Watertown, N. Y.....	Board of Public Works.....	Board of Public Works.....	{ 1 C 1 P }	{ 1,500 1,800 }	2 P 4 C	{ 1,100 2,000 }	25 C	4.00	.....	3.75	2 M	2.00	30	2.00	.....	.....
Cleveland, Ohio.....	Dept. of Sewers.....	Dept. of Sewer Maintenance.....	1 C	1,800	1 M	2,000	2 M	4.50	3 D 11 P	4.50	.....	.....	2	2.00	83 to 125	.....
Columbus, Ohio.....	City Engineer.....	City Engineer.....	1 C	.....	1 C	80 to 110	.....	.....	.....	60.00 60 to 100	.....	.....	2	2.00	2 D	.....
Portland, Ore.....	Eng'r. of Sewers and Bridges.....	Eng'r. of Sewers and Bridges.....	1 C 1 M	1,500	1 C	1,800	25 to 60c	1,200	.....	1,200	1 M	75.00	4 P 16 M	2.00 75.00	2 D 7 C	80 to 125
Erie, Pa.....	City Engineer.....	City Engineer.....	2 M	3.50	2 C	5.00	7 C	3.50	.....	3.50	.....	.....	.....	2.00	.....	.....
Harrisburg, Pa.....	Highway Dept.....	Highway Dept.....	1 D	.....	1 D	.....	1 M	.....	.....	.....	1 M	.....	4	16c hr.	.....	.....
McKeesport, Pa.....	City Engineer.....	Street Dept.....	1 M	1,200	1 C	2,000	1 M	.....	2 M	.....	.....	.....	4 M	.....	.....	.....
New Castle, Pa.....	City Engineer.....	Street Commissioner.....	1 M	100	1 C	45 to 85	.....	250 to 3.50	.....	4.50	.....	3.00	.....	2.00	.....	1.50
Norristown, Pa.....	Borough Engineer.....	Borough Engineer.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Reading, Pa.....	City Engineer.....	City Engineer.....	All work	except	mainten	ance done by contract	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Williamsport, Pa.....	City Eng'r and Supt. Sewers.....	City Eng'r and Supt. Sewers.....	1 C	2,000	3 C	1,400	4 C	2.75	5 C	2.50	.....	5.00	15 C	1.65	.....	.....
Williamsport, Pa.....	Dept. of Engineering, City Eng.	Street Commissioner.....	{ 1 M 1 D 1 P }	.....	1 C	123	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Providence, R. I.....	Commissioners of Pub. Wks.....	Commissioners of Pub. Wks.....	{ 1 M 1 P }	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Woonsocket, R. I.....	City Engineer.....	Sewer Commissioners.....	10 a	.....	.....	.....	15	{ 3.25 to 5.00 }	.....	.....	.....	.....	.....	.....	.....	.....
Spokane, Wash.....	Dept. of Sewers.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3.00	.....	.....
Wheeling, W. Va.....	Engineering Dept.....	Engineering Dept.....	{ 3 C 3 M 1 C 1/2 title }	{ 2.25 1,800 1,800 }	.....	.....	.....	.....	.....	875	.....	50c hr.	3 C	17 1/2 hr	.....	.....
Battle Creek, Mich.....	Board of Public Works.....	Supt. Sewers.....	1 C	1,100	2 C	1,100	2 C	875	2 Cb	450	2 M 1 to 3 Cb	4.50	15 to 100 20 to 22c hr.	1 C	55c hr.	.....
Webb City, Mo.....	Engineering and Street Dept.....	.....	2 a	{ 1,800 960 }	.....	.....	4	2.25	1	2.50	2	1.85	2	1.75	.....	.....
Asheville, N. C.....	City Engineer.....	Sanitary Plumber.....	1 M	100	1 C	.....	2 C	{ 3.00 }	3 M	1.75	.....	.....	3 M	1.25	.....	.....
Grand Forks, N. D.....	City Engineer.....	Street Commissioner.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Newark, Ohio.....	Dept. Public Service.....	Dept. Public Service.....	.....	.....	.....	.....	.....	.....	.....	.....	1 M	.....	.....	.....	.....	.....
Aberdeen, Wash.....	Engineering Dept.....	Engineering Dept.....	.....	.....	1	2,100	.....	.....	1	18 wk.	.....	.....	.....	.....	.....	.....

C—Means employed on construction; M—Employed at disposal plant; P—Employed at pumping plant; a Includes engineers. b During the season. * Foremen. † Inspectors.

TABLE No. 5—VOLUME AND DISPOSAL

City.	DAILY DISCHARGE DURING YEAR. GALLONS. TOTAL SEWAGE.			Method of Estimating or Measuring Quantity.	Is Sewage Purified?	Discharges Into	Number of Outlets.
	Average.	Maximum.	Minimum.				
Pueblo, Colo.					No		3
Hartford, Conn.					No	River	9
Meriden, Conn.	2,750,000		2,600,000	Gauged measurements at the outlet at disposal farm.	Yes	River	1
New Haven, Conn.	3,500,000	4,000,000	3,000,000	Based on water supply.	No	Harbor and Sound	9
Chicago, Ill.	480,000,000	537,000,000	423,000,000	From water supplied by pumping stations.	No	River	160b
Joliet, Ill.					No	River and creek	40
Rockford, Ill.						River	28
Springfield, Ill.						River	9
Terre Haute, Ind.	6,950,000 (a)	8,850,000 (a)	5,050,000 (a)	Current meters.	No	River	10
Cedar Rapids, Iowa.	2,200,000				No	River	3
Sioux City, Iowa.	(a)				No	River	8
Bangor, Me.					No	River	22
Haverhill, Mass.					No	River	35
Lawrence, Mass.					No	River	17
Lowell, Mass.					No	Rivers	32
Newton, Mass.	3,000,000	6,000,000	1,066,000	Weir measurements.	No	Metropolitan sewers	1
North Adams, Mass.					No	River	7
Springfield, Mass.					No	River	11
Battle Creek, Mich.	3,000,000 b				No		15
Grand Rapids, Mich.	(a)	(a)	(a)		No	River	7
Webb City, Mo.					No		2
Butte, Mont.	(a)				No	Creek	2
Elizabeth, N. J.					No	Rivers	29
Newark, N. J.					No	River and bay	17
Trenton, N. J.	18,000,000			Computed from Kutter's formula.	No	River	1
Binghamton, N. Y.	4,000,000			Weirs in sewer outfalls.	No	Rivers	15
Buffalo, N. Y.	130,000,000	180,000,000	110,000,000		No	Rivers and creek	
Mt. Vernon, N. Y.	2,000,000 b			Weir at disposal works.	Yes	Creek	1
New York (Bronx)					No		20
Asheville, N. C.					No	River	4
Grand Forks, N. D.					No	River	7
Cleveland, O.					No	Lake and river	
Columbus, O.	12,900,000	17,900,000	2,500,000	Venturi meter	Yes	River	1
Portland, Ore.					No		
Harrisburg, Pa.	7,000,000	8,000,000	6,000,000		No	River	36
McKeesport, Pa.	4,742,500				No	Rivers	34
New Castle, Pa.	6,000,000	16,000,000	5,000,000		No	River	2
Norristown, Pa.						River	1
Reading, Pa.	4,700,000			Weir measurement.	Yes	River	1
Wilkes-Barre, Pa.	(a)	(a)	(a)		No	River	10
Williamsport, Pa.					No	River	3
Providence, R. I.	19,790,000	50,000,000 b	8,000,000 b	By comparison of pumping records	Yes	Harbor	1
Woonsocket, R. I.					Yes	River	1
Aberdeen, Wash.					No	Rivers	7
Spokane, Wash.	6,250,000			By velocities and depth of flow.		River	10
Wheeling, W. Va.	13,600,000			By water pumped.	No	Creek and river	

(a) No record.
(b) Estimated.

TABLE No. 6—PUMPING SEWAGE

City	Is Sewage Clarified Before Pumping?	Kind of Pumping Plant.	Average Static Head.	Gallons Pumped During Year.	Pumping Station Expenses.
Chicago, Ill.	No	Seven plants, various kinds. Modern plants have steam operated submerged centrifugal pumps	Varies in different Stations.	18,520,000,000	\$67,250.00
Sioux City, Iowa.	No	Two steam centrifugal pumps. Capacity, 3,000 gals. per minute.	15	(a)	
Newton, Mass.	No	Two 2½-in. centrifugal pumps operated by two 6-horsepower gasoline engines.	28.75	12,141,322	630.00
Newark, N. J.	Yes	Steam plunger pumps, 30,000,000 gal. per day.	16	5,326,365,684	17,421.68
Buffalo, N. Y.	No	7x3x10-in. vertical compressor, 18-in. suction, centrifugal pump.	15	3,500,000,000	12,047.21
		8½x17x12-in. vertical compressor, 24-in. suction, centrifugal pump.	25	500,000	
		10½x20x14-in. vertical compressor, 30-in. suction, centrifugal pump.		gal. per day	
Mt. Vernon, N. Y.		Two centrifugal pumps, motor driven.			
		East Side Station, gas, two 10-in. centrifugals.	60		5,117.09
Columbus, Ohio.	Yes	Main Station, steam, two 12-in. centrifugals, three 20-in. centrifugals.	25		19,530.01
Reading, Pa.	No	Steam; two duplex, compound condensing plunger pumps. Snow-rated 10,000,000, actual 7,000,000 gal., 24 hrs	35	1,425,000,000	
Providence, R. I.	No	Three vertical, triple expansion, condensing engines, each running two 24-in. centrifugal pumps, connected by rope drive.	27	6,819,000,000	
Woonsocket, R. I.	No	8-in. centrifugal pump.	20.5		

lion gallons a day. All over this amount is treated in overflow beds, about 250 million gallons having been so treated during the past year. The amount of sewage is determined by gauging at the outlet of the sewage farm.

In New Haven, Conn., about 48,000 gallons a day from the almshouse runs into a collecting tank having a capacity of about 8,000 gallons, where it remains for an average period of four hours. The larger particles are caught by a wire basket in a manhole between the buildings and the collecting tank. About six times a day the tank is emptied onto sand filters. The sludge runs onto beds when enough has accumulated to make this advisable. Very little sludge collects, however.

From the collecting tank the sewage flows onto six intermittent sand filters having a combined net area of 21,600 square feet and a depth of 5½ feet. These are artificial beds of sand on crushed stone underdrained. One-half of these beds were built in 1898 and the remaining half in 1910. During the past year an average of 48,000 gallons per day was applied to the beds, the maximum quantity being about 56,000. In dosing, the sewage flows onto each bed for twelve hours, and then is given two and one-half days' rest. Each bed is ordinarily cleaned as soon as it is dried during each resting period.

At Providence, R. I., the sewage is treated by chemical precipitation, which is preceded by screening at the pumping station. There are four large precipitation tanks and sixteen finishing tanks, the total capacity of all of these being 11 million gallons. The average daily quantity of sewage applied was about 19¼ million gallons. From these was removed an average of 4,089 gallons of sludge per million gallons of sewage. About 700 pounds of lime were used per million gallons. The effluent is discharged into tide water and the sludge is carried down the bay and dumped into deep water. The cost of chemical treatment was \$23,617.06 or \$3.36 per million gallons. In addition to this the cost of sludge treatment and disposal was \$29,661.92, or about \$4.22 per million gallons of sewage treated.

At Woonsocket, R. I., there are five intermittent filters of sand and screened gravel having a net filtering area of 170,390 square feet, 5 feet deep. The first of these was built in 1898, and extensions have been added at intervals since then. The average daily quantity applied was 730,535 gallons. This flows for about six hours at a dose, each bed being used one day out of five. The beds are raked over every time after having been used.

In Mount Vernon, N. Y., the sewage is first received in five septic tanks, which have a total capacity of 1½ million gallons. Only two or three of these are in use at one time. The average daily quantity of sewage treated was about two million gallons, the average length of time remaining in the tanks about eight hours. About two-thirds of a cubic yard of sludge collected in these tanks per million gallons of sewage. The tanks have not been run long enough to learn how often they will need emptying, but Manager Hammond thinks this will probably be every four to six weeks. The sludge is buried in trenches.

The effluent from the five septic tanks is treated on five sprinkling filters having a total net area of 1¼ acres and a depth of about 8 feet. The filtering material is broken stone. This plant was built in 1908 to 1910, the cost of tanks and filters and pumping station being about \$140,000. The sprinkling filters received about 1,800,000 gallons per day on the average, the maximum amount being 2,200,000 gallons. There are about 400 nozzle sprinklers to the acre, which act under a head of 9 feet.

In Reading, Pa., the sewage first passes through a cylindrical screen and then to a settling tank having a capacity of 1½ million gallons. The average amount of sewage treated is four million gallons and the average length of stay in the tank is about nine hours. About 3.22 cubic yards of sludge are produced per million gallons of sewage, and about 50 per cent of the total solids is removed from the sewage by the tanks.

These tanks are emptied every six weeks, and the sludge is pumped into lagoons.

Two sprinkling filters receive the effluent from the settling tank, each of these having a net filtering area of one acre. One of these beds is of broken stone and the other of iron slag, each about 5 feet deep. They were constructed in 1907 and 1908 at a cost of \$35,000 and \$45,000 respectively. The average daily amount of sewage applied to the beds was 2½ millions gallons per acre per day. The effluent passes through settling basins having a capacity of 300,000 gallons. The total cost of maintaining the beds is given as \$3 per day.

The sewage of Columbus, Ohio, is coarse-screened, and then flows through two settling and six septic tanks, the former having a total capacity of eight million gallons and the latter of four million gallons. One-half of these tanks are used at one time. The average quantity of sewage treated per day in 1910 was 12.9 million gallons, and the average length of stay in the tanks was seven hours. About 0.55 ton of sludge was produced per million gallons of sewage, and 62 per cent of the total solids was removed from the sewage. These tanks were emptied five times during 1910 during flood stages of the river, the sludge being discharged into the river and disposed of by dilution. The cost of these tanks was \$66,730.

There are four sprinkling filters, each being an equilateral triangle in shape, having a total net filtering area of 10 acres, 5½ feet deep. The filtering material is crushed limestone. These beds were constructed in 1907 and 1908 at a cost of \$240,000. During 1910 they received an average daily quantity of 1.46 million gallons per acre, the maximum amount being 2½ million gallons per acre. The sewage is applied through sprinklers, the head being from 6 to 8 feet, having been uniform most of the time, although it may be varied up to 10 feet. The final effluent is settled in two basins 4 feet deep, each with a capacity of two million gallons.

DISPOSAL OF NIGHT SOIL

This is in charge of the Board or Department of Health in Wilmington, Del.; Chicago, Ill.; Terre Haute, Ind.; Cedar Rapids, Ia.; Lowell, Mass.; Grand Rapids, Mich.; Butte, Mont.; Reading, Pa.; Providence, R. I., and Wheeling, W. Va. In Battle Creek, Mich., it is in charge of the Board of Public Works; in South Omaha, Neb., of the garbage master, and in Asheville, N. C., of the sanitary inspector. The other cities made no report concerning this. In the majority of cities the removal is done by parties employed by the house holder; the exceptions being Asheville, where all is removed by the city once in two weeks; South Omaha, where about one-third of it is removed by the city an average of once in six months; Grand Rapids, where all is removed by this city; Battle Creek, where it was removed last year from 186 premises an average of once every two weeks, and Cedar Rapids, where about 4 per cent was removed by the city last year.

The city destroys this material in garbage crematories or incinerators in Wheeling, McKeesport and Terre Haute. In McKeesport the city charges 15 cents per barrel for incinerating it. The cost in Terre Haute is given as 50 cents per ton. In South Omaha the city disposes of that which it collects by dumping it into the river. In Butte it is buried in trenches at the city dump. In Grand Rapids it is disposed of on the dumping grounds, the house holder being charged 50 cents per barrel for removal; this city removed and disposed of 21,523 barrels last year. In Battle Creek the city removed about ten tons, which it disposed of on farms as fertilizer. The same use is made of it by private collectors in Lowell. In Cedar Rapids both the 800 cubic feet collected by the city last year and the 21,000 cubic feet by private contractors were dumped into the river. The charge made to the house holder was 10 cents per cubic foot. In Chicago the material is deposited in the public sewers by scavengers, for which they are charged 10 cents per cubic foot. Night soil was removed from about 10,000 premises in this city last year. In Wilmington about 74,000 cubic feet of material was hauled to pits. The house holder is charged 10 cents per cubic foot for the service.

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S. W. HUME, President

J. T. MORRIS, Manager. A. PRESCOTT FOLWELL, Secretary

A. PRESCOTT FOLWELL, Editor

F. E. PUFFER, Assistant Editor

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MAY 3, 1911.

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Control of Garbage Disposal

IN the abstract on another page of a paper by Professor Jordan the opinion is expressed that a municipal Board of Health should not be burdened with and have its funds diverted to the removal of garbage, which, in the author's opinion, is not a matter of sanitation, but merely one of municipal house-keeping. There are other very cogent reasons why this service, and the related one of ash and rubbish removal, should not be in the hands of the Board of Health. In the popular mind, and rightly we believe, members of the medical profession are considered best fitted for positions on the Boards of Health; but medical men are not often experienced in such practical

matters as the maintaining of large forces of men and teams such as are required for this work, nor in the mechanical engineering involved in the destruction of refuse by incineration or of garbage by utilization plants. We believe that the great advance in the disposal of garbage which has taken place during the past few years has, to a large extent, been due to the placing of the control of this in the hands of the city engineer or of a consulting engineer making a specialty of this work, rather than in those of the Health Department, as was formerly the practice.

This does not mean that the odors and general nuisance too often created by garbage and ashes are of no importance, but rather that it is a matter which should be controlled by the general police power of the city and remedied by the experience of practical men rather than of physicians on Health Boards.

Essentials of Sewage Purification

The essential features of tank and filter purification of sewage (which includes practically all methods other than sterilization), are the removal of polluting matters in suspension and in some cases an appreciable proportion of those in solution; the modification in the tank or filter of the matters so removed, and the removal of this matter either by the automatic action of the filter itself or by withdrawing it through valves, by pumps, etc. The effects produced by the filter may be divided into two general heads, that produced upon the effluent and the character of the matter voided or removed.

In a settling tank the suspended matter is removed by sedimentation, occasionally assisted by chemicals. In the fine grain filter the removal is largely effected by straining action. In coarse grain filters, such as sprinkling filters and contact beds, the removal is due partly to straining but mostly by surface adhesion to the filter particles and partly by sedimentation upon their top surfaces. In slate beds the last named is the principal form of removal.

The action of bacteria and other vegetable and animal life, together with a certain amount of oxidation and other chemical change, may produce a considerable modification in the character and form of the matter retained in the bed or filter. In fine sand filters there seem to be few living agents other than bacteria acting to produce this result. In coarse grain filters and slate beds, however, larvæ (as of the moth fly found in the Philadelphia experiments described elsewhere in this issue), earth worms and other animal life of the lowest forms; algae of various kinds and bacterial jelly all play their part in changing the organic matter removed into that having many of the characteristics of loam rich in organic matter, and little if any more objectionable to the senses. In the sedimentation tank there is little change in the matter deposited, except that due to septic action which takes place in the so-called septic tank. The latter gives a sludge less slimy and otherwise objectionable and easier to handle than fresh sludge; while that which has been worked over in the Emscher tank seems to have been reduced still further and to approximate in its nature the humous-like material found in slate beds. The matter strained out by the fine grained filter usually remains upon or very near the surface and when dried frequently resembles the dry, flaky cakes which form on wet clay when exposed to a hot sun. The organic matter from a sprinkling filter bears more resemblance to dry leaves, although thicker, being compared to leather by some.

This question of the character of the matter removed from the filter is a very important one in relation to the disposition which is to be made of it; and this disposition is one of the most important and difficult questions now confronting the designer and operator of sewage disposal plants. The humous or leathery matter from slate beds, Emscher tanks and sprinkling filters does not present nearly so many difficulties in its final disposal as the slimy liquid mass removed from precipitation tanks, or the somewhat less objectionable material from the septic tank.

Of only less importance in this connection are the methods

which must be employed for removing this matter from the tank or filter. As stated, it remains almost entirely upon the surface of fine grain filters and is easily removed by spades. That which collects in slate beds is usually flushed out by hose or other vigorous streams of water. Deposits in the sprinkling filters usually dislodge automatically at intervals and can be collected from the effluent in a settling basin with little difficulty or inconvenience. The sludge from settling and septic tanks is usually either pumped out or drawn onto beds by gravity. Probably the most difficult of all is the removal of this matter from contact beds, since it seems to be generally necessary to remove all the filter media from the beds and clean them by hose or otherwise.

In the past, most of the attention of investigators was paid to the character of the effluent obtained, and not enough to the difficulties of removing and disposing of the solid matters which collect in the plant. It is possible that this is to some extent responsible for the too general tendency of those who are placed in charge of the sewage treatment plants to fail to keep them up to a proper working condition; and it is hoped that with the study of this feature of the maintenance of such plants and the progress which is being made in removing or ameliorating the difficulties, together with an appreciation of the importance of proper maintenance and the employment of a higher grade of superintendents for this purpose, the actual operation of sewage disposal plants in this country will in the future more nearly approximate the intentions and promises of the designers.

For Better Sewerage Construction

In most branches of municipal and other construction there has been a great improvement in recent years in the materials and methods used and in minor details looking to greater perfection. Public funds have been appropriated and talent of a high order has been devoted toward working out better methods of sewage treatment, and more recently of disposal of sewage by dilution. But there appears to have been little change made in the collecting system for either house or storm water, as to either the main conduits or the appurtenances, if we except the adaptation of reinforced concrete to the former.

It may be said in extenuation of this that the materials which have been used for years are as satisfactory as can be expected, and that no change is necessary, and in a general way there is much truth in this. On the other hand, there frequently occur conditions where the sewer conduit requires special construction but does not often receive it; such as wet ground, where water-tightness is desirable.

The sewer conduit is buried beneath the surface of the street, and generally deeper and more inaccessible than any other sub-surface structure. It is therefore a matter of only ordinary economy and common sense to make sure that the materials and methods of construction are such as to obviate any future necessity for repairs due to a breaking of the sewer because of weakness, to gradual disintegration of the material or to wearing out of the invert. These practical precautions are as important as designing adequate capacity or securing sufficient, uniform grade to prevent deposits. Because of the difficulty of rectifying errors and because of the great importance to the health and convenience of the citizens of the uninterrupted serviceability of a sewerage system, there is, perhaps, no place where experimenting with doubtful materials or methods is more out of place or likely to prove more disastrous.

Unfortunately there seems to be an impression in the minds of many city officials and even engineers that, because there are available for sewer conduits for ordinary conditions comparatively cheap materials which are sufficiently serviceable, no conditions justify any great expense for sewer conduits. No one complains against the cost of iron pipe for water mains, which is much more expensive than the cost of the vitrified sewer pipe for removing this same water through a

house sewerage system; but should the presence of a large amount of ground water make it desirable to secure an impervious conduit there is great hesitancy and frequently absolute refusal to spend a few cents a foot additional in securing tight joints; although there is no question that it is possible to make perfectly tight sewer joints, nor that the failure to do so threatens the pollution of soil and ground water with sewage and adds greatly to the expense required for treating sewage; this latter point being especially likely to be overlooked when treatment is not immediately necessary.

Concerning the appurtenances of sewerage systems there seems to be even more necessity for more thoughtful consideration of the requirements and adaptation of the means to the end. We have frequently referred to the fact that catch basins are used in connection with surface water inlets more commonly than is necessary, and further argument in support of this is given in the statistics printed in this issue, these showing that most of the basins in the sixty cities reporting are not cleaned oftener than once or twice a year, and a considerable percentage of them are apparently never cleaned at all. Chicago reported 26,281 basin cleanings last year, the total number of basins being nearly 76,000. A basin is of little service if not cleaned at least three or four times a year; consequently, not more than 8,000 basins are giving real service in Chicago, and about 68,000 have been built in Chicago which are unnecessary, or at least are giving no returns; and if we assume these to cost but \$25 each (additional to the cost of a plain inlet) we have an expenditure of \$1,700,000 which was not only unnecessary but (since an uncleaned basin is a collector of filth and a disseminator of odors) is actually detrimental. We select Chicago as an illustration not because it is exceptional but because it is one of the few large cities which have the highly commendable habit of collecting statistics concerning the operation of its sewerage system. In another article we refer to the design of surface water inlets and to the fact that there are, perhaps, no more absurd and ineffective devices used by the Borough of Manhattan than its inlet openings.

To mention only one other appurtenance of the sewerage system which would seem to merit more attention than it has received, the ordinary method of making house connections or of locating the branch pipes for such connections appears to need improvement. Not much concerning this reaches the public print, but we know that in scores of cities it is impossible to find house connections a few years after the sewer has been constructed; or, at least, they are not found, and plumbers make more or less successful attempts at breaking open the sewer and connecting the house drain therewith, frequently producing a cracked pipe, a leaky joint and a deposit of cement in the bottom of the sewer and projecting drain pipe which form obstructions to the flow.

Modern science has made great progress in improving upon the older methods of sewage disposal, garbage disposal and other kindred problems. The questions connected with the sewer conduit are not as pressing, perhaps, but such as they are they are of even greater importance and should receive equally wise and careful attention. In no municipal structure is it truer that "the best is none too good."

UNDERGROUND STORM SEWER OUTLET

All the storm and waste water of a considerable area of the City of Reading, Pa., which is collected by sewers, was designed to discharge into a well at a street intersection, at the bottom of which was a seam in the underlying rock into which the water disappeared for three years after the construction of the well. A few months ago this well caved in, the dirt filling up the crevices so that they refused to take the water any longer. Efforts to locate other wells so as to avail of similar crevices proved unsuccessful, and the only solution was to construct a sewer to discharge into the river. We have previously referred to similar instances in other cities, but they are sufficiently unusual to make them of some interest.

SPRINKLING FILTER EXPERIMENTS

At Philadelphia Experiment Station—Various Kinds and Sizes of Media—Growths On and In Filter Beds—
Effect of Ventilation—Clogging and Unloading—Hypochloride as Cure for Clogging

AMONG the experiments in sewage purification conducted at the Philadelphia sewage experiment station, those upon sprinkling or percolating filters received the most attention. Fourteen sprinkling filters were operated, a battery of six being out of doors, and two large ones, a battery of five small ones and a Hamburg filter, being inside the building.

The six outside filters each had an area of 0.002 acre, and were arranged in three pairs, each pair forming a square in the center of which was a Columbus nozzle. These filters contained the following filtering media: No. 1, seven feet of $\frac{3}{4}$ -inch to 3-inch limestone; No. 2, eight feet of $2\frac{1}{4}$ -inch to 4-inch limestone; No. 3, five feet of 1-inch to 3-inch slag; No. 4, six feet of 1-inch to 3-inch trap; No. 5, three feet three inches of $\frac{1}{2}$ -inch to $2\frac{1}{2}$ -inch gravel, during the first part of the experiments, and the same depth of $1\frac{1}{2}$ -inch to 3-inch trap during the second half; No. 6, four feet three inches of $\frac{1}{2}$ -inch to $2\frac{1}{2}$ -inch trap. The filters were built on a concrete foundation, the floor of each sloping so as to concentrate the effluent at the outlet. Wooden posts and planking form the sides of and partitions between the units.

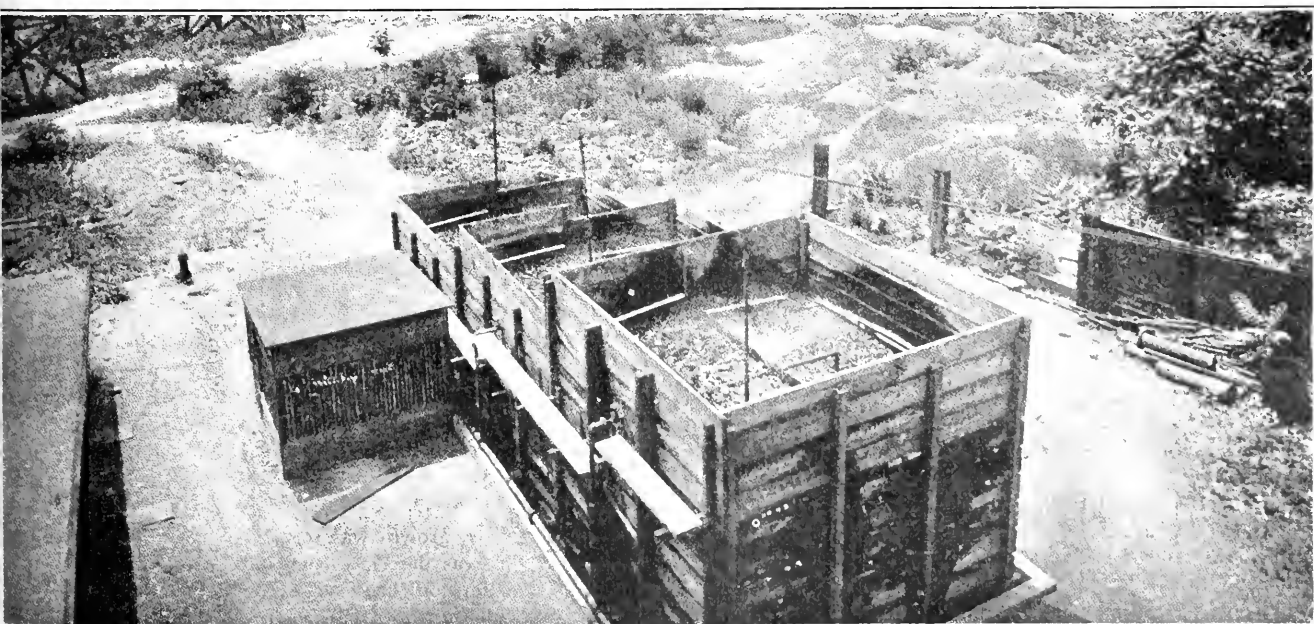
These filters received a sewage which had been roughly settled in a wooden tank, from which it flowed under a constant head through a 3-inch pipe to a dosing tank. This consisted of a cylindrical wooden tank, the inlet of which was controlled by a float valve and the outlet by a shear valve, both of which were operated by a float and weighted lever in such a way that the tank was alternately filled and automatically emptied. The bottom was given the approximate form of a frustum of an inverted cone, by bricks placed in the bottom of the tank; the object of this being to improve the uniformity of distribution upon the beds.

Of the two large indoor filters, one was 0.01175 acre in area and six feet deep above the underdrains, the filtering medium being hard clinker rejected by a $\frac{1}{2}$ -inch screen, the underdrains being formed of slabs of old concrete pavement. Taylor square nozzles were used during the first part of the test, and Reading nozzles during the latter part. The sewage applied was previously screened through $\frac{1}{2}$ -inch and $\frac{1}{4}$ -inch screens. A constant head was maintained in the dosing tank. An undulating

head upon the nozzles was obtained by a butterfly valve in the pipe line, the lever of which was controlled by a cam which was revolved by an over-shot water wheel. The other of the two large filters contained 6 feet 6 inches of hard stone, broken by hand into sizes ranging from $\frac{3}{4}$ inch to $1\frac{1}{2}$ inches. The drains were composed of 6-inch split vitrified pipe, with lugs on the edges. Over the central main drain 12-inch by 24-inch slates were laid, and on them three 4-inch vitrified pipes perforated by $\frac{1}{4}$ -inch holes were stood in a vertical position as ventilators, and other ventilators were placed along the sides composed of the underdrain tile. At three feet depth these ventilating pipes were connected together by horizontal 3-inch perforated pipes. The vertical ventilators extended to the surface of the filter material, where circular terra cotta caps were cemented on. This ventilating system connected at one corner to a 6-inch galvanized iron chimney, upon whose top was a cowl so arranged as to always produce an upward draft, with the intention of always drawing air from above the surface of the filter down through the ventilating system. The main drain was trapped at the outlet to prevent air entering there. Two Taylor nozzles were used, and an undulating head upon them was obtained in the same way as in the case of the other filter. The cam for this filter, however, was so designed that the nozzle was playing almost the entire time.

To study the effect of the nature of the filtering material upon the results, a battery of five small filters was used, these containing common marbles (spheres), gravel (spheroids), broken trap (irregular), broken slag (irregular), and broken coke (irregular), which had passed a $\frac{5}{8}$ -inch screen and been rejected by $\frac{1}{2}$ -inch. These were placed on a false floor of $\frac{1}{4}$ -inch mesh wire screen. Each of these small filters was dosed from a tipping tray.

The so-called Hamburg filter was constructed in a wooden tank of eight square feet area. The bottom was of sloping concrete, upon which was placed 2 feet 4 inches of clinkers, ranging in size from "fist to child's head," the spaces between the top layer being filled with $1\frac{1}{8}$ -inch clinker. On this was placed a distributing medium, a 4-inch layer of $\frac{3}{8}$ -inch to $1\frac{1}{8}$ -inch clinker, and on this 4 inches of $\frac{1}{8}$ to $\frac{3}{8}$ -inch coke and



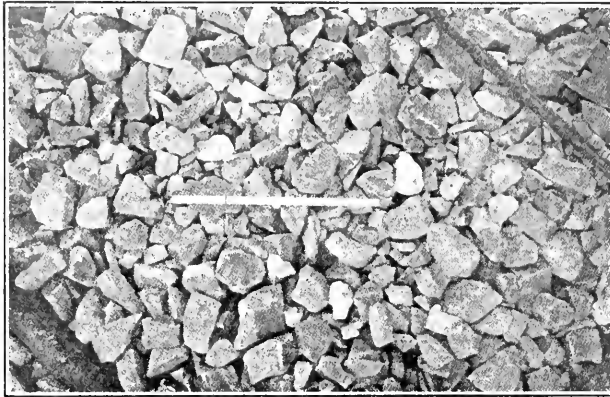
OUTSIDE SPRINKLING FILTERS, PHILADELPHIA SEWAGE EXPERIMENT STATION

1½ inches of 1-25 to ½-inch coke. One-inch holes were bored around the tank below the distributing layers to furnish ventilation, and this was also secured through the effluent openings.

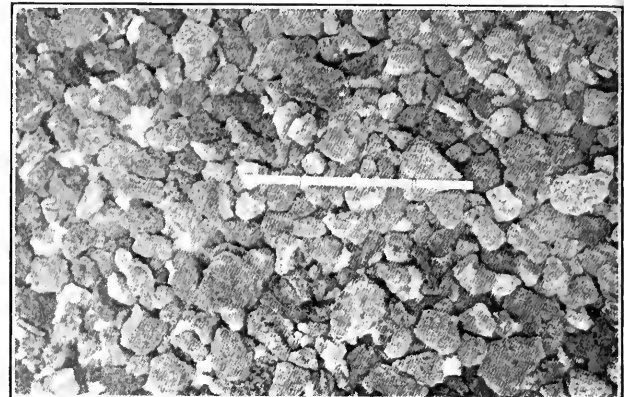
In general the rate on the outside filters was approximately one million gallons per acre per day. During the winter the rate was slightly increased, not by applying more sewage in a given time, but by the reduction of the area in service caused by the formation of ice in the corners of the filter. The tests generally seemed to show that, neglecting other factors, the maximum rate at which a filter can be economically operated is in inverse proportion to the amount of suspended solids applied. Owing either to the better underdrainage system or to the ventilating system, or both, the lower of the two inside filters,

favored the retention of both solids and bacterial jelly to such an extent as to make it very difficult to prevent clogging, and the unloading of the digested solids was less readily effected also.

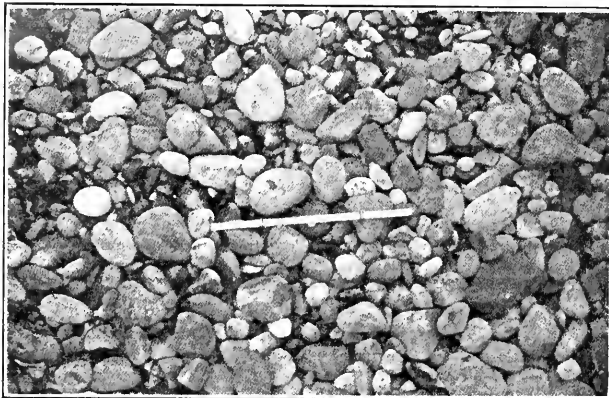
During these tests the size of limestone particles was reduced to a considerable degree by either a breaking down or dissolving of the limestone. To a certain extent the slag particles were also reduced in size. The trap rock showed very little change. Approximately the limestone in bed No. 1 changed from an average of 2 inches to an average of 1½ inches, and that in bed No. 2 from an average of ¾ inches to an average of 2¼. The slag in No. 3 changed from an average of 2½ inches to an average of 1½.



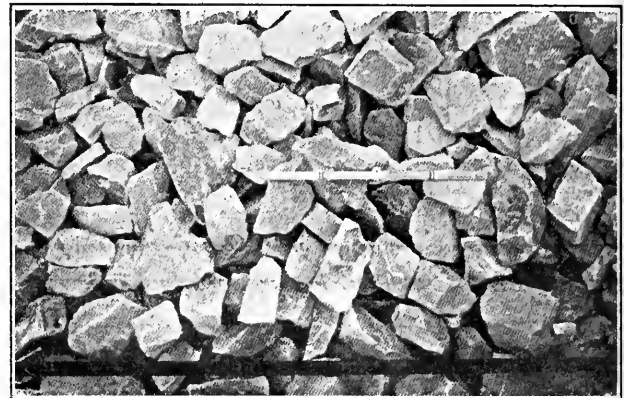
½-INCH TO 2½-INCH TRAP.



ONE-INCH TO 3-INCH SLAG.



½-INCH TO 2½-INCH GRAVEL.



2½-INCH TO 4-INCH LIMESTONE.

MEDIA USED FOR SPRINKLING FILTERS.—SCALE ABOUT ONE TO TEN.

although operated at a higher rate than the outside filters, produced a better effluent. This result was also probably assisted by a better protection from the weather, the more perfect distribution and better preparation of the applied sewage.

All observations tended to show that biological action is most efficient when regular, and that the sprinkling filters gave the best results when the sewage was applied continuously at a uniform rate over the entire area. This was found impossible of attainment with a fixed head on the nozzles, but was quite closely approximated by the use of the falling head, and especially by the undulating nozzle pressure described above. With this cam in service, although the spray alternately approached and receded from the nozzle, thus giving brief periods of rest to each part of the filter, and the volume discharged varied with the head, this occurred at such short intervals that the effluent left the filter at a practically constant rate, the pimple formed by the hook gauge at the weir used for measuring the effluent varying so little that it was impracticable to read the fluctuation.

A comparison of the various media showed that the smooth, rounded gravel did not retain a growth of bacterial jelly as well as did the limestone and trap, did not remove the impurities as effectively, and was generally less desirable. At the other extreme was the slag, which, with its rough, porous surface,

A peculiarity of the slag was the growth, upon the surface of the bed, of algae, known as cyanophyceae-oscillaria. A similar growth of algae had been found to take place on a slag bed at Reading, Pa. Another peculiarity of the slag was the fact that it apparently retained heat longer than the other media, or else created heat by some internal action; this being indicated by the fact that the slag bed resisted the formation of ice upon its surface much longer than the others.

As we have had occasion to suggest in a previous issue, there would appear to be considerable information as to the working of filter beds to be derived from a study of the algae and other growths which occur upon them. Aside from the bacterial jelly, which is found to cover the media to a greater or less depth there appeared at different times upon several of the beds several different kinds of growths. The most striking of these was a luxuriant growth of pink gelatinous material which followed the clogging and pooling of the filters. (Probably the same or a similar growth was that observed at Dorking, England, where it was described as a pinkish-yellow filamentous growth. In Kingston, England, a short, fibrous, gray growth appears annually on the surface of the filter between November and March, forming an almost impervious mat.) On outdoor filter No. 5 a layer of material resembling a mat of wool fibres

increased in bacterial jelly formed between the upper layer of stones and the ones immediately beneath, which seriously decreased the surface aeration of the bed and also its porosity.

The clogging of the filters seemed to be confined to the upper inches of most of the beds, the exceptions being the slag bed, which sludged up to a depth of 16 inches, and the fine trap bed, where the worst clogging was confined to the upper 3 inches. In most of the beds large quantities of larvæ were found, probably those of the moth flies which are found in enormous quantities around most sprinkling filters. These larvæ were found adhering to the cleaner stones within the top foot. They were especially numerous in the lower indoor bed, which was provided with the special aerating pipes, large numbers of the stones below the depth of 3 inches being covered by very active white larvæ.

As was shown some time ago by the special experiments at Waterbury, Conn., an examination of these beds at the end of the test indicated that there had been no lateral sub-surface distribution, as all of the stones in the corners of the beds which were not reached by the spray were perfectly clean.

The ventilated indoor bed gave excellent results, better than any of the others, but in spite of this the experimenters believe that there is not sufficient variation in the action of the filter under these two conditions (with and without the special ventilators acting) to show conclusively any distinct advantage due entirely to the use of ventilating appliances, although it is believed that ventilation will distinctly benefit and render uniform the action of the various parts of a percolating filter, and that its absence might tend to foster clogging or reduce the effectiveness of a filter in spots." We do not understand from this just what the conclusion on this subject was, unless that ventilation is very desirable, but that this particular method of curing it may have been unnecessarily elaborate.

One of the important features of the operation of a sprinkling filter is its automatic unloading, or voiding of digested suspended matter. Unless this takes place periodically the bed will clog and become more or less impervious. The methods employed at the testing station for securing this cleaning out of the beds were five: (1) Resting the beds, in order that the accumulated matter should dry sufficiently to desquamate and be washed out by the ordinary discharge from the nozzle; (2) washing the filter with water from a fire hose under pressure; (3) applying dry bleaching powder to the surface; (4) applying a strong solution of bleach through the filter nozzles; and (5) continuous disinfection of the influent.

The first method involves no expense, and with a well-constructed bed of uniform-sized large particles was successful in warm dry weather, but not in winter. The use of water jets under pressure removed large quantities of solids and left the bed in good condition, but it would require two or three men to manage the hose, would require probably a day for each acre, and the use of 100,000 to 150,000 gallons of water per acre. The use of dry bleaching powder, while successful, was not economical, but the application of a strong solution of bleach to the influent at the rate of two tons of powder per acre was found to be quite successful. The continuous disinfection of the influent maintained the filter in perfect condition, and supported the claims made for it by Dr. Rideal; it would require inexpensive apparatus and the same services for an attendant as is required for disinfecting water supplies. This bleach was found to destroy and eliminate in an hour or two the pink growth previously referred to. At one time when the lower indoor filter had been badly clogged it was entirely cleared in five hours by applying to the influent 850 pounds of bleach per acre. (This clogging followed about a week after the discontinuance of the ventilation system.)

When the beds unloaded after a rest it was found that the coarse trap bed unloaded the best, the process being a steady, even discharge of solids, which continued for quite a time. The coarse limestone, due to its large voids, easily yielded the stored solids, while the slag bed, probably due to the porous nature of the medium, which allowed the slimy deposit to take a firmer

hold upon it, discharged the solids only after several hours' service, and in less amount than the small-sized trap rock. The fine limestone, on account either of its depth or of the small size of the voids, or other unknown causes, discharged very little of the stored matters.

At once after the unloading in the spring the quality of the effluents all improved. This might not be entirely due to the rest and unloading, but partially to the increasing temperature stimulating biological activity. This unloading took place after the accumulation of solids during the winter, when the biological activity was at a minimum; and it was found that there was a slight continuation of the unloading for several weeks after the first maximum voiding of stored matter.

The upper indoor filter was operated to determine whether it is possible to operate a fine media bed, over which roughly screened sewage is well distributed, by properly arranged resting periods and raking. It was judged from this experiment "that it is not practicable to apply a poorly prepared influent to a sprinkling filter, expecting to maintain it by rest and rakings, on account of the low rate of operation and high cost of maintenance, together with the inequality of the effluent over extended periods."

Concerning the removal of bacteria, it was found that each of the beds removed on the average from 75 to 87 per cent., although during the period of unloading the numbers in the effluent were in excess of those in the influent. At times the percentage ran above the nineties for several weeks at a time.

It was believed that, although fats are very resistant substances, in the beds having the greatest bacterial action, at least, the fats were oxidized, as less of such matter was found in the effluent than in the influent, and none was found stored in the beds at the end of the experiments.

Concerning the stability of the effluents, the report contains the following:

The object of the sprinkling filter is to render stable the putrescent matters of sewage. Over long periods of time it ought not to remove solids, for in order that such a filter shall not become clogged it must unload the accumulated matter, and thus establish an equality between total suspended solids in the influent and effluent.

Also many substances nitrogenous or carbonaceous in their composition and therefore reported in the analyses under organic nitrogen or oxygen consumed, are stable, and not acted upon in transit through the filter; therefore, to preserve the permanence of the filter, they should be thrown off.

The measure of the putrescence of sewage is its avidity for oxygen. An effluent which requires but little oxygen from the stream into which it may be discharged will continue to improve as the stream flows on, regardless of the stable organic matter contained in said effluent.

For these reasons much weight should be given to the determination of relative stability of sprinkling filter effluents.

Comparing the general action of the fine limestone bed and the coarse trap bed, it was concluded that the oxidizing power of the seven-foot bed of coarse trap was equal to that of the eight-foot bed of fine limestone; and the almost perfect condition of the trap at the end of the test, as compared with the slightly clogged condition of the finer limestone, was much in favor of the shallower and coarser bed.

Apparently about the only conclusion of importance from the operation of the Hamburg filter was that it is impossible to maintain a sufficiently high rate with this method of distribution. After one week of service the upper or distributing layer of coke was so clogged with the suspended solids and colloidal matter that sewage stood continuously on the surface, and this layer did not seem to unload itself. It was found that the fine coke was embedded in a gelatinous mass, forming an almost impervious layer.

The suspended solids in sprinkling filter effluents are either granular or flakey. In August they averaged 29.5 per cent mineral matter from one bed and 35.5 from another. Settling for a nominal storage of two hours in a horizontal tank proved sufficient to remove a large part of the suspended solids and yield a uniform effluent.

NEWS OF THE MUNICIPALITIES

Current Subjects of General Interest, Under Consideration by City Councils and Department Heads—Street Water Works, Lighting and Sanitary Matters—Fire and Police Items—Government and Finance

ROADS AND PAVEMENTS

Movement for Good Roads to Be Made National.

Phoenix, Ariz.—Governor R. E. Sloan has been asked to issue a call for a good roads convention, which, it is hoped, will be the beginning of an attempt to institute a movement, national in scope, for the construction of a transcontinental highway. This highway, it is understood, is to secure the backing of the automobile manufacturers throughout the United States, and of this support the movement is already assured.

Oiling the Streets

Kingston, N. Y.—Street Superintendent Simpson has given Albany avenue a coating of oil to lay the dust. An experiment in the calcium chloride treatment for laying dust will be tried under the direction of the Street Superintendent on Railroad avenue in the near future. A representative of a Syracuse concern is anxious to make the test, and Railroad avenue was chosen as combining all kinds of traffic.

Old Bridge Caves In

Trenton, N. J.—A section of the South Warren street stone bridge about 8 by 50 feet in area caved in last week. All of the sidewalk and part of the roadway on one side fell in. The structure is 50 feet in length and 75 feet wide.



Courtesy Daily State Journal, Trenton, N. J.

LEAKAGE FROM SEWER BREAKS DOWN OLD BRIDGE

It is believed that the structure was made weak by leakage from a sewer. The main portion of the bridge was built in revolutionary days and the passageway was constructed in 1822.

Sidewalk Laying Will Be Pushed with Vigor

Altoona, Pa.—Mayor Hoyer has announced that the annual sidewalk crusade has been inaugurated and will be pushed vigorously throughout the summer. The daylight patrolmen were given a number of notices to be served during the present week, and next week a special officer will be delegated to give his entire time and attention to the sidewalk work. The work will be pushed vigorously in every ward of the city, wherever new walks are needed. The notices that are served by the officers give the property owners ten days in which to award contracts and get the work under way, and it was stated by the Mayor that where the property owners fail to comply with the notices the walks will be laid by the city and the property owner compelled to pay for it under the provisions of the city ordinances. There are already some on the list who failed to comply with the notices last summer, and their walks will be promptly laid by the city authorities.

Plan Boulevard System

South Bend, Ind.—An elaborate municipal boulevard system which may eventually extend north to St. Joseph Mich., is now proposed by the South Bend Board of Park Commissioners. The improvement, which would mean the beginning of a boulevard park system for the city, is made possible in the new powers of park boards of second-class cities. The added power is the result of laws which were adopted during the last session of the State Legislature. The plan for a boulevard system in South Bend and its ultimate extension through Southern Michigan to Lake Michigan was launched at a recent meeting of the Park Board. The boulevard as discussed would have its inception on the north side of the river at the dividing lines of South Bend and Mishawaka, continuing west to the west bank of the St. Joseph River, and thence north along the river to the beginning of Riverside Drive. This pretentious thoroughfare would form a portion of the boulevard, it is planned, continuing through Leeper Park and following the river bank to Mosquito Glen Bridge, four miles north of the city.

City Paving Work Completed

Puyallup, Wash.—The street paving contract has been completed and the Warren Construction Company is shipping the remnants of its plant as fast as possible to different parts of the country. The first paving was laid in Puyallup in November, 1909. In all, the company has spent 18 months in the city doing the work. It was impossible to work constantly, however, because of weather conditions. Puyallup now has about 75,000 square yards, or approximately 6½ miles, of paved streets. The work has been done at a cost to the city of about \$250,000.

Contractor Took Liberties

Altoona, Pa.—Mayor Hoyer caused his policemen to stop repairs to the paving destroyed several weeks ago by the breaks in water pipes, because the contractor was selling the old bricks and proposed to use new ones in the repairs. Mayor Hoyer maintains the old bricks belong to the city, unless the contractor is going to use them in the repairing. The City Solicitor has been asked for an opinion.

For Auto Road

Hamilton, Mont.—The Hamilton Chamber of Commerce has about completed arrangements for the launching of a campaign, which, if successful, will result in the establishment of a park to park highway under federal, state and county control, and connecting the Yellowstone National Park with the Glacier National Park. The road, if built, will be about 450 miles in length, and will cross six or seven counties. As planned it will traverse the entire length of the Bitter Root Valley, passing through Missoula, then across the Flathead reservation along the east side of Flathead Lake, and then to Glacier National Park. The road will pass through approximately 40 towns, connect two military reservations and cross four great railroads. Passing as it would through much of Montana's scenic country the road will furnish abundant opportunities for tourists. At the present time the road is well defined, and needs only to be united and some sections built.

Move for Good Roads

Bowling Green, Ky.—Good roads projectors of Tennessee and Kentucky met here last week to frame plans for the completion of the Lincoln-Jackson way. A large delegation of Tennesseans, headed by 500 citizens of Nashville, assured the Kentuckians they will be ready to go on with the highway as soon as the Kentucky section of the road reaches the State line. It is planned to extend the Lincoln-Jackson way from Mammoth Cave to Nashville via Bowling Green and Franklin, over the old Louisville and Nashville Pike.

SEWERAGE AND SANITATION

Important Contracts for Sewers Are Begun

Syracuse, N. Y.—Work is now in progress on three of the most important contracts of the general intercepting sewer improvement. Young & Douce started driving piles in Sawatha avenue for the foundation of the north section of the Harbor Brook intercepting sewer. The C. T. Hookway Construction Company is nearly ready to place concrete for a part of the southern section of the same improvement and concrete is being placed in Wallace street and North Franklin street on the Onondaga Creek intercepting sewer. The first work south of West Onondaga street on the Onondaga Creek sewer will be started in a few days. The tunnel under West Onondaga street has been finished and an open trench will be excavated through the property of the Delaware, Lackawanna & Western Company between West Adams and Onondaga streets as the first section.

Public Meeting to Talk Sewage

Hasbrouck Heights, N. J.—That the sewerage question is a live issue was made known at a recent Council meeting, when Mayor A. C. Austin was authorized to call, at his pleasure, a public meeting to discuss the matter. As a preliminary Mayor Austin will talk upon the sewerage question at the next meeting of the Borough League Forum.

State Board Orders Sanitary Measures

Oil City, Pa.—The citizens of Oil City have been instructed by Dr. Dowling, of the State Board of Health, to immediately clean up their town, provide better drinking water, improved street drainage and enforce sanitary and health rules in restaurants and other public service establishments. Lemargarine, Dr. Dowling states, has been served for butter, and canned milk mixed with water for dairy milk has been popularly served.

Important Additions to Sewer System Necessary

Buffalo, N. Y.—A system of sewers that will cost the city several millions of dollars is now claiming the attention of the Board of Councilmen. The tough question is: How are they to be paid for? Commissioner Ward, who proposes the building of this system, recommends that it be made a general fund charge, and the Board of Aldermen has approved his recommendation. A majority of the Board of Councilmen voted in committee to approve it, but at least ten members believe they should be paid for by local assessment levied in the sewer districts benefited. As recommended by the Commissioner, an enabling act will be necessary to issue bonds to pay for the sewers in the first instance. He favors spreading the payment over a long period of years and creating a sinking fund for that purpose. If the Mayor signs a majority report that probably will be adopted the bill will be sent on to Albany as soon as it can be prepared. "The bill would be broad enough," says the Commissioner in his communication, "to cover the necessary general improvements, but guarded against the inclusion of local sewers."

Pure, Clean Food in Seattle

Seattle, Wash.—Seattle now has an ordinance making the strictest kind of regulations concerning clean food. The whole matter has been put under the control of the Health and Sanitation Department. The "bakery ordinance" requires a bakery, candy kitchen, restaurant or confectionery to apply to the Commissioner of Health for a permit, which is to be issued only after the Commissioner of Health has caused to be inspected all the fixtures and appliances to be used. The requirements for light, ventilation, cleanliness and the attire of workers where food products are prepared are very strict. The workmen are required to file certificates to be approved by the Commissioner of Health. The use of tobacco in the workrooms is forbidden. An ordinance requires screening of all prepared foods—that is, foods which are not necessarily to be cooked before eating. The Health Department makes a bacteriological examination of milk of all the more important dairies every month, and a chemical examination every few days. This method, the Health Commissioners report, has almost entirely changed the character of the city's milk supply.

Property Holders Refuse to Use New Sewers

Millville, N. J.—Complaint has been made to the State Board of Health that, although Millville has erected a sewage disposal plant at the cost of about \$25,000, a number of property holders refuse to connect with the city system, but are still using a private sewer which dumps into Maurice River.

Sewage Disposal Plant of New Britain

New Britain, Conn.—The expenditure on the sewage disposal plant to date is approximately \$100,000, and probably before the city will fully accomplish its purpose another sum nearly equal will have to be paid out. The filtration plant is troubled considerably on account of iron in the sewage and the beds filter 6,000,000 gallons of sewage, when they were primarily designed to filter 3,000,000 gallons. The trouble caused by the presence of iron in the sewage will probably be the reason for early action on the subject.

Will Investigate Cost of Sewers in Other Cities

Macon, Ga.—The Mayor has appointed a special committee that will make an investigation into the cost of sewers in other cities as compared with the expenses here. The committee will visit Atlanta, Memphis, Birmingham and other cities so as to obtain the facts and figures first hand. The investigation will be made at once, as Council has suspended the sewer work for only thirty days.

City Gets a Premium on Sewer Bond Issue

Syracuse, N. Y.—City Comptroller M. E. Monahan has received payment for the \$100,000 intercepting sewer bonds which were sold to Curtis & Sanger, of Boston, April 13. The money was deposited and will be at the disposal of the Intercepting Board. The bid on which the bonds were sold was \$103,301.11 and accumulated interest. The interest for twenty-three days from the date of the issue of the bonds is \$287.50, which, with the premium of \$3,301.11, amounts to \$3,588.61. The bonds bear 4.5 per cent interest, but the premium reduces the interest to a basis of 4.09 per cent, and if the use of the premium by the city is considered the interest charge is reduced to 4.01 per cent. The same price was paid for the \$100,000 of park improvement bonds, which, according to the bond agents, is the highest given for municipal bonds in the last eighteen months. This fact, Comptroller Monahan pointed out, speaks well for the credit of the city. In all, twenty-six firms bid, four offering over \$3,300 premium, six of the others offering over \$2,800 and only two offering less than \$2,000.

Plans for Milk Exhibit

Philadelphia, Pa.—Upward of 300 persons, many of whom represented civic societies, attended a conference at the Mayor's office recently in the interests of a milk exhibit soon to be held in this city. Dr. Joseph S. Neff, Director of the Department of Public Health and Charities, presided at the conference. Much enthusiasm was manifested by those present, who assured Dr. Neff the heartiest co-operation in promoting the forthcoming exhibition. The milk exhibition, which will be one of the most unique affairs of its kind ever held in this country, will begin May 20 and will continue the entire week. The exhibit follows naturally upon the work of the Milk Commission, which lately made an exhaustive report on pure milk to the city authorities, the American Association of Medical Milk Commissions and Certified Milk Producers' Association of America, organizations whose work is confined to the problem of improving the milk supply of the country, meet in this city while the exhibition is in progress. Director Neff, in a brief address, reviewed the history of the handling of milk in this city, taking the opportunity of commending the newspapers for the part they have had in the crusade. Dr. Samuel Hamill explained the purpose of the milk show and announced that at conferences of two organizations to be held in connection with the exhibit 61 cities would be represented. He said that the aim of the exhibition was not to alarm consumers, but to point out the mistakes that are being made. He said that health officers and physicians would deliver lectures, and moving pictures would be used to show the danger of carelessness in the various processes between production and consumption. In conclusion he declared that much of the criticism leveled against the producers of milk should be leveled against the consumer.

WATER SUPPLY

Columbus Water Supply Polluted by Sewage

Columbus, O.—The State Board of Health will be requested to investigate the conditions relative to the alleged pollution of the Scioto River at Marion, Kenton, Magnetic Springs, Prospect and Marysville. This decision was reached at a meeting of the Board of Health after Dr. Clemmer read a communication from W. R. Copeland, chemist of the municipal filtration plant, in which he recommended that the above cities be compelled to erect sewage disposal plants. It is claimed that in these cities the Health Board is not following out the rules of the State Board, and that the source of the Columbus water supply is being polluted. The recommendations of Mr. Copeland were made after a personal visit to the towns.

Court Sustains Right to Cross Property with Water Conduit

Ogden, Utah.—A decision has been handed down in the District Court authorizing Ogden City to enter upon certain property in Ogden Canyon owned by W. G. Wilson and proceed to construct thereon that portion of the city's Cold Water Canyon conduit specified in the plans adopted by the Engineering Department. Mr. Wilson objected to the conduit being installed across his property without being remunerated for the privilege, and obtained a restraining order from the court. He placed his damages at \$1,000, which the city considered exorbitant, and condemnation proceedings were instituted, as in the cases of the owners of the Badger-Farr property and the Ogden Medicinal Springs Company. The work will not be delayed.

City Takes Steps Toward Purchase of Water Plant

Racine, Wis.—At the first meeting of the new Common Council a resolution was adopted empowering the Mayor, City Engineer and City Attorney to confer with the water works company as to the possibility of an amicable transfer of the plant to the city and to secure if possible the company's estimate of the value of the plant. An official notice and copy of the resolution was served on the water company for the purpose of opening the negotiations.

Special Court Appraises Water Plant

Council Bluffs, Ia.—A special court appointed to appraise the Council Bluffs water plant in the decision fixed the value of the plant at \$510,500. The result of the condemnation proceedings is a disappointment to both sides. The city expected a valuation of \$450,000 and the company wanted \$700,000. The company's offer to sell to the city for \$500,000 made during the appraisal hearing was refused.

Town Affected by the New Water Works Statute

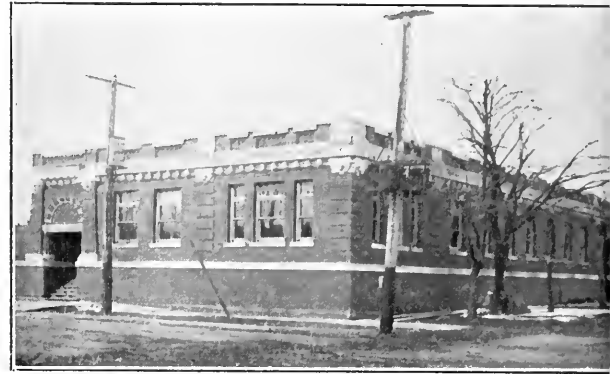
Kearney, Neb.—The last Legislature passed a law requiring customers of water works municipally owned to pay for the extension of pipes, and this law comes as a check on an extensive improvement campaign planned by the City Council of Kearney, although improvements and extensions of the city water property this year will be made regardless of the law. It is believed that the number of improvements will be lessened by this law, but that there will still be extensions sufficient to keep a force of men busy putting them in. The demand for extensions has been unusually great since the city assumed ownership of the plant. Many of these demands come from new sources and will mean new customers, while others are for improvements to the system as it now exists.

Filtration Plant Employees to Be Under Civil Service

Cohoes, N. Y.—As the filtration plant has practically been completed and will soon be placed in operation, there arises much conjecture as to whether or not the men who are to be employed at the plant will be under the jurisdiction of the Civil Service Commission. Men who are more or less skilled in the work will have to be employed at the plant, and for this reason, and because of the fact that there is much valuable city property to be taken care of at the new city institution, it will be necessary, so it is understood, to have the men who are to work at the plant pass an examination as to their fitness, and this examination will be conducted by the Civil Service Commission.

Waterloo Water Works Improvements

Waterloo, Ia.—Improvements in the water works have been going on for a year and are not yet completed. The illustration shows the new water works office just occupied. It is built over one-half of a reservoir which holds 2,000,000 gallons. At some later period a four-story municipal building may be built over the other half of the reservoir, found



WATER WORKS OFFICE OVER RESERVOIR

tions having been put in with this in view. The office measures 40 by 120 feet. The facing is of pressed brick and the trimmings Bedford stone. The cost of the building was \$10,000. The water in the reservoir comes from two artesian wells. A third is being drilled and has been sunk to a depth of 940 feet. For the first 150 feet it is 20 inches in diameter and from that point 12 inches.

Official Test of Standpipe

Montgomery, Ala.—An official testing of the standpipe at the river pumping station has been made. This plant is to furnish river water for boiler purposes for railroads and manufacturing establishments. It has a capacity of from one-half to a million gallons of water. No flaws have been found.

City Collecting Old Water Bills

Spokane, Wash.—Bills for tapping city water main amounting to \$8,000, some of them outstanding for years with no effort made to collect them, are now being collected by the legal department and suit instituted where debtors do not pay up at once. Warning that suit would be instituted unless payments were made, given by Assistant Corporation Counsel H. M. Dumphy, resulted in the collection of \$3,794.80 of the \$8,000.

Raw Water in New City Basins

Niagara Falls, N. Y.—Raw water has been let into two big basins at the new pumping station. Engineer W. Robbins superintended the work, and as soon as the scaffolding was taken out of the basins the valve in the intake pipe was opened and the almost pure water from near the middle of the river rushed into the basin at high pressure. The water will be allowed to settle in the basins until the electric pumps are connected, when tests will be made for several days. The pumps are not expected to be connected for another week yet.

Court Decides City May Own Water Plant

Bethlehem, Pa.—Bethlehem won an important victory when the State Supreme Court here reversed the Northampton County Court and held that the borough has the right to construct a municipal water plant. The court, however, holds in an opinion in another case effecting Bethlehem's water question that the municipal election to determine whether the indebtedness of the borough should be increased for the purpose of constructing the water works was invalid. It is held that the ballots did not comply with the requirements of the law of April 29, 1903, because the words "yes" and "no" were not printed upon them. The court holds, vitiates the election. The election case was brought by four taxpayers, while the suit involving the right of the borough to build its own water plant was brought by the Bethlehem City Water Company.

STREET LIGHTING AND POWER

Experimenting with New Lamps

Schenectady, N. Y.—As an experiment in street lighting the Schenectady Illuminating Company has recently installed 18 of the new flaming arcs on Dock street. Although this type of lamp has been used on lower State street by the business men, this is the first time they have been used for street lighting purposes in this city and they have been found very satisfactory during the two weeks they have been in operation. The lamps were installed at the expense of the Illuminating Company and the city has agreed to pay half the expense for the current in addition to the \$60 per year rental for each lamp, in accordance with the standing contract.

Rapid Progress of Municipal Plant in Lighting Streets

Richmond, Va.—Engineer E. W. Trafford, in charge of construction work for the municipal electric plant, has reported to the Council Committee on Electricity that within the next 30 days he would be ready to cut out all rented lamps save about 50 in outlying districts, the lines of the city plant not having yet reached out to embrace them. He said that he was pressing the work forward as rapidly as possible to save the double cost of renting lights and at the same time operating the power house, and for that reason had not as yet taken up the question of extending the ornamental lights westward on Broad street to Pine street, for which funds have been provided.

Favorable Monthly Report of Municipal Light Plant

Pasadena, Cal.—The February report of the general manager of the municipal electric light plant shows that the city made a net profit of \$6,225.40. Allowing for the payment of bonds, during the month of February the city cleared over \$4,500, which can be applied to the depreciation fund or to new construction.

Plan Conduits for All Wires

Pasadena, Cal.—The special committee appointed by the Mayor for the purpose of making recommendations in regard to the disposition of overhead wires made its report to the Council and recommended a municipally owned conduit system for all wires for the use of which corporations should pay in rent the equivalent of the interest and principal on a bond issue plus the cost of maintenance. The report further recommended that a commission be appointed to present in concrete form a plan to put wires underground in the business and congested districts and to establish one municipal pole line where conduits are impractical. The plan would be to have this pole line replace the half dozen present pole lines which duplicate in all parts of the city, making the streets hideous with their landscape-blocking obstruction.

FIRE AND POLICE

Fire Traps Must Be Razed

Spokane, Wash.—A score or more alleged unsanitary, unsafe and fire-trap buildings in the business district, the owners of which were successful in dodging condemnation orders of the former city administration, must be razed within 30 days, according to orders of Building Inspector John M. Goodwin. That he will attempt to enforce the penalty of \$100 a day fine and jail sentence against every owner who attempts to dodge the issue is the statement of the inspector. The buildings were condemned and ordered torn down by the former administration, but nothing was ever done when the owners refused to act.

New Hydrants Help Fight Fire

Jersey City, N. J.—Street and Water Commissioner Finke and Engineer J. W. Griffin, of the Water Department, have tested the water pressure at the new hydrants recently installed in connection with new water pipes. The test was very satisfactory. It showed that Jersey City's fire fighting ability has been greatly increased by the installation of new hydrants and water pipes. Commissioner Finke insists that the test ought to result in a further reduction of the fire insurance rates.

Fire Alarm System Installed

Placerville, Cal.—The new fire alarm system for this city is now installed. The fire bell has been moved from the Plaza to the top of Canon Hill and electrically connected with the central exchange office of the telephone company. The city has been divided into eight fire wards, and every telephone is a fire alarm box. Cards have been placed on every telephone in town, giving number of ward and directions how to sound an alarm.

Automobile Police Patrol for Emergency Use

Charleston, S. C.—The big automobile wagon of the Police Department has arrived, and is being given its final try-out. The introduction of the automobile patrol does not mean the exit of the "Black Maria." The new patrol will be used only for emergency cases, during fires or for duty in outlying districts.

City Acquires Automobile Apparatus

Bay City, Mich.—A new automobile patrol for the police has been received and will be put into commission at once. The horse patrol will not be used again.

Street Department Automobile Becomes Hose Wagon

Haverhill, Mass.—The latest acquisition to the city's fire equipment is an automobile combination chemical and hose wagon. The car is a beauty. It is the old Knox automobile purchased for the Street Department, and which was smashed up in a collision with a trolley car. It went into storage for several months at the Ward 6 engine house, but was turned over to the Fire Department a few weeks ago and by them entirely rebuilt. It now has a body which carries about 600 feet of hose with the necessary pipes and appliances, a couple of chemical tanks and has a rail and running-board. There are two seats forward, and while the new machine is small, it is, nevertheless, efficient along all lines of practical fire fighting. It will do fine service in responding to long run calls, there being plenty of power and endurance, and the apparatus is one of the city's most valuable acquisitions.

Suburbs Supplied with Fire Alarm Boxes

Oakland, Cal.—The city electric department is busily engaged in installing fire alarm boxes in the annexed district. The first lot of eight boxes are already in operation and the balance of about 25 boxes will be installed as rapidly as the shop can turn them out. An unavoidable delay in this work was caused on account of moving, as everything had to give way to that for about two weeks. The new machinery for the fire alarm shop has been received and is installed. With this machinery it will be possible to turn out a better grade of work and more per hour, thereby cheapening the product. The last shipment of electrical equipment for the fire alarm installation in the new building is received, and will be installed in the next few days. When this work is completed Oakland will have as an efficient an installation as can be found, and is far better housed and protected than any other fire alarm installation in the country, according to George Babcock, head of the electrical department.

Made-Over Chemical Apparatus Stands Tests

Bridgeport, Conn.—Thorough and successful tests of the new auto-chemical which is to be stationed at the Maplewood fire house have been made. This piece of apparatus is largely of the made-over type of which Superintendent of Machinery Tracy has done much of the work. The chemical, which formerly was horse-drawn, has been taken apart and is now mounted on a large type chassis from the Locomobile factory.

Ardmore Adds to Fire Equipment

Ardmore, Okla.—Ardmore has added to its fire fighting equipment an apparatus that would do credit to any city—a 55-horsepower auto truck and chemical engine combined. The machine has been set up, but before it is given a test the factory will send a man to demonstrate it. The truck carries six men besides the driver, and will carry 1,000 feet of hose and two ladders; the chemical tank having a capacity of 50 gallons. The machine was built by the Seagrave Company, of Columbus, O., and cost, delivered in Ardmore, \$4,600.

GOVERNMENT AND FINANCE

Mayors of All Cities to Serve Four-Year Terms

Harrisburg, Pa.—The bill fixing terms of Mayors and Select Councilmen of all cities of the commonwealth at four years and of all Common Councilmen at two, has been signed by Governor Tener. The bill was presented by Mr. Hess, Lancaster, and applies to all officials of the classes mentioned to be "hereafter elected." The repealing clause repeals all general, special or local laws inconsistent with the act.

Organization of Commission Government

Birmingham, Ala.—At the first meeting of the Commissioners under the new form of government the Commissioners agreed among themselves upon what department should be handled in detail by each of the members. The belief is official, however, that all questions such as public policy and generalities will be handled by the Commission as a whole. President Culpepper Exum will have the following departments: Accounts, finances (including public assessments for improvements), public affairs, Fire Department and the Building Inspector's department. Commissioner Lane will have charge of the following: Public Justice, Recorder's Court, City Attorney, Police Department, Health Department and the plumbing department. Commissioner Weatherly will have charge of the following: Department of streets, parks, city and public property, city and public improvements, electric department, engineering department. Twenty-nine city employees were dispensed with and a saving to the city effected of \$31,460 for the year.

Bond Issue Is Sold Locally

Houston, Tex.—The South Texas National Bank has purchased the entire issue of \$500,000 in bonds floated by the city of Houston for the purpose of constructing a steel and concrete viaduct over Buffalo Bayou at Main street. By the terms of agreement the South Texas National Bank will pay a premium of \$1,000 for the bonds. They are 4½ per cent securities, maturing at the expiration of 30 years, with a reservation by the city to call them in 10 years before expiration.

Will Ask for Bids on City Deposits

Woonsocket, R. I.—The perseverance of Mayor James Mullen in pushing the matter of getting more interest on the city's deposits has resulted in both branches of the City Council unanimously passing a resolution directing the City Treasurer to advertise for bids from local banks and trust companies for the city's deposits. The city now receives 2 per cent, the same as all other depositors on checking accounts, and Mayor Mullen pointed out that the city of Providence receives 3 per cent on its daily balances, while the city of Pawtucket receives more than 3 per cent.

Retiring Administration Leaves Enviably Record

Freeport, Ill.—At the last Council meeting of the retiring administration City Treasurer Wagner made reports for the fiscal year. His reports show that the balance of the corporate fund now in custody is \$22,029.15, not including delinquent taxes, which will bring the amount up to \$35,252.55. The amount of the fund is large for Freeport and the city's finances are in excellent shape, about \$47,000 better than at the beginning of the administration that has just closed. Starting with a deficit of over \$12,000, the administration just past has wiped out the deficit and left the treasury comfortably full. Although the administration has been economical and has left a large sum in the corporate fund, it has spent much for improvement and new equipment. The Street Department is well supplied with new wagons, etc.; the Fire Department has its new hose house in West Freeport, new wagon and equipment; the several city departments have been thoroughly reorganized on a business basis and a new accounting system has been installed. New office equipment for the City Hall has been purchased, too, and there have been various expenditures for other improvements. The city's affairs are clean and sound and the new administration is starting in with every possible advantage.

STREET CLEANING AND REFUSE DISPOSAL

City Intends to Keep Streets Clean This Summer

Wilmington, Del.—The Street and Sewer Commissioners have started an investigation with a view to improving the street cleaning. The immediate cause was complaints from the Delaware Mills that loads of debris were being dumped on the Morris Road. The directors said there were constant complaints of this sort from all over the city. Street Commissioner Pierson said city contractors had claimed it was done against their orders by irresponsible carters. It was difficult to catch any one because the carters did not do it if a policeman was around. It was obviously impossible, the directors thought, to keep a policeman on every vacant lot in Wilmington. The directors also complained that too large loads were carried, so that dirt fell off and was tracked along the streets. It was thought that might be one way to trace those who dumped loads in unlawful places. The department will take steps to make examples of some of the offenders.

Clean-Up Weeks Are Popular

Harrisburg, Pa.—Mayor Meals issued a proclamation naming the first week in May as clean-up week, and has assurances of co-operation from the Civic Club and other sources for giving Harrisburg a thorough house cleaning.

Knoxville, Tenn.—The week beginning Monday, May 15, has been designated by the Board of Public Works as "clean-up week" in Knoxville. The Police Department was instructed to notify the occupants of each house to begin "cleaning up" that day. All the city carts and wagons will be used that week to haul away the garbage. The Board also instructed the police to serve notice of the law on home owners, where there are no numbers on the houses.

City Officials Pleased with Street Flusher

Bridgeport, Conn.—Mayor Buckingham and other city officials express much satisfaction with the demonstrations of the Studebaker street flusher. It was tried on the brick pavement on Broad street, south of State street, the wood block pavement on Main street and the Belgian block pavement on Water street. The Board of Apportionment has made the appropriation for the purchase of a flusher and the various types are being demonstrated by the builders before Superintendent of Street Cleaning Schreiber decides which kind to purchase.

Board of Public Works to Put Auto Garbage Truck on Street

Manchester, N. H.—The practicability of the auto-chemical has been so clearly proved that the new Board of Public Works has decided to install a large garbage automobile truck. The new wagon will weigh upward of three tons and will have a capacity of six cubic yards at a load. This large amount with the quickness with which the auto can get about the city will allow the auto to take the place of three ordinary horse-drawn wagons, which would indicate that by its installation the city will be able in the course of the year to save a considerable sum of money. The saving is estimated to be such that the truck will pay for itself in the course of its life and in that time the scavenger service will be by its use greatly improved. It is the intention of the Board to use the new machine in the congested parts of the city. The probable cost of the truck will be in the neighborhood of \$3,400. Several representatives of the different automobile firms have been either in communication with the Board or appeared in person with illustrations of the trucks, and while it is an assured fact that the Board is to purchase one, the exact model has not yet been decided upon. It is understood, however, that the machine will be similar to that adopted in many of the large cities throughout New England, and will be in operation by the last of the month. It is anticipated that before the spring "housecleaning" has been completed the machine will have done its part in the important work. In an interview with Chief Engineer Samuel Lord it was learned that the residents of the city are responding most gratifyingly to the call of the department for cleaning up of the winter refuse, but there are still a great many who have not as yet done so. All the garbage teams are patrolling the city for this purpose, and will be kept at the work until every nook and corner has been taken care of.

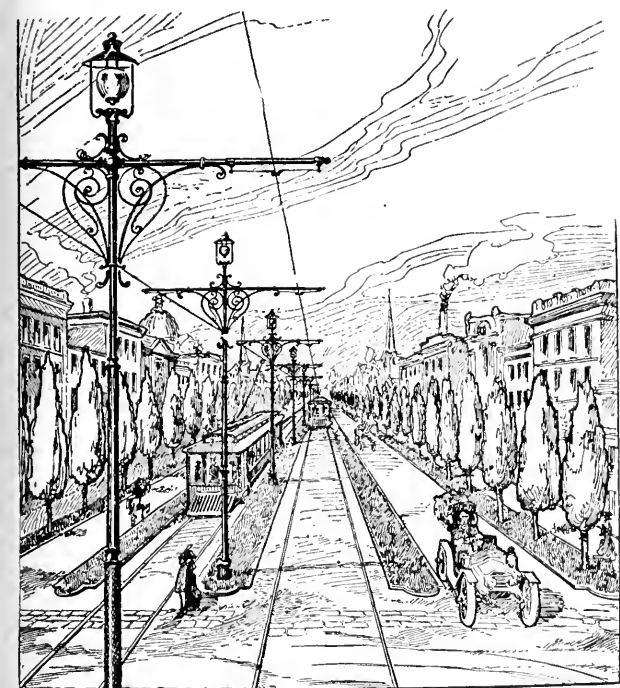
RAPID TRANSIT

Franchise Is Refused

Brownsville, Tex.—The application of the Brownsville & Gulf Railway for a franchise to broaden the gauge of its tracks on Twelfth street and to operate a motor car line between Brownsville and Matamoros has been denied by the City Council. The company's tracks run through the heart of the city and have not been used for years. The City Council recently declared the tracks to be a public nuisance and instructed the City Marshal to abate the same. A majority of the Councilmen held that to grant the Brownsville & Gulf a franchise on Twelfth street would preclude the securing of a street railway system throughout the city later. However, a resolution was introduced offering the company a franchise to operate a motor car system over the whole of the city.

Plans of San Francisco's Municipal Street Railroad

San Francisco, Cal.—Commissioner Charles S. Laumeister of the Board of Public Works, who has charge of the details of the construction of the city's Geary street railroad, intends having ornamental trolley and lighting



Courtesy San Francisco Chronicle.

PLAN OF ORNAMENTATION FOR SAN FRANCISCO'S MUNICIPAL RAILROAD

poles and grass plots, as shown in the illustration, on that portion of the road from Point Lobos avenue to the beach. Geary street is too narrow to admit of such ornamentation. The contracts for constructing the road and building the cars will be let in about a month.

Council Renews Franchise

Quincy, Ill.—The City Council has renewed the franchise of the St. Louis, Terre Haute & Quincy Traction Company. The new features incorporated in the ordinance are as follows: No franchise license shall be exacted for the first 10 years of the 50-year franchise; on the following five years \$10 a year per car shall be required; five years still later a flat cash license of \$500 shall be required, and at the expiration of the last five years a flat license of \$1,000 a year shall be required for each year during the remainder of the life of the franchise. Some concessions are also made in the payment of street pavement. A former ordinance required a cash license of \$20 per car for each year of the franchise operated within 100 miles of Quincy. It is generally known what the route of the proposed line is in the city limits: It starts at Twenty-fourth and Spring; runs west to Eleventh street; south to York; west to Sixth; north to Vermont; east on Vermont to Eleventh, completing the city loop.

MISCELLANEOUS

City to Insure Boilers

Providence, R. I.—The city will insure 18 of its high-pressure boilers against explosion and accident. This action, which is a radical departure from the custom of the past, was decided upon by the committee on city property as a measure which would prevent the city from becoming liable in case of any accident due to a boiler defect.

New Method of Street Marking Adopted

Walla Walla, Wash.—With the building of new walks throughout the city, all of which are to be concrete, a plan of marking the streets has been adopted that will prove useful to Walla Wallans, as well as strangers, in finding their way about the city. The names of the streets are being marked in the walks at the corners before the concrete hardens, and when the walk is completed the name of the street is written so that it may be easily read. Those who know Walla Walla best are oftentimes at loss for their bearings, so crooked are the streets, and so various the angles and directions. So the new move for marking them is being met with approbation everywhere.

Richmond Adopts Segregation Ordinance

Richmond, Va.—Mayor Richardson has approved the Von de Lehr ordinance providing for the domiciliary segregation of the negroes of the city, thus making it a law. Along with it goes an ordinance, as yet incomplete, providing for the annexation of territory to the negro quarter and the furnishing of sewerage, lights and other improvements necessary to health and comfort so that there need be no undue crowding of the negro population.

Ask State Aid in Protecting Harbor

Natchez, Miss.—Congressman William A. Dickson, attended by a delegation of 60 business men and bankers, appeared before the Mississippi River Commission here last week in behalf of the claim for protection for the local water front. City Solicitor Martin presented the memorial from the Board of Mayor and Aldermen. The Board of Mayor and Aldermen submitted resolutions to the Commission, and the petition from the Chamber of Commerce, Retail Merchants' Association and Board of Supervisors was read by Congressman Dickson. The petition asks the Commission to make such allotment out of the funds at its disposal as to provide for the immediate and adequate protection of the Natchez front, or harbor, from further encroachment by the Mississippi River.

New Law to Protect Trees

Wilmington, Del.—The Board of Directors of the Street and Sewer Department wish particularly to call the attention of the public to the fact that nobody in the city has the right to remove, plant or trim trees in the city streets without permission from the department, according to the new law passed by the Legislature giving absolute control over trees in the city streets to the Street and Sewer Department.

Citizen Donates Land for Park

Morristown, N. J.—Thirty acres of land to be used for park purposes have been presented to the city by Frederick G. Burnham. The tract is particularly suitable for park purposes, containing the three well-known Mills ponds and the fine woods surrounding them.

Town to Have New Park

Muncie, Ind.—Muncie is to have another new park and rest ground. Under the supervision of the Board of Park Trustees work was begun to make a park out of the tract of ground lying along the Fort Wayne, Cincinnati & Louisville Railroad, east of Madison street, from Gilbert to Wysox street.

Will Enforce Ordinance Regulating Height of Awnings

Haverhill, Mass.—City Marshal Mack has ordered an inspection of awnings, and in sending it out he directed that the owners of awnings be notified of violations of the ordinances, and in the event of failures to remedy conditions, that complaints be made in court.

LEGAL NEWS

A Summary and Notes of Recent Decisions—Rulings of Interest to Municipalities

Reasonable Use of Street—Moving Building

Western New York & Pennsylvania Traction Company vs. Stillman.—Vested rights of a street railroad company to the use of a city street are subject to the reasonable use of the street for travel and other purposes. Whether the moving of a private building through a city street under permit from the city is a reasonable use of the street is a question of fact and usage in each particular case. Where a street railroad company sues to enjoin interference with its wires and overhead construction by a person moving a building through a city street, and alleges irreparable injury, it has no ground for complaint when the order vacating the temporary injunction provides that the work of taking down and replacing its wires shall be done by its own employees, and that defendant shall pay the expenses.—Supreme Court of New York, 128 N. Y. S., 363.

Streets—Injuries—Negligence

O'Connor vs. City of Dunkirk.—A gutter ran down the side of a street, and the crosswalk was elevated above the bottom of the gutter from $2\frac{3}{8}$ to $5\frac{1}{2}$ inches, and there was a break between the end of the crosswalk and the sidewalk, leaving a space of $10\frac{1}{2}$ inches over the gutter, over which space pedestrians were required to step in reaching the sidewalk. Plaintiff in the daytime, instead of stepping over such space, stepped into the gutter, which was filled with snow, ice, water and dirt, but was not sufficiently frozen to hold her weight, though it appeared to be so, and was injured. Held, that the city was not negligent for allowing the gutter to fill up with material not sufficiently solid to bear a pedestrian who stepped into, rather than across, the gutter. Where, in an action against a city for injuries by stepping into the gutter, the court ruled that it was not negligence for the city to so construct the crosswalk as to leave a $10\frac{1}{2}$ -inch space between it and the sidewalk over the gutter, and that the only basis of recovery was permitting the gutter to fill up with semi-solid matter, evidence of a resolution passed by Council some days before the accident to the effect that the Council regarded the gutterway as dangerous on account of the openings left between the sidewalk and the crosswalk was not admissible.—Supreme Court of New York, 128 N. Y. S., 398.

Contracts for Public Work—Quantum Meruit

F. V. Smith Contracting Company vs. City of New York.—Greater New York Charter provides that contracts for work for the city shall be made by the appropriate borough president or heads of departments under regulations established by the Board of Aldermen, and that work necessary to complete a particular job or supplies needful, which shall involve expenditure of over \$1,000, shall be furnished by contract with the appropriate borough president and heads of departments. Section 149, as amended in 1901, provides that no claim against the city for work done or material furnished with immaterial exceptions shall be paid unless an auditor of account shall certify that the charges are just and reasonable, and if, in an action against the city on a claim, not embraced in the exceptions, the amount claimed by plaintiff is in excess of the amount so audited, it must be established by competent evidence. Held, that a contract by a department without public letting is equivalent to an agreement to pay quantum meruit, and the specification of a price can be deemed only a maximum limitation raising no presumption in favor of the contractor as to the value of his services. Such a contractor need not postpone action upon his claim until it shall have been audited; but, when 30 days have elapsed since filing of his claim with the Comptroller, if it has not been acted upon, he may sue, alleging the contract price and assuming that it would be found moderate by the auditor, and in such an action the city need not affirmatively plead that the auditor has audited adversely to the claim, but may plead a general denial, and at the trial object to plaintiff's proof of the claim.—Supreme Court of New York, 128 N. Y. S., 351.

Annexation—Propriety

State ex rel. Simpson, Atty. Gen., vs. Village of Dover et al.—Whether unplatted territory, included within the limits of a village corporation, is so conditioned as properly to be subject to village government is a question of fact to be determined by the voters entitled to vote upon the question, and their decision cannot be disregarded unless it clearly appears to have been the result of arbitrary action. It does not conclusively appear from the evidence that the unplatted territory of the objectors, incorporated in the village of Dover, was included for the purpose of exacting revenue for village purposes and without regard to its adaptability to village government.—Supreme Court of Minnesota, 130 N. W. R., 75.

Assessments—Manner of Review

Durst vs. City of Des Moines et al.—Code provides that all objections to assessments for street improvements not made before the council shall be deemed waived, and Section 839 permits one affected by the levy of a special assessment to appeal to the district court and provides that upon such appeal all questions touching the validity of the assessment shall be determined. Held, that the objection that an assessment exceeded the amount prescribed by Code Supp. 1907, providing that an assessment shall not exceed 25 per cent of the actual value of the tract, the last preceding assessment to be prima facie evidence of such value, must be made before the City Council and an appeal taken to the district court from an adverse determination, and hence an owner may not ignore such remedy and bring an independent suit in equity to obtain relief from the assessment.—Supreme Court of Iowa, 130 N. W. R., 168.

Sewers—Assessments—Abatement

Granite State Land Company vs. Town of Hampton.—Under Public Statutes, 1901, authorizing towns and village districts to adopt the chapter authorizing the Mayor and Aldermen of any city to construct sewers they adjudged necessary for the public convenience and health, and Laws 1883, providing that, where the chapter is adopted by a village precinct, the Selectmen of the town in which the village precinct is situated shall perform all the duties conferred on the Mayor and Aldermen in case of cities, the Selectmen of a town which has adopted the chapter may exercise the powers conferred within the territorial limits of a village district organized under chapter 53, providing for the organization of village districts, with power to construct and maintain sewers, where the district has not voted to adopt the chapter, and has not taken any action as to the construction of sewers; the powers conferred by chapter 79 and by chapter 53 not being conflicting. Assessments for the construction of sewers levied on the lands benefited thereby are a legal exercise of the taxing power, and must be justified on that ground alone, though such an assessment is not a tax imposed for the expenses for public purposes in which all are interested, and though it is merely the division of the expenses of an improvement which renders property more valuable in the ratio of the increase of such value. An assessment under Public Statutes, 1901, authorizing an assessment on lands receiving special benefits from the construction of a sewer, for their just share for the cost of construction and maintenance, etc., recognizes the ownership of buildings on lands of another, and buildings so situate are real estate for the purposes of assessment, and are properly assessed to the owner thereof such buildings being "lands." Under Public Statutes, 1901, authorizing one aggrieved by the refusal to abate a tax to petition the Supreme Court for an abatement, a tax invalid because assessed against a person not the owner is not abated on the petition of the owner, because justice requires that he shall be taxed for the value of his land, and the relief to which he is entitled is such as is equitable. A town leased its land for an annual rent for a long term of years. The lessee sublet to a third person on a like rent under a lease which had 17 years to run. The Selectmen of the town constructed sewers benefiting the land. Held, that the third person was properly assessed for his benefits resulting from the construction of the sewer, and, where he was assessed for the whole title, he was entitled to an abatement, so that the fair share of his interest would only be assessed against him.—Supreme Court of New Hampshire, 79 A. R., 25.

Public Improvements—Reducing Assessments

Camp vs. City of Davenport.—Where, on appeal from a special assessment, there is evidence that no benefit was derived and there was other evidence that the property was benefited, but there was no evidence to show the extent of the benefit conferred, it is error to reduce the assessment fixed by the City Council.—Supreme Court of Iowa, 130 N. W. R., 137.

Dumping Ground—Negligence—Liability

Brennan vs. City of Albany.—Where the defense of ultra vires is interposed by a municipal corporation to a contract obligation, it must be pleaded to be available. The liability of a principal for the act of his agent, which is beyond actual authority, can be based on apparent authority only where such apparent authority has misled the other party. Where private land was lawfully used by a city for a dumping ground, it was liable for the negligence of its employees in so piling refuse that surface water which would otherwise have escaped through a sewer flowed onto and damaged adjoining property.—Supreme Court of New York, 128 N. Y. S., 334.

Defects in Streets—Actions—Negligence

Heffern vs. Village of Haverstraw et al.—Where a city and one who excavated land near a highway were jointly sued for damages caused by the slide of the highway into the excavation, and the city's only negligence was non-performance of its duty to keep the highway in a safe condition, a finding that the one who made the excavation was not negligent necessarily exonerated the city. Where one in a place of safety, on hearing that there was a slide into an excavation with which he was familiar, went near that place from curiosity, and the land slid again, drawing down the street upon which he was standing, he was guilty of contributory negligence, barring a recovery against the city for his injuries.—Supreme Court of New York, 128 N. Y. S., 399.

Sewer Contract—Substantial Performance.

City of St. Louis vs. Ruecking et al.—The doctrine of substantial performance applies to municipal sewer construction contracts. In an action on the bond of municipal contractors, whether substitution of loose earth for sand in laying sewer pipe under a municipal construction contract was substantial compliance with the contract held, under the evidence, a jury question. Under a provision requiring a municipal sewer contractor to correct imperfect work when discovered before final acceptance, there can be no recovery by the city for defects discovered after such acceptance, in the absence of fraud or collusion. A city ratified its agents' unauthorized acts in permitting substitution of earth for sand in laying pipe under a sewer contract by accepting and paying for the work, in the absence of fraud or collusion by the agents.—Supreme Court of Missouri, 134 S. W. R., 657.

Contempt of Federal Supreme Court

Merrimack River Savings Bank, Appellant, vs. City of Clay Center et al.—The willful destruction by municipal officers of the poles and wires of a light and power company, pending an appeal to the Federal Supreme Court from a decree of a Circuit Court, dismissing a bill praying, among other things, an injunction to prevent such destruction until the right shall be determined, is, in and of itself, a contempt of the appellate jurisdiction of the Supreme Court, although such conduct may also be a violation of the temporary injunction order continued by the court below pending the appeal. The honest belief that when an appeal to the Federal Supreme Court from a decree of a Circuit Court, dismissing a bill asking injunctive relief against the removal or destruction by municipal officers of the poles and wires of a light and power company, had been dismissed and an order of dismissal entered, there was no reason why such poles and wires should not be removed or destroyed, although not sufficient to acquit of a technical contempt of court where no mandate had issued or could have issued under the rules of the Supreme Court, may reduce the punishment to the payment of the costs of the contempt proceedings.—31 S. C. R., 295.

Icy Sidewalk—Injuries

Ballard vs. Village of Hamburg.—A municipal corporation is not liable for injuries caused by an icy sidewalk, unless it is shown that the injuries were caused by hummocks or ridges of ice which had accumulated and were then permitted to remain for some time after the weather was such as to permit their removal.—Supreme Court of New York, 128 N. Y. S., 325.

Public Parks—Land Condemnation

Lake Shore & Michigan Southern Railway Company vs. City of Whiting.—Since Laws 1905, providing for the condemnation of land for public parks, provide that the repealing provisions shall not affect pending proceedings, but that they shall be concluded and judgment rendered, Laws 1905, giving a right of appeal from an interlocutory order appointing appraisers, would not authorize an appeal from an order appointing appraisers in proceedings to condemn land for a public park, where the appraisers were appointed and had filed their report more than a year before Laws 1905 became effective.—Supreme Court of Indiana, 94 N. E. R., 326.

Patrolmen—Dismissed—Action for Salary

Dolan vs. City of Louisville.—A city board of public safety may not dismiss a patrolman for conduct unbecoming an officer, alleged to have been committed two years prior to his becoming a member of the force. In an action by a patrolman to recover salary for the year subsequent to his illegal removal from the force, the burden is on him to establish his title to the office against the person succeeding him therein, or show that the office remained vacant during the year, and that the salary was not paid to any other person, or that he instituted proceedings against the Board of Public Safety for reinstatement. In an action for salary of a patrolman for the year succeeding his wrongful discharge, evidence held insufficient to show that there was a vacant place on the police force during the period sued for.—Court of Appeals of Kentucky, 135 N. W. R., 272.

Ordinances—Passage—Validity

Elliott vs. Monongahela City et al.—A municipal corporation can only exercise such powers as are granted it by the State, and only in the manner prescribed in its charter or by act of the Legislature creating it. The Monongahela city charter vests the corporate powers of the city in a Mayor and City Council. Section 62 provides that the Council shall be composed of the Select and the Common Council. Section 67 provides that a majority of each Council shall be a quorum. Section 68 provides that they may, when convenient, hold joint sessions, and section 69 provides that no appropriation of money and no ordinance shall be of any force unless concurred in by the Councils. Held, that an ordinance authorizing the city officials to contract for lighting and fixing the price to be paid for such service passed at a joint session by a majority of the collective body, but, failing to receive the approval of the majority of one of the branches separately, is void.—Supreme Court of Pennsylvania, 79 A. R., 144.

Contract for Public Work—Substantial Performance

St. George Contracting Company vs. City of New York.—The plaintiff had a contract with the city for excavation, which provided that all top soil and hardpan should be deposited as filling back of the completed wall, and that, should there be an excess of excavated material, the contractor should remove it at his own expense. After the contract was signed, and before plaintiff began work, a railroad company by mistake entered upon, excavated and carried away top soil amounting to about one-tenth of the measurement called for by plaintiff's contract, and the city on completion of the contract refused to pay plaintiff for this amount. Plaintiff, in an action to recover therefor, offered no proof that the material carried away was excess material not needed for filling. The evidence of the city tended to show that it had to purchase filling to back the wall, and plaintiff's evidence tended to show that defendant's damage thereby was only nominal. Held, that plaintiff had not sustained the burden of proving substantial performance, and had no case against the city.—Supreme Court of New York, 128 N. Y. S., 393.

MUNICIPAL APPLIANCES

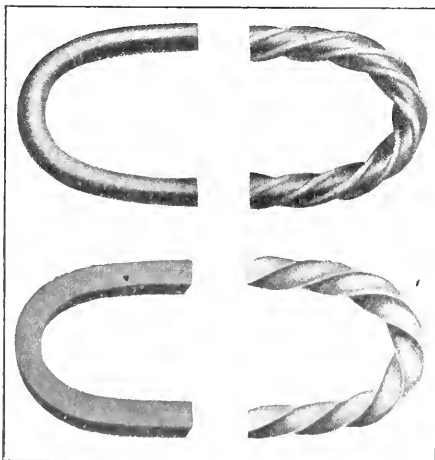
STEEL REINFORCEMENT FOR CONCRETE SEWERS

The general argument in favor of the use of steel as a reinforcement for concrete is as follows: The compressive resistance of concrete is about ten times its tensile resistance, while steel has about the same strength in tension as in compression. Volume for volume steel costs about fifty times as much as concrete. For the same sectional areas steel will support in compression thirty times more load than concrete, and in tension three hundred times the load that concrete will carry. Therefore, for duty under compression only, concrete will carry a given load at six-tenths the cost required to support it with steel. On the other hand, to support a given load by concrete in tension would cost about six times as much as to support it with steel.

In sewer construction the exact value of reinforcement cannot be stated in general terms applicable to all cases. The amount of the load on the sewer and stresses developed in different parts of the ring depend upon a number of conditions, among them the nature of the earth used in filling, the method of bedding the pipe, the way of tamping the earth on the pipe. Moreover, a sewer may be under pressure or may be so located as to need special strengthening. The question of whether a sewer requires reinforcement or not, and if so, what kind, has to be left to the engineer to work out in each instance.

The reinforcement for sewers may consist of circumferential rods in the form of hoops or spirals. Longitudinal rods, either inside or outside the hooping, depending upon whether the pressure is from within or without, and wired to the hooping, are often employed. Various forms of netting and expanded metal are also extensively used.

Steel imbedded in properly proportioned and mixed concrete is believed to be practically indestructible by such agencies as it is exposed to in a sewer. This fact has been demonstrated in a series of tests by Professor Norton, Massachusetts Institute of Technology. He advises the use of thoroughly mixed wet concrete.



ROUND, SQUARE, SPIRAL AND TWISTED BARS

BANDS, SQUARE AND ROUND RODS

While the adhesion between iron and steel is considerable, it may be weakened by various agencies, such as water; consequently some sort of mechanical bond is generally preferred. This is secured by making the bars of special shapes, as by the use of corrugations or twisting. Hence the plain bands and square and round rods have a limited use. Some engineers have objected to the use of square or flat sections on the ground that the sharp re-entering angles formed in the concrete weaken it and induce cracks to start from the angle when subjected to loads or shocks.

In selecting steel for sewer reinforcement not only the form of the steel, but its quality has to be considered. In the following account of the manufactures now on the market substantially the argument of the maker is presented in each case.

Plain steel bars, flat, square and round, are made by all manufacturers of steel. They have a limited use in sewer construction. Flat bars are, however, often used in the construction of sewer pipes which are made before they are put in place, as in Jackson pipes. Authorities differ as to the quality of steel to be used for reinforcement, soft, medium and high-carbon steel being used by different engineers. According to Homer A. Reid, the preference seems to be for soft or medium steel. Open hearth steel is preferable to Bessemer. Open hearth steel, either acid or basic, should conform to the following requirements: The maximum limit of phosphorus in the finished material should not exceed .07 per cent for acid and .05 per cent for basic open hearth steel. Soft steel should have an ultimate strength of from 54,000 to 62,000 pounds, and an elastic limit of not less than one-half the ultimate strength; it should elongate 25 per cent in 8 inches, and bend cold 180 degrees flat on itself without fracture on outside of bend. If medium steel is used, it should have an ultimate tensile strength of from 60,000 to 68,000 pounds per square inch, an elastic limit of not less than one-half the ultimate strength, and should elongate not less than 22 per cent in 8 inches, and bend cold 180 degrees around a diameter equal to the thickness of the piece tested, without fracture on outside of bend. If high steel is used it should have a tensile strength of 100,000 pounds per square inch, and an elastic limit of not less than one-half the ultimate strength, and should elongate not less than 10 per cent in 8 inches for a test piece $\frac{3}{8}$ to $\frac{3}{4}$ inch in diameter. A test piece $\frac{1}{2}$ inch in thickness should bend 110 degrees without fracture around a diameter equal to its thickness.

REINFORCING BARS

Twisted Bars.—Steel bars twisted cold are the invention of E. L. Ransome. Square bars are usually employed. The twisted form gives a firm grip on the concrete, thereby greatly assisting the adhesion between the two materials. The process of cold twisting also cleans the bar by removing scale, thus increasing its adhesion to concrete. Square bars may be twisted on the work by a simple apparatus. The operation of twisting the rods cold modifies the qualities of the metal, raising the elastic

limit and ultimate strength. Half-inch bars generally have three twists per linear foot.

The Inland Steel Company makes cold twisted medium open hearth steel billet bars in 60-foot lengths. Their elastic limit is given as 55,000 to 60,000 lbs. per sq. inch. Sizes run from $\frac{3}{8}$ inch to $1\frac{1}{2}$ inch. The company controls the manufacture of its product from ore to finished bar. The same company makes hot twisted, high elastic limit, rail-carbon bars in 10 to 40-foot lengths. The elastic limit is given as 50,000 pounds or over. These bars have one twist in eight diameters of the bar.

William B. Hough Company manu-

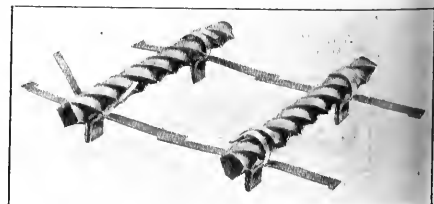


HOUGH SPECIAL METAL TWISTED BAR

fatures the M/B cold twisted steel bar having an elastic limit of 60,000 pounds yet capable of being bent double when cold. The high elastic limit and great ductility of these bars are said to be due to the fact that they are made from a special open hearth steel. High elastic limit in ordinary steel is obtained only by the presence of a large percentage of carbon, the result of which is brittleness. The percentage of carbon in the M/B bar is not high.

Jones and Laughlin Steel Company also manufactures cold twisted bars and control the manufacture from ore to finished product. The elastic limit of these bars is stated to be 60,000 pounds and they will bend around a diameter three times the size of the section. The effect of twisting in improving the qualities of the bar is well illustrated in a series of tests given in one of the company's pamphlets. The data regarding the tests of a $\frac{3}{8}$ -inch bar are quoted: Elastic limit, before twisting, 39,130; after twisting, 71,160; increase due to twisting, 82 per cent; tensile strength before twisting, 61,180; after twisting, 85,380; increase due to twisting, 39 per cent. Attention is called to the fact that in twisted bars a greater variety of sizes is available than in the case of any other concrete bar. The company manufactures all sizes from $\frac{1}{4}$ inch to $1\frac{1}{2}$ inch, increasing by sixteenths, in lengths up to 40 feet.

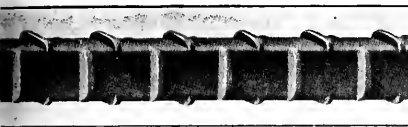
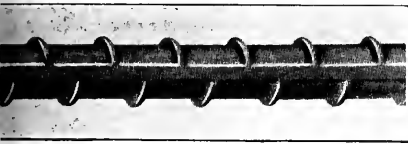
The Hough company makes a spacer called Securo, which accomplishes three purposes. It holds the bar in position at the correct distance from the surface of the shell; it locates the bar evenly and accurately at the specified distances from center to center. The prongs of the spaces when bent over the bar clasp it in a viselike grip, leaving positively no chance for slipping or sliding.



SECURO SPACER

The Buffalo Steel Company makes twisted bars besides special shapes described later. The company states that the elasticity is neither rolled nor twisted into their bars. It is in the steel, they say, and heating to forge, to bend or shape will not alter it. The twisting is done as the finished bars come from the rolls. Enough heat remains to allow the full mechanical effect of twisting without destroying the homogeneity of the steel. The process is claimed as a specialty.

Shaped Bars.—The Corrugated Bar Company manufactures square bars with corrugations on all four sides and round bars also with corrugations. The square bar of this type was developed in 1898 and the round bar only a few years ago. The round bar has the advantage of the greatest possible flexibility; its shape allows of bending being done without the use of special machinery or particular preparation. These bars are rolled in medium, soft or high



ROUND AND SQUARE CORRUGATED BARS

carbon steel. The company furnishes, upon special order, bars made from "rail carbon" steel. These bars are made from railroad rails, the rail being split and the head rerolled into the finished bar. Material of this type is, of course, subject to irregularity in chemical and physical characteristics due to the fact that the raw material is secured from a number of sources. However, owing to improvements in the manufacture of rails the rail carbon bar is a material much superior to that rolled a few years ago and is perhaps equal to much of the billet stock material sold for commercial purposes.

The Concrete-Steel Company makes the Havemeyer bars which have been designed to meet the requirements of mechanical bond and at the same time the important economical requirement that in the deformation no strength or metal is wasted. The deformations are so designed that a constant cross-sectional area is maintained. The square bar has a series of projections and depressions in conjunction with the plain square section of the bar, the projections on the sides equaling the depressions on the corners. The round bar has projections staggered on alternate sides, giving the same result. The pro-



ROUND AND SQUARE HAVEMEYER BARS

jections and depressions are rolled longitudinally with the bar. The absence of sharp angles, which tend to break the concrete, is claimed as a special merit. The bars may be rolled from any merchantable quality of steel. Unless otherwise specified they are rolled from high-grade, new billet steel, having an elastic limit of 50,000 to 65,000 lbs. per square inch.



RECTANGULAR RABBIT BAR—HAS NO SHARP CORNERS

The Buffalo Steel Company, in addition to the bars heretofore mentioned, makes spiral and rabbit bars. They have round corners, insuring the concrete from splitting, and a greater superficial area than square twisted bars, giving greater adhesion. Rabbit steel bars, with their corrugations and well balanced cross sections, have a greater transverse strength than plain bars.

SHEET REINFORCEMENT

Expanded Metal.—Expanded metal invented by J. F. Golding is a form of reinforcement in which a perfect union exists between the longitudinal and transverse systems of rods. It is a meshwork formed from a sheet of soft steel by slitting and opening or expanding the metal with meshes in a direction normal to the axis of the sheet. It is necessary to use a soft steel of very high quality in its manufacture, as only the highest quality of metal will stand without rupture the process of expanding, which stretches the sheet to a width of from three to eight times its original dimensions. It is manufactured in sheets 8 feet long and from 12 to 72 inches wide. Steel from No. 27 gauge, with 3/8-inch meshes, up to No. 3 steel, with meshes 5 inches by 12 inches, is used in the manufacture of expanded metal. The mesh most frequently used in sewer work is 3-inch mesh, No. 10 gauge steel.

The following table gives the data regarding standard expanded metal mesh.

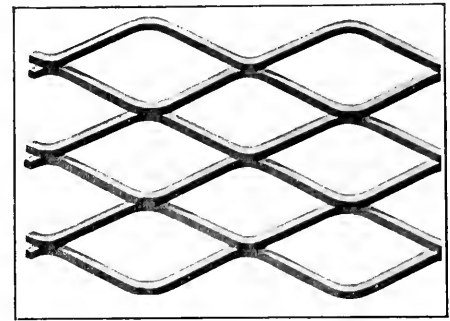
Mesh	Designation		Size of Mesh.		Section in Sq. Inches Per Foot of Width.	Weight per Square Foot in Pounds.
	Gauge (Stubs).	Strand, Standard or Extra.	Width of Diamond.	Length of Diamond.		
3"	No. 16	Standard	3.0"	8.0"	.083	.28
3 1/4"	" 10	Light	" "	" "	.148	.50
3 1/2"	" 10	Standard	" "	" "	.178	.60
3 3/4"	" 10	Heavy	" "	" "	.267	.90
3 1/2"	" 10	Ex. Heavy	" "	" "	.356	1.20
3 3/4"	" 6	Standard	" "	" "	.400	1.38
3 3/4"	" 6	Heavy	" "	" "	.600	2.07
4"	" 16	Old Style	3.86"	6.85"	.093	.42
6"	" 4	Standard	6.0"	16.0"	.245	.84
6"	" 4	Heavy	" "	" "	.368	1.26

Expanded metal as described is made by a number of companies joined in the Association of Expanded Metal Companies. They include the Northwestern Expanded Metal Co., Chicago; Central Expanded Metal Company, Pittsburg; Eastern Expanded Metal Company, Boston; Expanded Metal Engineering Company, New York; St. Louis Expanded Metal Fireproofing Company, St. Louis; Southern Expanded Metal Company, Washington, D. C.; Merritt & Company, Philadelphia; Buffalo Expanded Metal Company, Buffalo; Expanded Metal Fire-

proofing Company, Pittsburg; Western Expanded Metal and Fireproofing Co., San Francisco, and the Expanded Metal and Fireproofing Co., Limited, Toronto, Ontario.

In sewer construction expanded metal should be placed with the length of the diamond on the circumference. It has been placed in a number of sewers with the diamonds parallel with the bore, but such reinforcement is not economical. The following table contains data for the proper use of expanded metal in sewer construction:

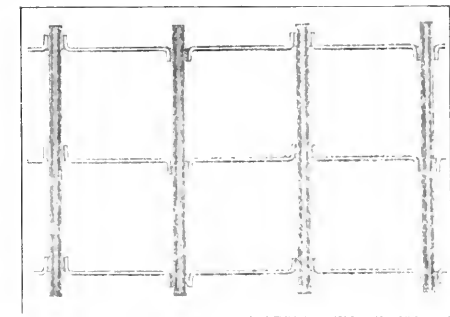
Inside Diameter.	Thickness of Concrete.	No. of Expanded Metal.	Inside Diameter.	Thickness of Concrete.	No. of Expanded Metal.
2' 6"	3"	15-3	5' 0"	4"	30-3
3' 0"	3"	20-3	5' 6"	4 1/2"	30-3
3' 6"	3"	20-3	6' 0"	5"	35-3
4' 0"	3"	25-3	6' 6"	5 1/2"	35-3
4' 6"	3 1/2"	25-3	7' 0"	6"	40-3



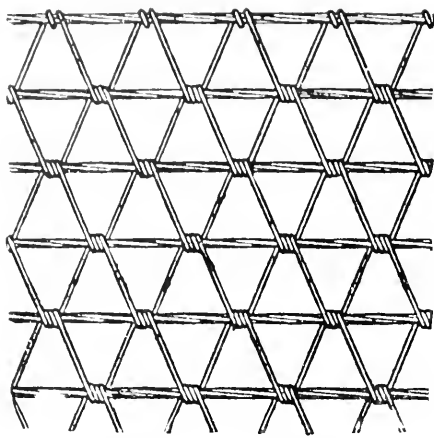
EXPANDED METAL

Special Sheet Reinforcement.—Rib metal is made by the Trussed Concrete Steel Co. It consists of a series of straight ribs or main tension members rigidly connected by light cross ties formed from the same sheet of steel. The main ribs are in the direct line of the greatest strain, while the cross members thoroughly reinforce the concrete against shrinkage or settlement cracks. The material is supplied by the manufacturer in either straight or curved sheets to meet every possible condition of sewer construction. Accuracy of curves is assured, as the sheets are machine bent. Owing to its rigidity and stiffness rib metal stays in the forms where placed and cannot be dislodged in the pouring of the concrete. The large open mesh permits the concrete to be readily tamped on all sides of the steel.

Triangle mesh reinforcement is made by the American Steel and Wire Company. It is used by those companies manufacturing reinforced concrete pipe which is made alongside the work and after the concrete is set lowered into



RIB METAL



TRIANGLE MESH

the ditch. These companies are the Lock Joint Pipe Company, the American Concrete Company and the Reinforced Concrete Pipe Company.

Triangle mesh woven wire reinforcement is made with either solid or stranded longitudinal members, properly spaced by means of diagonal or cross wires so arranged as to form a series of triangles between the longitudinal or tension members, the longitudinal members being invariably spaced 4 inches apart, the cross wires either 2 inches or 4 inches, as desired, providing either a 2-inch or 4-inch mesh. The wires are of cold drawn steel, possessing, it is stated, from 25 to 60 per cent greater tensile strength than hot rolled products of the same area. The longitudinal members may consist of one, two or three wires in the following sizes: Nos. 4, 5, 6, 8, 10 and 12½, or a ¼-inch wire used singly. Cross wires are either 12½ or 14 gauge on 2-inch or 4-inch centers, and the material is regularly supplied in widths from 18 inches to 58 inches, varying by steps of 4 inches and in rolls 150, 300 or 600 feet in length.

The Unit System of Reinforcing is made by the American System of Reinforcing, Chicago, Ill. This high tensile steel fabric is made of special steel claimed to have twice the tensile strength of any other woven material on the market. It is ductile enough to wrap around itself three or four times. Adjoining widths of fabric are fastened together by hooks. This makes it unnecessary to overlap the fabric. The

following gives the result of tests of Unit fabric made by Prof. A. N. Talbot:

	Area Sq. In.	Ultimate.	Elast. Limit. Sq. In., Lbs.	Ultimate Sq. In., Lbs.
On 8 tests on No. 9 wire, average.	.017	2450	124,000	146,000
On 8 tests on No. 11 wire, average.	.010	1230	118,000	140,000

The American company calls attention to the fact that their reinforcement affords more surface to the concrete grip than large rod reinforcement.

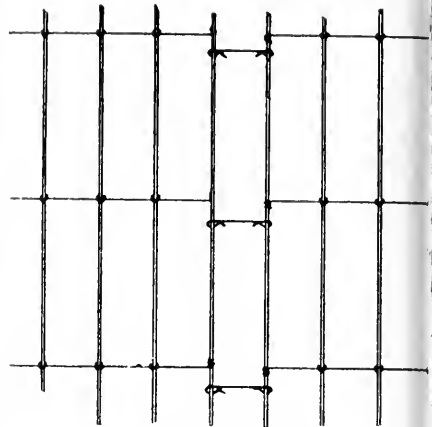
FLUSHING TANKS

The Pacific Flush Tank Company, Singer Building, New York, N. Y., has employed in the past three methods of flushing two or three lateral sewers from one tank. The first uses a single standard Miller siphon dividing the discharge outside the tank by a V branch or double Y branch into two or three streams as the case may be. The second employs a single special Miller siphon which discharges contents of tank directly into a manhole and flushing the two or three laterals converging into same. The third method uses a two-way discharge Miller siphon located in a flush tank, the siphon having a discharge head with two outlets. As the water in each of the above methods is used to flush the two or all three sewers at the same time, each tank must be two or three times the capacity of a flush tank to flush a single sewer.

A fourth method is the latest and best and does not require any larger tank than a single flush tank, as the different sewers are flushed in rotation, each lateral receiving in its turn the entire contents of the tank. To accomplish this, two or three (as the case may be) Miller-Adams alternating siphons are set into one tank, each siphon being connected with its respective sewer. The accompanying illustration shows the triple alternating design. In this device the bells and traps are so arranged as to allow them to flush in rotation.

STARY TANK

F. Stary & Sons, Cedar Rapids, Ia., manufacture an automatic siphon for use in connection with a sewer flush tank. It consists of but three plain castings, the discharge limb and trap, the cap with a relief trap cast integral



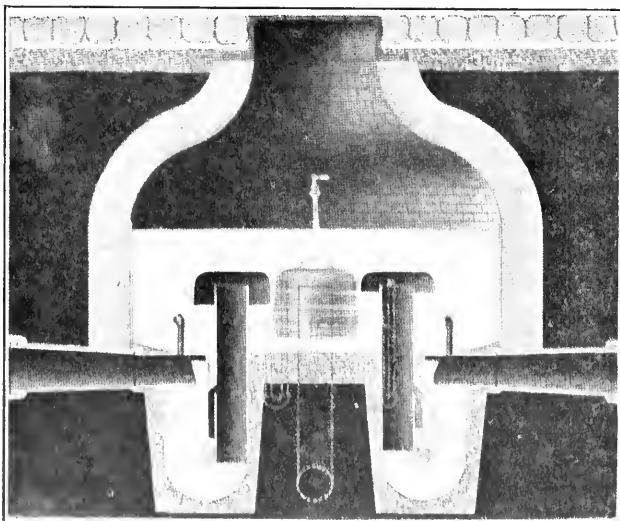
THE UNIT SYSTEM

therewith, and the intaking limb or bell. It has no moving parts and no joints. The siphon is sealed by filling the trap with water. When the water entering the tank rises above the level of the lower edges of the intaking limb or bell the air within becomes enclosed. A continued rise of the water in the tank compresses the air confined within the siphon and this compression gradually forces the water from the traps until the water in the tank has reached sufficient depth to draw the liquid seal whereupon the confined air suddenly escapes and the water from the tank rises in the bell bringing the siphon into full action. The water is then drawn out of the tank to a level with the lower edges of the bell, the siphon is reverted by admission of air through the shallow relief trap and the operation is repeated.

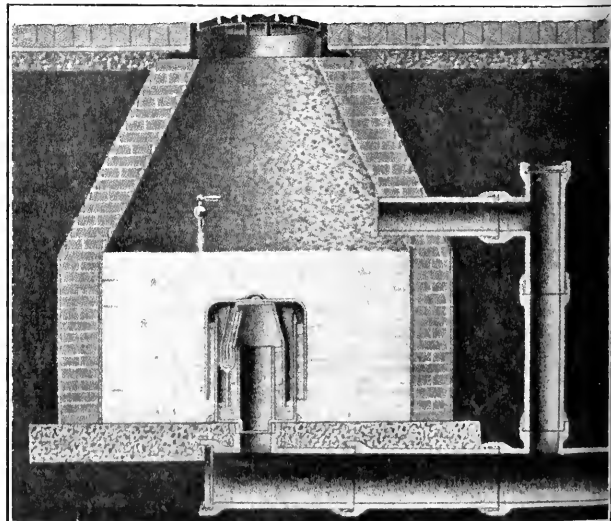
The instructions for installing the flush tank, as given by the company are as follows:

The excavation for the tank shall be opened so that the last pipe laid in the line of sewer, which may be either a T branch, ¼ curve, or a tapped length of straight pipe, shall form an outlet from the center of the bottom of the tank. This outlet shall be of sufficient size to receive the siphon outlet.

The floor of the tank is laid to a level with the outlet from the tank the walls are built up and plastered both inside and outside with cement mortar and the supply pipe, vent pipe and iron steps are built into the wall each at its proper place. After hardening of the plaster the walls and floor



MILLER-ADAMS TRIPLE AUTOMATIC SYPHON FLUSH TANK



STARY AUTOMATIC SYPHON FLUSH TANK

of the tank will be coated with thick cement slush applied with a brush so as to make the tank absolutely water tight.

The siphon may be installed either during the construction of the flush tank or after the tank has been completed.

To install the siphon, a light bed of cement mortar is formed around the outlet from the tank and the trap of the siphon is placed upon this bed so that the outlet of the discharge leg shall enter the outlet from the tank. The discharge leg is made level by placing a spirit level on top of the trap and leveling it both ways. Cement mortar is then built up around the trap and care shall be taken that the trap is not disturbed until the cement has set sufficiently to hold it in place. After hardening of the cement the trap shall be filled with water, the cap placed over the discharge leg and the bell placed over the trap. Water may then be supplied and the tank put into operation.

ing in sewer and trench work is exactly similar to that followed in driving wooden sheeting. Any form of light pile driver may be used, and the greatest economy is obtained when the piling is driven by a driver arranged to move on rollers along the line of the excavation as the work progresses. A 200-pound hammer operated by gas, steam or compressed air will drive light sections through ordinary soils up to 10 or 12 feet penetration. It has also been driven with a wooden dolly dropped from a tripod, by mauls, etc. It is desirable to use some form of driving cap to protect the heads of the piling from battering in order to permit reuse as often as possible without the necessity of straightening the material at the tops to prevent the binding of the sections in the interlock.

The most economical way to handle the work is to provide steel sheet piling for a convenient section of trench of such length that as the work pro-

gresses and, therefore, resisting the earth pressure both as beams and as arches.

The number of times that steel sheet piling may be driven, pulled and re-driven is unknown. The largest number of times recorded in available records in any installation is 80, and the piling was reported to be just as good after the installation was completed as it was when it started.

In the construction of the Colonial avenue and Jamestown boulevard, at Norfolk, Va., in 1907, 6-inch 11-lb. United States steel sheet piling was driven 35 times with a 200-pound gas hammer in building 7,000 feet of trench. The piling was driven in quicksand and withdrawn with a tripod and horse, at a saving of about 40 per cent as compared with the cost of wooden sheeting.

In 1908 a trench 5 feet wide, 12 feet deep and 700 feet long, was excavated in sand, gravel and quicksand for the blast furnace of the Wickwire Steel Company, on the Niagara River, near Buffalo, N. Y. Enough 12-inch piling 16 feet long was bought for a trench 70 feet in length and was driven with a 2,800-pound drop hammer at a cost, including material, driving and pulling, of about \$3,300, as compared with an estimated outlay of \$4,200 for wood, and after the job was completed the steel sheet piling was inventoried by the contractor at \$1,400. The total saving was 48 per cent.

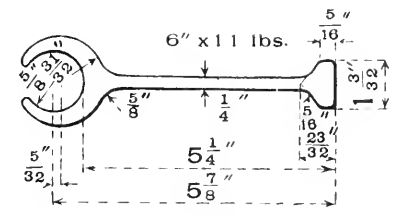
Some extremely low driving costs have been made in sewer work, as low as 3½ cents per foot of penetration, and experience amply demonstrates the value of piling as a modern up-to-date tool of construction.

The illustration shows 6-inch 11-lb. United States steel sheet piling driven by a wooden dolly falling from a tripod in the construction of a sewer at the city of Flint, Mich., by a A. P. Southworth. Two thousand lineal feet of sewerage was built in 60-foot sections. The sections were driven about 35 times each at a cost for driving and pulling of 25 cents per lineal foot of trench for 10-foot lengths, and \$1 per lineal foot of trench for 20-foot lengths, through considerable quicksand and in water, the longer lengths being used through the quicksand.

PORTABLE GASOLINE DERRICK

A PORTABLE gasoline derrick called the Wonderhoister has been placed on the market by W. Van R. Whitall, Inc., 30 Church street, New York, N. Y. It consists of a direct connected gasoline engine and hoist with single or double drums mounted on a portable truck. The whole device is simple, compact, portable and economical, built of steel throughout, with either steel or wooden mast and booms.

The builder states that the machine is so constructed that it is adaptable for all hoisting purposes. It operates at a speed of from 75 to 150 feet per minute, and is arranged for use with a simple bucket or with a plain hook for ordinary hoisting; also with a drum and counterweight for operating with a clamshell bucket, and with a bull wheel on the mast for self-swinging. The "Wonderhoister" is also adapted to conveying, hauling, excavating and unloading purposes. It is used by contractors for handling concrete, sand and gravel in connection with sewer work and other construction. When not in operation with the derrick the engine is available for furnishing power for general purposes, such as running air compressors or small pieces of machinery.



SECTION UNITED STATES STEEL SHEET PILING

gresses the piling at the rear may be pulled and driven ahead, which means that the operations of driving, excavating, placing the sewer and backfilling are to go on continuously, the initial operation being carried on at the pile driver and the final operation at the rear of the excavation where the piling is pulled. Generally a hundred-foot length should be sufficient.

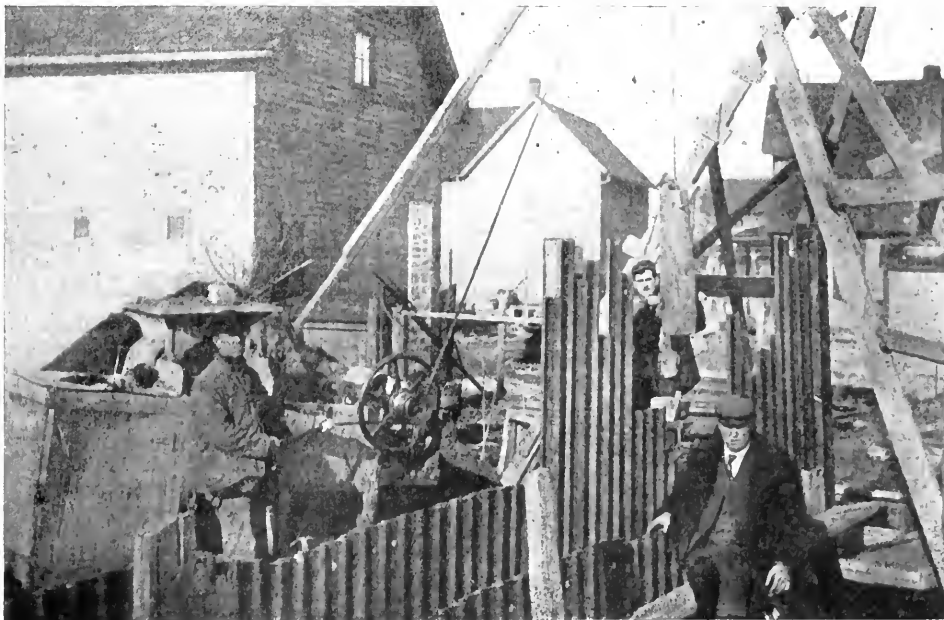
Steel sheet piling, being much stiffer than the ordinary 2-inch planking, there is less necessity for bracing, and it is possible to use safely only extensible trench braces and to omit the rangers, depending of course on the depth of the trench. In this way both the transverse and the longitudinal strength of the piling may be utilized, the sections taking a catenary curve between the

STEEL SHEET PILING

Immediately after the introduction of steel sheet piling, in November, 1901, when it was first used in the construction of the cofferdams for the Randolph Street Bridge, Chicago, its advantages in sewer and trench work, by reason of the possibilities of its indefinite reuse, were instantly recognized.

There are manufactured a number of sections which are suitable for sewer and trench work, in which case much lighter sections can be used than those required in cofferdam construction and deep foundations where the depth of penetration is great and the driving conditions difficult. In city sewer and trench work the driving is usually through loose ground to shallow depths, and heavy sections are not required. Sections are therefore, made light in weight, particularly adapted to his class of work.

The driving of steel sheet pil-



DRIVING UNITED STATES STEEL SHEET PILING WITH WOODEN DOLLY

NEWS OF THE SOCIETIES

Third National Conference on City Planning.—Count Heinrich von Bernstorff, the German Ambassador to the United States, will be Philadelphia's guest and the principal speaker at the dinner to be given at the Bellevue-Stratford, May 17, to the members of the Third National Conference on City Planning. The dinner, which will be the closing feature of the three days' City Planning Conference, was originally arranged for 100 guests, but so great has been the interest in the conference that more than 600 men and women have already expressed a desire to attend. The invitations have been extended jointly in the name of the Mayor and the City Club.

The programme for the conference is being completed and the committee is now devoting its time to the exhibit which will be a popular feature of the conference. This will be the first municipal exhibit of city planning held in the United States under the auspices of a municipality.

The exhibition will be open to the public from May 15 to June 15, daily, between the hours of 10 a. m. and 10 p. m., and on Sundays between 1 and 5 p. m. The exhibits will be shown in the Mayor's reception room in the large conversation hall on the second floor of the City Hall, directly facing the north staircase, the Board of Education's main room and the north, east and west corridors on the second floor. The exhibition will be specially lighted by the Electrical Bureau.

More than 100 cities, including Paris, Berlin, Liverpool and other foreign municipalities, will be represented in the exhibition. In the London exhibit will be drawings of Piccadilly Circus. Through the efforts of the Commercial Museums a large collection of photographs will show harbor improvements in Havana, Rio de Janeiro and Buenos Ayres.

New York City will be represented by a large collection of plans prepared in 1907 by the New York Improvement Commission, showing dock and street improvements. These plans are all in perspective and are owned by the city of New York. Included in the plans will be a number of bridge improvements and the design, in perspective, for the Hudson-Fulton Memorial Water Gate.

Chicago will show plans which were prepared for the Commercial Club by D. H. Burnham and D. H. Bennett. About \$60,000 was spent in the production of these plans and about \$20,000 additional was expended on the preparation of the report, which has just been issued. This exhibit will be made by the Commercial Club of Chicago, and it will occupy the entire space in the Board of Education's main room. The plans in themselves show a linking up of all the territory within a radius of 75 miles of Chicago.

Philadelphia's exhibit will be the recently designed comprehensive plans, which will be shown in the Mayor's office.

Boston, which has officially appropriated \$1,500 to make an exhibit, will show many drawings illustrating projected improvements, together with designs for the Boston Exposition of 1915. Included in the Boston exhibit will be drawings showing the new park system, generally admitted to be the most magnificent park area in the United States. Cleveland will be represented

by a large number of original drawings showing improvements. The Chamber of Commerce is supervising the improvement work in Cleveland.

Baltimore will have a large exhibit showing the municipal activity started in that city, together with many drawings showing future development.

The Pittsburgh exhibit will be largely made up of the report, just published, showing projected improvements for the remodeling of the city streets so as to meet the traffic demands of the rapidly increasing population. The report was designed by Frederic Law Olmstead, chairman of the executive committee of the City Planning Conference, and one of his recommendations to the city of Pittsburgh is the creating of a magnificent park at the point where the two rivers join the Ohio and where Fort Duquesne was located. From that point the city of Pittsburgh had its beginning.

Other American cities which have arranged exhibits include Buffalo, Milwaukee, Washington, Minneapolis, Jersey City, Seattle, Rochester, St. Paul, Denver, Portland, Ore.; Columbus, Ohio; Toledo, New Haven, Scranton, Hartford, Des Moines, Kansas City, Wilkes-Barre, Savannah, San Diego and Los Angeles.

A general invitation will be extended to the public, and special days will be set apart for schools, organizations, societies, etc., to view the exhibits. It is probable that the offer of a number of university students to act as volunteer lecturers and guides will be accepted.

International Association of Municipal Electricians.—Secretary Clarence R. George, Houston, Tex., has announced that the annual convention will be held in St. Paul, Minn., September 12-15.

American Society of Mechanical Engineers.—Several important papers on patents will be presented at the New York meeting of the American Society of Mechanical Engineers, 29 West Thirty-ninth Street, at 8:15 p. m. on Tuesday, May 9, 1911. The subject will be discussed by E. W. Marshall, D. Howard Haywood, Edwin J. Prindle, all of New York. The purpose of this meeting is to outline to the engineer and manufacturer the fundamental principles of the patent law, the position and qualifications of a patent expert and the industrial development for the purpose of establishing a patent monopoly. The question of patent law is more a question of pure and applied science than it is of law and for this reason this subject interests engineers and all those trained in the mechanic arts. There are few legal practitioners who even pretend to have sufficient knowledge of patent law to practise in this field successfully and the experts who are to discuss the papers are by experience professionally conversant with the particular branch of the subject of which they treat.

Good Roads Association of Western Kentucky.—Over 200 citizens of six counties in Kentucky met at Middlesboro April 19 to attend a good roads convention. The convention was called to order by County Judge B. A. Fuson. Mayor Helburn, Middlesboro, delivered the address of welcome. Among the speakers were John W. Chalkley, Big Stone Gap, Va.; J. F. Bosworth, Middlesboro; T. J. Stewart, Winchester, and Ruby Lafoon, Madisonville. One of the objects of the meeting was to promote the construction of a road from Virginia to the Blue Grass region.

Playground Association of America.—The fifth annual meeting will be held

at the New Willard Hotel, Washington, D. C., May 10-13. The following is the program:

Wednesday, May 10, 8:00 p. m.—Rural Recreation, Professor L. H. Bailey, Cornell University, Ithaca, N. Y., Chairman Committee on Rural Recreation; Hon. William Kent, Kentfield, Cal.

Thursday, May 11, 9:30 a. m.—Games for Children under Ten Years of Age, Alice Corbin, Pittsburgh Playground Association. Demonstration, George E. Johnson, Superintendent Pittsburgh Playground Association. 10:45 a. m.—Games for Girls Ten to Fourteen Years of Age—Discussion by playground experts. Demonstration, George E. Johnson, Superintendent Pittsburgh Playground Association. 12:00 m.—Playground Equipment, E. B. DeGroot, General Director South Park Commissioners, Chicago, Ill.

Thursday, May 11, 2:30 p. m., Rosedale Playground, 17th and Kramer Sts., N. E.—Games for Boys Ten to Fourteen Years of Age, George E. Johnson, Superintendent Pittsburgh Playground Association. Delegates will themselves play volley ball, playground ball, soccer football. The teams will be captained by George E. Johnson and E. B. DeGroot. The leading playground workers have agreed to play on these teams. There will also be a volley ball game for young women delegates. 8:00 p. m.—Play as an Antidote to Civilization, Joseph Lee, President Playground Association of America, Boston, Mass.

Friday, May 12, 9:30 a. m.—What About Athletics on the Playground? Lee F. Hammer, Chairman Committee on Institutes, Playground Association of America, New York City. 10 a. m.—Play Leaders and Boy Scout Activities, James E. West, Secretary Boy Scouts of America, New York City. 10:30 a. m.—Sources from Which Recreation Workers May Be Secured, Clark W. Hetherington, Chairman Committee on Normal Course in Play, Chicago, Ill. 11 a. m.—The Guild of Play, Madeline L. Stevens, Play Supervisor Parks and Playgrounds Association of New York City. 11:30 a. m.—Question Box—Questions answered by leading playground experts. 2:30 p. m.—Possibilities of Dramatic Work—Demonstration, Edna V. Fisher, Pittsburgh Playground Association. 3:30 p. m.—Folk Dancing, Mrs. James J. Storrow, Chairman Committee on Folk Dancing, Boston, Mass. 4:30 p. m.—Folk dancing by delegates. 8 p. m.—Boys and Girls at Night—Speaker to be announced. Evening Recreation—Social Dancing, Mrs. Charles Henry Israels, Committee on Amusements and Vacation Resources of Working Girls, New York City. Active Games—Discussion by playground experts.

Saturday, May 13, 9:30 a. m.—Practice of Boy Scout activities by delegates. Boy Scout Patrols on the Playground, Preston G. Orwig, Field Secretary, Boy Scouts of America. 1 p. m.—An invitation to delegates has been extended by Mr. Arthur C. Moses, President of the Washington Playground Association, to be his guests at a luncheon at the Neighborhood House Social Settlement, 472 N Street, S. W., at 1 p. m. Following this there will be an opportunity to inspect the Settlement playground and witness a part of the Settlement's Annual Spring Festival. Small parties will be arranged to go from the Settlement to visit the other playgrounds.

American Society for Testing Materials.—The fourteenth annual meeting of the American Society for Testing Materials will be held at the Hotel Traymore, Atlantic City, N. J., Tuesday to Saturday, inclusive, June 27 to July 1. This year it is expected that most of the papers and committee reports will be printed and circulated in advance of the meeting. The present membership of the society is 1,342.

Syracuse Commission Government Association.—As the result of agitation which has been carried on for some time a number of citizens have formed the Syracuse Commission Government Association for the purpose of disseminating information regarding this system of municipal administration. Officers have been elected as follows: President, Giles H. Stilwell; vice-president, Thomas W. Meacham; treasurer, W. C. Brayton; secretary, Virgil H. Clymer. The following were placed on the executive committee: Louis Will, Hurlbut W. Smith, Charles W. Snow, Carlton A. Chase, J. Brewster Gere, Salem Hyde and Robert Dey.

Health Officers of Central New York.—A sanitary institute for the benefit of health officers of central New York was held at Syracuse, May 2 and 3. The following program was carried out:

First session, May 2, 2-5 p. m., held in the Municipal Laboratory, City Hall, Syracuse.

2-3—Laboratory demonstrations by laboratory staff. How to collect samples of water. The taking of specimens from throat for examination for diphtheria infection. The taking of blood for examination of typhoid infection. Collection of stools—specimen. Laboratory methods of examination.

3-4—Brief talks, Dr. W. W. White, "The Work of Municipal and County Bacteriological Laboratories"; Dr. F. E. Englehardt, "Local Laboratory Control of Water Supplies"; Dr. W. A. Bing, "Bacterial Diagnosis by the State Laboratory"; L. M. Wachter, "State Investigation of Water Supplies"; Dr. W. S. Magill, "The Use of the State Laboratories to the Physician."

4-4:30—Intermission, affording opportunity for discussion, the answering of questions, and further demonstrations.

4:30-5—H. B. Cleveland, "The Principles of Sanitary Investigations."

Second session, May 2, 8 p. m., held in the Municipal Laboratory.

Informal talks, Health Officer D. M. Totman and the State Commissioner of Health.

Question box, conducted by Dr. Hills Cole.

Third session, May 3, 9-12 a. m.

Field work on Skaneateles lake—A boat will convey the party to various points on the shores of the lake where the State sanitary engineers will discuss the methods employed for the protection of water supplies.

Lunch at Skaneateles.

Fourth session, May 3, 2-5 p. m.

Field work in sanitary investigation—(a), inspection of Skaneateles sewage disposal plant with a brief exposition of the construction and operation of disposal plants. (b), investigation of sanitary conditions of farms, villages, etc. Automobiles and other means of transportation were provided and the party (under the guidance of the State sanitary engineers) investigated the sanitary condition of as many farms, villages, etc., as time permitted.

The Health Bureau of the city of Syracuse demonstrated to visiting health officers the following features of its work:

Medical school inspection.

Isolation Hospital for contagious diseases.

Distributing reservoir and pumping plant.

Intercepting sewer (under construction).

Detention hospital for the insane.

Albany Society of Engineers.—At the meeting, April 25, Theodore Horton, consulting engineer, New York State Department of Health, gave an illustrated lecture on water filtration.

Engineers' Society of Western Pennsylvania.—At the monthly meeting of the society held in its headquarters in the Oliver Building, Pittsburgh, April 18, Dr. Joseph W. Richards, of Leigh University, South Bethlehem, Pa., presented a paper on "The Electrometallurgical Revolution in the Iron and Steel Industry of Norway and Sweden."

Southern Gas Association.—The annual meeting was held in Montgomery, Ala., April 19-21. The program of addresses was as follows: Commercial

Lighting, by J. N. Cooke, Jacksonville, Fla.; The Inspection of Gas Consumers and Gas Appliances, by F. G. Dean, of W. N. Crane & Co.; The All-Gas Kitchen, by G. W. Howsmun, Mobile, Ala.; Advertising, by Albert B. Kelley, U. G. I. Co.; Water Heaters—Automatic, Instantaneous, Circulating, W. J. McCartney, of Humphrey Company; Application of Gas-Fired Boilers, by G. W. McKee, of the Eclipse Fuel Engineering Company; Gas Illumination, by Norman MacBeth, Welsbach Company; Relation of the New Business Department to the Gas Consumer, by George Williams, of H. L. Doherty & Co.; Street Mains and Service Construction Policy, by K. L. Simons, Birmingham, Ala.; Starting a Gas Company, by J. C. Storm, Amarillo, Tex.; High Pressure Gas Plant with Medium Pressure on Mains, by F. H. Sawyer, Newbern, N. C.; Shop Management, by A. W. Young, Knoxville, Tenn. A gas show, held under the auspices of the Montgomery Light and Water Power Company, was one of the attractions of the session.

National Electric Light Association.

—A tentative program has been announced for the annual convention at New York, May 30-June 2. There will be 16 sessions in all, with 24 papers and some 40 reports. The general calendar of meetings is as follows:

May 30, A. M., first general session; evening, Public Policy Committee, report on welfare work plan.

May 31, A. M., first technical, commercial and accounting sessions; afternoon, second general and accounting sessions. June 1, A. M., first power transmission, second commercial and third accounting sessions; afternoon, second technical and third commercial sessions. June 2, A. M., second power transmission, third technical and fourth commercial sessions; afternoon, third general session.

Among the papers and reports the following are to be noted:

General Sessions—Reports on progress, accounting, overhead construction, insurance, question box, library, rate research, section organizations and changes in constitution; "Master and Men," by Mr. Paul Lupke; "Electrical Exhibitions," by Mr. L. A. Ferguson; "Valuation of Properties as Related to Rates," by Mr. W. F. Wells; "Reasons for Variations in Rates Under Varying Conditions of Operation," by N. T. Wilcox; "The Standardization of Electrical Selling," by Douglass Burnett; "Economics in Operation Possible Through Time Study," by Mr. L. B. Webster.

Technical Sessions.—Reports on pole preservation, underground construction, overhead construction, meters, prime movers, lamps, electrical apparatus, grounding of secondaries; "The Ventilation of Turbo-Generators," by Mr. R. B. Williamson; "Progress and Development in Self-Cooled Transformers," by Mr. H. O. Troy; "Grounding Low Tension Circuits," by Mr. P. M. Lincoln; "Recent Improvements in Single Phase Motors," by W. A. Layman; "Relation of Motor Load to Central Station Equipment," by F. D. Newbury.

Power Transmission Sessions.—Reports on governmental control of water powers and lightning protection; "Utilization of Central Stations for Supply of Electricity to Operate Railroads," by Mr. Fred Darlington; "A New Method of Reducing the Investment in Central Station Boiler Plants," by Mr. H. A. Wagner; "Determining Cost of Production in Steam Properties Under Varying Conditions," by G. H. Walbridge.

Commercial Sessions.—Reports on electricity in rural districts, power, electric vehicles, residence, business, improved standards of industrial lighting, advertising, competitive illuminants, sales departments.

Accounting Sessions.—"Tracing Store-room Material," by J. T. Brady; "The Purchasing Department," by Mr. T. W. Buxton; "Advantage of Job Cost System," by Mr. Alex. Holme; "Handling Customer's Orders," by Mr. R. F. Bon-sall; "Collection of Bills," by Mr. E. J. Bowers; "Electric Vehicle Accounts," by Mr. Herman Spoehrer; "General Office Accounting," by Mr. Franklin Heydecke; "Depreciation," by Mr. H. M. Edwards; "Use of a Tabulating Machine in Accounting Work," by Mr. Wm. Schmidt, Jr.

International Congress on Hygiene and Demography.

—The fifteenth congress will be held at Washington, D. C., September 23-28, 1912. The object of the congress is to extend the knowledge and improve the practice of hygiene, public health and vital statistics in the countries which participate. Invitations to participate have been accepted by 21 countries. Occupational diseases and industrial accidents will be taken up by the section of industrial and occupational hygiene; the hygiene of houses and streets, water supply, disposal of waste and the legislative and administrative functions of boards of health will be discussed before the section of state and municipal hygiene; the section of hygiene of traffic and transportation will take up street traffic, street railway (including subways and elevated lines), railways, river and lake traffic and sea traffic, giving attention both to sanitation and to the prevention of accidents. The six other sections will deal respectively with microbiology and parasitology; dietetics and physiology; hygiene of infancy and childhood; control of infectious diseases and tropical, military and naval hygiene.

The preliminary announcement states that any person interested may become a member of the congress, entitled to participate in the proceedings and to receive a copy of its transactions upon payment of the membership fee of \$5. The address of the congress is Army Medical Museum, Washington, D. C.

Missouri Electric, Gas, Street Railway and Water Works Association.

—The fifth annual convention was held at Jefferson Hotel, St. Louis, Mo., April 13-15. Mayor Kreismann delivered the address of welcome. In connection with the reading of the minutes a discussion arose as to the advisability of admitting municipal plants to membership and a resolution was carried to the effect that they should be admitted. Among the papers read were the following: "Centrifugal Pumps," by W. H. Reeves; "Lubrication," by A. E. Flowers, University of Missouri; "Liability Insurance for Public Service Corporations," by Judge D. D. Taylor, St. Louis; "Illuminating Engineering," by J. H. McGlensey, St. Louis; "The Electric Vehicle," by Herman Spoehrer, St. Louis; "Ornamental Street Lighting," by N. J. Cunningham; "District Steam Heating," by H. C. Kimbrough; "Coal and water Gas," by P. A. Bertrand.

The following officers were elected: F. E. Murray, Louisiana, president; P. A. Bertrand, Jefferson City, first vice-president; J. G. Harsh, Joplin, second vice-president; C. L. Clary, Sikes-ton, third vice-president, and N. J. Cunningham, Springfield, secretary-treasurer.

Calendar of Meetings

- May 15-17.
National Conference on City Planning.—Philadelphia, Pa.—Flavel Shurtliff, Secretary, 19 Congress street, Boston, Mass.
- May 17.
Massachusetts Highway Association.—Quarterly Meeting in conjunction with the New England Conference on Street Cleaning, Springfield, Mass.
- May 17.
New England Conference on Street Cleaning.—Springfield, Mass.—Corresponding Officer, Carol Aronovici, 55 Eddy street, Providence, R. I.
- May 18-19.
Ohio Society of Mechanical Steam and Electrical Engineers.—Annual Convention, Youngstown.—F. E. Sanborn, Secretary, Ohio State University, Columbus.
- May 23-25.
National Fire Protection Association.—Annual Meeting, New York City.—F. H. Wentworth, Secretary, 87 Milk St., Boston.
- May 23-26.
National Good Roads Association.—Fourth National Good Roads Congress, Birmingham, Ala.—J. A. Rountree, Secretary, Birmingham, Ala.
- May 25-26.
League of Second and Third Class Cities of New York.—Poughkeepsie, N. Y.
- May 29-June 2.
National Electric Light Association.—New York City.—T. C. Martin, Secretary, 31 West 39th St.
- June 5-14.
National Probation Officers' Association.—Boston, Mass.—Roger N. Baldwin, Secretary, 903 Security Building, St. Louis, Mo.
- June 6-10.
American Water Works Association.—Thirty-first Annual Convention, Powers Hotel, Rochester, N. Y.—John M. DiVen, Secretary, 14 George street, Charleston, S. C.
- June 7-14.
National Conference of Charities and Correction.—Boston, Mass.—Alexander Johnson, Secretary, Ft. Wayne, Ind.
- June 7.
National Association for the Study and Prevention of Tuberculosis.—Denver, Col.—Dr. Livingston Farrand, Executive Secretary, 105 East Twenty-second street, New York City.
- June 11-16.
International Association of Chiefs of Police.—Eighteenth Annual Convention, Rochester, N. Y.—Major Richard Sylvester, Superintendent of Police, Washington, D. C., President.
- June 13-18.
New York State Association of Chiefs of Police.—Annual Convention, Rochester, N. Y.
- June 13-16.
American Society of Civil Engineers.—Annual Convention, Chattanooga, Tennessee.—Charles Warren Hunt, Secretary, 220 West 57th St., New York.
- June 21-22.
National Conference of Poor Law Officials.—Boston, Mass.—Dr. Robert W. Hill, President State Board of Charities, 105 East Twenty-second street, New York City.
- August 15-18.
Firemen's Association of the State of New York.—Watertown, N. Y.—A. H. Otto, Secretary.
- September 12-15.
International Association of Municipal Electricians.—Annual Convention, St. Paul, Minn.—Clarence R. George, Secretary, Houston, Tex.
- September 19-22.
International Association of Fire Engineers.—Annual Convention, Racine, Wis.
- September 19-22.
American Hospital Association.—New York City. J. N. E. Brown, M.D., Secretary, Toronto General Hospital, Can.
- September 24-30.
International Congress on Tuberculosis.—Rome, Italy.—Professor Ascoli, Secretary-General, Via Lucina, Rome, Italy.
- September 26-29.
American Society of Municipal Improvements.—Grand Rapids, Mich.—A. Prescott Polwell, Secretary, 239 West Thirty-ninth street, New York City.
- October 4-6.
League of American Municipalities.—Annual Convention, Atlanta, Ga.—John MacVicar, Secretary, Des Moines, Ia.

PERSONALS

BALDWIN, BERT, expert engineer, of Cincinnati, O., will be sent to Louisville to inspect the roller bearings and steel work for the reconstruction of Mohawk bridge.

BENNETT, WM. W., has been elected Mayor of Rockford, Ill.

BINGHAM, GEN. THEODORE A., U. S. A., retired, has been appointed Chief Engineer, in charge, in the Bureau of Highways, New York City, succeeding George W. Tillson.

BROGDEN, W. J., was elected Mayor of Durham, N. C., without opposition, at a recent election.

BURNS, CLINTON S., Consulting Engineer, of Kansas City, Mo., has completed an investigation of the water works system of South Bend, Ind.

BUSSE, CARL, was elected Mayor of Laurenceville, Ill., on the Citizens' Improvement ticket.

CARPENTER, GEORGE, City Engineer of Providence, R. I., recently delivered an interesting and instructive address on the Panama Canal.

CASSON, HERBERT N., efficiency engineer, who has lectured on and investigated municipal problems all over the country, spoke before the Chamber of Commerce of Rochester last week at a corporation meeting. The title of his address was "Industrial Efficiency as Applied to the Development of a Great City."

CHADWICK, JOHN B., has been appointed road superintendent of Great Barrington, Mass.

CHISHOLM, R. B., was elected Mayor of Halifax, N. S., for a third term by acclamation.

CHRIST, S. V., has been re-elected Mayor of Miller, S. D.

CLARK, C. N., is the new Mayor of South St. Paul, Minn.

DALTON, RUFUS I., has been elected Mayor of Winston-Salem, N. C., on the Democratic ticket.

FAWCETT, C. V., Mayor of Tacoma, Wash., has been recalled by a recent election instituted by the Welfare League, and W. W. Seymour is the new Mayor-elect, having polled 11,246 votes against 10,394 for Mr. Fawcett. Mr. Seymour will take office at the end of ten days. Mr. Seymour and Mr. Fawcett were the two leading candidates at an election only two weeks ago, when a Socialist also was in the race. Mayor-elect Seymour was the candidate of the Welfare League, and was defeated.

FRANKLIN, H. M., who has served as Mayor several times, was elected Mayor of the city of Tennillo, S. C., without opposition.

GLEASON, WALTER L., has been selected attorney for the Sewerage and Water Board of New Orleans, succeeding Omer Villere.

GOODLAND, W. S., is the new Mayor of Racine, Wis.

HANCOCK, H. D., has been appointed Fire Commissioner of Binghamton, N. Y., succeeding Wm. Barnett, resigned.

HAY, S. J., Mayor of Dallas, Tex., expects to travel in Europe this summer.

HICKEY, JOHN M., representing the American Association for Highway Improvement, delivered an address in Birmingham, N. Y. The organization which he represents has in view the affiliation of all good roads associations, and Captain Hickey has arranged to tour many of the Southern cities which have figured prominently in recent days in the movement for building public highways. Among the other cities Captain Hickey will visit are Roanoke, Va.; Bristol,

Tenn.; Knoxville, Chattanooga, Atlanta, Montgomery, Mobile, New Orleans, Vicksburg, Memphis, Little Rock, Nashville, Louisville, Frankfort and Lexington.

LAWTON, CHARLES F., has been re-elected superintendent of public works of New Bedford, Mass.

LEWMAN, WILL C., has been elected Mayor of Danville, Ill.

MCCLELLAN, WM., of New York, has been appointed Consulting Electrical Engineer of the Public Service Commission, Second District, to succeed Howard H. Crowell, of Syracuse, who resigned from the service of the commission on April 15. Mr. McClellan is a graduate of the University of Pennsylvania, and was also instructor there. He has been engaged in work with the Philadelphia Rapid Transit Company, the electrification of the New York terminal of the Pennsylvania Railroad, the electrification of the Rochester branch of the Erie Railroad, and as consulting engineer on other important work. He is a member of the Railway Committee of the American Institute of Electrical Engineers, the Electrification Committee of the New York Railroad Club, the American Institute of Electrical Engineers, and of the American Society of Mechanical Engineers.

MCGRAW, P. H., has been appointed Street Commissioner of Duluth, Minn.

MCINTIRE, WM. W., who was appointed a member of the Sewerage Commission by Mayor Mahool, was immediately confirmed by the Second Branch of the City Council. He succeeds the late Gen. Peter Leary, Jr., as a member of the commission, Charles England having recently been elected to succeed General Leary as chairman.

MILLER, BEN F., has been elected City Civil Engineer of Meadville, Pa.

MUESER, WM., one of the best-known bridge builders and civil engineers of the United States, has been invited by the Board of Contract and Supply of Albany, N. Y., to inspect the drawings of the proposed river front improvements.

MURPHY, J. J., has been appointed Chief of Police of Butte, Mont.

O'NEIL, JOSEPH, has been reappointed City Engineer of Leavenworth, Kan.

SCHORER, ARNO R., has been appointed Director of the Parks and Playgrounds Association of New York City. Mr. Schorer was for four years connected with the Bureau of Advice and Information of the Charity Organization Society.

SITTERLE, S. S., has been re-elected Mayor pro tem. of Victoria, Tex.

THATCHER, CHARLES W., the "Apostle of Good Roads," delivered an address last week at Vincennes, Ind., under the auspices of the Board of Trade.

TODD, J. H. L., who has been Mayor of Fanwood, N. J., since 1909, has resigned because of the pressure of personal business.

WEIR, L. H., the public playground worker, who is touring the Northwest in the interest of playground improvements, recently delivered several addresses at Tacoma, Wash.

WEST, JOHN T., is the new Mayor of Pueblo, Col.

WHITE, JOHN T., has been reappointed Fire Commissioner of Saratoga Springs, N. Y.

WILGUS, WM. J., has been awarded the Telford gold medal for the paper read by him before the recent session of the Institution of Civil Engineers of Great Britain. Mr. Wilgus was formerly vice-president and chief engineer in charge of maintenance of way and construction of the New York Central, on which he installed the electric system between this city and suburban points.

TRADE NOTES

Cast Iron Pipe.—Chicago: Actual business recently closed has been comparatively small, but specifications are liberal and inquiries frequent. Prices are firm. Quotations: 6 to 12-inch, \$24.50; 16-inch and up, \$24. Birmingham: Consumers of cast-iron pipe have been inclined to delay in placing orders. Prices are well maintained. Quotations: 4 to 6-inch, \$23; 8 to 12-inch, \$22; over 12-inch, average, \$21. New York: The market is very quiet. Quotations: 4-inch, car loads, \$21 to \$22.

Lead.—Lead is quiet and barely steady. Quotations: New York, 4.425c.; St. Louis, 4.275c.

Pumping Machinery.—The International Steam Pump Company, through its foreign branch, has obtained a contract to build municipal water works at Buenos Ayres, the estimated cost of which will be \$1,090,000. The company has not decided as yet at which of its plants the pumping equipment will be made, but it is understood that the fulfilling of the contract will entail expenditures in the general market.

Contractors' Machinery.—Hetherington & Berner, Indianapolis, Ind., engineers, have under construction a new plant which will cover about four acres. The plant will be of fireproof construction. The company will enlarge its line of manufacture, and in addition to its specialty of asphalt paving plants and machinery will manufacture other kinds of contractors' machinery, including concrete mixers, road rollers, steam shovels, etc. The company will also extend its operations in steel construction work.

Cement Plant.—The Dakota Portland Cement Company, Sioux Falls, S. D., states that the construction of its plant at Chamberlain, S. D., is well under way, and that it is expected to be ready for operation about Nov. 1. It will have a daily capacity of 2,500 to 3,000 barrels. The buildings are of steel and concrete construction, and together with the terminals cover an area equal to 12 acres. The company owns its own terminals, and will operate its own locomotives.

Road Work Condemned.—The protest of the Board of Supervisors of Ontario County, N. Y., against the acceptance of the Manchester-Clifton springs highway 607, built by the Ganz-Wilson Construction Company in 1908, under State Engineer Skeene, has been sustained by the State Highway Commission. The decision stated that the road was not in condition for acceptance. The stone used in the top course was not that called for in the contract. That the change in stone was permitted by the State Engineer's Department without the approval of the Board of Supervisors of Ontario County. The contractors were notified to complete the work in accordance with the terms of the contract.

Road Oil.—The Standard Oil Company is now delivering in different parts of the Borough of Queens, New York, 40,000 gallons of oil. It will be used on the roads in the thickly settled sections and on main traffic thoroughfares.

Auto Fire Apparatus.—The Garford Company, Elyria, O., have announced that they will manufacture motor-driven fire apparatus, patrol wagons, ambulances and other automobiles used in the public service of municipalities. R. K. Johnson, of the Garford Company, has designed a chief's car, carrying a 35-gallon chemical tank.

Street Oiling.—Street Commissioner Thompson, Elizabeth, N. J., will have the streets oiled this year at a unit contract price per square yard. Sands & Company have taken a contract to apply Texas oil for \$0.009 per square yard for the first application, and \$0.0085 for subsequent applications. The grade of oil used contains 25 per cent of asphalt.

Gasoline Fire Engine Tested.—In the presence of Battalion Chief John Howe and Captains Demarest and Henry, of the New York Fire Department, at Springfield, Mass., a test of the Knox 700-gallon capacity gasoline fire engine was made. When the gasoline engine was started one line of hose burst and the motor had to be shut down to make repairs. It was started again and ran an hour without a skip. The two lines of 2½-inch hose connected to the pump were each 150 feet long. One line was equipped with a 1½-inch nozzle and the other had a 1¼-inch nozzle. In the capacity test the pressure at the 1½-inch nozzle was 73 pounds and at the 1¼-inch nozzle, 66 pounds. With the 66-pound pressure, 378 gallons per minute were discharged and with the 73-pound pressure 330 gallons were thrown, making a total of 708 gallons every minute. The overflow from the radiator, which was 12 gallons per minute, added to the 708 gallons, made a total throw of 720 gallons per minute. The average altitude was 130 feet and the pump action was 310 revolutions per minute. The pressure test showed 235 pounds at the pump and 125 pounds at the 1½-inch nozzle, throwing 425 gallons, to which was added the radiator overflow amounting to 12 gallons, making a total of 437 gallons for the pump discharge. During the hour and over that the engine was run every part of the motor gave perfect service and owing to the new system of oil cooling there was no trouble with overheating. At the test of the first gasoline pump made by the company it was noticed that the vibration was considerable and to overcome this a set of special jacks was designed for the frame. These reduced the vibration to a minimum. The first pump built had a capacity of 600 gallons a minute, but the New York department wanted more, so this pump was designed to furnish 700 gallons capacity.

High Pressure Gas System.—The Galveston Gas Company has installed a high pressure system to serve the eastern section of the city. A 4-inch wrought-iron pipe carries the gas under pressure from a booster at the works. Eight district governors or pressure-reducing devices have been installed and eight more will be put in. One governor is used to distribute the gas over an area of two or three blocks. The governors are installed in concrete stepping stones, an idea which originated with General Manager F. M. Lege, Jr., who conceived the idea of presenting residents with stepping stones costing \$35 each, and at the same time serving the valuable purpose of housing the governors.

Consulting Engineer.—James L. Tighe, Holyoke, Mass., announces that after serving the city of Holyoke for the past nineteen years as engineer of the municipal water works and city engineer, he has opened offices in the Caledonian Building, Holyoke, Mass., and hereafter will be open to engagement as consulting engineer in all problems relating to hydraulic and municipal engineering.

Consulting Engineer.—Hiram Allen Miller, Consulting Engineer, announces that, having completed the Charles River dam and basin, he has removed his office to 8 Beacon street, Boston, Mass.

Pavement Litigation.—Through the awarding of a contract for street paving to the Barber Asphalt Paving Company, Holland, Mich., will become involved in paving litigation. Contractor Harry Vanderveen, of Grand Rapids, who represents the Barber Company, submitted figures on the job for paving the thoroughfare with a mixture, upon which material the Warren Bros. claim to hold a patent and on which they claim the right to collect a royalty of 25 cents per yard. Warren Bros. warned the City Council in a telegram not to award the contract to any firm not having a license to use their mixture, as they would certainly bring suit, but the Barber Company immediately put up a certified check for \$3,000, so that in case of suit being brought it will be between the companies and the city can go ahead and complete the work. The Barber Company claims there is no difference between the mechanical mix to be used by them and that under the patent and are anxious to test the case in the courts.

Cement Rates.—The Interstate Commerce Commission has decided that general increases in freight rates on cement in trans-Missouri territory were not justified and the commission ordered the carriers to withdraw practically all of the tariffs making the increases. The carriers are directed to withdraw the tariffs by May 15 and if they do not do so the commission says that it will issue an additional order directing the maintenance of the present rates for a period of two years. If the additional order is issued the railroads will not be able to make any increases in this community until the two years have expired. The commission approved a few of the increases.

Foundations.—The Foundation Company, 115 Broadway, New York, announces that Daniel E. Moran has retired from active participation in the management of the company to engage in the practice of engineering. He will hereafter act as consulting engineer of this company, with offices at 55 Liberty street, New York City.

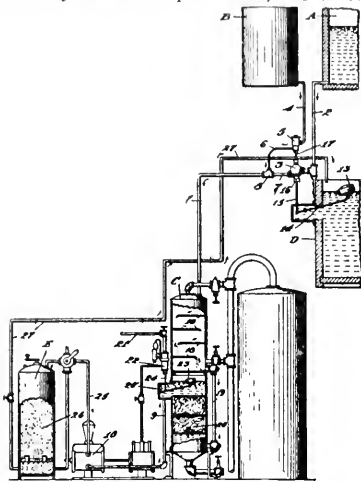
Concrete Mixers.—The Eureka Machine Company, Lansing, Mich., has published a budget of letters commending its mixer. Several years ago the Davenport Construction Company, Milwaukee, Wis., preliminary to the purchase of a mixer, wrote to a number of parties whose names were mentioned in a Eureka circular as customers, asking them about the machine. The letters published are the replies.

Crane Signal System.—Terry & Tench are testing a new crane signal system on their work at the Grand Central Station improvements. It is claimed to reduce the chances of accident to a minimum. By means of a small bulb the signal man at the boom can operate electric lights which show white for "Go slow," green for "Full speed," and red for "Stop." The lights are accompanied by whistles which designate, by the length and tone of the blast, what they are intended to indicate. In case of a short circuit putting the lights out the signal man can press a button at the end of the bulb, which rings an electric bell warning the engineer that he must rely on the whistles for working the boom instead of the lights.

PATENT CLAIMS

989,141. PASTEURIZING APPARATUS. Frederick Gettelman, Milwaukee, Wis. Serial No. 495,177.

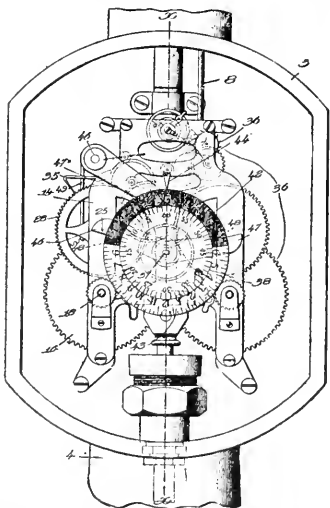
A pasteurizing apparatus comprising a housing having a series of four vats arranged therein one above the other adapted to contain water at progressively higher temperatures from the first vat to the second vat of the series, the third and fourth vats being adapted to contain water at progressively lower temperatures, the water in



the first and last vats of the series being approximately at even temperatures, guide sheaves disposed at the ends of each vat, a well at the forward end of the housing communicating with the lower vat, an endless conveyer arranged to pass over sheaves of the first vat under the rear sheave of the second vat and over the forward sheave thereof, under the forward and over the rear sheave of the third vat and under the sheaves of the fourth vat and from thence completing its circuit to the forward sheave of the first vat through the housing well.

989,654. AUTOMATIC GAS LIGHTER AND EXTINGUISHER. Francis W. Sherman, Everett, Mass., assignor to Independent Street Lighting Company, Boston, Mass., a Corporation of Massachusetts. Serial No. 569,449.

In an automatic gas lighter and extinguisher, the combination with a valve, of a spring for operating said valve, a cam member operated by said spring and having a recess, a pivoted locking lever adapted to enter said recess, an arm provided with a nose connected to and moving with said



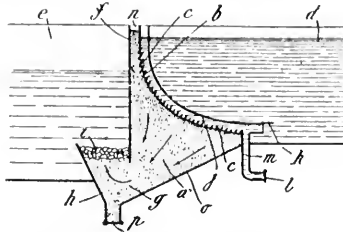
lever, a wheel provided with notches to receive said nose when the locking lever is occupying said recess, a toothed member rigid with said notched wheel, a one-toothed pinion rotated by said cam and adapted to engage said toothed member thereby to rotate the notched wheel intermittently when the cam is released, and time mechanism to release the locking lever from the recess of the cam at predetermined intervals.

989,322. DISINFECTING COMPOSITION. Oscar Bernheimer, Vienna, Austria-Hungary. Serial No. 457,281.

A microbicide composed of bisulfate of soda and sodium borofluorid.

989,665. SAND FILTER AND THE LIKE. Auguste Tixier, Billancourt, France. Serial No. 523,417.

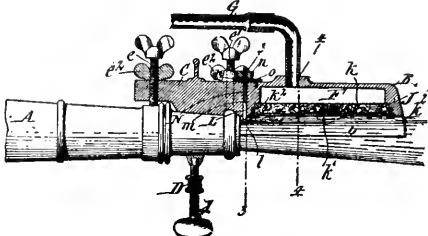
In a filter for liquids and gases, a body of granular filtering material, a wall formed by spaced blades to hold the filtering mate-



ria, a supply chamber of which said wall forms a part, means to produce a scouring current of liquid over said wall to remove the surface of the filtering material exposed between the blades.

989,880 AIR-SUPPLYING DEVICE FOR FIREMEN. George W Shaw, Buffalo, N. Y. Serial No. 338,609.

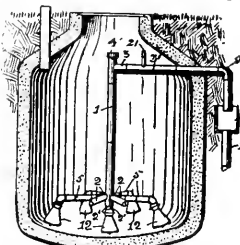
An air supplying device comprising a hood having a shank adapted to be attached to a water delivery nozzle and having an



air receiving chamber adapted to be arranged at the side of the stream issuing therefrom, a delivery conduit connected with said chamber, and a filter arranged in the path of the air.

989,827. AUTOMATIC CISTERN-CLEANING APPARATUS. Louis Thiem, Toledo, O. Serial No. 582,462.

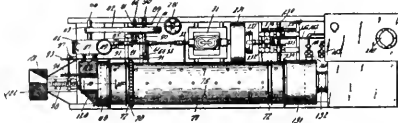
In an automatic cistern cleaner of the character described, the combination with the waste pipe of a cistern, of a main discharge pipe connected to the waste pipe and extending from the waste pipe to near the bottom of the cistern; a plurality of



extensible branch pipes radially connected to the lower portion of the main pipe, and a plurality of receivers, one for each branch pipe and the main pipe, said receivers having enlarged rim bases provided with a plurality of feet adapted to support the main pipe and its branches above the bottom of the cistern and form openings to admit water and sediment radially to the receivers.

990,782. APPARATUS FOR PREPARING PAVING MATERIAL. Herman J. Rufli, Indianapolis, Ind., assignor to The American Paving & Manufacturing Company of Indianapolis, Indianapolis, Ind., a Corporation of Indiana. Serial No. 479,580.

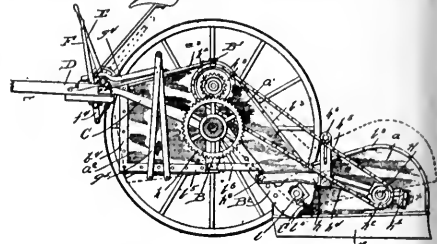
The combination, in an apparatus for preparing paving material, of a rotary drying cylinder, a stationary inclosing casing at each end of said cylinder, a furnace communicating with the inclosing casing at the delivery end of said rotary drying cyl-



inder, and a suction fan communicating with the chamber of the casing at the receiving end of said cylinder whereby the products of combustion from said furnace are drawn through said cylinder and discharged from the delivery nozzle of said fan, a receiving hopper delivering to said rotary drying cylinder, and an automatically opening and closing door arranged in the passage between the hopper and drying cylinder.

990,128. SWEEPING - MACHINE. Pierre Haerst, Chicago, Ill. Serial No. 350,055.

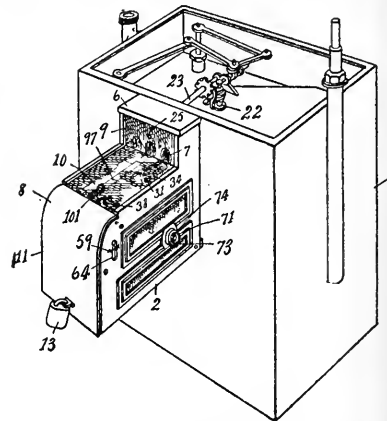
A sweeping machine, embracing a housing pivotally supported intermediate its length, a rotative brush inclosed thereby, an ele-



vator in the housing for the dirt swept up by the rotative brush, and yielding means for adjusting the housing on its pivot to vary the pressure of the rotative brush on the surface swept.

990,125. BILL-DELIVERY MECHANISM FOR METERS. Richard W. Gallagher, San Francisco, Cal., assignor to Automatic Billing Company, Los Angeles, Cal., a Corporation of California. Serial No. 244,634.

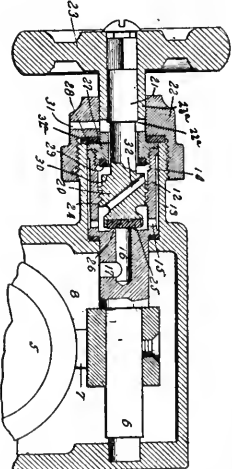
In an apparatus of the character described, the combination, with meter gear-



ing, of a recording wheel, a gear wheel for intermittently advancing said recording wheel, means for moving the recording wheel bodily to take a record therefrom, an operative connection between said gear wheel and gearing, inoperative when the wheel has been so moved and means adapted to be brought into operative connection with said gear wheel when the latter is out of operative connection with the gearing to turn said wheels to zero, substantially as described.

990,580. PIPE-TAPPING MACHINE. Philip Mueller and Anton C. Schuermann, Decatur, Ill., assignors to The H. Mueller Manufacturing Company, Decatur, Ill., a Corporation of Illinois. Serial No. 593,854.

In a tapping machine, a valve body, a main valve therein, said body having a by-pass formed therein and leading around



said valve, a by-pass valve of the compression type for controlling communication through said by-pass on opposite sides of the main valve, and an operating device common to both said valves.

THE WEEK'S CONTRACT NEWS

relating to Municipal and Public Work—Street Improvements—Paving, Road Making, Cleaning and Sprinkling—Sewerage, Water Supply and Public Lighting—Fire Equipment and Supplies—Bridges and Concrete Work—Sanitation, Garbage and Waste Disposal—Police, Parks and Miscellaneous—Proposals and Awards.

To be of value this matter must be printed in the number immediately following its receipt, which makes it impossible for us to verify it all. Our sources of information are believed to be reliable, but we cannot guarantee the correctness of all items. Parties in charge of proposed work are requested to send us information concerning it as early as possible; also corrections of any errors discovered.

BIDS ASKED FOR

Table with 4 columns: STATE, CITY, RECEIVED UNTIL, NATURE OF WORK, ADDRESS INQUIRIES TO

STREET IMPROVEMENTS

Main table listing street improvement projects across various states including Missouri, Indiana, Ohio, Illinois, New Jersey, Florida, Minnesota, West Virginia, California, New York, Maryland, North Carolina, South Carolina, Louisiana, Arkansas, Kentucky, Pennsylvania, New Hampshire, Tennessee, Mississippi, and Wyoming.

SEWERAGE

Table listing sewerage projects across various states including Pennsylvania, Ohio, Indiana, Illinois, West Virginia, Kansas, Minnesota, Wisconsin, New Mexico, Missouri, and California.

WATER SUPPLY

Table listing water supply projects across various states including Michigan, Mississippi, Missouri, Nebraska, Illinois, Pennsylvania, Ohio, and Oregon.

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
WATER SUPPLY (Continued)				
Ohio	Cincinnati	May 9, noon	Laying cast iron pipe, special castings and valves; and miscellaneous work for Water Dept.	John J. Wenner, Clk. Bd. Pub. Ser.
California	Anaheim	May 11	Furn. compound automobile steam engine; 150 kv., 2,200 volts, 3-phase, 60-cy. alter. current gener.; an exciter for gen.; gener. switchboard panel; building foundations.	Edw. B. Merritt, City Clk. F. Feuchter, Clerk. C. H. Foy, City Clerk. Chas. Strauss, Pres. Bd. W. Sup.
Ohio	Rockport	May 12	Constructing water mains.	D. P. McIntyre, City Clerk.
Iowa	Tipton	May 15, 7:30 p.m.	Drilling an artesian well.	C. H. Foy, City Clerk.
New York	New York	May 16, 11 a.m.	Construct. portions of the city tunnel of the Catskill aqueduct.	Chas. Strauss, Pres. Bd. W. Sup.
Minnesota	Eveleth	May 16	Furn. 12,500,000 gal. capacity, high duty pumping engine of the crank and flywheel type.	D. P. McIntyre, City Clerk.
California	Fort Mason	May 17, 11 a.m.	Constr. a 6,000,000-gal. reinforced concrete reservoir.	Col. Geo. McK. Williamson, C on Q.M
California	Los Angeles	May 26	Furn. fabricated steel and rivets necessary to con. abt. 1,865 ft. of 9-ft. 3-in. and 8,313 ft. of 11-ft. riveted steel syphon.	Board of Public Works. Wm. McQueen, City Clerk.
Brit. Col., Can.	Vancouver	May 31, 4 p.m.	Furn. steel pipe, i. pipe; also 18-in. flexible joint c. i. pipe.	
BRIDGES				
Pennsylvania	Holidaysburg	May 5, noon	Repairing 5 bridges in Blair County.	W. S. Hostler, Clk. Co. Com Board of County Commissioners.
Pennsylvania	Sunbury	May 5	Constructing four bridges.	
Ontario, Can.	Woodstock	May 6	Constructing three steel bridges and concrete abutments for same; also constructing two or three concrete bridges.	F. J. Ure, County Engr.
Kentucky	Louisville	May 8	Constructing Underhill st. bridge reinforced concrete, cost about \$15,000.	City Clerk.
Indiana	Shelbyville	May 8, 10 a.m.	Constr. a bridge in Sugar Creek township and constructing concrete abutments and the repair of St. Paul bridge.	G. B. Huntington, County Auditor. County Commissioners.
Indiana	Washington	May 8	Constructing 7 culvert bridges.	
Pennsylvania	Lancaster	May 9	Constructing a concrete dam across Conestoga river at pumping station of water works.	J. A. Leinbach, Clk. Water. Com.
Pennsylvania	Philadelphia	May 9	Widening Chestnut Street bridge over Schuylkill River; building bridge on Springfield Ave., value of work about \$40,000; constructing additional piling fender for the Passyunk Ave. bridge.	
New Jersey	Newark	May 9	Constructing concrete arch bridge and a plate girder bridge in Bloomfield.	Geo. Hummel, Chm. Chosen Freeholders Essex County. John M. Tucker, Chm. S. R. Com.
Maryland	Baltimore	May 10, noon	Constructing one concrete bridge in Calvert County.	Philadelphia & Reading R. R. Co.
Pennsylvania	Philadelphia	May 10	Constr. masonry wall and abutments; also bridges ready for ballast over Aramingo av., Belgrade and Thompson sts.	F. M. Sayre, County Auditor. City Clerk.
Ohio	Columbus	May 16, noon	Constr. the approaches and superstructure of the Wilson Bridge over Olentangy river.	Kingsley L. Martin, Comr. of Br. City Clerk.
Pennsylvania	Pittsburg	June 1	Widening Smithfield Street Bridge, cost about \$150,000.	
New York	New York	June 1	Strengthening the end spans of the Williamsburg Bridge.	
Pennsylvania	Pittsburgh	July 1	Constructing one concrete arch, estimated cost \$85,000.	
LIGHTING AND POWER				
Tennessee	Gallatin	May 5, noon	Furn. Corliss engine; 2 gen.; 2 switchb.; 2 elec. oper. pumps.	E. L. Anderson, Chm. W. & L. Com.
Missouri	Chillicothe	May 8, 9 a.m.	Constr. municipal electric light and power plant, including deep well for water supply, tower and tank, etc.	Ira G. Graham, City Auditor.
Illinois	Yorkville	May 10, noon	Constr. a dam across Fox river; a power house with wheel pits, etc., complete.	Fred W. Simpson, Secy.
Maryland	Baltimore	May 10, 11 a.m.	Furnishing ornamental lamp posts.	Robt. J. McCuen, Supt. of Lamps and Lighting.
California	Riverside	May 24	Franchise to run poles and line for conveying electric power on all roads of county.	County Supervisors.
FIRE EQUIPMENT				
New York	Rensselaer	May 8	Furn. 500 ft. 2½-in. fire hose.	Salt, City Clerk.
California	Oakland	May 17, 11 a.m.	Furn. 3 combination chemical hose wagons; 3 third size steam fire engines; 1 motor driven pumping engine; 3 motor-driven combination chemical and hose wagons, and fire hose.	Jas. W. Nelson, Sec'y Bd. Pub. Wks.
Oregon	Astoria	May 27, 8 p.m.	Furn. 1,200 ft. 2½" fire hose for Fire Dept.; 200 ft. for Street Dept.	C. E. Foster, Chief Fire Dept. E. M. Urdike, Chm. P. & W. Com.
New Jersey	Princeton	July 5	Furn. auto pumping engine.	
MISCELLANEOUS				
Pennsylvania	Eric	May 8, 8 p.m.	Constructing an incinerator plant complete.	B. E. Briggs, City Engr.
West Virginia	Wheeling	May 8	Wrecking the easterly resort house and rebuilding.	City Engr.
Ohio	Cincinnati	May 10, noon	Constructing hospital buildings.	Hannafor & Sons, Arch.
Connecticut	Plymouth	May 10, noon	Alterations and additions to Town Hall at Terryville.	J. D. Waldron, Selectman.
Wisconsin	Superior	May 11, 1 p.m.	Improving of Quebec Pier by constructing a revetment along the sides of driveway.	P. J. Ekstrand, Pres. Bd. Public Wks. Isidore Wachsmann, Sec'y Bd. Cont. and Supply.
New York	Albany	May 15, 3 p.m.	Installing police signal system.	M. B. Matthews, Chm. Com. Pub. S. Clinton Sipe, County Auditor.
New Jersey	Passaic	May 19, 8 p.m.	Install Police Signal, Fire Alarm and Mun. Tele. Exchange.	
Ohio	Mount Gilead	May 19, 11 a.m.	Furn. iron culvert pipe from 8 to 48-in. diameter.	

STREET IMPROVEMENTS

Selma, Ala.—Paving of portion of Broad st. is being considered.

Tuscaloosa, Ala.—Council has ordered City Engineer to ask for bids for proposed street paving.

Fullerton, Cal.—Council is considering election on \$178,000 bonds for improvement of streets.

Napa, Cal.—Council has decided to macadamize and curb portions of Polk, Seymour, North Seminary, Clary and West 3d sts.; work will be done by George Errington and will cost about \$9,000.

Riverside, Cal.—City will grade, macadam and oil Mulberry st.; also construct cement curb and concrete gutter.—W. V. Darling, Superintendent of Streets.

Santa Monica, Cal.—Paving of Ocean ave. is being considered by Council.

Pueblo, Col.—Work will at once begin on extension of Grand ave.

Hartford, Conn.—Board of Finance is considering \$4,739 appropriation for macadamizing Whitney st. and \$2,000 for Capitol ave.

Washington, D. C.—District Commissioners have asked Congress for authority to build municipal asphalt plant.

Brooksville, Fla.—Citizens have voted \$18,000 bonds for street improvements.

Palatka, Fla.—Council is considering election on \$12,500 bonds for additional vit. brick paving.

Perry, Ga.—Houston County Commissioners of Roads and Revenues are considering \$100,000 bond issue for improving roads and bridges.

Evansville, Ind.—Board of Public Works is considering improvement of McCormick ave. with asphalt.

Fort Wayne, Ind.—Board of Public Works has ordered plans prepared for paving 15 additional streets.

Indianapolis, Ind.—The Board of Public Works has confirmed resolution for improving Locke st., Walnut st. to Indiana ave.; estimate of cost prepared by City Engineer Klausmann is \$10,100.

New Orleans, La.—State Board of Engineers has rejected bids received for proposed highway from Colfax to Rochelle via Droug, Selma and Georgetown, Grant Parish; bids were received for two kinds of road, labeled No. 1 and No. 2; for No. 1 it was stipulated that the timbers should be creosoted, concrete culverts, vit. pipe for sewers and other high-class materials; No. 2 road did not call for treated timber and instead of concrete culverts and vit. piping, it was stipulated that corrugated iron would be acceptable; road No. 1, J. W. Thompson, Jackson, Miss., \$107,290; A. L. Patterson & Co., New Orleans, \$98,768.20;

road No. 2, J. W. Thompson, \$82,936.60; A. L. Patterson & Co., \$76,445.76.

Rockville, Md.—Montgomery County Commissioners are planning to improve road from Rockville to Norbeck; distance of four and a half miles; work will be under supervision of M. Donaldson Knight, County Road Superintendent.

Gloucester, Mass.—Board of Aldermen has adopted order appropriating \$2,500 for improvement of East Main st.

Lowell, Mass.—Committee on Streets has voted to recommend loan of \$75,000 for paving.

Southbridge, Mass.—Contract will soon be let for paving Hamilton St.; \$23,000 is available.

Detroit, Mich.—Commissioner of Public Works J. J. Haerer will soon ask bids for paving several streets and alleys, estimated at \$14,000.

Lexington, Mo.—Citizens have voted \$125,000 bonds for road improvements.

Reno, Nev.—Commissioners of Washoe County are considering matter of building a road from Reno along banks of Truckee River to Nevada State line.

Merchantville, N. J.—Citizens are considering improvement of streets.

Paterson, N. J.—Board of Freeholders will expend about \$55,000 on roads.

Perth Amboy, N. J.—County will again macadamize State st. from the point where

avement stops in the northern section of city to Woodbridge creek; distance about one mile; Amboy ave. will receive similar treatment from New Brunswick ave. at high Valley tracks to Woodbridge, distance of about five miles.

Rahway, N. J.—Bids will soon be asked for paving Main st.

Trenton, N. J.—County Engineer Eppel has estimated cost of properly repairing and resurfacing county roads at \$180,000.

Rochester, N. Y.—Board of Aldermen is considering following improvements: Ave. B asphalt pavement, estimated cost \$28,000; Dewey ave. asphalt pavement, \$22,000; Lake View Terrace asphalt pavement, \$6,000; Raines Park asphalt and brick pavement and sewer, \$26,000; Park ave. asphalt pavement, \$16,000; Roosevelt st. asphalt pavement, \$3,900; Pinnacle road asphalt pavement \$10,000; Conkey ave. brick pavement, \$25,000; Weaver st. brick pavement, \$8,000; Seward st. asphalt pavement, \$34,000; Post and Bingham sts. asphalt pavement, \$12,000; Ashland st. asphalt pavement, \$8,000; Alpine st. macadam pavement, \$4,500; Goldsmith place asphalt pavement, \$3,000.

Utica, N. Y.—Mayor Gillmore has recommended resurfacing of asphalt streets.

Cincinnati, O.—Supervisor of Roads Mills has prepared plans for proposed road from independence to Ryland; cost \$2,400.

Girard, O.—Council has decided to ask for bids for building sidewalk and cross walks.

Maple Grove, O.—Township will vote May 2 on \$10,000 bonds for construction of five miles of stone roads.—W. Yakiin, Township Clerk.

Pittsburg, Pa.—Department of Public Works will soon ask bids for improvement of Eighteenth st. road.

Columbia, S. C.—Council is considering paving of Sumter st. with bitulithic and Hampton and Washington sts. with wooden blocks.

Sumter, S. C.—City will expend \$25,000 on improvements on its main street.—W. Worring Lee, Engineer.

Chattanooga, Tenn.—Main st. will be paved with 14-ft. center of brick, flanked on each side by 11-ft. strip of bitulithic or some similar substance; Main st., in St. Elmo, will be paved with brick to point near the cemetery gate, and from that point, Georgia ave., St. Elmo, will be paved with bitulithic or some similar substance to end of street car line.

McMinnville, Tenn.—Warren County will vote May 6 on \$100,000 additional bonds to extend pikes.

Waverly, Tenn.—Citizens have defeated proposition to issue \$100,000 bonds to build roads.

Brady, Tex.—District No. 1, McCullough County, will at once engage engineer to make surveys and estimates for macadamizing roads; \$75,000 bonds voted; district is 10 miles wide and 20 miles long; bids will soon be asked; Committee, Lee Jones, Chairman, will have direct charge of work under County Commissioners. A. M. Martin can be addressed.

Dallas, Tex.—City Commissioners have decided to place two concrete culverts on Haskell and San Jacinto and on Haskell near Ross; cost \$3,085.

Dayton, Tex.—Dayton precinct of Liberty County will vote May 23 on \$275,000 of bonds for construction of shell road.

Longview, Tex.—Citizens have voted \$90,000 bonds for paving business streets, electric lighting, etc.—G. A. Bodenheim, Mayor.

Paris, Tex.—Precinct No. 1 has voted \$300,000 bonds for construction of good roads.

San Angelo, Tex.—City is planning immediate paving of from 16 to 20 blocks in business section; about \$100,000 will be spent.

Alexandria, Va.—Council has passed resolutions for proposed improvements: \$4,000 for vit. brick on Duke, Royal to Fairfax; \$7,500 for narrowing Alfred st., Prince to Wilkes, and providing roadway with macadam and also sidewalks; \$4,000 for roadway and paving with vit. brick Alfred, King to Prince; \$3,650 for improving South Royal st. with vit. brick, and laying sidewalks; \$4,000 for vit. brick street and sidewalks on Fairfax between Duke and Wolfe; \$11,200 for vit. brick on Washington st., King to Duke st.; \$11,200 for vit. brick on Washington st., from King to Queen; \$3,150 for curbing and guttering on Payne, from Cameron to Oronoco; \$4,200 for guttering and sidewalks on West, King to Oronoco; \$2,400 for macadam roadway on Alfred, Queen to Princess; \$4,000 for vit. brick on Pitt, King to Cameron st.; \$4,000 for vit. brick on St. Asaph, King to Cameron; \$4,700 for macadam on Cameron, Royal to Pitt; \$5,000 for macadam on Cameron, Pitt to Washington.

Betair, Va.—Alexandria County will expend about \$30,000 on road improvements.

Wise, Va.—Wise County Board of Supervisors will open bids about May 25, for con-

struction of about 125 miles of macadam roads.

Spokane, Wash.—City Commissioners have called for proposals for which following bonds must be issued this year: Paving, \$928,668; grading, \$796,765; sidewalks, \$16,011; sewers, \$612,657.

Tacoma, Wash.—Council has passed ordinances for improvement of Columbia ave., East B., North 16th and other streets.

Beloit, Wis.—Council has decided to improve portions of seven streets.—J. L. Hendley, Chmn. Board Public Service.

Janesville, Wis.—Mayor John C. Nichols has recommended improvement of streets.

Burnaby, B. C., Can.—Citizens have voted \$850,000 bonds for road improvements and extensions to water works.

CONTRACTS AWARDED

Aliceville, Ala.—To J. M. Swaim, Chapel Hill, Tenn., to construct concrete sidewalks; walks to be 5½ ft. wide, including curb.

New Decatur, Ala.—To Halliburton & Brooks, Birmingham, to construct cement sidewalks in East New Decatur, \$8,319.38.—Henry Hartung, City Clerk.

Los Angeles, Cal.—To Paonissa & Taylor, Shory Bldg., Los Angeles, for grading streets, constructing curbs and gutters, at the new townsite Planada, about \$50,000.

Los Angeles, Cal.—Paving 16th st. with asphalt, Figueroa st. to Pacific ave., to Barber Asphalt Paving Co., \$53,473.60; Figueroa to Main st., to B. F. Ford, \$11,149.58; paving portions of Flower and other streets on hill, to Barber Asphalt Co., \$34,377.04.

Vincennes, Ind.—By Board of Public Works for improvement of Culop st., 6th st. to the E. & O., to Foukes Construction Co., Terre Haute; improvement of 13th st. from Hickman to the east limits of city, to P. W. Lenahan.

Wabash, Ind.—Grading, paving and curbing Manchester ave., to Western Construction Co., \$33,800.

Des Moines, Ia.—Paving W. 38th st. and other streets, to Bryant-McLaughlin Co., Waterloo, \$1.75 per sq. yd.

Bunkie, La.—Constructing road and canal from Bunkie to Bayou Dulac, to S. J. Burlin, Cottonport, \$22,700.

Boston, Mass.—To Connelly & Diamond for tar macadam roadway, trap rock in Granville st., \$5,518.16; other bidders: John Kelly & Co., \$5,806; J. H. Ferguson, \$6,408.90; Fred S. & A. D. Gore Corporation, \$5,794.30; John McCourt & Co., \$5,819.95; Wm. J. Rafferty & Co., \$5,663.30; R. J. Young & Co., \$7,288.50; James Doherty, \$5,978.20; Daniel E. Lynch, \$7,348.20; Timothy F. Bradley, \$5,818.40; D. M. Biggs & Co., \$5,919.80; John F. O'Connell, \$5,778.85; Engineer's estimate, \$7,500; to William Rafferty & Co. for tar macadam roadway, trap rock, in Emmet st., \$890.15; other bidders: J. H. Ferguson, \$1,134.60; John McCourt & Co., \$1,016.10; Engineer's estimate, \$1,400; to the West Roxbury Trap Rock Co. for tar macadam roadway of local stone in Danville st., \$3,275.60; other bidders: William J. Rafferty & Co., \$3,373.90; Engineer's estimate, \$4,000; to John Kelly & Co. for tar macadam roadway of trap rock in Ainsworth st., \$6,598.63; other bidders: West Roxbury Trap Rock Co., \$7,499.10; William J. Rafferty & Co., \$7,989.60; Engineer's estimate, \$8,600; to J. C. Coleman & Sons Co. for macadam roadway of local stone in Greenwood st., \$13,261; other bidders: Connelly & Diamond, \$13,501.10; James Doherty, \$13,859.15; William J. Rafferty Co., \$14,115.80; John F. O'Connell, \$14,368.90; D. M. Biggs & Co., \$15,509.50; John McCourt & Co., \$13,756.05; John Kelly & Co., \$13,651; Daniel E. Lynch, \$16,788.30; Engineer's estimate \$16,700; to Lowe Armington Co. for repairing tar sidewalks in various sections of city, 69c. per sq. yd. for three-layer work, 49c. for two-layer work, and 34c. for wearing surface; to C. D. Dolloff & Co. for repairing artificial stone sidewalks, 35c. per sq. ft. for less than 20 sq. ft., each job, 25c. for 20 and less than 100 sq. ft., 17c. for 100 and less than 300 sq. ft., 15c. for 300 and less than 500 sq. ft., 13c. for 500 and less than 700 sq. ft., 12c. for 700 and less than 900 sq. ft., 12c. for 900 sq. ft. and over.

Fall River, Mass.—Laying pavements, to Alexander Burrows, 24c. per sq. yd.

Granby, Mass.—To Charles E. Horn, Milbury, for putting in mile and a half of State road.

Holyoke, Mass.—Furnishing Portland cement, to C. J. Burnham, \$1.64 per bbl., four sacks to the barrel; there will be 10 cents rebate for the return each sack, the expense of shipment to be borne by the Water Department; Saylor's cement will be furnished; other bidders: Samuel Snell, \$1.65 for Nazareth cement and \$1.70 for Vulcanite; Prew & Co., \$1.70; W. R. Ross & Co., \$1.70 for Dexter; C. B. Sampson, \$1.70 for Atlas or Ironclad; Prentiss, Brooks & Co., Lehigh or Dragon.

Lynn, Mass.—Upon recommendation of Street-Commissioner McPhetres Council has decided to instruct the Purchasing Agent to reject all of the bids recently submitted on finished curbs and to award contract to John L. Goss, Stonington, Me., for a large load of curbstones in the rough to be delivered at city landing at rate of approximately 25c. per ft.

Holland, Mich.—Paving Central ave., from 8th to 18th st., to Harry Van Der Veen, Grand Rapids, Mich.; Bermuda asphalt upon concrete base, \$17,613.

Duluth, Minn.—To D. H. Clough for paving 3d alley between 20th and 21st aves. and 21st and 22d aves., \$1,280.90 and \$709.65; to Harry E. Raymond for furnishing plank for sidewalks for coming year; for the district east of 12th ave. West, \$5,569.50 and for that west of that avenue, \$3,904.50.

Webb City, Mo.—Asphalted macadam pavement, to Webb City Paving Co., Webb City, 8,266 sq. yds., 83c.; 1,718 lin. ft. curb and gutter, to M. Gilloze, Pierce City, 60c. per lin. ft.—A. J. McKenzie, City Engineer.

Elizabeth, N. J.—Repairing county road running through village of Chatham, to C. H. Winans Co., 12,678 sq. yds. of 3-in. amiesite, \$10,649.52; 12,678 sq. yds. of 4-in. amiesite, \$13,058.34; 400 tons of crushed stone, \$680, and 200 lin. ft. under drain, \$60.

Newark, N. J.—Tentative awards for street paving have been made to following low bidders: Bigelow st., Elizabeth to Prelinghuysen ave., brick, McMahon Construction Company, \$7,961.20; South Fourteenth st., Springfield to South Orange ave., brick, Van Keuren & Son, \$89,930; Ogden st., repaving, Clay to Bridge sts., oblong granite block, \$78,346.50; Vincent st., Ferry to the Waverly and Passaic Railroad, brick, \$9,672, both to the New Jersey Paving Corporation; South Seventeenth st., Springfield to South Orange ave., brick, \$40,717.60; Fourteenth ave., South Eleventh st. to city line, brick, \$23,224.50, both to Newark Paving Company; Malvern st., Pacific st. to Wheeler Point Lane, \$47,247.90; Delancey st., between same points, \$42,041.80, and Tyler st., Walnut to South sts., \$3,717.60, all with granite block, and to the Shanley Company; Sherman ave., Pointer to Peddie sts., \$31,938; Mapes ave., Elizabeth ave. to Bergen st., \$13,500; Clifton ave., Grafton ave. to Verona ave., \$15,039, and Madison ave., from Chadwick ave. to South Eleventh st., \$30,813, all with bitulithic, and to Standard Bitulithic Company.

Ventnor, N. J.—Paving, to G. Mulock Co., asphalt macadam, \$1.33½ per sq. yd.; total about \$85,674.70.

Albany, N. Y.—Improving West Lawrence st., to John M. Holler, \$8,882.80.

Albany, N. Y.—Construction of good roads: Highway No. 5103 and Highway No. 5104, Stuyvesant Falls and Valatia, respectively, to J. O. Houriza, Albany, \$118,440; Highway No. 881, Cortland County, to Joseph McCormick, East Providence, R. I., \$22,780; Highway No. 5092, Dutchess County, to Suffolk Construction Co., Huntington, \$40,990; Road No. 5095, Dutchess County, to W. K. Cowbig, Poughkeepsie, \$12,280; Road No. 913, Erie County, to Louis H. Cipp, Buffalo, \$38,990; Road No. 5096, Fulton and Montgomery counties, to the Hollington Co., Troy, \$39,370; Highway No. 465, Herkimer County, to Brown & Lowe, Schenectady, \$52,147; Highway No. 716, Livingston County, to Carlton-Reynell, Long Island City, \$17,950; Highway No. 883, Madison County, to Joseph McCormick, East Providence, R. I., \$23,973; Highway No. 5109, Montgomery County, to John E. Consalus, Albany, \$51,420; Road No. 898, Nassau County, to H. J. Mullen, Jamaica, \$38,800; Road No. 896, Onondaga County, to W. J. Burns Co., Syracuse, \$27,117.05; Road No. 415, Orange County, Harper, to Jova & Kehoe, Inc., Newburg, \$31,900; Road No. 909, Putnam County, to Harvey B. Sproul, Peekskill, \$45,800; Road No. 5093, Putnam County, to Samuel Beskin, Peekskill, \$15,900; Road No. 5107, Rensselaer County, 40 miles, to Wiltsey & Rigney, Rensselaer, \$7,468.06; Road No. 903, Steuben County, to Fred E. Ellis, Melrose, Mass., \$19,901.55; Post Road No. 310, Ulster County, to Lane Construction Co., Meriden, Conn., \$34,380; Road No. 918, Wayne County, to Belive & Merritt, Tuckahoe, \$8,990; Road No. 899, Westchester County, to Frank C. Fowler, Mt. Kisco, \$464,513; Road No. 892, Wyoming County, to Frederick J. Munn, Buffalo, \$15,800; Road No. 923, Genesee County, to Miller & Knickerberg, Buffalo, \$15,941.07; Road No. 923, Genesee County, to Miller & Knickerberg, \$42,500.

Albany, N. Y.—By State Highway Commission for Highway No. 921, Rifton Village, to Joseph Walker, New Paltz, \$28,706, on Bermuda; other bidders: James E. Martin, Poughkeepsie, \$32,900; L. F. Bannon, \$31,092; S. B. Van Wagoner, \$31,258; DeGraff & Hogeboom, \$36,000; Lane Construction Co., \$32,200; Ballock & Andel, \$31,893; Kennedy Construction Co., \$37,375; Samuel Beskin, \$30,383; Thomas H. Karr,

\$31,700; to same, for .61 mile of highway in Fort Leno Village, Montgomery County, \$7,204; Tuxedo road, in Orange County, to Sprout & Elsin, Peckskill, \$86,230; the W. J. Burns Co., Syracuse, for improvement of the Skaneateles-Camillus road, 4.24 miles, \$48,389.80; J. H. Weidman, also of Syracuse, \$50,000; P. H. Murray, Rochester, \$19,370; Eastwood-East Syracuse village road, to W. J. Burns Co., \$27,171.05; Champlain to Mooers Forks, Clinton County, 6.52 miles, to the Spellman-Oliver Co., Chateaugay, \$63,500; Fishkill Village, Dutchess County, .89 of a mile, to Hallock & Angle, Newburg, \$15,598; Johnstown to Broadalbin, to S. B. Van Wageningen, Rondout, \$58,000; Little Falls City, Herkimer County, 1.45 miles, to James E. Martin, Poughkeepsie, \$22,994; Wyatts to Hoffman, Schenectady County, 5.31 miles, to Joseph Walker, New Paltz, \$42,301; Milton to Marlboro, Ulster County, 3.82 miles, to Samuel Beskin, Fishkill, \$33,400; Cambridge to Salem, Washington County, 3.68 miles, to W. A. Burnham & Co., Glens Falls, \$34,000; Luzerne to Lake George, Warren County, 3.67 miles, to S. B. Van Wageningen, Rondout, \$36,779; Woods Bridge-Lewis Corners County highway, in Westchester County, 4.26 miles in length, to Samuel Beskin, Fishkill, on residuum, \$44,825, subject to right of way; Highway No. 5108, Brainard Station, Rensselaer County, .35 mile, to Krow & Walsh, Pittsfield, Mass., \$4,650, on Bermudez; other bidder: Kennedy Construction Co., Albany, \$5,473; County Highway No. 709, Millerton-Columbia County line, Dutchess County, 4.70 miles, to Lane Construction Co., Meriden, Conn., \$41,390; other bidders: Samuel Beskin, Fishkill, \$42,500; James E. Martin, Poughkeepsie, \$45,498; Thomas H. Karr, Troy, \$43,750; E. W. Peck, Stratford, Conn., \$45,950; Joseph Walker, New Paltz, \$42,833.

Laurelton, L. I., N. Y.—Laying about 50,000 yds. of street resurfacing, to M. C. Nilsen.

New York, N. Y.—Repairs to asphalt pavement on bridges over Harlem River during 1911, to Barber Asphalt Paving Co., 30 Church st., \$6,930.—Kingsley L. Martin, Commissioner of Bridges.

Oneida, N. Y.—By Board of Public Works for construction of William st. pavement, to Meyer & Ballard, city, crowning brick, \$16,259.50.

Rochester, N. Y.—Hopkins st. brick pavement, to Clarence Aikenhead Co., \$1,497.50; granite steps at Cobb's Hill reservoir, to F. C. Laue & Sons Co., \$1,667; cement walks on Lyell ave., to William Baker, \$236.55.

Schenectady, N. Y.—Grading Vischer ave., to Union Paving Co.; paving Hattie st. with asphalt and brick, to Schenectady Contracting Co.

Beach City, O.—Paving Main and West sts. with vit. block on gravel foundation, to T. J. Norman & Son, Coshocton, \$12,195.

Columbus, O.—Street improvements: Barthman ave., High st. to Parsons ave., to William M. Graham, \$21,681 for brick; Beech st., Forest to Schiller st., to S. T. Knight, \$9,325; brick; Columbus st., Parsons ave. to Front st., to S. T. Knight, \$25,603, for brick; Pendleton ave., Raymond st. to Livingston ave., to John C. Beasley, \$6,903.50, for brick; Reeb ave., High to 7th st., to William M. Graham, \$12,404, for brick; Stone ave., Nicholas to 18th st., to John C. Beasley, \$7,788, for brick; Town st., Hawkes to Central ave., to D. E. Sullivan & Sons, \$14,932, for brick.

Pawhuska, Okla.—Paving to cost \$90,000, to Shelby-Downard Co., Ardmore; Ardmore rock asphalt will be used.

Erie, Pa.—Laying asphalt pavements in E. 14th and W. 26th sts., to J. & M. Doyle; E. 14th st., 95c. for Class B and 90c. for Class C, 50c. for base, artificial curb, 30c. per ft., \$40 for catchbasins, \$5 for spills, 75c. per ft. for 9-in. and 80c. for 6-in. pipe; pavement on W. 26th st. from Cascade to Cranberry st., Class B asphalt bid, 95c. with 40c. for base, and 30c. for curbing; catchbasins, \$30; flush spills at \$5; 9-in. pipe 50c., and 6-in. pipe, 40c.

Harrisburg, Pa.—To William L. Martin, to build the road in Wildwood Park from the breast of the dam to the Lingletown road, \$3,795; other bidders were Stucker Bros.' Construction Co., \$4,300; United Ice and Coal Co., \$4,250.

Harrisburg, Pa.—Opening and grading Nectarnel, Hunter and Summit sts., to United Ice and Coal Co., about \$1,000.

York, Pa.—Improving six miles of State highway in Springfield Township, to Reilly, Fritz & Co., Lancaster, \$40,921.

Greenville, Tex.—Paving, to General Paving Co., Hot Springs, Ark., 10,000 sq. yds. brick pavement, \$2.24 per sq. yd.; 4,000 sq. yds. asphalt concrete pavement, \$1.85 per sq. yd.; Texas Bitulithic Co., 91,000 sq. yds. bitulithic pavement, \$2.29 per sq. yd.; to Cresscott Wood Block Paving Co., 33,000 sq. yds. wood block pavement, \$2.53 per sq. yd.; to R. C. Stubbs, 4,000 sq. yds. vit. lithic concrete pavement, \$1.75 per sq. yd.

Logan, Utah.—Paving District No. 19, to Adams-Whitlier Construction Co., Boise, Idaho, \$19,386.01; other bidders: J. E. Wilson, Jr., \$20,218.27; L. S. Hill, \$20,082.42; N. S. Andrew, \$20,638.86; Brown & Doremus, \$23,429.70.

Salt Lake City, Utah.—To P. J. Moran, for street paving extension No. 61, in Sixth South st., State st. to First West st., \$2,032.04.

Everett, Wash.—Improving Wall st., to F. K. Polhette, \$10,415; other bidders: Atlas Construction Co., \$11,970; Snyder & Co., \$11,279; N. T. Ellenson, \$11,777.

Hillyard, Wash.—To Contractor A. Woodward for grading and improving Logan st. and the west end of Everett st.

North Yakima, Wash.—To Root & Biegle, Spokane, to building concrete walks in McKinley ave. district of Modern addition, \$23,431.75; to Kiebler & Erickson, Tacoma, for cement walks in the Garfield district of Modern addition, \$22,589.65, and for grading this district, to D. T. Daniels, city, \$13,069; total length of the new walks will be 11 miles.

Paso, Wash.—Paving with bitulithic, to C. A. Squires, Walla Walla; paving, with a concrete base, will be \$2.41 sq. yd., or a total cost of \$11,630.44; bid was on paving for Lewis and 4th sts., the estimated amount of work to be completed being 17,171 sq. yds.; City Engineer's estimate, \$44,075.17.

Seattle, Wash.—Grading and curbing 8th ave. S., to Agaszez & Hadley, 1212 Western ave., \$9,466.50; paving 8th ave. S. and Duwamish ave. with vit. brick, 6-in. curb, to T. Ryan, 214 Sullivan Bldg., \$52,051.28; grading 20th ave. N. E., to L. H. Goerig, 836 Shelby st., \$15,749; resurfacing 15th ave. N. W., to Great Western Fuel Co., 2523 4th ave., \$9,283.90; concrete walks on N. and W. 74th st., to Geo. Hanson, 5312 6th ave. N. W., \$17,898.85.

Clarksburg, W. Va.—By Harrison County Commissioners, to W. T. Gates & Co., Flemington, to pave West Milford pike, \$8,230.

Saskatoon, Sask., Can.—Cement sidewalks aggregating about 500,000 sq. ft. exclusive of curbing and amounting to over 12 miles, to Western Pavers, Ltd., Winnipeg; price slightly over \$90,000; work is in charge of Charles Curtis, Winnipeg.

BIDS RECEIVED

Stockton, Cal.—By Supervisors for construction of 2,713 ft. of asphaltum pavement on California st. and for 3,437 ft. of same pavement on Cherokee Lane; Ransome Cumney Co., California st., \$11,998; Cherokee lane, \$16,726.46; City Street Improvement Co., California st., \$11,860; Cherokee lane, \$16,726.46.

Muncie, Ind.—Paving streets with brick: Jackson st., Mulberry st. to Ohio ave., Gubbins & Co., \$15,305.40; Birch, \$15,394.70; Moore, \$15,417.68; Simmons, \$15,713.48; Torrence, \$15,732.48; Gunnup, \$15,858.66; Worley, \$16,107.99; G. Freshwater & Sons, \$16,121.09; Daniels & Lyst, \$16,389.79; Harding & Co., \$16,529.60; Jefferson st., Adams to Charles, Birch, \$939.22; Gubbins & Co., \$944.77; Torrence, \$959.78; Worley, \$978.12; Moore, \$1,000.35; Gunnup, \$1,005.90; Simmons, \$1,011.46; Daniels & Lyst, \$1,017.02; Howard st., High to Council, Birch, \$7,158.08; Moore, \$7,159.69; Gubbins & Co., \$7,213.06; Daniels & Lyst, \$7,499.67; Simmons, \$7,501.87; Freshwater & Sons, \$7,505.62; Harding & Co., \$8,170.50; Liberty st., Seymour to Washington st., Birch, \$8,255.82; Moore, \$8,277.41; Gubbins & Co., \$8,521.20; Simmons, \$8,569.04; Worley, \$8,676.73; Gunnup, \$8,694.99; Harding & Co., \$8,857.34; Freshwater & Sons, \$8,858.64; Brineman, \$8,863.86; Daniels & Lyst, \$8,903.50; Torrence, \$9,096.19.

Mt. Sterling, Ky.—Building brick streets, H. I. Shoupe & Co., Dayton, O., only bidder; streets laid in concrete base and with very best brick, \$1.78 per sq. yd. complete; bid was made on basis of 11,000 sq. yds. of brick in first contract, work to be begun by May 1, and streets completed by Oct. 1.

Lynn, Mass.—Furnishing stone in the rough to be delivered to the city, lowest bidder, John L. Goss, Stonington, 25 1-5c. per lin. ft.; other bidders: H. E. Fletcher Co., Westford, 29 2-5c.; C. E. Mudge, Lynn, 25c.; Hildreth Granite Co., 37c.; Thomas Rafferty, 40c.; Ryan-Parker Construction Co., 55c.

St. Louis, Mo.—Municipal asphalt plant, which will enable the city to attend to the maintenance of its asphalt streets, on which contractor's maintenance contract has expired, Warren Bros. Co., Boston, \$19,800; bid is below the appropriation of \$20,000; second bidder, Heatherington & Berner, Indianapolis, \$22,162; third bid, made by the Equitable Asphalt Co., of Kansas City, \$16,700, was rejected because no specifications accompanied bid.

Columbus, O.—Paving various streets, low bidders were as follows: Beech st., Forest to Schiller st., S. T. Knight,

Portsmouth and Trimble block, \$9,325; Bartham ave., High st. to Parsons ave., Wm. M. Graham, Trimble block, \$21,408; Stone ave., Nicholas to 18th st., J. C. Beasley, Trimble, Portsmouth, Nelson block, \$7,788; Reeb ave., High to 7th st., Wm. M. Graham, Trimble block, \$12,235; Town st., Hawkes to Central ave., D. E. Sullivan & Son, Nelson, Trimble block, \$14,932; Pendleton ave., Raymond st. to Livingston ave., J. C. Beasley, Nelson, Portsmouth, Trimble block, \$6,903; Summit st., 11th ave. to Hudson st., G. W. Patterson & Son, Nelson Townsend block, \$61,582; Columbus st., Front st. to Parsons ave., S. T. Knight Portsmouth, Trimble block, \$25,395.

Dallas, Tex.—Grading Brown st., continuation of Routh, north of the Katy, to a connection with Turtle Creek drive, Doty-Conley Co., 24c. for earth cut, 14c. for fill 72c. for rock cut, per cu. yd.; Cullom & Vavousett, 19 1/2c.; L. M. Kirkes, 17c. earth, 59c. rock; W. I. Mason, 29c. earth, 18c. fill, 95c. rock; A. F. Moberly, 24c. for earth and 92c. for rock; E. L. Haralson, 30c. for earth and 90c. fill; paving with asphaltic macadam Oak lane, from 14th to Exposition, J. A. Gregory, \$1.32 per sq. yd.; Standard Engineering and Construction Co., \$1.35, or without excavation to subgrade, \$1.28; F. O. Brown, \$1.34; paving 3d ave., Texas and New Orleans to Parry, F. O. Brown, \$1.34 per sq. yd.; J. A. Gregory, \$1.32; Standard Engineering and Construction Co., \$1.35, or without subgrade excavation, \$1.28; 2d ave., from Santa Fe to Grand, F. O. Brown, \$1.34, or without subgrade excavation, \$1.26; J. A. Gregory, \$1.32; Standard Engineering and Construction Co., \$1.35, or without subgrade excavation, \$1.28.

Galveston, Tex.—Bulkheading, surfacing and paving of the road from the west end of Broadway to Causeway; Suderman & Dolson, 13,400 cu. yds. of shell in place \$1.64 per cu. yd., \$21,976; 9,000 cu. yds. soil in place, \$1.49 per cu. yd., \$13,490; creosoted lumber in place, 60,000 ft., \$60 per 1,000 ft., \$3,600; total for entire work, \$38,986; F. Freund, shell, \$1.64 per cu. yd., \$21,976; soil, \$1.52 per cu. yd., \$13,680; lumber, \$58.50 per 1,000 ft., \$3,510; total, \$39,166; Hanson Sons, shell, \$1.64 1/2, \$22,043; soil, \$1.45 1/2, \$13,005; lumber, \$59.50, \$3,570; total, \$39,518; J. C. Kelso, shell, \$1.69, \$22,646; soil, \$1.44, \$12,960; lumber, \$30, \$1,800; total, \$37,406.

Portsmouth, Va.—Improving streets in Sixth Ward; F. J. McGuire, paving County st., from Chestnut to Blount, exclusive of the Norfolk and Portsmouth Traction Co.'s share, with Mack brick, \$1.55 per sq. yd.; Porter brick, \$1.50; laying 5-in. granite curbing on County and Glasgow sts., 58c. per lin. ft.; paving County st., Blount to Rose, and Glasgow to County, the Air Line turnpike, with tarvia bituminous paving on 8-in. base, \$1.34; with asphalt, \$1.44; grading County st., \$5,000; Pearl st., \$5,000; Glasgow st., \$3,000; paving Traction Co.'s share of County st., \$2,500; Dabry-Nottingham Co., laying 5-in. granite curbing in Glasgow st., 60c. per lin. ft.; grading in Glasgow st., \$3,000; E. Park Lindsay, paving County st., Chestnut to Blount st., with brick, excepting the Norfolk and Portsmouth Traction Co.'s share, \$1.60 per sq. ft.; County st., Blount to Rose st. with tarvia macadam, 8-in. base, \$1.92 1/2 per sq. yd.; add 10c. per sq. yd. for asphalt; same figures apply to Glasgow st.; traction work, add 10 per cent to cost of material and labor; grading Pearl st., \$1,039; County st., Blount to Rose st., \$1,207; Glasgow st., \$2,431; laying 5-in. granite curbing in County st., Chestnut and Blount st., 59 1/2c. per lin. ft.; in County st., Blount and Rose, 62c. per lin. ft.; in Glasgow st., 60c. per lin. ft.

SEWERAGE

Florence, Ala.—City is considering construction of storm sewers at estimated cost of \$12,000.

Ashburn, Ga.—Citizens will vote on \$20,000 bonds for construction of sewer system and water-works.

Barnesville, Ga.—Citizens have voted \$15,000 bonds to extend sewerage, electric light and water systems.

Lawrence, Kan.—Council has decided to construct storm sewers on Euclid and New Hampshire sts.

Ridgely, Md.—Town Council has decided to build a sewerage system; outlet will have to be run nearly four miles to reach nearest creek.

Rockland, Mass.—E. R. Studley, Town Clerk, has been appointed Chairman of Committee to report on proposed construction of sewer system.

Detroit, Mich.—Board of Estimates has allowed \$195,229 appropriation for new sewers.

Amory, Miss.—Citizens have voted \$65,000 bonds for installing sewerage and water-works.—E. C. Dalrymple, City Clerk.

Elizabeth, N. J.—Council has ordered construction of sewer in Jersey ave.—Edw. Nugent, President.

Trenton, N. J.—Council is considering construction of sewers on three streets.—H. B. Salter, City Clerk.

Syracuse, N. Y.—Council has adopted ordinance offered by Alderman Davis declaring intention to construct several sewers in Ninth Ward.

Gresham, Ore.—Bids for construction of sanitary sewerage system will be received about May 29.—L. C. Kelsey, Selling Bldg., Portland, Engineer.

Hillsboro, Ore.—Plans, specifications, etc., have been prepared by Louis C. Kelsey, Civil Engineer, Selling Bldg., Portland, for sanitary and storm sewerage systems and street pavements; sewerage systems are estimated to cost \$83,247.90 and the pavements \$59,355.75; separate contracts will be let for the sewerage and the street paving, and bids for construction will be invited about June 1.

Newport, Ore.—Estimated cost of sanitary sewerage system, according to plans and specifications prepared by Louis C. Kelsey, Consulting Engineer, Selling Bldg., Portland, is \$64,023.83; bids for construction will be invited during the coming summer.—F. B. Davis, City Engineer.

West Middlesex, Pa.—Borough Council has formulated plans for probable construction of sewage disposal plant and taken steps toward having town sewerred. (Incorrectly given in April 19 issue as West Midland.)

Alliquippa, Pa.—Architect Owens, Beaver, is drawing plans for sewage system and sewage disposal plant, which will be brought before the Council in a short time. William Anderson, Alliquippa, has been selected as Engineer.

Waco, Tex.—Election on bonds for additional sewers is being considered.

Blacksburg, Va.—Citizens will vote May 16 on \$12,000 bonds to install sewerage and water systems.

Elma, Wash.—Louis C. Kelsey, Civil Engineer, Selling Bldg., Portland, Ore., has been employed by city to prepare plans, specifications and estimates for installing sewerage system.

Oakesdale, Wash.—Council is considering installation of septic tank and sewer system.

CONTRACTS AWARDED

Calxico, Cal.—To Watson & Spicer, Colorado Springs, Col., for construction of sewers, \$26,650.

Chicago, Ill.—Building sewers, to Mich. Pontorelli, 4817 W. Dakin st.; to C. Roberts, 7565 Taylor st.; to J. Savaino, 732 Ewing st.; to Simon Ryan, 2927 W. Congress st.; to C. Fosco, 814 Desplaines st.

Evansville, Ind.—Building Morton ave. sewer, to Frank Megear, 52c. per ft.; \$18 for manholes and \$26 for inlets.

Richmond, Ind.—To Hipskind & Son, Wabash, for installation of sanitary sewer.

Allegan, Mich.—Building sewers, to Peter De Witt, 36 Hope and st., Grand Rapids, \$2,798.82; other bidders: G. W. Edwards, Milan, \$3,376; Swanson Co., Chicago, Ill., \$3,799.40; C. R. Meeks, city, \$3,780.50; Lewis Jagnau, Jackson, \$3,678.20; Hotan & Roach, South Bend, Ind., \$7,747.80; Geo. A. Lowry, Saginaw, \$3,447.85; J. A. Brown & Co., city, \$3,494.—John W. Peete, City Clerk.

Rochester, Minn.—Constructing sewers in Broadway, 4th and 7th sts., to Fraser & Danforth, city, \$6,363.

Roselle, N. J.—Extension of Fifth ave. sewer into Aldene section, to T. Foster Callahan, \$7,317.15; other bidders: Matthew Wade, Elizabeth, \$7,921; Louis Jaques, Elizabeth, \$8,555.55; Martin & Miller, Seneca Falls, N. Y., \$8,731.53.

Albany, N. Y.—Laying sewers in three streets, to John M. Holler, \$784.80, \$1,382.40 and \$2,026.50.

East Aurora, N. Y.—Building sewers, to the Republic Engineering Construction Co., Buffalo, \$75,139.00; disposal plant, to A. C. Bame, Lancaster, N. Y., \$21,719.20.—Alfred Brotherhood, Village President.

Hempstead, L. I., N. Y.—To Cyril Marshall, Hempstead, by Trustees of Village, for construction of proposed sewer system.

Rochester, N. Y.—Building sewer in Rockland st., to F. V. Brotsch, \$1,376.75; Lime st., to Rochester Vulcanite Pavement Company, \$4,965.50.

Schenectady, N. Y.—Laying sanitary sewers in two streets, to John Nolan, city.

Springfield, O.—To Huncker & Williams for construction of Elmwood sewer, about \$14,000.

Providence, R. I.—Pacasset ave. sewer, to Chas. Crankshaw, \$5,666; Elk st., to Gammino & Roberts, \$13,824; Union ave., Tell st. and President ave. sewers, to W. A. Gamino; total \$8,053; sewers on Langham road, 10th and Geneva sts., to F. E. Shaw, \$4,379.

Seattle, Wash.—Building Virginia st. trunk sewer, circular brick, to B. N. Graff, American Bank Bldg., \$14,614.20.

Milwaukee, Wis.—Building 3d st. relief sewer, to R. J. Hickey, \$45,802.

BIDS RECEIVED

East Aurora, N. Y.—Furnishing material and labor for construction of sewer system, including sewage disposal plant, as follows: (a) sewer, (b) disposal plant, (c) sewer and disposal plant; Moore & Smith, Buffalo, N. Y., (b) \$29,265; Baker Owen Construction Co., Johnstown, Pa., (a) \$104,831; Albert Gaffey, Syracuse, N. Y., (b) \$26,922; (c) \$120,458; Duronithic Co., Buffalo, N. Y., (b) \$33,065; Williams & Knowlson, Grand Rapids, Mich., (b) \$26,859, (c) \$118,157; Hydro Construction Co., Buffalo, N. Y., (b) \$29,577; Busch & Percival, Buffalo, N. Y., (b) \$29,228, (c) \$129,509; Alfred C. Bame, Lancaster, N. Y., (b) \$21,719; John E. Johnson & Co., Buffalo, N. Y., (a) \$91,865; Cusano & Dower, Niagara Falls, N. Y., (a) \$88,730; John D. Kuhn, Greensburg, Pa., (a) \$76,325; James Duff Construction Co., Cleveland, O., (b) \$24,370, (c) \$115,888; Joseph F. Slabele Co., Buffalo, N. Y., (b) \$21,730, (c) \$101,848; Gray & Miller, Hornell, N. Y., (a) \$79,657; Republic Engineering and Construction Co., Buffalo, N. Y., (b) \$24,400, (c) \$99,757.

Mount Vernon, N. Y.—Construction of a sewer in East Lincoln ave., Louis Petrillo, \$13,518; Sabino Guarino, \$12,760; Smith Bros., \$11,912; Tony Lougo, \$12,189; James Piro, \$11,087; Charles Motolla, \$10,750; Frank Nordone, \$12,970; Inter-Urban Development Co., \$14,917; Charles Sillery & Sons, \$11,950.

Nashville, Tenn.—John Broderick was lowest bidder for building sewer in alley 268, \$1,177.

Prince Albert, Sask., Can.—Constructing main intercepting sewer: Wm. Newman Co., Ashdown Block, Winnipeg, Man., \$83,234; Maudeas Bros., 541 Front St., Edmonton, Alta., \$120,987; John Craig, Prince Albert, \$125,667; Power Construction Co., Saskatoon, \$126,828; Flannagan & Dunphy, Dauphin, Man., \$144,700, and Parsons Const. & Eng. Co., Regina, Sask., \$165,428; work includes following: 13,031 lin. ft. concrete egg-shaped sewer, 4 to 4 ft. 6 in.; 355 junctions, 16 manholes, 2 penstock manholes, 462 lin. ft. 18-in. pipe sewers, 1 manhole on pipe sewer; cast iron for manholes and penstocks and sewer pipe for 18-in. sewer are supplied by city; all other materials and labor is supplied by contractors; average depth of trench, 12½ ft.

WATER SUPPLY

Attala, Ala.—Etowah Light & Power Co. will improve water and electric light systems at cost of \$50,000; 20-year franchise has been granted.

Gadsden, Ala.—Citizens have voted \$50,000 bonds for water works improvements.

Washington, D. C.—Inquiry has been received by American consular officer in Mexico for names and addresses of American manufacturers of cast iron pipes and iron pipes.—Address No. 6568, Bureau of Manufactures.

Fort Lauderdale, Fla.—Water-works system will be installed during year.—W. H. Marshall, Mayor.

Ashburn, Ga.—Citizens will vote on \$20,000 bonds for construction of water-works and sewer system.

Barnesville, Ga.—Citizens have voted \$15,000 bonds to extend water, electric light and sewerage systems.

Oglethorpe, Ga.—City will construct water-works; bids will be opened about July 1; engineer not selected.—C. A. Allison is interested.

Swainsboro, Ga.—Citizens have voted \$40,000 bonds to install water works and electric lights.

Preston, Ida.—Citizens have voted bonds for installation of municipal water works system.

New Athens, Ill.—Village Board has passed ordinance for construction of system of water works.

Sterling, Ill.—Sterling Water Co. will make extensions to system throughout city; cost, \$75,000.—J. D. Arey, City Engineer.

Evansville, Ind.—Water Works Board has recommended installation of 16-in. water main in Adams ave. at cost of \$12,000.

Leesburg, Ind.—Establishment of water works system is being considered.

Baxter, Ia.—Citizens will vote on \$10,000 bonds for installation of water works.

Roland, Ia.—Citizens have voted \$10,000 bonds for installation of water works system.

Sioux City, Ia.—Council has rejected bids for pump for Morningside station; new bids will be asked.

Sully, Ia.—Citizens have voted \$8,500 bonds for installation of water supply system.

Vail, Ia.—Citizens have voted bonds for installation of water works system.

Amesbury, Mass.—Town has sold \$12,000 water bonds.

Hastings, Mich.—Citizens have voted \$120,000 bonds for construction of a water

power plant.—James M. Patten, City Clerk.

St. Cloud, Minn.—Mayor P. J. Sebergen has recommended installation of filtration plant.

Taconite, Minn.—Duluth Eng. Co., Duluth, has been selected as engineer for proposed water-works; cost about \$15,000.

Amory, Miss.—City voted \$65,000 bond issue for installing water-works and sewerage.—E. C. Dalrymple, City Clerk.

Helena, Mont.—Construction of the municipal water works plant, C. L. Morris Construction Co., Seattle, Wash., \$618,840; Adams Bros. & Co., Helena, \$648,419; P. E. McHugh, Tacoma, Wash., \$646,000; Engineer's estimate, \$606,000; the Helena Water Works Co., April 17, made offer of its plant, complete, for \$400,000, which is \$190,000 less than the offer of March 6; Council has rejected all bids in order to consider offer.—Charles W. Helmick, City Engineer.

Pacific, Mo.—The Fuller-Coult Co., Chemical Bldg., St. Louis, is making profiles and estimates for water-works.

Pleasant Hill, Mo.—Council has granted 20-year franchise to C. W. Dobbins for construction of water-works; proposes to construct dam.

Diller, Neb.—D. F. Sturdevant, Holdrege, Engineer, will supervise installation of water works plant.

Maimo, Neb.—Citizens have voted bonds for installation of water works.

Central Valley, N. Y.—Commonwealth Water Co., New York, is considering installation of chemical filter.

Cortland, N. Y.—Board of Water Commissioners is preparing to build 1,000,000-gal. standpipe or water storage tank at top of Court House hill; George F. Cooper and Grove T. Mason are committee to prepare plans and specifications for both open hearth and ingot iron construction, as well as of any other material they will recommend.

Portland, N. Y.—E. A. Wilder, Fredonia, will prepare preliminary plans and estimates for diversion channel around present impounding reservoir with necessary dams and connections; estimated cost, \$15,000 to \$20,000.

Sodus, N. Y.—Installation of water-works is being considered.

Concord, N. C.—City has \$50,000 bond issue available for construction of water-works.

Petersburg, N. D.—Citizens have voted \$6,000 bonds for installation of water works system.

Kenton, O.—Bids will be asked about June 1 by the city for constructing partly new and remodeling old water works.—Charles Brossman, Indianapolis, Ind., Engineer; V. H. May, Superintendent Water Works.

Springfield, O.—City will ask for bids for material for proposed water works force main and for the supply of pipe for season.—George Cotter, Superintendent Water Works.

McAlester, Okla.—Citizens have voted \$80,000 additional bonds for water works improvements.

Oklahoma City, Okla.—National Board of Fire Underwriters has recommended replacing dam with one of permanent construction; installation of two additional high-lift pumps; installation of two additional boilers and extension of distribution system.

Oklahoma City, Okla.—Bids for proposed new sedimentation basin at water works plant, to take care of extra amount of water consumed during summer months, have been rejected, because they exceeded estimates of Vincent G. Shinkle, Superintendent of the department, who prepared them; will be readvortised; bidders were: Hunter & Hunter, \$13,130; John A. Johnson, \$14,587; Fielder & Co., \$13,992; J. W. Smith & Co., \$13,800; Oklahoma City Construction Co., \$16,500; Stokes Construction Co., \$14,630; Illinois Concrete Machine Co., \$32,400; Black & Laird Construction Co., \$15,930; George H. Keifer, \$13,917.

Soper, Okla.—City will receive bids on 110 tons c.-i. pipe, 30,000-gal. steel tank on tower, deep-well geared pump, 12-hp. gasoline engine, 10 hydrants, valves, etc.—H. Hughes, City Clerk.

Soper, Okla.—Citizens have voted bonds for installation of water works system.

Gresham, Ore.—Bids for construction of the water works distributing system and sanitary sewerage system will be received about May 29.—Louis C. Kelsey, Selling Bldg., Portland, Ore., Engineer.

Haines, Ore.—Citizens have voted \$20,000 bonds to install water works system.

North Bend, Ore.—Mayor has authorized J. L. Stannard, Portland, to prepare plans and specifications for municipal water-works to supply both Marshfield and North Bend.

Franklin, Pa.—Council has passed resolution for construction of city water main to Oak st. in Tentk Ward at estimated cost of \$4,735.

McKeesport, Pa. Board of Water and Lighting Commissioners is considering rebuilding of pumping station.—D. M. White, Superintendent.

Wyomissing, Pa.—Council will consider \$60,000 bond issue for municipal water and light plant.

York, Pa.—Water Co. has decided to spend \$15,000 to extend trunk line through northern and western sections of the city.

Hearne, Tex.—Citizens have voted bonds to install water works.

Port Lavaca, Tex.—W. E. Shell has petitioned City Commissioners for franchise for water-works and electric light system.

Princeton, Tex.—Princeton Water-Works Co. will expend \$7,500 on water-works construction; erect engine and pump house; install 10-hp. oil engine and 20,000-gal. tank.

Blacksburg, Va.—Citizens will vote May 16 on \$12,000 bonds to install water and sewerage systems.

Christiansburg, Va.—Citizens have voted \$10,000 bonds to install water works.

Rocky Mount, Va.—Citizens will vote June 14 on \$50,000 bonds to establish and operate water works and electric light plant.

Elma, Wash.—Louis C. Kelsey, Civil Engineer, Selling Bldg., Portland, Ore., has been employed by city to prepare plans, specifications and estimates for increasing water supply by means of pumping and for installation of sewerage system.

Tacoma, Wash.—Bids will be asked at once for construction of 54-in. stove pipe line from main reservoir at McMillan to Wright ave. and J st. and for construction of telephone line along pipe line.

Independence, Wis.—Water system will be installed; \$3,500 bonds issued.

Monticello, Wis.—Consulting Engineer W. G. Kirchoffer, Madison, has been employed to prepare plans for water works system, consisting of 8,000 ft. of 6-in. and 8-in. c.-i. pipe; a concrete reservoir or elevated tank, one deep well and a power pump; plant will be operated by engine and boilers now located in electric light plant.

Niagara-on-the-Lake, Ont., Can.—Village is planning to install water works at cost of \$21,500.

CONTRACTS AWARDED

Chicago, Ill.—Furnishing and laying water service pipes, to Jas. T. Renn, 367 W. Chicago ave.; to Daniel Hardin, 3139 Indiana ave.; to David Walsh, 6628 S. Chicago ave.; furnishing and laying c.-i. water supply pipes, to Simon Ryan, 2927 W. Congress st.; to M. Murphy, 5315 Wabash ave.

Nevada, Ia.—To Guy E. Smith, Indianola, for constructing water-works.

Baltimore, Md.—By Board of Awards, for 1,300,000 - gal. vertical, triple - expansion pumping engine for the Mount Royal Pumping Station, to Allis-Chalmers Co., \$166,336.

South Hadley Falls, Mass.—To John E. Palmer, Boston, contracting engineer, for laying 27,700 ft. of water pipe for Fire District No. 2 and setting of 35 hydrants; to Daniel O'Connell Sons, to erect pumping station.

Alexander, Minn.—To W. B. Bosworth, Ada, by city, for construction and installation of water mains in 6th ave.

Duluth, Minn.—Laying 19,714 ft. of water pipe and 19,930 ft. of gas pipe; Crescent View extension, Woodland ave. to Crescent View Park, 4,382 ft. 8-in. water and 4-in. gas pipe and 2,770 ft. 6-in. water and 4-in. gas pipe, to J. Bergman, \$3,141.44; total estimated cost, \$14,000; Fourth alley force main, 2,040 ft. 20-in. water and 8-in. gas pipe, to Pastoret-Lawrence Co., \$2,694.80; total estimated cost \$9,767.38; 1,008 ft. 6-in. water and 4-in. gas mains, to Woodland, Johnson & Johnson, \$651.84; total estimated cost, \$1,720; 540 ft. 6-in. water and 4-in. gas mains in 43d ave. West, to Adam McAdams, \$313.20; total estimated cost, \$868; 2,350 ft. 6-in. water and 4-in. gas mains in Lewis st. and Dunnedin ave., Hunters' Park, to Johnson & Johnson, \$1,518.68; total estimated cost, \$3,650; also smaller contracts, to J. Bergman, J. W. Preston and Adam McAdams.

Hastings, Neb.—To Ingersoll-Rand Co., Chicago, to furnish for the city pumping station new air compressor of a capacity of 1,193 ft. of air per minute.

St. Paul, Neb.—To J. P. Johnson & Son, St. Paul, for the construction of extensions to water works; materials for the work have already been purchased.

Rochester, N. Y.—Laying water pipes in streets comprising group 247, to Wm. H. Sours, Second, \$23,882.

Troy, N. Y.—To the McDonough Construction Co., of Troy, for construction of the Martin-Dunham reservoir and spillway, \$15,276; to Ludlow Valve Mfg. Co., for valves; to R. D. Wood & Co., Philadelphia, Pa., for c.-i. pipe.

Cincinnati, O.—Service Director Sundmaker for wash water pumps and motors

for filtration plant, to L. G. Flindley & Co., \$3,110.

Salt Lake City, Utah.—To P. J. Moran, for construction of city's water main extensions during 1911; only other bid submitted was that of J. W. Percival.

Seattle, Wash.—Laying water mains on Grand Blvd., to John Contracting Co., Leary Bldg., \$16,408.60.

Richland Center, Wis.—To the Heine Chimney Co., Chicago, Ill., for erection of chimney.

BIDS RECEIVED

Tucson, Ariz.—Construction of a reinforced concrete standpipe, plain and ornamental finish; Geo. Cook & Co., \$16,150 and \$16,564, respectively; V. S. Griffith, \$16,450; Piedmont Construction Co., \$17,750 and \$19,590; Petterson & Schmidt, \$18,250 and \$18,955; Welch & Co., \$20,000; Barman Construction Co., \$23,116.

Fort Baker, Cal.—By Major George McK. Williamson, Q. M., U. S. A., for reconstructing pump house, installing machinery, erecting a steel tank and laying 6-in. water main at Fort Baker, (a) for entire work, (b) reconstructing pump house, (c) installing machinery, (d) steel tank, (e) 6-in. water main; Braun, Williams & Russell, 503 Market st., (d) \$2,795; F. C. Roberts & Co., 461 Market st., (a) \$14,725; American Construction Co., 359 Monadnock Bldg., (b) \$3,160, (d) \$3,564, (e) \$4,485; Compressed Air Machinery Co., Stevenson & Ecker, (a) \$18,838, (b) \$2,723, (c) \$6,765, (d) \$4,987, (e) \$4,143; Duncanson Harrison, 1407 Chronicle Bldg., (a) \$22,890, (b) \$6,985, (c) \$6,895, (d) \$4,445, (e) \$5,900; H. W. Moffit & Co., Oakland, Cal., (a) \$15,994; Butte Engine and Electric Co., 683 Howard st., (a) \$17,178, (b) \$2,288, (c) \$5,500, (d) \$4,102, (e) \$5,288; Pringle, Dunn & Co., 338 Pine st., (a) \$15,477, (b) \$1,947, (c) \$5,225, (d) \$4,262, (e) \$4,480; Nelson Bauer, Metropolitan Bank Bldg., (a) \$18,075, (b) \$3,250, (c) \$5,032, (d) \$4,095, (e) \$4,985; Michael Murphy, Berkeley, Cal., (e) \$4,750; Chambers & Heafey, Oakland, Cal., (a) \$16,141, (b) \$2,905, (c) \$4,980, (d) \$3,600, (e) \$4,956; George E. Dow, 410 Sheldon st., (c) \$4,850; Sampson Iron Works, Stockton, Cal., (c) \$4,575; all bidders of San Francisco unless otherwise stated.

Washington, D. C.—Furnishing pipe, etc., c.-i. water pipe: Item (1) 811 tons 16-in., (2) 1,125 tons 20-in., 9-in thick, (4) 475 tons 20-in., 6-in. thick, (3) 90 tons (a) specials on standard specifications, (b) on bidder's specifications; U. S. Cast Iron Pipe and Foundry Co., New York, Items (1-3) \$22.84, (4) \$54.84; Standard Cast Iron Pipe and Foundry Co., Bristol, Pa., Items (1-2) \$24.80, (3) \$24.58; (4a) \$51.50; Lynchburg Foundry Co., Lynchburg, Va., Items (1-3) \$24.02, (4b) \$52.60; Camden Iron Works, Camden, N. J., Items (1-3) \$24.02, (4b) \$52.60. Cocks: Item (1) 4,000 ¾-in. corporation cocks, (2) 200 1½-in. corporation cocks, (3) 250 ¾-in. lead corporation cocks, (4) \$4,250 ¾-in. iron curb cocks, (5) 150 ¾-in. lead and iron curb cocks; H. Mueller Mfg. Co., New York, (1) 60.75c., (2) \$2.40, (3) 71.5c., (4) 77c., (5) 77c.; 82.5c. on solid curb cocks; A. P. Smith, East Orange, N. J., (1) 59c., (2) \$1.96, (3) 62c., (4) 72c., (5) 77c.; Walworth Mfg. Co., Boston, Mass., (1) 67c., (4) 85.6c.; Glauner Brass and Mfg. Co., Cleveland, O., (1) 56.5c., (2) \$2.18, (3) 86c., (4) 81c., (5) 82c.; Hayes Mfg. Co., Erie, Pa., (1) 58.5c., (2) \$2.22, (3) 58c., (4) 63c., (5) 63c.

Fulton, N. Y.—Furnishing 300 tons of 18-in. and 70 tons of 14-in. pipe, and 1,200 lbs. of 14-in. and 5,000 lbs. of 18-in. Standard castings; Charles Millar & Son Co., Utica, N. Y., \$21.40 per ton for pipe, and \$50 per ton for special castings; U. S. Cast Iron Pipe and Foundry Co., \$21.40 and \$50.

Niles, O.—Installing clear well and filtration plant; Youngstown Construction Co., Youngstown, \$63,390; Louis Adavaslo & Co., Youngstown, \$47,400; W. H. Ralston, Mt. Vernon, \$48,900; Ensminger Co., Columbus, \$34,455; Niles Lumber Co., Niles, O., \$48,300; Falken Electric Co., Chicago, \$73,500; Clarendon Construction Co., Wilmington, N. C., \$49,086; Roberts Filtr Co. Mfg. Co., Philadelphia, Pa., \$49,100; Pitts Construction Co., Pittsburg, Pa., \$46,000; the American Water Softening Co., Philadelphia, Pa., \$57,239.50; R. P. Burnett, Geneva, O., \$41,000; Pittsburg Filter Co., Pittsburg, Pa., \$48,865; W. N. Henderson, Youngstown, \$45,225; furnishing the pumps, Harris Pump and Supply Co., Pittsburg, \$2,760; Goulds Mfg. Co., Seneca Falls, N. Y., \$4,130; the Allis Chalmers Co., Milwaukee, \$3,100; the Drava-Doyle Co., Cleveland, \$3,240; Henry R. Worthington, Cleveland, \$2,940; Lathrop & Dollier Co., Philadelphia, \$3,670; Jeansville Iron Works Co., Broadway, N. Y., \$2,802.27; Platt Iron Works Co., Dayton, O., \$2,687.

Norwalk, O.—Furnishing 12, 10, 8, 6 and 4-in. water pipe and special castings to be used for construction of the water pipe extensions on Woodlawn ave., Corwin, East

Maln, Chatham and St. Mary's sts., Buckeye Engineering Co., Norwalk, lowest bidder, \$23.25 per ton.

Lebanon, Pa.—Furnishing horizontal, cross-compound crank and flywheel condensing cross-compound pumping engine of 2,500,000-gal. capacity per 24 hours, (a) with foundation, (b) without foundation, (c) duty in millions of foot lbs. per 1,000 lbs. dry steam; Snow Pump Works, Buffalo, N. Y., (a) \$14,075, (b) \$13,500, (c) 122; Allis-Chalmers Co., Milwaukee, Wis., (a) \$16,650, (b) \$15,100, (c) 118; Platt Iron Co., Dayton, O., (a) \$14,140, (b) \$13,548, (c) 115.

Pittsburg, Pa.—Mission st. pumping station building and appurtenances; William Kerr's Sons, Lewis Bldg., Pittsburg, \$93,200; Golden & Crick, \$94,194; W. T. Powell, \$94,358.

Dallas, Tex.—Furnishing three 250-hp. boilers for White Rock reservoir; John O'Brien Boiler Works Co., St. Louis, \$8,800; Oil City Boiler Works, Oil City, Pa., by M. P. Wolfe, \$9,895; Smith & Whitney, \$10,300; E. Keeler Co., Williamsport, Pa., by John G. Hunter, \$8,529; Babcock & Wilcox Co., New Orleans, \$13,715; Randall-Lovegrove-Wyman, Houston, \$9,615; Casey Hedges Co., Chattanooga, by A. G. Wright, \$9,636; Briggs-Weaver Machinery Co., \$8,750; Walsh & Weidner Boiler Co., Chattanooga, \$8,960.

Tacoma, Wash.—Building McMillan Reservoir and pipe line, the remaining units of the Green River gravity water system; Pipe Line—Pacific Coast Pipe Co., \$767,927.75; Nisqually Contract Co., \$771,711.67; B. W. Kibler, \$778,356.64; Morris Construction Co., \$784,316; John Construction Co., \$790,432.74; P. E. McHugh, \$798,453.37; Sound Construction Co., \$810,208.89; International Contract Company, \$858,846.26; Reservoir—Nelson Bennett, \$289,589.22; Northwest Contract Co., \$297,144.96; Robert Wakefield Co., \$304,328.40; United Reservoir Construction Co., \$309,754.81; Keasal Construction Co., \$305,794.52; Sound Construction Co., \$326,200.62; Nisqually Contract Co., \$328,752.43; Morris Contract Co., \$342,403.66; International Contract Co., \$349,856; Lister Construction Co., \$302,062.62.

LIGHTING AND POWER

Attala, Ala.—Etowah Light & Power Co. will improve electric light and water systems at cost of about \$50,000; 20-year franchise has been secured.

Hawthorne, Cal.—Board of Supervisors has formed lighting district.

Los Angeles, Cal.—Better street lighting in the southeast section of the city is recommended to Board of Public Works by R. H. Manahan, City Electrician.

Los Angeles, Cal.—Board of Supervisors has refused Southern California Gas Co.'s application for franchise giving it privilege of laying gas pipes on all highways of county.

Quincy, Cal.—President O. C. Pratt, of Indian Valley Power Co., now supplying Greenville, has announced that line will be extended immediately to Taylorsville and Crescent Mills; plant will be enlarged and two towns lighted by electricity this summer.

Sacramento, Cal.—Citizens Light and Power Co. has been incorporated by Geo. Peltier to construct generating plant and supply electric current for light and power, also gas; capital, \$2,500,000.

Georgetown, D. C.—Georgetown Gaslight Co. is planning to build plant costing about \$500,000.

South Jacksonville, Fla.—Citizens have voted \$60,000 bonds for construction of electric light system and water works.—R. O. Moore, Chairman, Board Bond Trustees.

Atlanta, Ga.—Atlanta Hydro-Electric Power Co., 1014 Candler Bldg., is completing plans for construction of water-power electrical plant; \$3,000,000 will be expended for construction of high dam and power house, installation of machinery for developing 30,000 hp., and construction of transmission line to city.

Barnesville, Ga.—Citizens have voted \$15,000 bonds to extend electric light, water and sewerage systems.

Buchanan, Ga.—City will construct electric light plant.—G. N. Moore and H. S. McCalman, Committee in Charge of purchase and installation.

Oglethorpe, Ga.—City will open bids about July 1 for electric light and water plants construction; engineer not selected. C. A. Allison is interested.

Elwood, Ind.—Bacon-Olds Co. will build artificial gas plant in city.

Marion, Ind.—Board of Public Works has passed resolution granting to John L. McCulloch, city, a petition to furnish citizens artificial gas at price of \$1 per thousand cu. ft.

Muncie, Ind.—Martin Sears and L. Dunham, Yorktown, are working on organization of electric lighting company to furnish

light to incorporated towns of Daleville, Chesterfield and Yorktown, and to farmers between these towns.

Bonaparte, Ia.—J. A. Johnson and others are considering installation of electric light plant.

Fort Dodge, Ia.—Council has passed motion instructing City Engineer Reynolds to run level from city pumping station north for one-half mile to determine feasibility of dam for municipal power purposes.

Humboldt, Ia.—Northern Roller Milling Co. and the Humboldt Electric Light and Power Co., both operated under the same management, will at once build concrete dam across Des Moines River, and will also construct large power house near present one; about \$80,000 will be spent; plant will develop 1,200 horsepower.

Milo, Ia.—Citizens have voted bonds for establishment of municipal gas lighting plant.

Lake Charles, La.—J. S. Connolly, Carthage, Mo., will petition Council for franchise for gas plant.

Shreveport, La.—Council has decided to have estimate made of probable cost of electric light plant.

Chestertown, Md.—Council has granted franchise for gas plant in town.

Brainerd, Minn.—Council has adopted resolution asking Water and Light Board to expend \$1,800.75 for rectifier system of street lighting.

Minneapolis, Minn.—Dr. P. M. Hall, Health Commissioner, is preparing plans for enlarging city incinerating plant and increasing number of the electric generators so as to enable the plant to supply enough electricity to light up workhouse, Hopewell hospital, and 20 miles of streets in vicinity of workhouse.

St. Vincent, Minn.—Installation of electric light plant at cost of \$4,000 is being considered.

Wabasha, Minn.—Plans are being considered for establishment of the Minnesota Wisconsin Power Co. to furnish light and power to the cities of Wabasha, Lake City, Red Wing, Hastings and Winona; current will be furnished from the plant in this city, which will be enlarged to meet the increased demand.

Tupelo, Miss.—Citizens have voted \$50,000 to improve electric light plant, pave streets, etc.

Bloomfield, N. J.—Mayor Hauser has recommended installation of municipal electric light plant.

Madison, N. J.—Repairs, alterations and increased equipment for the local electric lighting plant that will total \$18,000, plus fees for preparing plans and supervising construction, have been outlined in report submitted to Council by New England Engineering Co.

Newark, N. J.—Committee on Municipal Lighting is planning to extend city hall lighting plant in order to light public buildings at cheaper rate.

Vincetown, N. J.—Water Co. is considering installation of generator to supply electricity for lighting town.

Albany, N. Y.—Proposition of the Municipal Gas Co. to light streets of the city of Albany for a period of five years from June 21 has been unanimously rejected by Board of Contract and Supply.

Binghamton, N. Y.—Council has asked Board of Estimate that \$250 be appropriated to procure services of electrical engineer to make plans for boulevard lighting and placing wires in conduits.

Oxford, N. C.—Oxford Electric Co. has been incorporated, \$15,000 capital stock, by A. H. Powell, of Oxford; Richard C. M. Calvert, of College Park, Md., and Charles F. Nesbit, of Washington, D. C., to furnish electric power and lighting and gas.

Dickinson, N. D.—Hughes & Deiters, owners of electric light plant, are planning extensive and permanent improvements.

Akron, O.—The Northern Ohio Traction and Light Co. has decided to develop water power on the Cuyahoga River near this city; Consulting Engineer H. von Schon, Detroit, Mich., is preparing plans.

Kingfisher, Okla.—Citizens have voted \$28,000 bonds for enlargement of electric light plant and extension of water-works; electric light system will be changed from single-phase to three-phase.—V. H. Francis, Superintendent of Light and Water plant.

Steelton, Pa.—Steelton Light, Heat and Power Co. is considering erection of auxiliary plant having 400-hp. dynamo.

Union City, Pa.—Keystone Electric Light Co. has been granted franchise to erect poles and string wires in streets; will build electric light plant. L. D. Shreve is interested.

Wyomissing, Pa.—Council will consider \$60,000 bond issue for municipal light and water plant.

Columbia, S. C.—Columbia Gas Light Co. is considering improvements to system.

Edgefield, S. C.—Citizens will vote May 18 on \$15,000 bonds for electric light plant.

Granbury, Tex.—Granbury Water, Ice, Light & Power Co., James W. Hockaday, Manager, desires 100-hp. power gas producer and engine.

Hearne, Tex.—Citizens have voted bonds to install electric lights.

Longview, Tex.—Citizens have voted \$90,000 for electric lighting facilities, paving, etc.—G. A. Bodenheim, Mayor.

Port Lavaca, Tex.—W. E. Shell has petitioned City Commissioners for franchise for electric light system and water works.

Temple, Tex.—J. A. Walker, 4210 Lafayette st., Dallas, desires prospective plans, specifications and construction bids on complete gas plant; 100,000 cu. ft. capacity; 50,000-ft. holder; five miles main, 8, 6, 4, 2-in.

Troup, Tex.—R. C. Schumate, Zephyr, has purchased electric light plant and will improve.

Rocky Mount, Va.—Citizens will vote June 11 on \$50,000 bonds to establish and operate electric light plant and water works.

La Crosse, Wis.—Plans for construction of fourth dam and another power house are being prepared by La Crosse Water Power Co.

Sun Prairie, Wis.—Citizens will vote May 9 on \$9,000 bonds for installation of electric light plant.

CONTRACTS AWARDED

Pasadena, Cal.—To S. M. Kerns, Los Angeles, to construct underground conduit system for electric light and telephone wires on South Orange Grove ave., \$33,700.

Taunton, Mass.—Lighting naphtha lights at northern end of the city, viz., Bassett, Fremont, Field and other streets, to James Barry, \$2,400.

Jackson, Tenn.—Furnishing generator and arc lamps, to the General Electric Co., of Schenectady, N. Y., and engine, to Hoover, Owens, Rentschler Co., Hamilton, O.; total cost, \$14,750.

Galveston, Tex.—Supplying fifty-set transformer and twenty-five new arc lamps, to the General Electric Company.

BIDS RECEIVED

Baltimore, Md.—McKay Engineering Co., 10 East Lexington st., is lowest bidder for installing ornamental lampposts about City Hall plaza and Key monument.

Seattle, Wash.—Furnishing machinery for Lake Union plant generator: Westinghouse Electric Co., \$9,424; Fort Wayne Electric Works, \$9,558; S. Morgan Smith Co., Eates & Clark Co., \$9,987; E. P. Jamison & Co., \$12,480; Water wheel: the Platt Iron Works Co., \$7,690; E. P. Jamison & Co., \$7,500; Pelton Water Wheel Co., \$6,350 and \$6,670.

FIRE EQUIPMENT

East Holly, Cal.—Council is considering purchase of chemical engine.

Ocean Park, Cal.—City Clerk Watt will receive bids for auto truck for city fire department within two weeks.

New Britain, Conn.—Fire Chief R. M. Done has recommended purchase of 500 ft. of 3/4-in. hose and equipment of truck with ladders.

Stratford, Conn.—Fire house will be erected at Nichols and Johnson aves. Wm. Clements is interested.

Bridgeville, Del.—Volunteer Fire Department is considering erection of \$3,000 fire house.

Dalton, Ga.—City has purchased site on Pentz st. for erection of combined fire headquarters and city hall.

Sterling, Ill.—Bids will soon be asked by Fire and Water Committee for combination auto fire truck carrying ladders and hose.

Princeton, Ind.—Council is considering purchase of fire engine.

Neola, Ia.—Council has decided to erect fire engine house.

Baltimore, Md.—City will erect engine house in near future at Light and Montgomery sts.

Greenfield, Mass.—Town has appropriated \$6,000 to purchase motor-propelled combination chemical and hose wagon.

Gloucester, Mass.—Town is considering purchase of flying squadron.

Swampscott, Mass.—Town has appropriated \$6,000 for purchase of auto chemical and hose wagon.

St. Cloud, Minn.—Mayor P. J. Sebergers has recommended erection of engine house.

Waterloo, Neb.—Citizens have voted \$15,000 bonds for better fire protection.

Westfield, N. J.—Fire Committee is considering purchase of auto apparatus.—J. A. Dennis, Mayor.

Old Forge, N. Y.—Village is considering erection of combined engine house and municipal building.

Sauquoit, N. Y.—Purchase of chemical engine is being considered.

Syracuse, N. Y.—Fire alarm ordinance has been adopted without opposition by

Council and early action will be taken to contract for installation of central office equipment.

Troy, N. Y.—Council has passed ordinance for purchase of truck.

Columbus, O.—Mayor Marshall is favorable to purchase of auto fire apparatus.

Boyetown, Pa.—Keystone Fire Co. will purchase fire engine.

Dunmore, Pa.—Plans for erection of two new fire houses are being prepared by Architect P. J. Morris, of Scranton.

Lansford, Pa.—Council has decided to install borough electric fire alarm system.

Harrisburg, Pa.—Council is considering purchase of 2,500 ft. of fire hose.

Pottstown, Pa.—Council is considering purchase of modern truck for Empire Hook and Ladder Co.

Sellersville, Pa.—Fire company has been organized.—Fred Shubert, Chief.

Sellersville, Pa.—Council has agreed to furnish equipment for local fire company, and proper building will be erected.

Seven Valleys, Pa.—Fire company has been organized.—H. S. Behler, Chief.

Columbia, S. C.—Engine house will be erected at once at 1112 Green st.

Fort Worth, Tex.—Plans for expending \$45,000 in equipping adequate police and fire alarm system have been approved by Commission.

Spokane, Wash.—Fire Commissioners are considering election on \$100,000 bonds for extension and improvements in fire department.

Tacoma, Wash.—Council is considering purchase of site in Indian addition for erection of fire house.

Montreal, Que., Can.—Board of Control has ordered erection of two fire stations.

CONTRACTS AWARDED

Hartford, Conn.—Building 55-ft. water tower, to American-La France Fire Engine Co., Elmira, N. Y., \$6,000.

Lawrence, Mass.—Furnishing auto combination chemical and fire truck, to Knox Automobile Co., Springfield, \$5,500.

New York, N. Y.—By Board of Estimate, to Star Electric Co., Binghamton, N. Y., for installation of several thousand dollars' worth of fire-alarm boxes.

BIDS RECEIVED

Chico, Cal.—Furnishing automobile engine, Pope-Hartford, \$5,500; Rambler, \$5,250; Webb Motor Fire Apparatus Co., \$5,750; Gorham Engineering and Fire Apparatus Co., makers of the Seagrave chemical engine, three bids, \$5,105, \$5,055, \$5,755; White, \$4,590; Knox, new, \$5,980; used, \$5,630; Kissel, \$5,300.

St. Paul, Minn.—Furnishing motor-driven squad wagon: Waldref-Odel Motor Car Co., \$6,000; Webb Motor Fire Apparatus Co., \$5,000; Knox Automobile Co., \$5,600; Robinson Fire Apparatus Co., \$5,500; P. J. Downes Co., \$5,000; Waterous Engine Works, \$5,500; American-La France Fire Engine Co., \$5,500.

Paterson, N. J.—Changing of the hose wagons and engine apparatus attached to steamer companies Nos. 1 and 5; William J. Tynan sent in two bids, first for changing of the two hose wagons to motor propelled vehicles for the sum of \$7,300, and second for the same work, substituting Knox chassis for a Sampson chassis, \$6,000; Hughes Garage Co., on a Kelly truck chassis, \$7,000; James Boyd & Sons, two hose wagons, \$6,375; Seagrave Co. bid \$5,000 each for changing of two wagons and \$5,500 each for changing of the two engines; the Nott Fire Engine Co. offered to install universal chassis similar to that in present use in the motor propelled steam fire engine in New York department for the sum of \$6,000 for each engine; Couple Geering Co., New York, offered to install electric driven tractor for engines at a cost of \$5,500 each; Victor Motor Truck Co., for engines, \$7,000; Webb Motor Fire Apparatus Co. bid on 75-hp. hook and ladder motor-propelled truck, \$12,600.

Hamilton, O.—Furnishing auto trucks and other fire department equipment: Auto trucks, West Side Motor Co., two trucks, \$4,300 each without equipment or \$1,950 with equipment; American-La France Co., Elmira, N. Y., \$5,200 and \$5,000; Seagrave Co., Columbus, \$7,800 and \$8,250 for two trucks, ladder wagon, aerial, \$5,000; Hamilton Motor Car Co., \$7,000 for two or \$3,500 for one truck; Central Motor Car Co., one motor wagon, \$5,000. Hose: Bi-Lateral Fire Hose Co., Chicago, \$1, 95c., 90c. and 80c. per ft. for 3,100 ft., according to brand; J. R. Muddon, Dayton, made general bid on clay pipes, nozzles, gate valves, etc.; Diamond Rubber Co., Akron, fire hose, \$1, 90c. and 80c. per ft.; Fabric Fire Hose Co., New York, \$1.10, \$1, 95c., 90c. and 85c. per ft.; Boston Woven Hose and Rubber Co., 90c. and 85c. per ft.; Eureka Fire Hose Co., New York, \$1.10, \$1, 90c., 95c. and 85c. per ft.

South Bethlehem, Pa.—Supplying 1,000 ft. of Fire Hose: Hudson Mechanical Rubber Co., No. 1, 69½ cts. per ft.; No. 2, 52½ cts.; No. 3, 46 cts.; No. 4, 34 cts., all coupled; B-Lateral Fire Hose Co., Progress, double jacket, \$1.10 per ft.; Ohio, double jacket, \$1, coupled; Mineralized Rubber Co., double jacket, 78 cts., and 90 cts., coupled; Goethers Rubber Manufacturing Co., 1-ply Conqueror, \$1.10; Overall, \$1; Kearney brand, \$1; double jacket, 90 cts.; C. C. C. Fire Hose & Rubber Co., Gold Standard, \$1; Canton Special, \$1; Standard, 90 cts.; Independence brand, solid rubber, \$1.10; Gutta Percha & Rubber Manufacturing Co., Ajax, 75 cts.; Princeton, \$1.20; Baker Fabric, \$1.25; Princeton, double jacket, 95 cts.; Rescue brand, 85 cts.; Burka Fire Hose Manufacturing Co., 3-ply jacket, \$3; Fabric Fire Hose Co., Keystone, \$1; Patrol, \$1; Safety, 95 cts.; Arrow, 90 cts.

BRIDGES

San Jose, Cal.—Plans for four new county bridges have been ordered by the Board of Supervisors and the replacing of bulkheads torn out by the recent floods authorized.

Perry, Ga.—Houston County Commissioners of Roads and Revenues are considering \$100,000 bond issue for improving bridges and roads.

Shreveport, La.—Bids will be asked soon by the Shreveport Commissioners for constructing traffic bridge over Red River; cost \$250,000.—George Wilson, City Engineer; Ira G. Hedrick, Kansas City, Mo.

Minneapolis, Minn.—Tentative arrangements for construction of three new bridges in Minneapolis and widening of the Plymouth ave. bridge have been made by Council Roads and Bridges Committee; Gov. A. O. Eberhart has signed \$850,000 bridge bond bill.

Albany, N. Y.—State Engineer Benschel has prepared plans for construction of portion of Schuylerville bridge; cost is estimated at \$23,553; bids will be asked at once.

Marborough, N. Y.—Citizens will vote May 12 on \$3,000 appropriation for bridge at Main and Landing sts.

Dayton, O.—Council is considering construction of bridge across hydraulic race at Spurling ave.

Hugo, Okla.—Citizens have voted \$120,000 bonds for bridges.

Janesville, Wis.—Mayor John C. Nichols has recommended erection of bridge across Racine st.

CONTRACTS AWARDED

Paducah, Ky.—Constructing reinforced concrete bridge, 43 ft. wide and 295 ft. long, to J. A. Omburg, Memphis, Tenn., \$30,600; other bidders: Foy-Proctor Co., Nashville, Tenn., \$39,062; L. W. Hancock Co., Louisville, Ky., \$35,770; Standard Concrete Construction Co., Chicago, Ill., \$32,700; Nashville Bridge Co., Nashville, Tenn., \$31,800; Davis-Hoys Construction Co., Paducah, \$33,339.

East Las Vegas, N. M.—To the Missouri Valley Bridge and Iron Works, of Leavenworth, Kan., by Board of County Commissioners, for erection of three new bridges to be constructed by the county this year, \$14,000.

Niles, O.—To Western Reserve Lumber Co., Warren, for building of Squaw Creek Bridge at Mosier lane, \$3,898 plus 40c. per cu. yd. for excavation and \$6.62 per cu. yd. for extra concrete work as ordered by Engineer.

Portland, Ore.—Reconstruction of county bridge in West Portland district, by the County Court, to P. W. White, 928 East Couch st., \$2,650.78.

Easton, Pa.—By Northampton County Commissioners for a bridge over the Lehigh River at foot of 3d st., to Ferro Concrete Co., Harrisburg, \$109,950.

Reading, Pa.—Building bridges: Bordner's bridge, No. 1, over Tulpehocken Creek, seven miles from Rosensonia, to Carl R. Cramp, Harrisburg, \$6,925; other bidders: Nelson Meredith Co., Chambersburg, \$8,185; J. O. Sherry Co., Wyomissing, \$9,007; Ferro Concrete Co., Harrisburg, \$7,149; H. E. Ahrens Co., Reading, \$7,027; Bordner's bridge, No. 2, crossing the Swatara Creek about six miles from Myers-town, to H. E. Ahrens Co., Reading, \$6,290; other bidders, Nelson Meredith Co., Chambersburg, \$6,500; J. O. Sherry Co., Wyomissing, \$8,480; Ferro Concrete Co., Harrisburg, \$6,950; Willauer & Co., Pottstown, \$6,897.50.

Yardley, Pa.—Constructing concrete arch bridge over Delaware River at Yardley, to the F. M. Talbot Co., 1 Madison ave., New York, N. Y., about \$500,000.

Memphis, Tenn.—Shelby County Commissioners, to Memphis Bridge Co., to construct bridge over Hatchie River at Pite ave., \$13,945 for bridge at Bell's Switch,

\$3,698; for structure at Walnut ave., near White Station, \$2,285, and for structure at Hurricane Creek, near Bartlett, \$2,995; to W. P. Allen, to build bridge over Big Creek, \$3,197.

Milwaukee, Wis.—Building fender pilings around Chestnut and State st. bridges, to A. E. Bines for Chestnut st., \$375; and to J. E. Hathaway, for other, \$2,220.

BIDS RECEIVED

Indianapolis, Ind.—Construction of concrete slab bridge across Pogues run, at Highland ave.: H. F. Hackborn, \$6,785; Hease-Buzzart Construction Co., \$7,500, and the American Construction Co., \$8,200. The estimate of City Engineer Klausmann was \$7,756.

Niagara Falls, N. Y.—Building approaches for proposed new bridge over the New York Central tracks at 11th st.: Braas Bros., \$59,887; Reed-Coddington Co., \$86,950; Eastern Construction Co., \$30,155; J. E. Johnson Co., \$26,000.

MISCELLANEOUS

Opelika, Ala.—Dr. Wm. N. Oates, State Prison Inspector, has recommended immediate erection of jail for Lee County.

Los Angeles, Cal.—Swimming pools and a general children's playground on side of Griffith Park, toward Tropic, are suggested by J. B. Lippincott Park Commissioner.

Niles, Cal.—Board of Supervisors will ask for bids for auto for Sheriff's office.

Niles, Cal.—Board of Supervisors has decided to erect brick jail.

Willows, Cal.—C. N. Russell, San Francisco, has been selected as architect for proposed \$25,000 city hall.

Pueblo, Col.—Board of Works will purchase four street washers.

Naugatuck, Conn.—Warden W. J. Neary has recommended erection of new police headquarters.

Washington, D. C.—An American Consular officer in Canada has announced that local City Engineer is considering purchase of motor type of dump wagon of about 3 tons capacity; also a motor tank wagon for street sprinkling purposes; vehicle should be adapted for use on hilly streets; engineer is anxious to receive as soon as possible catalogues and illustrations, prices to be quoted delivered in certain city. Address No. 6589, Bureau of Manufactures.

Dalton, Ga.—City has purchased site on Pentz st. for erection of combined city hall and fire headquarters.

Macon, Ga.—Architect will shortly be commissioned to draw plans for erection of building on Cotton ave. for Water Works Commissioners.

Fort Wayne, Ind.—Mayor Grice has recommended more funds for street cleaning.

Fort Wayne, Ind.—River Front Commission has recommended the employment of Morrison P. Eddy, of firm of Metcalf & Eddy, of Boston, to report plan for disposal of the sewage, also plans for dams in the river to make boating possible, and George E. Kessler, of St. Louis, as Landscape Engineer.

Markle, Ind.—Citizens are urging installation of garbage disposal plant.

Noblesville, Ind.—Council is considering \$20,000 bond issue to purchase site and erect city building.

South Bend, Ind.—Architect E. R. Austin is preparing plans for building for Zoo planned by Park Board.

Catlettsburg, Ky.—City hall has been destroyed by fire.

Winchester, Ky.—Grand Jury has recommended erection of jail for Clark County.

Baltimore, Md.—Architects Archer & Allen have prepared plans for erection of \$20,000 public bath house at Greenmount and Harford aves.

Gloucester, Mass.—County Commissioners are considering erection of addition to jail and house of correction.

New Bedford, Mass.—Board of Health has rejected second proposal of New Bedford Extractor Co. to dispose of city's garbage from years 1914 to 1921 at annual cost of \$7,500.

Duluth, Minn.—Board of Public Works has advertised for bids for improvement of the Quebec pier at Bay end of Becker ave.; cost about \$6,000.

Leseoeur Center, Minn.—County Board has decided to erect county jail.

Dassel, Minn.—Citizens will vote on bonds for erection of village hall.

Tupelo, Miss.—Citizens have voted \$50,000 bonds to build city hall, improve electric light plant and pave streets.

Mexico, Mo.—Citizens have voted \$15,000 bonds to erect almshouse.

St. Louis, Mo.—E. E. Wall, Water Commissioner, has recommended revetment of river banks at cost of \$150,000; also new joint boiler house for the engines at Bissell's Point.

Central City, Neb.—Merrick County will vote May 31 on erection of \$100,000 court house; plans being prepared.

Springfield, N. J.—Springfield Township is considering erection of municipal building.

Old Forge, N. Y.—Village is considering erection of combined municipal building and engine house.

Hugo, Okla.—Choctaw County has voted \$125,000 bonds for erection of court house and jail.

Philadelphia, Pa.—Architect D. K. Boyd, 139 S. 15th st., has prepared plans for erection of \$10,000 public library at 5th and Elisworth sts.

Darlington, S. C.—Oakes & Lamotte desire addresses of manufacturers of and dealers in metal and porcelain numbers and signposts for city street names; also catalogues.

Anahuac, Tex.—Chambers County will vote June 20 on \$43,000 bonds to erect court house and jail.

Calvert, Tex.—Citizens have defeated proposition to issue \$25,000 bonds to erect city hall.

Galveston, Tex.—Contract will soon be let by V. E. Austin, Commissioner of Streets and Public Property, for construction of a trash and garbage incinerator; cost about \$7,155.

Salt Lake City, Utah.—Council will be furnished with plans and specifications for erection of two comfort stations; cost \$5,000 each.

Beckley, W. Va.—Raleigh County is considering erection of jail.

Milwaukee, Wis.—Council has appropriated \$5,000 to Park Board for needed improvements.

New Westminster, B. C., Can.—Citizens have voted \$200,000 bonds for garbage system, bridge and electric light plant extensions, etc.—John Lee, Mayor.

CONTRACTS AWARDED

Long Beach, Cal.—Constructing combined bulkhead and sidewalk with parapet of reinforced cement concrete on Seaside blvd., from Chestnut pl. to jetties at ocean channel entrance, to J. D. Kneen Contracting Co., \$110,985; other bidders: J. C. Beer, \$120,000 and \$122,947; A. S. Bent, \$140,000; J. W. Young, \$121,499.

Asbury Park, N. J.—By the Public Grounds Commission for construction of a bathing plant and pool on the east side of Ocean ave., between 1st and 2d aves, to J. R. Taylor & Co., city, \$8,000; other bidders: Frank N. Goble, \$89,590; A. Whitehead, \$82,350; C. H. Peckworth, \$85,394; H. O. Gardner, \$82,088; J. A. Conklin, \$99,000.

New Brunswick, N. J.—Laying loose riprap under the retaining wall at Jamesburg, to Contractor John F. McGovern, city, lowest bidder; William I. S. Davison, of Cranbury, and Abraham Pelin, city, were other bidders.

Trenton, N. J.—Construction of a public comfort station at Cadwalader Park, to Joseph D. Smith & Son, low bidders, \$3,115, and Piper Bros., plumbing contract, \$1,730; other bidders: Andrew J. Trier, \$3,556; W. J. & J. H. Morris, \$3,175; Scott & Day, \$3,873; Stephen Dilkneit, \$3,325; P. J. O'Neill, \$3,468; S. W. Mather & Sons, \$3,398; Edward A. Lee, \$3,590; W. S. Hill & Son, \$3,326; plumbing, F. S. Katzenbach & Co., \$1,996; Greiner Plumbing Co., \$1,962; William Deekson, \$1,981.

Geneva, N. Y.—Sprinkling and flushing streets, to Edw. Higgins, \$100 per week for sprinkling and \$12.50 for flushing.

Philadelphia, Pa.—By Acting Director Hasskarl, of Department Docks, for dredging 40,000 cu. yds. of material from Delaware River, to American Dredging Co., 23½c. per cu. yd.

Seattle, Wash.—Collecting garbage in Dists. 1, 2, 3, 4 and 8, to C. E. Packard, E. 62d st. and Latonia ave.

BIDS RECEIVED

Boston, Mass.—By Metropolitan Park Commission, for construction of wooden landing piers in lower Charles River Basin, W. H. Ellis, Boston, \$8,885; George T. Rendle, Boston, \$7,545; Waldo Bros., Charlestown, \$7,380.

New York, N. Y.—Construction of a comfort station in Central Park near the Swiss Cottage, Richard Carvel Co., lowest bidder, 401 West 59th St., \$21,996.

Providence, R. I.—Oiling city streets: The Texas Co. bid on road oil in car tank lots. 3.65-100c. per gal.; the Daniels Road Oiling Co., East Providence, 1c. per sq. yd. on spraying with road oil, 4c. per sq. yd. on oiling with road oil for entire season, 3c. per sq. yd. for oiling with emulsion oil for season; the Standard Oil Co., Boston, 1¼c. per sq. yd. for spraying with road oil and for three treatments by spraying in season. 3¼c. per sq. yd.; 4.15-100c. per gal. was bid on road oil in car tanks and 5c. per gal. for emulsion in car tanks.

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ICE MOUND IN LAKE, DIRECTLY OVER INTAKE

TORONTO WATERWORKS INTAKE TROUBLES

Six-Foot Steel Pipe Intake Stopped with Anchor Ice—Pipe Shifted by Ice—Later, Filled with Sand from Lake Bottom—Method of Cleaning—Difficulty Caused by Ice in Lake

In 1895, when the city of Toronto, Ont., found it necessary to increase the water supply, the plan was adopted of locating an intake in Lake Ontario and obtaining lake water through this. Immediately south of the waterfront is Toronto harbor and bay, which is navigable for about half a mile from the shore, and for $1\frac{1}{2}$ miles to 2 miles further south is shoal, there being a number of islands and a long bar and breakwater which furnish the southern protection to the harbor. The intake was located south of this shoal in water 65 feet deep and protected from any pollution from the harbor or the sewers discharging therein. It was proposed to construct the intake partly of steel pipe and partly in tunnel.

Between 1896 and 1898 2,357 feet of 6-foot steel pipe was laid from the intake to a crib on one of the islands known as the shore crib. For some reason nothing further was done in carrying out the plan until 1904, when a contract was let for 85 lengths of 6-foot steel pipe, completing the section from the intake to the south shaft of the tunnel which was proposed to complete the intake up to the pumping station. It was decided to tunnel for 5,087 feet under the bay for several reasons, among them the difficulty and cost of laying large

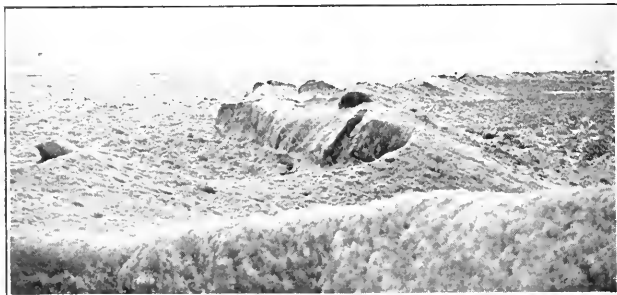
pipe across the harbor at a depth which would not obstruct future deep-water navigation, the expense of anchoring the same so as to permit of its being safely emptied and examined for leaks, and the impossibility of keeping out of it, while being laid, the sewage-contaminated mud which covered the bottom of the harbor to a depth of three or four feet. This tunnel was begun in the spring of 1906, and was carried through rock for the entire distance. It has a horseshoe section, lined with three rings of brick on the arch and side walls and having an invert of 1:2:4 concrete. The tunnel was completed in the latter part of 1908 and the pumps began taking water from the lake through the tunnel and steel pipe on January 1, 1909.

Early last winter it was found that severe easterly storms and a change in the formation of the sandy lake bottom which was probably caused thereby had resulted in the sand piling up within two or three feet of the top of the intake, which is 20 feet high. This was remedied by placing a large cylinder on the top of the intake, raising the same 10 feet higher.

A short time previous to this City Engineer C. H. Rust had recommended that an additional intake be constructed, prob-

ably because, among other objections resulting from too small an intake, the heavy consumption caused too great velocity of water flowing into it. In December last it was found that, owing to some stoppage in the intake or pipe, it was impossible to obtain sufficient water through them to keep the pumps going. Investigation revealed the fact that the pipe had been completely stopped by anchor ice, which had evidently formed along the shore in shallow water and been driven off by the wind to the vicinity of the intake, where it had been sucked in with the inflowing water. This ice was removed in two or three hours and pumping resumed.

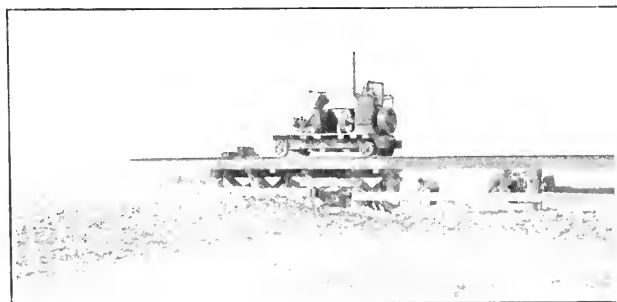
In February it was again found impossible to obtain sufficient water through the suction, which, in fact, appeared to have become completely stopped. An examination showed that a considerable length of the 6-foot steel pipe was completely choked with sand. As this difficulty could not be remedied in a few hours and it was necessary to continue the water



TYPICAL ICE BANKS, LOOKING WEST FROM INTAKE

supply, steps were immediately taken to let in a temporary supply of water from the bay. This was realized to be dangerous on account of the known pollution of the water of the bay, and it was realized that there was danger that typhoid fever would result from such use. The city already had an efficient system of applying hypochlorite, however, and especial pains and vigilance were exercised to sterilize the water by this means, and an outbreak of typhoid fever has been prevented.

Unfortunately, the entire lake along the shore was covered with a very heavy field of ice which prevented a thorough examination of the pipe for several days, there being an especially high mound of ice directly over the intake. When finally the authorities were able to reach and examine the intake they found that at a point about 600 feet from the shore a section of the pipe had risen from its bed and the flange had opened about 4 feet. It was thought probable that this had occurred in December. (Although no reason was suggested by our informant, Mr. Rust, it seems possible that this might have been caused by the partial emptying of the pipe during the trouble with anchor ice, thus increasing its buoyancy, which fact, combined possibly with a lessening of the depth of sand above the pipe due to the shifting of the bottom above referred to, may have resulted in a lifting of the pipe by flotation.) At a point 900 feet from the shore a section of pipe 150 feet in length had been carried out of line 20 feet at one end and 8 feet at the other. This Mr. Rust believed to have been the effect of the motion of a large and thick field of ice moved by a very heavy easterly gale.



CENTRIFUGAL PUMP OVER INTAKE



SAND PARTLY REMOVED FROM INTAKE

Steps were immediately taken to remove the sand from the intake pipe. This pipe follows practically the bottom of the lake, and thus slopes toward the intake crib. The method of removal adopted was to wash the sand down the pipe toward the crib, through which it was removed. One of the illustrations shows a centrifugal pump located on the ice over the intake, to be used in connection with this work. Another photograph shows the use of fire hose for loosening up and washing the sand toward the intake. Two or three weeks ago the pipe had not yet been entirely cleaned.

The work has been very difficult and arduous owing to the cold and rough weather. Three tugs, four divers, scows, etc. have been engaged constantly; but owing to the winter storm there have been some weeks during which it was possible to get in only about a total of 24 hours work.

These difficulties connected with lake intakes in northern climates should certainly be taken into consideration when considering or comparing proposed sources of supply where the alternative is between lakes and gravity supplies.



FLUSHING SAND TOWARD PUMP

CHEAPER STREET LIGHTING IN WICHITA

In his report for the year 1910 L. F. Means, Commissioner of Water and Lights of Wichita, Kan., states that the streets of that city are now illuminated with lamps giving a much superior light to that of previous years and at such a reduction in price as to enable the city to give an all-night service with many more lights than formerly, at a total expenditure less than in previous years. Formerly vapor lights were used, but in July of last year the Kansas Gas & Electric Company began a five-year contract substituting tungsten lamps for these. The same company also is supplying 117 electric arc lights of 2,000 candle-power for all-night service at \$66 per year per light, the same price formerly paid for lamps extinguished at 1 a. m. The city is using 850 80-watt tungsten lights, in addition to which the same company is furnishing 146 100-watt tungsten lights, which are paid for by the steam railways which cross the city, which also pay for the electric arc lights.

CHICAGO STREET PAVING REPORT

Organization of Street Department Complete and Efficient—
Specifications and Contracts Criticised—Concrete Foundations—Vehicle Tax

THERE has recently been published for distribution a report made to the Chicago Commission on City Expenditures last December by Samuel Whinery, of New York, on the general subject of the street pavements of that city. This report appears to have been made in a very fair and impartial spirit, a number of criticisms of present practice and recommendations being made therein, but the general tenor of the report being commendatory of the department. Concerning the nature of the work done Mr. Whinery states:

The organization in the department of the chief engineer of streets is quite complete and seems to be efficient. There are a large number of assistants and employees, but not more than are needed, with the possible exception of street inspectors. The system of blank forms in use is fairly complete, and the individual blanks for reporting and recording the progress and quality of the work and the quantity of materials used are sufficient, if properly used, for the purpose. It may be said, I think, that in this respect the Bureau is better and more intelligently equipped than those in most cities. Some of the methods and the procedure in carrying them into effect might be improved, and my impression is that the bookkeeping methods in the accounting department of the city, based upon this system of blank forms and reports, are not as complete and do not make note of details to the extent that they should.

I had many opportunities to examine street foundation concrete in Chicago, both while it was being laid and afterwards, before it was covered by the pavement. I found it very generally to be of excellent quality, averaging better than in most cities. The materials were clean and of good quality and mixing (by machine) well done.

Except in the matter of the oil used for the preservative treatment, the creosoted wood block pavement now being laid by the Board of Local Improvements is excellent. The blocks are more carefully and rigorously inspected than in most American cities. The concrete foundation was good and the blocks were properly laid.

I was able to inspect on the streets a few asphalt pavements in progress in Chicago, but not to analyze or test carefully the materials used. On most of the work I saw the materials appeared to be satisfactory and the work of construction well done. In one case, however, I found the work very unsatisfactory. On the whole, the asphalt pavements now being laid in Chicago are not up to the high standard of excellence that they should be; although it may also be said that they appear to be as good as the average in other cities, and they are probably as good as the city can hope to secure at prevailing prices, which are below a figure that would enable the contractor to do first-class work and make a reasonable profit on it.

I was able to examine but two brick pavements in course of construction. In these the brick was of excellent quality; they were laid with care and the joints were well filled with paving pitch of proper quality.

Mr. Whinery makes a number of suggestions in this report which are of equal interest to other cities, large and small, although a number of them would not receive the approval of all paving engineers and experts. One of the most important general criticisms is that

The same paving specifications and the same requirements are in nearly every respect made to apply to all pavements of one kind in the city, regardless of the conditions found on the individual streets. Thus, a 6-inch concrete foundation is specified for asphalt pavements, whether the street be one of the heaviest traveled in the heart of the city or a residence or suburban street carrying very light travel. Chicago is not, however, alone in this, since the same practice prevails in nearly all American cities. On some of the heaviest traveled streets the concrete foundation should be 8 inches thick, while on a large percentage of the suburban or residence streets, where only a small quantity of the lightest character of travel needs to be provided for, a pavement with 4 inches of concrete foundation, one inch of binder and 1½ inches of surface would be ample and the cost would be but about three-fourths of the cost of the heavier standard.

It is specified that the sidewalk shall consist of 9 inches of foundation, 3½ inches of concrete base and ¾ inch of surface course. The main object of the 9 inches of cinders or other porous material in the foundation is to facilitate drain-

age, and thus prevent the heaving action of frost. It is useful for this purpose only when the porous foundation is quite free from water. Unless drainage is provided for the trench occupied by the porous material it may be filled with water and the purpose of the foundation defeated. The specifications do not provide for such drainage. This should be done by placing drain tiles to carry the water from low points to the nearest sewer inlet or to some other outlet, so that all water reaching the foundation shall be promptly carried away. If such drainage were provided it would not be necessary to make the foundation course more than 6 inches, which is sufficient to distribute the weight over the underlying soil.

The width of berm called for (one foot) is often not sufficient where the grade of the sidewalk is considerably above the natural surface of the ground. In many existing sidewalks that may now be seen in Chicago, this berm or bank of earth has been entirely washed away, or it has at least disappeared, so that the edge of the concrete is unsupported and sometimes projects more than a foot beyond the supporting earth. I would suggest that the width of this berm, at the grade of the sidewalk, be made twice the depth of the fill at each point. Thus, where the top of the sidewalk is one foot above the natural surface of the ground the berms should be 2 feet wide at grade.

Commenting upon the fact that the department has adopted practically all of the specifications recommended by the Association for Standardizing Paving Specifications, Mr. Whinery considers this unfortunate, as he believes these to be open to severe criticism in many respects. The most serious objections which he finds to them are in connection with the specifications for asphalt to be used in asphalt pavements, the description of the wood to be used for wood blocks and the oil to be used in treating the same. These will be referred to later.

Another general criticism which he makes is in connection with the right reserved in the contract to change plans and increase the amount of work. Concerning this he says:

In justice to the contractor and as a safeguard to the city, the power to increase or decrease the quantities of work for which unit prices are provided in the contract should be limited to a definite per cent of the quantities on which the contract is based. The latitude thus given should not exceed ten per cent either way. Any greater increase or decrease should be the subject of a supplemental contract. Within the units named the contract unit prices should apply to and cover all the work done.

The term "extra work" is necessarily indefinite. It is elastic and may be made use of to cover up a great quantity of crooked or questionable transactions between the contractor and dishonest city officials. It should be carefully and strictly defined in contracts and should in every case be the subject of a supplemental contract if its value is to exceed a stated sum, say \$250.00.

Supplemental contracts should be made on standard printed blank forms and should be filled in with the same care and executed with the same formality as the original contract to which they should refer. They should include a form of consent which should be executed by the bondsmen.

So much care and formality may be thought unnecessary by city officials in most cases, but should be strictly enforced. More honest misunderstandings and greater opportunity for dishonest practices occur in this matter of extra work, as ordinarily handled, than in any other element of contract work and it should be dealt with accordingly.

Commenting upon the fact that, in proportioning concrete materials the cement is measured loose, he suggests the following clause to cover this:

One barrel of Portland cement shall be held to be four cubic feet and one standard bag of cement (four bags to the barrel) as one cubic foot; and the quantity of sand and stone to be used shall be determined accordingly.

The proportions for pavement foundations and also those for sidewalk foundations he considered unnecessarily rich and recommended changing the former from a 1:3:6 mixture to a 1:3:7 and the sidewalk foundation from a 1:2½:5 to a 1:3:6. As stated above he also recommended reducing the thickness of the pavement foundation on residence streets from six to four inches; and he considered the 9 inches of sidewalk foundation as unnecessarily deep and recommended reducing this to 6 inches. He also recommended that the 7-inch concrete foundation and 2-inch surface course required at driveways across the sidewalks be reduced to 5 inches and 1½ inches respectively. These changes were recommended as reducing the cost

of the work, without, in his opinion, making it undesirably weak.

Concerning brick pavements his principal recommendations were that for 12 to 14 inches out from the curb the brick be laid parallel with the curb, whereas the present practice is to carry all courses at right angles with the street for the entire width from one curb to the other. The object of the proposed change is to reduce resistance to flow of water in gutters on flat grades. He also recommended the use of cement grout filler instead of bituminous filler; in spite of the confessed advantage of the latter that the street may be thrown open to travel as soon as the bituminous filler cools, which will be well within 24 hours; while if the grout filling be used the street must be closed from four to seven days until the cement sets hard enough to withstand the travel.

The specifications for asphalt he considered to be insufficiently exact. "Experience has shown beyond question that it is unwise for cities to admit asphalts the use of which is more or less experimental. Desirable as is free competition among contractors, it is secured at too great a cost when the result is inferior pavements. This is particularly true now when unreliability of long time guarantees of pavements by contractors is generally recognized." He recommended confining the asphalts admitted for use to three or four well-known varieties and practically preparing different specifications for each of these, recognizing their varying qualities and adapted to secure the best results. He refers to the danger that in obtaining the so-called artificial asphalts by distillation the oils may be raised to too high a temperature, resulting in "cracking," which greatly injures the asphalt for paving purposes. This matter of quality of asphalt he considers so important and so difficult to control under the ordinary contract system that he recommends "that cities shall themselves supply the contractors with the refined asphalt for asphalt pavements, in the same way that many cities and corporations supply their contractors with hydraulic cement, in order that its quality may be satisfactory and uniform. . . . Uniform material of high quality would be insured and contractors could then have no motive for using cheap and inferior asphalt. The contracts would then be for the construction only of the pavement, and as only a few different kinds of asphalts would probably be used the city could determine the kind to be placed on any given street and prepare the specifications explicitly to fit the work."

Concerning wood paving blocks Mr. Whinery apparently believes in the use of real long leaf yellow pine and not what is commercially offered under this name; and therefore recommended that it be called for under its botanical name, *Pinus palustris*, since a considerable amount of short leaf pine and lob-lolly pine are sold as long leaf yellow. He also stated that considerable amounts of Tupelo gum, a very inferior wood, is sold under the name of black gum. The specification that "the annual rings shall number not less than six to the inch measured radially from the center of the heart" will not, he states, exclude all wood other than long leaf yellow pine, as it is intended to do; since other species of pine often have more than six rings. But in mature true long leaf yellow pine the rings are seldom less than 12 to the inch, and he therefore recommended specifying not less than ten annual rings and the strict enforcement of this.

Concerning the oil used for treating wood blocks he severely criticized the specifications of the Association for Standardizing Paving Specifications, stating that these do not provide for a true creosote oil at all, and that "it is not claimed by its advocates that the oil called for by these specifications has this antiseptic property to any useful degree, but they do claim that its preservative property, due to the exclusion of water, is sufficient for paving blocks." We think Mr. Whinery is mistaken in this, and that the advocates of these specifications do claim that they provide for a considerable amount of creosote in the oil and that it does have antiseptic property. He also makes the claim, which has been frequently made by others and emphatically denied by the advocates of these specifi-

ications, that the oil called for by them is a monopoly and that free competition is thus prevented.

One practice in connection with asphalt pavement repair which he criticises seems to us to have much to commend it. He found that the contract for resurfacing asphalt pavement was let last June to the Barber Asphalt Paving Company for 76 cts. per square yard, which he says is below actual cost if the work be properly done. This he explains by the fact that the same contractor is also to repair, ordinarily at the same time, the pavement over plumbers' ditches and other cuts, the price for which is fixed by the city and is not subject to bidding. The price for this work is \$3.00 per square yard for openings less than 25 square yards and \$2.00 per square yard for those over 25 square yards, with \$10.00 as a minimum charge. When these are done in connection with the general resurfacing of the street there is a very large profit in them and a part of this profit is probably figured by the contractor as offsetting any loss in the general resurfacing contract. The repair of these pavement cuts is paid for by the parties for whom the cuts are made; and therefore, if his assumption is correct, the same parties pay for a portion of the resurfacing of the entire street outside of the cuts. It is this to which he seems to take exception, as not being equitable; but to us it seems a very admirable arrangement since it tends to confine the number of cuts to those actually necessary, and since the damage done to a pavement by a cut is not limited to the area of the cut itself but frequently extends to a considerable distance and where the cuts are numerous it seems quite probable that the life of the entire pavement may be reduced by them.

The city of Chicago taxes the owners of vehicles and applies the funds thus raised to keeping the pavements in repair. This principle Mr. Whinery considers a sound one and congratulates the city upon its successful introduction. He refers to some difficulties in carrying out the ordinance, among these being the inconspicuousness of the tags used and the lack of uniformity in their location on the vehicle, thus making it difficult for the police to determine whether or not a vehicle carries a license tag. There is also the complication in the detection of unlicensed vehicles offered by the fact that a considerable number are exempt from the tax and that a great many non-resident vehicles are to be found on the city streets. The matter of the plates or tags he is able to suggest solutions for; but he confesses that he has none to offer concerning the non-resident vehicles.

MADISON, WIS., WATER NOTES

In his report for the year 1910, Mr. John F. Icke, superintendent of the municipal water works, gives the new schedule which the Water Commissioners prepared last year, based upon the order of the Railway Rate Commission. This new schedule in some cases slightly increases the cost to consumers and in others decreases it. According to this, the charge is divided into two parts, one a service charge which is independent of the amount consumed, the other an output charge based upon the quantity consumed as measured by meters. For one consumer on a meter the service charges are: 3/4-inch meter, \$1.50; 1-inch meter, \$1.75; 1 1/4-inch meter, \$2; 1 3/4-inch meter, \$2.75; 2-inch meter, \$3.75; 3-inch meter, \$6; 4-inch meter \$10. For each additional consumer on the same meter there is an additional charge of \$1. Each dwelling, flat, suite, store tenant, etc., is regarded as one consumer. The output charge is 6 cents per 100 cubic feet, up to and including 75,000 cubic feet, and 5 cents for quantities in excess of 75,000 cubic feet. The service charges are payable semi-annually in advance. The report states that the output charges are also payable in advance, but this must be a mistake.

In addition there is a provision for flat rates, under which residences, stores, etc., with sewer connections, are charged \$3, and those without sewer connections \$1.50; barns, ware houses, etc., with sewer connections, paying \$3, and those without sewer connections, \$1. These rates are payable semi-

ually in advance. The decision of the rate commission included the payment by the city to the Water Department \$20,000 for fire protection and other services.

Attention is called to the considerable and serious consumption of water by a sewage lift which is operated by city water which raises the sewage from a small low-lying section of city. The water for operating this is taken from the city as through three 5/8-inch taps, which are wide open all time. Last winter Mr. Icke metered this water and the measurements obtained indicated a yearly consumption of about 5,300,000 cubic feet, which, at the lowest rate charged, would cost \$2,650. At the time of reporting he was preparing plans for an electrical pumping station to take the place of the water-operated lift, since this amount was a heavy drain on the supply system.

The increasing use of water for street sprinkling also had been seriously felt but it was believed that this would be greatly reduced this year, as Common Council had provided for oiling all macadam roads during the present season.

USE OF FIRE HYDRANTS

In the report for the year 1910 of A. J. Walden, Fire Marshal of Wichita, Kan., it is stated that "the frequent use of the hydrants by sprinkling wagons, cement workers and others have injured the stems until a great many of them cannot be used quickly in case of fire. Our plug wrenches cannot be used on many of them to turn water on, and each plugman is required to have a Stillson wrench in order to get water from them. We frequently find the caps on the hydrants corroded and rusted so that they cannot be removed by ordinary methods, which is a serious handicap and a menace to efficient service." The damage done in Wichita by improper use of fire hydrants appears to be greater than in most cities, but it is greater in degree only, and not in kind, than that which is always sure to result from permitting the use of fire hydrants by any except the fire department.

PAVEMENT CROWNS IN WASHINGTON

Method Used for Seventeen Years—Development of Formulas for Curbs at Same and at Different Elevations.

Report by T. J. Powell before the American Society of Civil Engineers, published in the Proceedings of that society for March, 1911.

The following method of treating crowns has been used by the Engineer Department of the District of Columbia since 1894, and has only recently been formulated.

This formula was suggested and deduced by Mr. Joseph W. Lee, assistant engineer of the District of Columbia, and takes account the width of the roadway and the longitudinal grade of the street. It is applicable for all widths of roadway from 10 feet to and including 50 feet, after which it is necessary to treat the section as a special one. The formula is:

$$C = \frac{W(100 - 4P)}{6300 + 50P^2}$$

in which C = the crown, in inches,
 P = the longitudinal grade, expressed as a percentage,
 W = the width of the roadway, in inches.

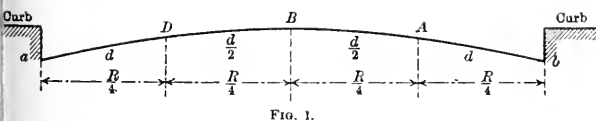


FIG. 1.

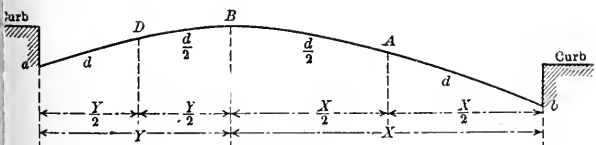


FIG. 2.

DIAGRAM OF ROADWAY CROWNS

When the curbs are level, the crown is distributed as shown by the following formula:

$$\frac{8C}{0.3R} = d$$

$$a \text{ or } b + \frac{C}{18} = \text{the elevation at } A \text{ or } D;$$

$$a \text{ or } b + \frac{C}{12} = \text{the elevation at } B;$$

d = the transverse grade, expressed as a percentage;

a or b = the elevation at the gutters, expressed in feet and hundredths.

As will be noticed in this formula, the percentages of grade from gutter to quarter and from quarter to crown in no case exceeds 4 per cent and 2 per cent, respectively, and the diagonal rate from quarter to the curb, along the hypotenuse of an isosceles triangle, the legs of which are equal to the distance from the quarter to the curb, will not materially exceed the longitudinal rate, thus keeping a team on the same rate of grade, whether they are going straight up hill or taking a diagonal course as is their desire if left to themselves.

This, as far as the writer knows, is the only formula in which this holds good.

Another point, which has been taken into consideration and is shown in the following formulas, is the location of the crown when there is a difference in the elevations of the curbs.

$$\frac{a-b}{1\frac{1}{2}d} + \frac{R}{2} = X$$

$$R - X = Y$$

$$b + \frac{X}{2}d = \text{the elevation at } A;$$

$$b + \frac{3X}{4}d = \text{the elevation at } B;$$

$$a + \frac{3Y}{4}d = \text{the elevation at } B;$$

$$a + \frac{Y}{2}d = \text{the elevation at } D;$$

X = the long side of the crown;

Y = the short side of the crown;

R = the width of the roadway, in feet and hundredths;

d = the transverse grade, expressed as a percentage.

This formula puts the crown and quarter points in such a position that the transverse grades from gutter to quarter and from quarter to crown will be the same as if the curbs were level, for the same longitudinal grade.

It is the practice in Washington, D. C., to put vitrified block gutters on streets on which the longitudinal grade is 1.5 per cent or less. This does not change the formula, as 0.1 feet is added to the curb side of the gutter for the rise of the same. The crown is then worked, using the distance between gutters as the width of roadway.

These formulas refer particularly to streets paved with sheet-asphalt, but for asphalt block, granite block, or other pavements having a more or less rough surface, and therefore giving a more secure foothold, it can be used equally well and give as good results by the addition of one inch to the amount of crown given by the above. This gives rates a little steeper from gutter to quarter and from quarter to crown, which is necessary, as these materials when paved on a gravel or sand base, as is usually the case, have a tendency to settle until all joints are entirely closed and water does not get between them.

These crowns give transverse grades sufficient to carry all water to the gutters as rapidly as necessary, besides reducing to a minimum the number of accidents caused by horses falling; and it produces a section which is pleasing to the eye.

CONSUMPTION OF WATER IN DRY SEASON

In Newton, Mass., during 1910 with precipitation 25 per cent less than the average and mean temperature, one of the highest on record, the per capita consumption of water for the year increased to 62.5 gallons as compared with 59.1 during 1909.

DENVER MUNICIPAL ASPHALT PLANT

Annual Report for the Year 1910—Repair Work Done—
Cement Gutters—Detail Cost of Materials
and Labor—Cost of Plant

By SAMUEL R. MURRAY, Asphalt Superintendent.

The municipal asphalt plant, of Denver, Colorado, which is in charge of the commissioner of highways, was completed July 4, 1910, but as 30 days' notice was given the contractor making the city asphalt repairs, the plant did not commence operations until August 5, 1910.

From that date until the close of the season there was turned out by the plant and laid by the department 6,058 boxes of surface mixture, 1,580 boxes of binder and 2,208 boxes of asphalt and tar macadam, a total of 9,846 boxes of mixture. The total yardage laid was 31,928.3 square yards of asphalt surface, 11,901.32 square yards of binder, 1,868 square yards of asphalt macadam and 5,447 square yards of bituminous or coal tar macadam.

In addition to the asphalt and coal tar macadam there was laid on Speer Boulevard 1,443 square yards of Amiesite, the material for which was purchased already mixed from the Amiesite Co. at a cost of \$1.306 per square yard for material and labor for 2-inch wearing surface exclusive of base.

The asphalt macadam 2-inch wearing surface cost \$1.10 per square yard without base, which consists of 5 inches of smelter slag rolled and coated with bituminous cement. The tar macadam 2-inch wearing surface cost \$.685 per square yard, also exclusive of base, which was the same as the base for the asphalt macadam and Amiesite. All the work on Speer Boulevard was paid for by the Highway Department from its fund.

The resurfacing of Larimer street between Nineteenth and Twenty-fifth streets with 1-inch binder and 2-inch asphalt wearing surface was made necessary by the removal of the old cable slots and the laying of new steel, which changed the grade of the street; and as the original asphalt pavement had been laid 19 years it was economy to replace it entirely. Instead of the straight asphalt gutters such as had been used on the street, 5,120 lineal feet of cement gutters 2 feet wide were constructed. To the foundation was added 10,460 square yards of concrete which was laid to make up the difference in grades after new steel was in. This concrete ranged from 1 inch to 6 inches in thickness and was laid on top of the old 6-inch concrete base.

The work of laying the concrete and cement gutters on Larimer street, also the laying of the concrete around Pioneer Monument and the concrete for a great deal of the private work was performed by the Highway Department, but the entire cost was paid from the paving fund. The total cost of removing the old asphalt surface from Larimer street, constructing 5,120 lineal feet of cement gutters, bringing up 10,460 square yards of concrete to grade and laying this same yardage of 1-inch binder and 2-inch asphalt wearing surface was \$15,999.64, and the cost of the binder and surface alone was \$.913 per square yard.

The total amount of the money available for the paving fund by appropriation, credits, and including \$2,635.02 of the highway money used by this department, was \$128,655.96. Of this \$51,074.34 was used for the sandstone block repairs and the contractor repairing asphalt streets before the operation of city plant, leaving a balance of \$77,581.62 which was expended by this department.

The total cost of the asphalt plant, ground, building, steam roller and equipment was \$30,488.11, leaving \$47,093.51 which was expended on the asphalt work. Material on hand and paid for to January 1, 1911, amounted to \$4,427.00, for which amount our fund should be credited.

The cost of resurfacing Larimer street, Nineteenth to Twenty-fifth streets, was \$15,999.64, leaving \$26,666.87 which was expended for the city's own repairing and the private work performed for plumbers, contractors and public service corporations which made cuts in the asphalt pavements.

The money received or due the city for private work done by the municipal plant (4,078 square yards), including credit for empty cement sacks returned, amounted to \$10,269.10.

The cost of laying a standard asphalt pavement at Pioneer Monument (975 square yards), consisting of the excavating, laying 6 inches of concrete base, 1-inch binder and 2-inch asphalt wearing surface, and laying 200 square yards of standard pavement in Carlton Hotel alley, amounted to \$1,938.75 for this 1,175 square yards. Deducting this from the total yardage of city work leaves 16,215 square yards of actual city repairs at a cost of \$14,459.02 or \$.891 per square yard. This includes all necessary concrete or binder where the holes had worn too deep into the pavement to be filled with surface mixture without wasting good material. All work was done on the 8-hour basis, as was other city work, and the very best of material and workmanship was used throughout.

As limestone filler was impossible to secure, Portland cement was used instead. We are now installing a mill for grinding our own limestone dust, which will lessen the cost of filler about 4 cents per square yard, so that the dust mill will pay for its installation in one season.

The greater part of the city's repairs and the repairs on the thinner pavements such as Colfax avenue and on Fifteenth street was done while the contractor was furnishing the material. This work will be done by the city plant this season which should also decrease the cost per square yard.

RECAPITULATION

Money used from Highway Department fund.....	2,635.02	
EXPENDITURES		
Appropriation and credits.....	\$126,020.00	
Sandstone repairs and asphalt repairs to time of starting city plant.....	\$51,074.34	
Cost of plant and equipment.....	30,488.11	
Material now on hand.....	4,427.00	
Cost of Larimer St.....	15,999.64	
Pioneer Monument, etc.....	1,938.75	
Private work and credits.....	10,269.10	
Cost of city's own repairs.....	14,459.02	
	\$128,655.96	\$128,655.96

HOUSE NUMBERING BY LATITUDE AND LONGITUDE

A CORRESPONDENT from Paris, France, to a Chicago daily paper states that a system of house numbering has been recommended for that and other European cities, by which the entire city would be divided into small squares ten meters on a side and the location of all buildings in the city be designated by the square it occupies, in addition to the street numbers. This amounts to practically a system of co-ordinates, each square being designated by a certain number of units of distance north or south and east or west of co-ordinate axes. The advantage claimed by the advocate of this is that the position of any building sought relative to any other locality could easily be recognized and the building found, since every lamp post or street corner would carry the co-ordinate numbers of its particular locality, north and south ordinates being in red and east and west in blue. In addition, there would be an arrow pointing approximately north.

It seems to us that this system, while it has some advantages is more cumbersome and in general less desirable than the method adopted by some cities in this country of numbering the houses according to a co-ordinate system, the chief advantage of the proposed system being that it is unnecessary to know the location of the street on which the desired building is located, as in the system of co-ordinate numbering. On the other hand the proposed system requires a double address, one giving the co-ordinates and the other the street and house number. The location of streets is a simple matter where all are given numbers, and those in one direction called avenues, as in New York; but this system can be adopted completely only where the street system is almost wholly on the rectangular or grid-iron plan. Where this is not the case the arrow to designate north would doubtless be of assistance, to be placed on each corner street sign on streets running approximately north and south.

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CHANGE OF ADDRESS

Subscribers are requested to notify us of changes of address, giving both old and new addresses.

Contributions suitable for this paper, either in the form of special articles or of letters discussing municipal matters, are invited and paid for.

Subscribers desiring information concerning municipal matters are requested to call upon MUNICIPAL JOURNAL, which has usual facilities for furnishing the same, and will do so gladly and without cost.

MAY 10, 1911.

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Pollution Through Water Mains

SOME time ago there appeared in one of the New York daily papers a letter from an interested citizen which undoubtedly must have amused most engineers who read it. This called attention to the great danger of polluting the city's water supply which was occasioned by permitting dirty street water to enter the valve boxes; the writer's supposition, of course, being that these valve boxes led into the mains, and that the street water flowed into the mains through them. It seemed difficult to understand how any one with the most elementary knowledge of technical matters could imagine such a thing. However, a recent report of the Virginia State Board of Health contains a report by a civil engineer and a physician that just this thing had occurred at Lexington, in that State, and when the circumstances are set forth it does not seem so

impossible. It seems that, owing to the drought last fall, an effort was made to retain water in the reservoir for fire protection by closing certain valves on the main distributing pipes every evening and opening them in the morning. The continued use of water from the mains while the valves at their upper ends were closed tended to produce a vacuum in this above the points of greatest consumption, and the hypothesis is advanced that this vacuum caused the entrance of ground water into the mains through leaky joints, which ground water was presumably polluted with sewage from sewers in the vicinity which were known to have been leaking. The circumstances were such that the only other plausible reason which suggested itself for the epidemic which occurred in November was that some of this same sewage from the leaky sewer had entered the main during the making of a house connection. One argument in favor of the former supposition is that the indrawing of the ground water by the vacuum would probably have taken place daily, whereas the entrance through the tap for the house connection could have occurred but once and all the water containing it would, under the circumstances, probably have been drawn off within a day or two.

The danger of drawing in polluted water through leaks in water-works intakes, where these pass through bodies of impure water, is thoroughly appreciated; but a new danger is suggested by this report from Lexington, and it does not necessarily require the existence of a leaking sewer, since the ground under most cities and the water in it are more or less grossly polluted. The danger of such a happening should, therefore, be borne in mind whenever any manipulation of water mains is contemplated which might result in a negative pressure. Theoretically, of course, the joints should be so tight that the indrawing of water in such a way would be impossible, but this cannot be certified to in many cities. The simplest preventive would be to leave a few fire hydrants open as long as the hydraulic gradient is below their nozzles.

Prepare Now for Water Shortage

THE Water Commissioner of New York City within the past week, through the several daily papers, requested that the consumers be as careful as possible not to waste water, as the amount of water at present in the reservoirs was the lowest in several years. "The department is doing everything it can," the commissioner is reported as saying, "to avert the famine, and we have already stopped the use of hose in the city. The per-capita daily consumption of water in the city is 111 gallons. This is altogether too large, and means that a great deal of water is being wasted."

The same commissioner last October removed a deputy commissioner of water supply who, it was generally understood, had been appointed at the request of citizen organizations expressly to discover and stop the leakage, waste and illegal use of water in New York and who, in about six months, by inspection, the use of pitometers and the testing of meters in the boroughs of Brooklyn and Richmond had increased the meter registration about 300,000,000 gallons a year and had discovered and stopped leaks which had been flowing at the rate of about 1,350,000,000 gallons a year. This work was abruptly terminated with the dismissal of the deputy commissioner. It is interesting to recall these facts while reading the commissioner's plea.

The last year or two has seen cities, both large and small, in all sections of the country from Maine to Texas, confronted by a shortage of water supply. In many of these cases it is not even a question of spending the necessary funds—an increased supply seems to be actually unobtainable. In view of this it seems necessary that thorough, intelligent and honest effort be made to adopt some method or methods which shall restrict the use of water to that which is necessary, and discover and remedy most of the loss through leaky mains. What methods should be adopted we do not pretend to say, and they would possibly differ in different cities, but several such are available and it would seem to be the part of wisdom and true economy for a great many of our cities to initiate or increase the use of them.

BUDGET EXHIBIT IN HOBOKEN

A MUNICIPAL budget exhibit, gotten up by the Board of Trade, assisted by the Robert L. Stevens Fund for Municipal Research and the Board of Education, is being held in Hoboken, N. J. The exhibition occupies two large rooms, one containing the Board of Education exhibit, consisting for the most part of samples of work done in the schools, and the other containing the exhibits prepared mostly by the office force of the Stevens fund. This includes the same classes of articles shown in the exhibit of the city of New York, held last winter, namely, placards containing data or calling attention to interesting facts, graphic illustrations, photographs, plans, models and physical objects. On the whole, the exhibit is a very commendable one, and has attracted crowds of visitors. A series of talks on topics of municipal interest is also a drawing feature of the show.

The data supplied by the financial department is, of course, the most comprehensive. This tells the same story as similar statements of almost any other city, namely, constantly increasing taxation. Other parts of the exhibit indicate that the benefits also have been constantly increasing. In Hoboken's case however, it seems that State and county taxes have increased even faster than city taxes. Other tabular statements give the mileage of pavements and sewers, and figures about the cost and strength of the fire, police and other departments. The accompanying illustration is a reproduction of one of the most interesting placards. The proposition presented is purely a local one, but the condition prevails in many other cities. The laws regarding city government and administration are recorded in so many different books that only experts can find them, and perhaps not even they with certainty.

**DO YOU WANT TO LOOK UP
THE LAW ABOUT OUR CITY -
GOVERNMENT AND ADMINISTRATION?**

**YOU MUST READ THESE BOOKS THROUGH
BEFORE YOU FIND THE LAW, AND THEN YOU
MUST STILL LOOK FURTHER TO INTERPRET
IT.**

**WOULDN'T IT BE SAFER AND CHEAPER TO HAVE
IT IN ONE BOOK?**

ONE PLACARD IN THE EXHIBIT

Among the models are three which convey information of considerable practical value at a glance. One shows the strength of the fire department. On a map of the city are miniature houses, properly placed, and small models of firemen. The observer who looks closer will see written on the map on each side of the house a statement of just what apparatus it contains. A similar map gives the distribution and housing of the police force throughout the city. Still another gives the distribution of the street cleaning force, and shows plainly how much more it costs to clean a business than a suburban street.

Photographs show nearly every branch of municipal activity. Those showing park scenes are perhaps the most attractive to the general public.

Among the physical objects shown are devices actually used by the various city departments, such as the rattan broom of a

street sweeping machine, an iron rubbish can and a set of tools used by the street cleaning patrol man. A water main tapping machine attracts considerable attention. Along with this are samples of iron cut from water mains forty years old, showing the metal seemingly in as good condition as when new, and free from tuberculation. This exhibit has a cheering effect showing citizens that some things have been done fairly well if only by a private water company. The fire department shows a pretty complete set of small tools, such as axes, door opening hose nozzles, rubber hose and the like. The Playground Commission has one of the most complete exhibits in the whole collection. It includes photographs of grounds and the physical objects used, as well as models. The prominence of the playground feature may be an inheritance, for Hoboken citizens are largely of German descent, and Germany leads the world in interest in children and the invention of toys and apparatus for their amusement and development. Judging from the exhibit, Hoboken must be far ahead of most cities in the equipment of its playgrounds.

Bureaus for municipal research are naturally critical, and show gotten up under such auspices would not be complete without a "table of lemons." This, with an appropriate placard portraying the citrus fruit, contains a series of small articles purchased by contract or otherwise by various city departments at prices considerably above those ordinarily charged at retail. These are mostly stationery articles, such as erasers, etc.

The exhibit, of course, has an object. The 1911 budget is to be voted on June 11. The sum of \$675,000 has been asked. The Board of Trade, which is responsible for the exhibit, does not assume to say whether the sum is too much or too little; but circular which it distributes states that it should be large enough to meet all obvious needs. Whether it should be greater than last year depends upon whether it guarantees greater benefits to the community, for an increased budget should mean increased returns. What the Board of Trade has done is to collect such information as it could in regard to city affairs and present it in a popular way, all for the purpose of making the people think.

GREENWOOD WATER AND LIGHT PLANT

In the report for 1910 of the municipal water and electric light plant of Greenwood, S. C., Superintendent A. J. Sproule shows the condition of the plant to be apparently quite prosperous. Water is obtained from wells and pumped into a reservoir and a standpipe, steam power being used. Current for the lighting plant is purchased from the Savannah River Power Company. The department furnishes to the city without charge 18 incandescent lamps, 87 6.6 ampere arc lamps, 6 fire hydrants and water for flushing sewers, sprinkling street for public fountains and watering places. The water rate is 20 cents per 1,000 gallons up to 10,000 per month and 1 cent for all over this, while the charge for electric current is 10 cents per kilowatt up to 100 per month and 8 cents for all over that. The accounts of the water and light plant are not kept separately. The total receipts during the year were \$28,612, of which \$6,539 was spent in extensions, \$1,118 remained as a balance and \$3,500 was used for redeeming bonds.

Although the city is not regularly charged with the service rendered, a book account has been kept in which the fire hydrants are charged at \$25 each, the arc lights at \$60 each and incandescent lamps at \$25 each. Water for flushing sewers and streets, for faucets and fountains and for street paving construction is charged at \$900 for the year 1910. Figuring it this way and deducting the interest on the bonds, which is paid by the city, shows a balance to the credit of the department of \$47,436. The original bond issue was \$40,000 and later bond issues have brought the total up to \$57,358. Since 1900 the department has made extensions from its earnings costing from \$1,500 to \$6,538 each year. These extensions from earnings would have sufficed to pay each year into a depreciation account nearly 7 per cent on the first cost, or about 6 per cent on the first cost plus extensions.

NEWS OF THE MUNICIPALITIES

urrent Subjects of General Interest, Under Consideration by City Councils and Department Heads—Streets, Water Works, Lighting and Sanitary Matters—Fire and Police Items—Government and Finance

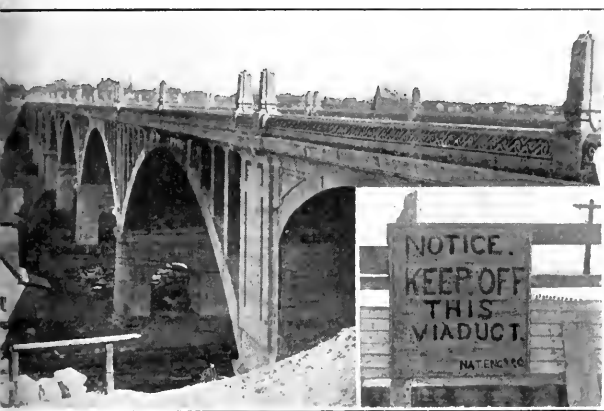
ROADS AND PAVEMENTS

Merchants Improve Streets

Hastings, Pa.—At a recent meeting Council accepted the proposition of the business men to improve the thoroughfares of the borough. A King road drag was used most effectively on the streets, and after a few holes and ruts were filled the thoroughfares will be in good condition again. No permanent improvements are contemplated, as the question of a sewer system is still before the citizens.

Viaduct Finished but Unused

Milwaukee, Wis.—The Grand avenue viaduct which was practically completed last October at a cost of \$500,000 is untricked by the contractor, the National Engineering Company and is unused. The builders claim that the work has been finished and accepted by the authorized officials. The county board of highways and bridges say that it is not



Courtesy Milwaukee Sentinel.

VIADUCT UNUSED ON ACCOUNT OF LITIGATION

Completed according to contract and have advised the contractor not to permit its use. The condition of things shown in the illustration is the result. The trouble arose from a change in the specifications from the sectional to the monolithic form of construction. Litigation and dissensions have been almost constant since the starting of the viaduct by the Newton Engineering Company in 1907, when \$200,000 worth of work was done, declared defective and the contract reawarded to the National Engineering Company.

Oppose Street Improvements

Cincinnati, O.—Protests against the proposed improvement of Richmond street, from Freeman to McLean avenues, have been made to the Council Committee on Streets and Parks by manufacturers whose plants are located along the street. They claimed that the improvement was not necessary and that the asphalt street would not be as good a street for the heavy traffic as the present boulder street. John Gigos, School Board member, spoke for asphalt. The committee took the protest under advisement and will instruct the street.

Boulevard Plans Are Now in Shape

Salt Lake, Utah.—Revival of the Saltair boulevard project, on a scale and with a backing that practically assures the early culmination of this long-talked-of enterprise, was brought about at a recent meeting of local autoists. Joseph Nelson, president of the Saltair Railroad, appeared before the meeting and pledged the necessary money required for the building of the road, above \$25,000, which the autoists themselves must raise. The proposed route is directly west of Saltair, on to Garfield and returning to the city through the southern end of the valley. It is intended to complete the road within six weeks, in time for the coming season at the lake.

SEWERAGE AND SANITATION

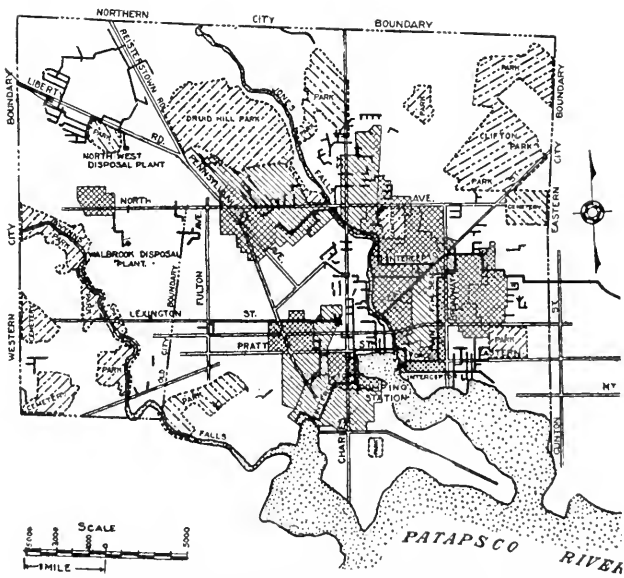
Starts Anti-Fly Crusade

Portland, Ore.—Health officers are going to make Portland a flyless town this summer. They promise these disease breeders will be rare and that the fly pest of former summers will be almost wholly abated. The system of flushing the downtown pavements every night, instead of sweeping them as formerly, washes the larva of the flies into the sewers, thus doing away with one of the most favorable breeding places. Every road leading into Portland will be oiled this summer to lay the dust and this treatment completely kills flies and renders their eggs harmless. The oil applied is crude petroleum which contains a small quantity of carbolic acid and is sure death to flies and mosquitoes.

Present Condition of Baltimore Sewerage Construction

Baltimore, Md.—The accompanying map shows the area in which lateral sewers will be built from the proceeds of the first sewer loan. The heavily shaded sections are those in which the laterals have already been laid or contracted for. The lightly shaded sections are those for which no contracts have been made, but to cover which there are still sufficient funds on hand from the last loan.

In addition to this work, principal parts of the system have been built, at a cost of \$3,700,000, which are designed for a population of 1,000,000. These are:



MAP SHOWING PRESENT STATE OF BALTIMORE SEWERAGE IMPROVEMENT

- Outfall sewer, from Chase and Durham streets to disposal plant, 5.3 miles in length.
- High-level interceptor, from Chase and Durham streets, to Jones' Falls.
- Low-level interceptors, from Warner and Alluvion streets to Boston and Hudson streets.
- Force main and force main sewer, from pumping station to Chase and Durham streets.
- At the disposal plant a sufficient number of units to pump the sewage of a population of 275,000, comprising hydrolytic and sludge digesting tanks, sprinkling filters, settling basins, hydro-electric plant and discharge conduits.
- Sewage pumping station building, at Eastern and East Falls avenues, of sufficient size to contain pumps to pump sewage from the lower lying sections, which comprise one-third of the city.
- Three sewage pumps of 27,500,000 gallons daily capacity, with the necessary boilers and other equipment.

These expensive items having already been taken care of, a much larger proportion of the next loan can be devoted to laterals. While less than half the city has as yet been laid with them, therefore all the remainder can be provided for from this loan.

Ohio Village Has Modern Disposal Plant

Marble Cliff, Ohio.—Marble Cliff, a village of 300 inhabitants, now has a complete modern sewage disposal plant besides a system of sewers 12,000 feet in length. The disposal plant, shown in the illustration, comprises a contact filter system with sedimentation tanks and secondary fine cinder filters. The sedimentation tanks are roughly 20 feet square and 6½ feet deep. They are divided into three chambers of equal size and so arranged as to allow the sewage to flow through all tanks in series or parallel, to allow the cutting



Photo. by C. L. Dowerman, Staff Photographer Columbus Dispatch.

A VILLAGE SEWAGE DISPOSAL PLANT

out of any of the chambers for cleaning. The contact filters are 87 x 29½ feet in area and 5 feet deep. They are divided into three filter areas, and are provided with airlock apparatus which automatically directs the flow of sewage onto each of the three beds in rotation, allowing each bed to fill to the depth of 3 feet and then directing the flow into the next filter, while at the same time starting a timing device which automatically controls the outlet. The timing device is so arranged that the sewage can be held for from fifteen minutes to four hours on the filter, and then thrown onto the secondary filters. The secondary filters are of the same dimensions as the contact filters, but are only 3 feet instead of 5 feet deep. They also are divided into three beds and equipped with a system of gates to direct the flow into any of the beds.

Sanitation Ordinance Is Passed by Board

Dallas, Tex.—An ordinance has been passed by the Board of Municipal Commissioners providing for the sanitary condition of bakeries, canneries and other places where foods are prepared or offered for sale. The ordinance will become effective in thirty days. The act requires that such places shall be "properly lighted, drained, plumbed and ventilated and conducted with strict regard to the influence of such condition upon the health of the operatives, employees, clerks or other persons therein employed, and the purity and wholesomeness of the goods therein produced." Cleanliness as to all walls, ceilings and floors, paint for all exposed surfaces, care for the cleanness of the implements, machinery, utensils and boxes and for all paper used, care for the cleanness and health of persons employed are required. Screening is obligatory with self-closing screens. Sleeping will not be permitted in any workroom nor will any person with a contagious or infectious disease be employed. Members of the Board of Health or their agents will be permitted at any and all times to make inspection of all such premises. Sweeping the floors of restaurants while a patron is present is forbidden. No garbage is to be brought through the serving room or any eating place while any patron is present. Fruits, vegetables or other foods are not to be exposed on the sidewalks or outside of any screened place. All such fruits are to be shown in cases that are to be at least two feet above the sidewalks. All must be protected from "flies, dust, dirt and all other foreign or injurious contamination by suitable coverings of glass, wood or metal."

WATER SUPPLY

Will Cut Water Rates

Spokane, Wash.—Spokane's Water Department shows actual 100 per cent profit on maintenance and operation and it is planned by the new administration to cut the rate if the debts, now eating up half the gross receipts, can be cared for.

City and County Drive a Bargain

Tacoma, Wash.—An agreement has been reached between Mayor W. W. Seymour and the municipal commission and the board of county commissioners whereby in exchange for a pipe line franchise to the Green River water plant the city will give the county water for its institution in Tacoma at half the price paid by private individuals.

May Go to Ozarks for Water

Oklahoma City, Okla.—It begins to look as though Oklahoma City would have to go to the Ozark Mountains, Missouri for its water supply within a few years. At a rate, some of the most accomplished engineers who have studied the question recently are convinced that such course is the only possible solution to the matter of supply coupled with the purity of the water. There is now being tentatively considered a proposition to vote a \$5,000,000 bond issue for the purpose of extending the water system so as to get water by a gravity flow from some point in the Ozarks.

Commissioners Inspect Pipe Line Extension

East Hartford, Conn.—The Commissioners of the East Hartford fire district, Engineer C. Henry Olmsted a Superintendent of Water Works John H. Walsh recently inspected the new pipe line extension. The party took trolley as far as Brewer street and then took carriages to Hillstown. The pipe line is nearing completion, and it was said that a connection will be made inside of a week. The contractors have worked on the line during the winter when the weather would permit. The cost is about \$60,000.

Councilmen Go Over Aqueduct

Los Angeles, Cal.—The members of the City Council are making a tour of inspection of the Owens River aqueduct system. The trip is made in a Pullman car and automobiles. At night the Pullman is used for sleeping purposes and by day the automobiles are utilized for sightseeing. General Adna R. Chaffe, the head of the Aqueduct Commission, is in charge of the party. William Mulholland and J. B. Lippencott, the chief engineer and assistant chief engineer, respectively, will explain the work to the Councilmen and will tell them of the advantages to be gained by starting the work of providing a lighting and power system at once.

City Will Have Fifteen Wells Connected Soon

Lansing, Mich.—Frank J. Nichols, who has charge of the construction work for the Water and Electric Light Board states that next week he will have another well of water added to the nine at the Pennsylvania avenue subpump station. Then there will be five more to be connected which will make the total 15. At present the wells in use are furnishing little more than that demanded by the city users. When the weather has really settled, and the thermometer begins to climb, there will be an increased demand for water, and this can be met by the addition of these unconnected wells.

Water Company Told Its Franchise Ends

Des Moines, Ia.—Municipal ownership of the Des Moines Water Company by condemnation proceedings may be resorted to if voters express a desire to hold a special election to determine the question. Mayor Hanna, on a resolution passed by the Commissioners, notified the company that the franchise under which it operates expired on May 1st. The grant was given the company by the city in 1871. "We are not opposed to municipal ownership of the water company," said Manager Charles Denman, of the Water Company. "If the city and company can agree on a price, the city may make over the works. Under the law governing municipal ownership the city is given the power to own and operate water plants."

STREET LIGHTING AND POWER

Preparing for Valuation of Rail-Light Physical Property

Colo., O.—According to plans outlined by Mayor Whitlock and City Engineer Tonson, the latter will confer next week with Rail-Light representatives to agree upon the method they will follow in making the valuation of the Rail-Light physical property. It is expected that Tonson will work as far as possible jointly with the company's engineer. Points upon which they do not agree will be referred to Mayor Whitlock and President Lang as negotiators.

Ornamental Light System Will Be Installed

Hastings, Neb.—The first step for an ornamental lighting system for the business section of the city has been taken by the Council in the granting of a petition for ornamental lights in Lincoln avenue, between First and Fourth streets. The property owners in this section have agreed to purchase the posts for the lights and the city will supply the current and maintain the lamps. A design for an ornamental standard will be accepted by the Council to be followed in this district and others that may wish to adopt the system on the same basis. Each post will support either three or four incandescent lamps. They will be placed at each corner on intersections and on both sides of the street at the middle of each block.

New Boulevard Lights Put in Service

Altoona, Pa.—With at least 25,000 lined up on the sidewalks, the tread of marchers, the waving of banners and the sound of martial music, the new boulevard lighting system on Eighth avenue between Eighth and Thirteenth streets was formally placed in service last week. It was a grand holiday and the interest and enthusiasm manifested in the triumph scored by the Second Ward Civic Association were bounded. The new boulevard lights are distinctly different from those on the West Side. There are three lamps instead of five, and the poles are enameled iron instead of brass. The poles are considerably higher and the arm is wider. They are covered with a profusion of fancy iron work and present an attractive appearance.

Light and Water Report for Year

Tacoma, Wash.—The annual report of the Light and Water Departments of the city for 1910 has been filed with the Municipal Commission by Nicholas Lawson, Commissioner of Light and Water. The report shows that during the year ending December 31 the Light Department netted the city \$72,678.11 above expenditures, while the net profits of the Water Department were \$28,927.81. The operating revenues of the Light Department for the year were \$499,007, while the disbursements aggregated \$393,493.41. The difference under normal conditions might be termed surplus earnings from operation, according to the report. On new work the department expended, however, \$122,838.55, which, added to maintenance and operation cost, brings the total expenditures up to \$426,331.96. The surplus is thus \$72,678.11. The operating revenue of the Water Department amounted to \$381,009.40, while the disbursements were \$263,993.05. The \$117,016.35 difference represents the surplus earnings from operations. On new work there was expended \$88,088.54, which makes the total expenditures \$353,081.59. The net surplus is \$28,927.81. During the year the city pumped 609,850,000 gallons of water. In addition there were 128,680,000 gallons repumped, the total pumpage being 738,530,000 gallons. The total cost per 1,000,000 gallons, figured on total maintenance plus interest on bonds, was \$6.03. The city at the end of the year had 220.8 miles of water mains in use, the size ranging from 2 inches to 24 inches. Twenty-nine miles of mains were laid during 1910. The total number of services at the end of the year was 5,146. Of this number 1,810 were on vacant property, where they were placed when streets were paved. New services installed totaled 1,017. Water meters in use at the end of the year were 1,254, 151 new ones being installed in 1910. Water is furnished to 1,045 hydrants, six drinking fountains and 24 watering troughs. During the year 1,045 new hydrants were installed in various parts of the city.

FIRE AND POLICE

Ordinance Provides for Police Matron

Hutchinson, Kan.—An ordinance has been passed by the Board of Commissioners creating the office of Police Matron.

Auto Chemical Gives Satisfaction

Stratford, Conn.—A new auto chemical has been received, accepted and placed in commission. Stratford is fortunate in having the kind of a chemical that this new machine is, for not only has it two chemical tanks but it carries ladders and 1,000 feet of hose so that when the auto gets to the fire everything that is needed in the majority of those fires that occur in town is right there.

Drill Tower for Fire Department Is Completed

Rochester, N. Y.—Announcement has been made by Commissioner of Public Safety C. S. Owen that the drill tower in the rear of the house occupied by Truck 5 and Engine 13, on Genesee street, has been completed and that the instruction of the members of the Fire Department in pompiere ladder work, raising of ladders, life net work and wall scaling will be commenced next week. Captain Titus Watchhouse, of Truck 5, will be the instructor.

Police Patrol Auto Here

Poughkeepsie, N. Y.—The much looked for and talked about police automobile has at last arrived and has been placed in commission. The interior may be used as a patrol auto or it can be changed into an ambulance by the dropping of the seats and the use of a stretcher, which is always ready. Besides the auto horn, a large gong is attached to the machine.

Will Study Fire Engines

Duluth, Minn.—The Board of Fire Commissioners at a recent meeting decided to recommend to the City Council that T. E. Phillips, Superintendent of Machinery of the Fire Department, be sent to Elmira, N. Y., to visit the plant of the American-La France Engine Company. In this manner he would thoroughly post himself upon the most modern fire department machinery and greatly improve his knowledge of the apparatus which is in use here. The matter will be left to the Council, with the understanding that the Board of Fire Underwriters is willing to pay half the expense of the trip, which, it is estimated, would cost \$100.

Automatic Hose Wagons Arrive

Portland, Ore.—The two automobile chemical and hose wagons ordered by the City Executive Board from A. G. Long for the Fire Department have arrived in this city and are on exhibition at the store at Sixteenth and Marshall streets. An instructing engineer from the factory in Ohio, where the vehicles were built, is on his way to Portland, and when he arrives the two pieces of apparatus will be thoroughly tested. This engineer will teach the men assigned to drive the machines how to handle them before he leaves the city. This is the first automobile fire apparatus purchased in this city and is attracting much attention.

Will Change Law to Provide for Policewomen

Spokane, Wash.—A new obstacle has arisen in the park board's program for placing policewomen in parks of the city. The recent civil service requirements promulgated by the city commissioner are so stringent as to physical requirements that it is believed few women would be able to pass the examinations. "It undoubtedly will be necessary to draw up an entirely new ordinance in this connection," said Attorney W. J. C. Wakefield, chairman of the board committee having the matter in charge. "I have not gone into the matter thoroughly, but that is my belief, off-hand." So far as their sex is concerned, the lawyer says, there need be no legislation. As yet, however, there is no provision for policing the parks and it is likely the same ordinance authorizing the patrolling of city parks will stipulate different physical requirements from those expected to patrol downtown streets.

Fire Department Gets Apparatus

Manchester, N. H.—Orders for a two-horse truck for engine 7 of Somerville street, and for an automatic hoist for Aerial Truck 1 of the Central Fire Station, were passed at a recent meeting of the Aldermen.

Tests Deluge Set and Purchases It

Albany, N. Y.—A test of a four-way Eastman deluge set was recently made in Market Square in the presence of Commissioner of Public Safety Conine and Fire Chief Bridgeford. Four lines were run from three steamers to the deluge set. A 2-inch stream was thrown to a height



Courtesy Knickerbocker Press.

TESTING EASTMAN DELUGE SET, ALBANY, N. Y.

of 250 feet. With a 1½-inch nozzle the stream went still higher, but did not impress Chief Bridgeford as favorably as the larger stream. It is believed that if the department had had this set at the time of the capitol fire the results might have been different.

Police Receive Correspondence Course of Instruction

Louisville, Ky.—Through articles published in the Police Bulletin, the official organ of the Louisville Police Department, the members of the force are receiving a "correspondence course" in policing. Col. H. Watson Lindsey is the instructor and schoolmaster. Chief Lindsey recently adopted this plan of giving the officers a daily lesson in the duties of a policeman. Not only are the members given instruction on many important subjects in connection with the work, but they are given rules and regulations concerning their personal conduct.

Tapper System Being Installed

Portsmouth, Va.—The tapper auxiliary system for the fire alarm has been received here and installed by Superintendent Smith, of the fire alarm system. The auxiliary system will enable the firemen, by its operation, to instantaneously inform all of the other engine companies of their departure from headquarters on "still alarms," a tapper system of indication sounding in all of the houses when the firemen are called out on other than alarms over the fire telegraph system. When the apparatus returns to any one of the houses from the "silent" calls, it will be possible to immediately inform the other companies that the apparatus is back and ready again to cover its territory. Hitherto it has been necessary for the firemen to inform those in other stations of their activity on "still" alarms by use of the telephone.

Citizens Work for New Charter

Lockport, N. Y.—In support of the new charter for Lockport a big delegation went to Albany to be present at the hearing before the Cities Committee of the Legislature on the progressive charter bill. The supporters of the charter will be backed by petitions with over 2,500 signatures of electors of the city.

Bonding System May Be Changed

Youngstown, O.—Guarantee bonds were discussed at length by council at a recent meeting, and suggestions for the establishment of a new system were brought out. A number of contractors have complained that they are unable to get bonds from some of the bonding companies. This was brought up by Councilman Jerry Sullivan several weeks ago. There has never been a case in the city where a bonding company had to make good on any job they went sure for. Last year \$10,000 was paid out by local contractors to these companies, and an effort will be made to retain this money in the city. Councilman William Sampson suggests that one-half of 1 per cent., the amount contractors pay for their bonds, be retained by the city when a contract is made, that this sum be put in a bank and in case the street needs repairing it be paid out of this fund. The money thereby kept in the city instead of being paid out to foreign companies. A plan similar to this is in force in Cleveland. City Solicitor David Jenkins has a plan whereby 3 per cent. of the amount of the contract be retained by the city. The amount of the guarantee is increased and the city will have a large fund to call upon. The money will draw interest and at the expiration of the guarantee the money is refunded to the contractor with or without interest, as is decided upon. Another feature in connection with this, as advanced by Mr. Jenkins, is to have all repairing on a street made under the supervision of the contractor who originally did the work.

STREET CLEANING AND REFUSE DISPOSAL

Test New Method of Laying Dust

Newburgh, N. Y.—Grand street between Broadway and Ann street looked like a winter's day recently, notwithstanding the fact that the thermometer was performing unbecomingly stunts and the heat was broiling. The reason for the appearance of this particular portion of the street lies in the fact that Waldo E. Austin and the representative of the Solvay Process Company of Syracuse have been demonstrating the merits of the dust preventer manufactured and sold, by the Solvay Company. The material used is granulated calcium chloride, and it is practically a new factor in dust laying.

Street Washer Is Tested Here

Trenton, N. J.—The Charles Hvas street washer was tried by the city last week and proved all that was claimed for it. When the washer has passed over a pavement it can scarcely scrape up a speck of foreign substance. The trials were on South Stockton street, Front street, Broadway and West State streets, and everywhere the experiment was lighted the many members of the Chamber of Commerce who were invited by Chairman Charles H. Reichert and Louis P. Nitz of the councilmanic street committee to witness the performance. All the committeemen and Street Commissioner Burk were likewise well pleased.

Board of Health Urges Installing Garbage Crematory

Atlanta, Ga.—In the hope of getting something done toward the city's long delayed crematory, the Board of Health at a recent meeting named a special committee of three to confer with the Bond Commission with reference to a site and to otherwise push the matter. The crematory is one of the most important things the present administration has to deal with, and yet it has been delayed more than most anything else connected with the city government. Not only has nothing been done this year, but no progress was made in the closing months of last year. The bond issue provides \$50,000 for the crematory. But this sum is not a third the amount needed. The first thing to find a site. Two have already been selected, in a tentative way, but abandoned because of the howls of protest that arose when their selection was made public.

RAPID TRANSIT

Would Stop Custom of Blocking Car Doorways

Indianapolis, Ind.—An ordinance forbidding persons to stand in the doorways of street cars is being prepared by Councilman Charles B. Stilz, who believes the practice of blocking street car doorways is an inconvenience to other passengers.

Trolley Company Gets Franchise

Carlisle, Pa.—The local trolley company at a special session of Council got the much-desired franchise for a line under the Orange street subway, but it is limited to 10 cars, and the only reason other restrictions were not put on it is that it is believed the borough authorities do not possess the power.

Anticipate Much Benefit from Electric Road

Caldwell, Ida.—W. E. Pierce, president of the Boise In-Corporated Urban, held a conference with members of the Caldwell Commercial Club relative to the proposed extension of the company's line from this city through the Deer Flat country and ending with a terminal at Roswell. The matter of extending the company's line has been hanging fire for the past two months, but the conference was fraught with indications that work would be commenced shortly and that the rich territory through which the project is planned to pass would soon be placed in closer relations with Caldwell.

New Traffic Regulations

Elizabeth, N. J.—Elizabeth is to have drafted an ordinance regulating street traffic, and if the ideas of Mayor Van and City Attorney Connolly are inserted in the ordinance the regulations will be such that the lives of pedestrians on Broad street at the East Grand and West Grand street crossings and in the vicinity of the arch will be safe. The ordinance has been adopted by City Council instructing the City Attorney to draft such an ordinance. The ordinance gave the whole jurisdiction in the matter to the City Attorney, who states that he will begin work on the ordinance immediately and confer with various city officials regarding the subject.

MISCELLANEOUS

Brockton Gets a Picture

Brockton, Mass.—The Brockton Woman's Club formally presented to the city an oil painting, "The Brook," by John Enneking. The presentation was in the office of Mayor Perry C. Howard at the City Hall. The picture will be displayed in the municipal art gallery at the public library.

Planning a New Bangor

Bangor, Maine.—Following the disastrous fire of May 1 plans are being made for rebuilding the burned district with new arrangement of streets. There is a movement to create a large park along Kenduskeag stream, which shall be lined by public buildings. Plans for scores of new business blocks and residences are being made. Wooden structures will be prohibited in the business section.

Plan Bonus System for Park Employees

Los Angeles, Cal.—Arrangements will be made by the Park Commission, if possible, to institute a bonus system for the employees of the department, somewhat similar to the one in use on the aqueduct and which has made it possible to break world records in hastening that project. The plan of the Commissioners, which is somewhat in embryo at present, is to offer a certain amount—\$5 has been suggested—to each workman in that park which wins the quarterly prize for merit and efficiency. Under the merit system the present Park Board has succeeded in greatly increasing the efficiency of the park workmen, in addition to effecting a considerable saving in cost of upkeep. Figures showing the averages for economy and efficiency in all the parks except Central, Griffith and Exposition, for the quarter ended March 31 have been approved by the Board, and for the second time the prize has gone to M. F. Duncan, foreman of Sunset Park. Considerable rivalry already is shown among the different park foremen to increase their average and it is believed the spirit could be still further augmented, especially among the laborers, if the bonus system was put

into effect. The members of the Commission are in doubt as to exactly what procedure should be taken, and the Council will be asked to provide a way—probably by ordinance.

Municipal Spelling Book

Milwaukee, Wis.—Milwaukee is to have a municipal spelling book after the teachers in all grades make reports next January of the words most frequently misspelled in their classes. The School Board has so ordered.

Gives 5,000 Trees to School Children

Gloucester, Mass.—Through the generosity of William G. Brown, of the Boston Store, 5,000 trees were distributed among the school children to be planted on Arbor Day. The trees were yearling catalpas, a hardy North American tree which grows readily and rapidly in New England soil and bears a large, handsomely formed leaf.

Harrisonburg Favors Compulsory Education

Harrisonburg, Va.—In a special election recently Harrisonburg decided in favor of compulsory education by a vote of 248 to 11. Harrisonburg is the second place in Virginia to vote on this question since the passage of the referendum or enabling act by the General Assembly of Virginia in 1908.

City Planners Will Inspect Kansas City

Dallas, Tex.—As many members of the incoming and outgoing city administration as can arrange to do so, together with members of the Dallas City Plan and Improvement League and other interested citizens, will some time during the next three weeks visit Kansas City to witness the work that has there been accomplished toward making that a better city in which to live. This was decided at the conference between George E. Kessler, the city planning engineer, and the new and old boards of municipal commissioners and officers of the City Plan and Improvement League. The suggestion to make the trip was an unexpected incident of the morning's proceedings, but no sooner had it been made than it met with a cordial response.

Plan Forty-Foot Lots and No Alleyways

Milwaukee, Wis.—The Milwaukee of the future will be a city without alleys and with lots 40 feet wide in the residence districts. During the discussion in the office of Tax Commissioner Schutz last week of the proposed new unit system for assessing real estate, it developed that members of the real estate board are already platting residence property with 40-foot lots and without alleys. It was stated that alleys are a disadvantage. They are disease breeders and refuse collectors. They detract from rather than add to the value of adjoining property. Many of the new subdivisions recently planned are without alleys and eventually all alleys in the city will be done away with. Existing ones will be added to adjoining property or done away with in some other manner.

Conducts Municipal Employment Agency with Success

Washington, D. C.—Municipal employment agencies are being conducted with great success in many European countries. Especially is this true in Norway, where the Government endeavors to keep its army of unemployed as small as possible. The following report from Emerson Taylor, American Consul at Stavanger, Norway, is of interest in this connection. "The Stavanger City Employment Bureau report for the year 1910 has just been made public, and indicates the bureau's increasing utility to both employers of labor and laborers seeking employment. The bureau is a municipal institution, maintained entirely at the expense of the city, under the management of a superintendent appointed by the city government. The salaries and all other expenses are paid out of the city treasury, and no charge is made either to the workmen seeking and finding employment by means of the bureau, or to the employers of labor when workmen are found for them. Although in 1910 a smaller number of men sought employment through the bureau than in 1909, in which year labor conditions were very unfavorable, employment was found for a larger number of men in 1910 than in 1909. The increase in business in the women's department was more marked than in that for men. When both departments were under one management the former was little used, but the city has now appointed a woman as manager.

Kenosha Opens New City Hall

Kenosha, Wis.—The city of Kenosha dedicated its new city hall last week with elaborate ceremonies, large delegations being present from Racine, Waukegan and other nearby cities, including a delegation of more than 50 members of the State Legislature.

Children Plant Twelve Thousand Trees

South Bend, Ind.—Twelve thousand flowering catalpa trees were planted by the South Bend school children in commemoration of Arbor Day. This number breaks all records for northern Indiana. Lectures on care of trees also played an important part in the celebration of the day.

To Have Censor for Moving Picture Shows

Harrisburg, Pa.—Among the measures passed last week was one by Representative Allen providing for an official censor of moving pictures. This establishes the office of Examiner, who is to inspect all films and stereopticon views and approve only those which do not tend to "debase or corrupt morals," and who is to be paid \$3,000 a year. A fee of \$1 for films and 10 cents for separate views is provided, the money to go to the State, and violation of the act is to be punished by a fine of from \$50 to \$100.

\$500 Appropriation for School Gardens

Providence, R. I.—A resolution to appropriate \$500 for the maintenance of school gardens, recommended by Superintendent of Schools Randall J. Condon, was adopted by the School Committee of the City Council after a short period of debate as to the propriety of appropriating money when the School Department was facing a deficit.

May Introduce Fly-Catching Birds in War on Mosquitoes

Trenton, N. J.—The suggestion has been made that the so-called fly-catching bird that eats both flies and mosquitoes be imported into the State in large numbers. It is believed that if the multiplication of these birds was encouraged in sections troubled with mosquitoes the nuisance would be materially decreased. The State Health Department is investigating the practicability of the scheme.

Free Libraries for Small Towns

Nashville, Tenn.—Plans are now on foot for the beginning of the free library system for rural towns and small cities in Tennessee. In 1909 the General Assembly enacted a law creating a free library commission and the present General Assembly made an appropriation of \$2,500 per year to carry on the work. While the library has gotten a start during the last two years, practically nothing definite could be done until the present appropriation was made. If matters are settled satisfactorily at the State Capitol and the money is delivered into the hands of the library commission within a month or two all plans will be in readiness to proceed with the establishment of reading rooms and libraries throughout the State.

Prepares Course in Civics

Indianapolis, Ind.—An outline of study of civic conditions for the use of civic classes in grade schools has been prepared by Dr. Charles S. Woods, Secretary of the City Board of Health, and has been approved by C. N. Kendall, Superintendent of Schools. A copy of the outline and a letter is being mailed to each school principal. The course of study is intended to teach children the duties of the various city departments in assuring sanitary conditions and also to teach them to observe closely whether various contracts are being executed properly. As prepared by Dr. Woods, the outline plans close study of the disposal of garbage, calling attention to the contract of the Indianapolis Sanitary Company for removing it, and stating how garbage should be prepared for removal. Attention is also called to the fact that ashes, cans, etc., should be removed by the city contractors. Sewers, streets and alleys are suggested for close study, this to cover the sewer plan of the city and to teach the children what is necessary to keep streets and alleys in proper condition. There are also suggestions for caring for vacant lots and for improving the banks and beds of streams.

Fountains Will Be Placed in Schools

Portland, Ore.—Bubbling drinking fountains will be placed in all the public schools, according to a decision of the

School Board, and School Architect Jones has been directed to prepare plans and specifications for the installation of such fountains in 14 of the school buildings at once. According to an ordinance the School Board is compelled to install fountains.

San Antonio Plans City Beautiful

San Antonio, Tex.—A call has been issued by the City Improvement League for a "city beautiful" convention to consist of delegations from all civic organizations and the public generally to consider ways and means for bringing to San Antonio a noted civic expert, or "city architect," to lay out comprehensive plans for a boulevard system, beautify San Antonio River and to beautify the city in other ways. The Real Estate Exchange, which has appointed a committee to co-operate with the Civic Improvement League, the Chamber of Commerce, the Farmers' Institute, the International Federation of Woman's Clubs, the City Association and other interested organizations, is asked to be represented in force.

City Plans to Own Newspaper

Los Angeles, Cal.—Members of the City Council are planning the details of the municipal newspaper sanctioned under an amendment to the charter which carried by large vote at the last election. Thirty thousand dollars will be required to finance the publication for the first year, and some of the Good Government officials are scratching their heads in perplexity because strong opposition has developed to such an appropriation. As at present planned, largely in line with the suggestions of ex-Mayor Dunlop of Hollywood, father of the idea, the paper is to be a weekly, will be conducted by a municipal newspaper department under the control of an unpaid commission composed of three Councilmen. There will be no subscription price, but a copy will be furnished free to every registered voter in the city. Commercial advertising may be accepted at rates to be fixed by the commission. Political intelligence and news about subjects related to municipal affairs are to constitute the particular field. There are provisions permitting each political party to supply news matter at fixed amounts of space and requiring that the newspaper shall favor all enterprises for which the city stands.

Insure Students to Protect Bond Issue

Rogers, Ark.—To protect a bond issue of \$35,000 to the Board of Education, in order that a new high school building may be built, the lives of 18 young men were insured here to-day for \$1,000 each. The board will pay the premiums on the policies.

Distribution of Trees

New Bedford, Mass.—Following close on the removal of the big elms from around the Free Public Library comes the activity of the Board of Trade and Horticultural Society, whose joint committee is raising funds for the distribution of trees. This committee has decided to follow the example of Providence, and set the trees out in residential districts, especially in the tenement neighborhoods. Ten residential portions of the city will be divided into sections with a man in charge of each section, and an effort will be made to have the boys and girls of the city co-operate. The cost of setting up a tree and maintaining it for one year is \$3, and the committee is asking for contributions of a tree instead of \$1. One man has offered to give four or five trees provided they will be set out in front of his house.

Children's Bureau Asked of Council

Milwaukee, Wis.—Resolutions asking the appointment of a commission of not more than five members, to be chosen by the Mayor, "for the purpose of studying and investigating conditions relating to infant mortality and child welfare," were adopted at a recent meeting of representatives of fourteen charitable and philanthropic associations and societies. A committee was appointed to secure the introduction of the resolutions into the Common Council. Another resolution was adopted petitioning the Common Council, "without regard to party affiliations, to grant immediately as large an appropriation as possible for child welfare work, to be spent in co-operation with the commission." Wilbur C. Phillips, child welfare worker from New York, who has come to Milwaukee to aid in the establishment of a bureau, gave a short account of the work in New York and made suggestions for Milwaukee.

LEGAL NEWS

Summary and Notes of Recent Decisions—Rulings of Interest to Municipalities

Taxation—Counterclaim.

Village of Charlotte vs. Keon.—In an action by a village delinquent taxes a counterclaim for a debt due from the village is not available.—New York Supreme Court, 128 Y. S., 80.

Laying Out and Altering Streets

City of Hartford vs. Poindexter.—In laying out and altering streets and establishing building lines, municipal authorities act under special and limited authority as inferior tribunals, and hence there is no presumption in favor of their jurisdiction, which may be attacked collaterally, so that a recital of the performance of the things requisite to jurisdiction in the final proceedings of a City Council establishing the improvement and confirming an assessment therefor is insufficient to establish a prima facie case in a suit to foreclose the assessment lien, and the burden is on plaintiff to prove that all the proceedings taken were in accordance with the charter. The record of proceedings for street improvement, taken in 1871, began with what purported to be a report of the highway committee in the matter of laying out a street and building lines on both sides of A. avenue. The preamble of the report purported to give the building line, and the report then stated that each line was described in a resolution establishing the same, reciting the resolution which was identical with one passed four years before by the Common Council establishing and laying out the same avenue, but containing no reference to building lines. Held, that the laying out of the avenue and the establishment of building lines were independent improvements, and, there being nothing to show publication of the necessary notice to property owners of the proposed vote establishing building lines, an assessment levied therefor was void.—Supreme Court of Errors of Connecticut, 79 A. R., 80.

Architects' Contract for City Building

Bernstein et al. vs. City of New York.—Architects' contract to furnish plans for a municipal building provided for payment of 1 per cent. on completion of the drawings, etc., called for in a certain clause of the contract, which required that the estimated cost of the building should be not less than \$48,000, and provided that the preliminary plans could be revised to meet a commissioner's requirements. The plans were abandoned, because, as so revised, they called for a building costing much more than \$48,000. Held, that the architects are not entitled to the 1 per cent. fee provided for in the contract.—New York Supreme Court, 127 N. Y. S.; 987.

Laying Pipe in Highway—Injunction.

Mayor and Council of City of Bayonne et al. vs. Mayor and Council of Borough of North Arlington.—Where a corporation asks a court of equity to restrain a municipality from interfering with it in the excavation of a public highway for the purpose of laying a water pipe across it as a part of a pipe line system, the corporation must show a legal right to use the street for the purpose intended. The right to regulate is not limited to mere supervision of the method of excavation, but implies the power to prohibit the disturbance of the public easement by one who has no legal right to do it. A permit to lay water pipes in a public street can only be claimed by one legally entitled to use the street for such purpose, and if one, without such right, attempts to excavate a street for such purpose, a court of equity will not restrain a municipality having the power to regulate the use of streets from forcibly preventing the disturbance of the public easement. Assuming that a permit would be granted upon reasonable conditions to one legally entitled to lay such pipe in a public highway, the prevention of such use of the highway by one without a legal right is a lawful exercise of the power to regulate the use of such a highway.—Court of Errors and Appeals of New Jersey, 79 A. R., 358.

Street Assessments—Action to Invalidate

Whetsell et al. vs. City of Elkins et al.—As the section of a street between two cross streets or a cross street and an alley is the unit for paving, established by Section 34 of Chapter 47 of the Code of 1906, a bill to enjoin collection of special assessments made under that section, on the ground of lack of a sufficient petition to the council by property owners, must be confined to property on the particular section in respect to which the petition is insufficient and owners thereof, and cannot extend to property on more than one section or the owners thereof.—Supreme Court of Appeals of West Virginia, 70 S. E. R., 754.

License Tax—Recovery

Wood-Mendenhall Co. vs. City of Greer.—The powers of a municipal corporation must be exercised in strict conformity to the grant, and an ordinance imposing a license on a business is void if it does not graduate the license under Civil Code, 1902, requiring the license to be graduated according to the gross income of the person, etc., required to pay it or upon the amount of the capital stock invested in the business. The proper course for one claiming the invalidity of a license tax imposed upon a business is to pay the tax under protest and sue the city to recover the amount paid.—Supreme Court of South Carolina, 70 S. E. R., 724.

Defects in Streets—Contributory Negligence

Hysell vs. Central City.—If a traveler on a public road or street negligently sustain injuries from open and apparent defects therein, of which his observation prudently exercised would or ought to have informed him, he is guilty of contributory negligence, precluding recovering of damages for the injuries thus sustained. When the facts showing such contributory negligence are undisputed, the question becomes one of law for the court and not of fact for jury decision.—Supreme Court of Appeals of West Virginia, 70 S. E. R., 767.

Regulation of Rates for Public Service

Bluefield Waterworks & Improvement Co. et al. vs. City of Bluefield et al.—In the absence of a delegation thereof by the Legislature, express or necessarily implied, a municipal corporation has no power to regulate or control rates for public service, such as the furnishing of water, gas, or electricity, or the terms and conditions of contracts therefor, otherwise than by contract with the corporation or person rendering such service. Though such regulation is usually in the form of an ordinance, it is nevertheless contractual or administrative in character, and not enforceable by criminal penalties, except in those instances in which the Legislature has delegated to the municipal corporation power and authority to enforce compliance therewith in that way. Authority in a municipal charter to pass all ordinances necessary to the execution of the powers vested in the city and such as may be deemed necessary and proper to conserve the health, comfort, happiness and convenience of its inhabitants and enforce the same by reasonable fines and penalties does not include power to regulate or control such public service rates and conditions otherwise than by contract, nor to enforce regulation so made by fines or criminal penalties. Attempted enforcement of contractual regulations of public service, by criminal proceedings under an ordinance of a city not authorized by legislative enactment to adopt such means of enforcement, may be enjoined.—Supreme Court of Appeals of West Virginia, 70 S. E. R., 772.

Unskilled City Employee—Wages

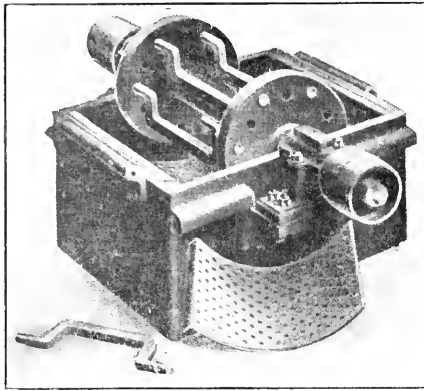
Walsh vs. City of New York.—Where plaintiff worked for a city as an unskilled laborer, and was paid when he actually worked, and if the weather did not permit him to work he was not paid, and he was laid off, held he was not entitled to wages for the days he did not work. That a laborer was removed or suspended because he was a henchman of one faction of a political party which was in disfavor with his superior officer, and that the formality of recertification of his name to the Civil Service Commission was not observed, putting him out of line for re-employment, would not render the city liable for wages while he did not work, especially where, within two months of his laying off, his name was placed upon the certified list.—New York Supreme Court, 127 N. Y. S., 972.

MUNICIPAL APPLIANCES

Plant for Grinding Garbage

The accompanying illustrations show the construction and equipment of the Southwark garbage grinding plant referred to in the Municipal Journal, April 12, page 518. Southwark is a borough of London, England. To this plant is brought the ashes, garbage and refuse from the East Side of London. The different kinds of waste are not separated, but are placed in cans by the householder and brought to the grinding plant in carts. The plant has been established about four years and handles about 500 tons a day, the running time of the four Gardner crushers which are used to grind it being only five hours a day.

The sketch shows the general ar-

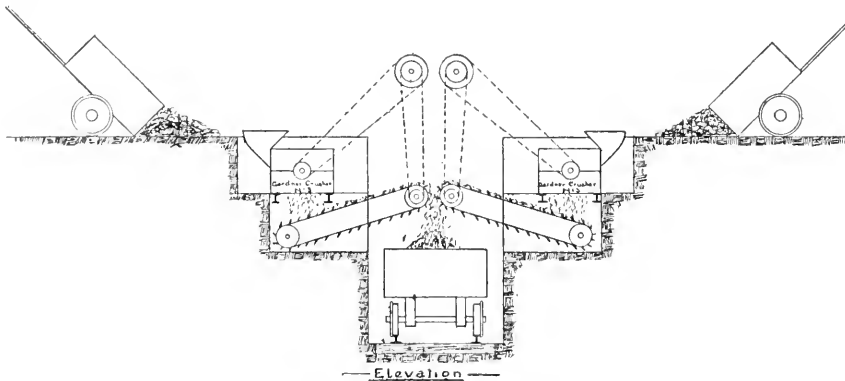


GARDNER CRUSHER AND PULVERIZER

angement of the installation. A roof, not shown, covers the machinery. The crushers are elevated and located two on each side of a tramway over which the cars that carry away the finished product run. Carts deliver the waste near the hoppers of the crushers. At this point, such materials as have value, leather, bottles, iron articles, etc., are picked out by hand. The remainder is shoveled into the mouths of the crushers which have 12 by 14-inch openings. From the crusher the ground material is elevated and carried to the cars. The waste, when it arrives at the plant, has so much garbage in it that it has an offensive smell. The product is a fine material, grading from quarter-inch to powder. It has no disagreeable odor, the gases presumably being absorbed by the carbon contained in the ashes. The product has a yellowish color, much like earth discolored about a leak

in a gaspipe. Although the waste contains considerable paper, not a trace of it is visible in the ground material. It is carried by the tram cars out into the farming districts where it finds a ready sale at a moderate price as a fertilizer. The power required to operate the plant is 100 hp, and the grinding operation so rapid—100 tons an hour—that it is not necessary to run the plant more than half a day to take care of the 500 tons, the usual amount collected.

The Gardner crushers used in this plant are No. 3, the largest size. Their construction and operation is peculiar. The crusher consists of a very strong cast iron frame in two parts, a base and a top, which fit together with a machined joint. The sections are hinged to allow quick inspection and cleaning. The main shaft rests on bearings attached to the lower section. These bearings are specially constructed to stand the wear of the shaft, which revolves at 1000 revolutions a minute. Inside the casing are two circular cheek pieces, or disks, which are, in this instance, connected by four beaters or hammers shaped something like brace cranks. These beaters are the working part of the mechanism. They are pivoted to the disk, but when in operation, through centrifugal force, assume a position radial to the line of the main shaft. They are made of manganese steel. The bottom of the apparatus consists of a rounded perforated iron plate which acts as a screen for the discharge of the material. The wear on the screen is said not to be great, one screen generally lasting a year or more. On the inside of the upper casing are substantial rectangular blocks of steel which can be adjusted in relation to the hammers so as to regulate the fineness of the product. The crushing effect is produced not only by the hammers striking on the material, but by the grinding of the particles on each other. The high speed of the hammers is the factor of controlling importance, together with their pivoted construction, which permits them to give way a little to an unusual resistance.



GARBAGE GRINDING PLANT, SOUTHWARK, LONDON

New Motor Combination Hose Wagon

The Northern Fire Apparatus Company, Minneapolis, Minn., has placed an auto combination hose and chemical apparatus on the market. The following are the main points in the specifications:

Motor: Four cylinders, water cooled cast in pairs. All gears encased. Bore 4¼x4½.

Power: Horsepower, 30, A. L. M. A. rating.

Speed: Will carry load of 2,500 pounds at 20 miles per hour.

Hose Capacity: 1,200 to 1,500 feet, 2½-inch cotton rubber-lined fire hose.

Crank Case: Made in two parts. Divided horizontally through plane of crank shaft center.

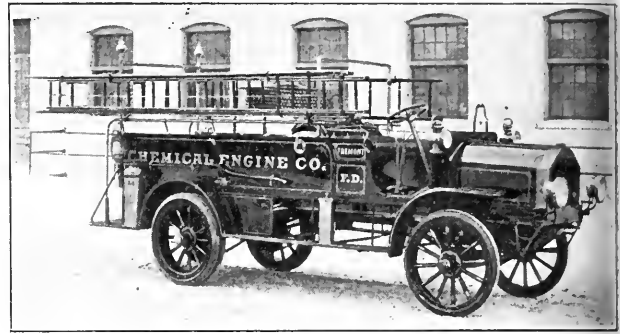
Crank Shaft: Drop forging ground to finish size.

Fly Wheel: Of liberal size and designed to receive cone clutch.

Clutch: Plunger type cone clutch, lined with thermoid friction. Operated by pedal lever.

Bearings: All anti-friction bearing metal.

Lubricating: Furnished by power-driven gear pump, which pumps oil from the oil reservoir from bottom of the motor to the crank case proper. Splash system supplying all parts.



NEW AUTO COMBINATION CHEMICAL

Cooling: By water circulated by gear-driven pump.

Transmission: Selective type transmission mounted on Timken roller bearings throughout.

Drive: Double chain drive.

Brakes: Two sets, one pair on the rear wheels and one pair on jack shafts, both external contracting type.

Control: Throttle and spark levers are located on top of steering wheel, engaged with sector, which is stationary and does not turn with wheel. The three speeds and reverse are operated by the lever at the right of the driver.

Ignition: Double.

Carburetor: Bennett.

Frame: Channel steel of ample size for load and severe service.

Springs: Front springs full elliptic, rear platform type of ample capacity.

Axes: Front 1½-inch, Timken "T" beam type, with Timken bearings throughout. Rear, 2-inch dead square with wheels, mounted on Timken bearings.

Wheels: Artillery type.

Tires: Front tires are 36x3½ solid Hartford make. Rears are 36x3½ solid Hartford. Tread, 58 inches. Wheel base, 117 inches.

Chemical Equipment.

Cylinder: One 35-gallon, 40-gallon or 50-gallon capacity, seamless, steel cylinder, mounted back of seat.

Acid Receptacle: Best chemical lead held in heavily tinned red brass frame, so arranged that when cap is put on and wheel screwed down receptacle is hermetically sealed and cannot be prematurely discharged.

Method of Discharging: Release stopper by turning cap valve wheel to left and revolve cylinder. This gives positive action and perfect agitation.

Piping: Brass piping and valve so arranged that when cylinder is empty it can be refilled from 2½-inch intake connection, or plain water run right through instead of chemical.

Hose Basket: Woven wire reinforced with half round steel mounted over bed of wagon. Capacity, 200 feet.

The complement of small tools usually supplied with such apparatus also goes with it.

NEWS OF THE SOCIETIES

Texas Mayors' Association.—Dr. R. H. Greer, secretary, has issued a circular letter inviting eligible officers of all municipalities not belonging to the association to join it and participate in the benefits. At the next annual meeting, he says, special attention will be given to the question of beautifying Texas cities. Another topic to which special attention will be given is the initiative, referendum and recall. Another question that will have full and free discussion will be that of whether cities and towns should have concurrent jurisdiction with the county courts which would enable them to accomplish greater headway toward the building of good roads and better streets.

The secretary states that it is the desire to have a photographic exhibit of the cities and towns which will be represented in the association, showing public buildings, highways, street improvements, parks or anything that will have a tendency to inspire others to greater achievements along this line.

Society for the Promotion of Engineering Education.—The annual convention will be held at the Carnegie Technical School, Pittsburgh, Pa., June 27-29. Plans for the 1911 convention are now being made. The local committee to handle the details has just been appointed by the council of the society. The chairman of the committee is Dr. John H. Leete, dean of the engineering school at Tech. The other members are Charles F. Scott, of the Westinghouse Electric Company; Dr. Bishop, of the University of Pittsburgh, and Dean Connelley and Professor Mott, of the Carnegie Technical schools.

A new and interesting feature to be introduced this year will be the reunions of the faculty members from the various institutions represented in the convention with their graduates located in this district. The very large number of college men holding positions in the various local engineering plants makes it especially possible to schedule a convention feature of this description in Pittsburgh, with every prospect of success. Arrangements will also be made for visits and inspection trips to local points of interest. Prof. Henry H. Norris, Cornell University, is secretary.

International Association of Railway Special Agents and Police.—At the convention which closed in Chattanooga, April 20, the following officers were elected: President, M. B. Earle, Birmingham, special agent Southern Railway; first vice-president, Patrick J. Kindelon, San Francisco, chief special agent Southern Pacific; second vice-president, H. S. Harrod, Buffalo, special agent B. & E.; third vice-president, T. L. Phelps, Bluefield, W. Va.; secretary and treasurer, W. C. Pannell, Baltimore, special agent Chesapeake Steamship Company. Buffalo was selected by acclamation as the meeting place for 1912.

Following a paper by A. W. Worthington, D. M. & N. Railway, on the need of a central bureau of identification it was decided to establish such a bureau, and Mr. Worthington was appointed its head.

Detroit Engineering Society.—At the annual meeting, held April 21, officers for the coming year were elected as follows: President, Ralph Collamore; vice-presidents, Charles Y. Dixon (Amherstburg, Ont.) and Geo. H. Fenkell; secretary-treasurer, Frederick H. Mason, 612 Moffat Building, Detroit, Mich.

Calendar of Meetings

- May 15-17.
National Conference on City Planning.—Philadelphia, Pa.—Flavel Shurtleff, Secretary, 19 Congress street, Boston, Mass.
- May 17.
Massachusetts Highway Association.—Quarterly Meeting in conjunction with the New England Conference on Street Cleaning, Springfield, Mass.
- May 17.
New England Conference on Street Cleaning.—Springfield, Mass.—Corresponding Officer, Carol Aronovici, 55 Eddy street, Providence, R. I.
- May 18-19.
Ohio Society of Mechanical Steam and Electrical Engineers.—Annual Convention, Youngstown.—F. E. Sanborn, Secretary, Ohio State University, Columbus.
- May 23-25.
National Fire Protection Association.—Annual Meeting, New York City.—F. H. Wentworth, Secretary, 87 Milk St., Boston.
- May 23-26.
National Good Roads Association.—Fourth National Good Roads Congress, Birmingham, Ala.—J. A. Rountree, Secretary, Birmingham, Ala.
- May 25-26.
League of Second and Third Class Cities of New York.—Poughkeepsie, N. Y.
- May 29-June 2.
National Electric Light Association.—New York City.—T. C. Martin, Secretary, 31 West 39th St.
- June 5-14.
National Probation Officers' Association.—Boston, Mass.—Roger N. Baldwin, Secretary, 903 Security Building, St. Louis, Mo.
- June 6-10.
American Water Works Association.—Thirty-first Annual Convention, Powers Hotel, Rochester, N. Y.—John M. Diven, Secretary, 14 George street, Charleston, S. C.
- June 7-14.
National Conference of Charities and Correction.—Boston, Mass.—Alexander Johnson, Secretary, Ft. Wayne, Ind.
- June 7.
National Association for the Study and Prevention of Tuberculosis.—Denver, Col.—Dr. Livingston Farrand, Executive Secretary, 105 East Twenty-second street, New York City.
- June 11-16.
International Association of Chiefs of Police.—Eighteenth Annual Convention, Rochester, N. Y.—Major Richard Sylvester, Superintendent of Police, Washington, D. C., President.
- June 13-18.
New York State Association of Chiefs of Police.—Annual Convention, Rochester, N. Y.
- June 13-16.
American Society of Civil Engineers.—Annual Convention, Chattanooga, Tennessee.—Charles Warren Hunt, Secretary, 220 West 57th St., New York.
- June 21-22.
National Conference of Poor Law Officials.—Boston, Mass.—Dr. Robert W. Hill, President State Board of Charities, 105 East Twenty-second street, New York City.
- August 15-18.
Firemen's Association of the State of New York.—Watertown, N. Y.—A. H. Otto, Secretary.
- September 12-15.
International Association of Municipal Electricians.—Annual Convention, St. Paul, Minn.—Clarence R. George, Secretary, Houston, Tex.
- September 19-22.
International Association of Fire Engineers.—Annual Convention, Racine, Wis.
- September 19-22.
American Hospital Association.—New York City. J. N. E. Brown, M.D., Secretary, Toronto General Hospital, Can.
- September 24-30.
International Congress on Tuberculosis.—Rome, Italy.—Professor Ascoli, Secretary-General, Via Lucina, Rome, Italy.
- September 26-29.
American Society of Municipal Improvements.—Grand Rapids, Mich.—A. Prescott Folwell, Secretary, 239 West Thirty-ninth street, New York City.
- October 4-6.
League of American Municipalities.—Annual Convention, Atlanta, Ga.—John MacVicar, Secretary, Des Moines, Ia.

PERSONALS

ATKINSON, ROBERT, field secretary of the Playground Association of America, recently visited St. Paul, Minn., and addressed the recreation and education committee of the City Club.

CROSBY, W. O., has been appointed consulting engineer in connection with the Arrowrock dam of the U. S. Reclamation Service.

CROKER, EDWARD F., ex-Fire Chief of New York City, extended a reception at his new headquarters in the Thorley Building, Forty-sixth street and Fifth avenue, to numerous fire chiefs throughout the country.

CULVER, IRVING, has been elected Mayor of Delmar, Del.

DOW, JOHN B., is the new Mayor of Cookeville, Tenn.

EWART, C. W., has been appointed City Engineer of Aberdeen, Wash.

FOWLER, J. E., has been appointed Health Sergeant of Hutchinson, Kan.

GAMMON, L. H., has been re-elected Mayor of Bristol, Va.

GAY, C. W., has been engaged as Chief Engineer of the Lynn, Mass., Harbor Commission.

GILBERT, H. K., has been re-elected Mayor of Florence, S. C.

GRADY, W. J., has been re-elected Superintendent of the Light & Water Department of Denton, Texas.

HARLOW, GEORGE J., has been appointed Commissioner of Public Works of Mt. Vernon, N. Y.

HESS, W. J., has been elected Mayor of Redondo Beach, Calif.

HOWARD, CHAS. C., is the new President of the Board of Fire Commissioners of Mt. Vernon, N. Y.

KUHN, FRED H., Chief of the Fire Department of Plymouth, Ind., has invented a very ingenious and useful contrivance for fastening and instantly opening the doors of the fire station in case of fire. It is connected with the fire alarm and the first pull of the bell dislocates the fastenings and the four doors fly open.

O'NEIL, GEO., has been appointed Superintendent of the municipal electric light plant of Topeka, Kan.

PIERCE, A. P., is the new Mayor of Red Wing, Minn.

PRESTON, JAMES H., has been elected Mayor of Baltimore, Md.

SCHMIDEL, JOHN E., has been re-elected director of playgrounds of Elizabeth, N. J.

STAMMS, NORMAN L., has been appointed Engineer of the Department of Wharves, Docks and Ferries of Philadelphia.

SYLVESTER, MAJ. RICHARD, in charge of the Police Department of Washington, D. C., and who is President of the International Association of Chiefs of Police, recently called on Chief of Police Quigley of the Rochester force. He was taken on a tour of inspection of the Exchange Street building, and expressed himself in complimentary terms regarding methods in vogue at headquarters, and the general condition of the building and the various devices in use.

THOMPSON, F. M., has been elected Mayor of Salisbury, N. C.

THOMPSON, DR. FRANK S., has been appointed a member of the Board of Health of Dayton, Ohio. The appointment is for five years. Dr. Thompson formerly served as dairy inspector, an office which he resigned owing to the demands of his private practice.

WEBER, WALTER H., was elected Mayor of Havre de Grace, Md., as the result of a hotly contested election.

TRADE NOTES

Cast Iron Pipe.—Birmingham: With the exception of a large letting in Kansas City, there is little tonnage before the trade. Shipments remain fairly good. Quotations: 4 to 6-inch, \$22.50 to \$23; 8 to 12-inch, \$22 over 12-inch, average, \$21. San Francisco: Business continues to come out in good volume both from municipalities and private corporations. New York: Buying continues extremely light. Prices show no indication of strengthening. Quotations: 6-inch, car loads, \$21 to \$22.

Lead.—Market is weak and neglected. Quotations: New York, 4.425¢; St. Louis, 4.425¢.

Street Cleaning.—Daniel J. Hauer, Consulting Engineer, Park Row Building, New York, N. Y., has published a brief pamphlet stating that he expects to devote considerable of his time to problems of street cleaning. He states that by improved methods and system the ordinary cost of street cleaning may be reduced and the streets kept cleaner. The troublesome snow problem, he says, can be easily cared for and the cost of removal reduced.

Road Machinery.—The Good Roads Machinery Company, New York City, have moved their office to 18 Old Slip, cor. Water street. They are the selling agents for the American Road Machine Company, the Climax Road Machine Company, Indiana Road Machine Company and Monarch Road Roller Company.

Gravity Concrete Mixer.—C. Raymond Weaver, of the Hains-Weaver Concrete Mixer Company, 13 Park Row, New York City, has issued an announcement to the effect that the partnership previously existing between C. Raymond Weaver and Peter C. Hains has been terminated. The Hains Concrete Machinery Company, Washington, D. C., has no connection with the Hains-Weaver Concrete Mixer Company. Each member of the former partnership has the right to manufacture and sell the gravity mixer which was the joint invention of C. Raymond Weaver and Peter C. Hains. The Hains-Weaver Concrete Mixer Company is selling Hains-Weaver mixers which are stated to have many improvements over the old style sold under the name of Hains mixers.

Rubber Tires.—The Fisk Rubber Company, Chicopee Falls, Mass., has been awarded a contract for equipping the chiefs' cars of the New York Fire Department with Fisk pneumatic tires. These tires were selected after tests were made under the direction of Commissioner Waldo, who uses a Lozier car equipped with Fisk tires. The Springfield, Mass., Fire Department also uses Fisk pneumatic tires.

Garbage Reduction.—The Sanitary Machine Company has been incorporated at Buffalo, N. Y., with a capital stock of \$25,000 to manufacture machines for the automatic extraction of grease, fertilizer products and other by-products from city garbage and to build and operate garbage reduction plants in cities. W. D. Huntington, general manager of the Buffalo Fertilizer Company, is president of the new company; Henry Thieroff, chemist and superintendent of the Buffalo Fertilizer Company, vice-president; and William H. Hotchkiss, secretary and treasurer. The offices of the company are at 62 and 64 Pearl street, Buffalo.

Fire Alarm Boxes.—The Star Electric Company, Binghamton, N. Y., have received an order from the New York City Fire Department for 150 of their fire alarm boxes.

Testing Laboratory.—The Pittsburgh Testing Laboratory, Pittsburgh, Pa., has moved into its new five-story office and laboratory building at the corner of Seventh and Bedford avenues, where it will have more complete facilities for looking after its clients. This plant is claimed to be the largest of its kind in the country.

Sewer Pipe.—The attention of men interested in the sewer pipe business all over the country has centered upon a meeting of prominent men in the industry at Chicago two weeks ago. Among those present were: George R. Hill, president of the American Sewer Pipe Company; also Vice-President Stambaugh, Secretary A. S. McCombe and other officials connected with the Akron, O., works. There has been much complaint that the sewer pipe prices, during the past few years, have been so low that little or no profit has been left in the business. It is expected that a price agreement rather than a merger will be the result of the meeting.

PATENT CLAIMS

990,255. MANUFACTURE OF WATER-METER DISKS. William L. Gumprecht, New York, N. Y., assignor to Neptune Meter Co., New York, N. Y., a Corporation of New Jersey. Serial No. 487,727.

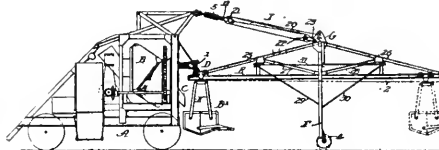
A meter disk comprising a laminated body of fibrous material and rubber and an outer protective coating of rubber, the whole being vulcanized.

990,521. PROCESS OF EXTINGUISHING FIRES. Max Breslauer, Charlottenburg, Germany, assignor to The Firm of Minimax Consolidated Limited, London, England, and Neuruppin, Germany. Serial No. 385,665.

The process of extinguishing fires from burning benzine, kerosene oil, petroleum and other easily inflammable liquids consisting in adding free uncombined bromine to said burning liquids, substantially as herein described.

990,513. MACHINE FOR USE IN STREET-PAVING WORK. Charles E. Bathrick, Chicago, Ill., assignor to Frederick C. Austin, Chicago, Ill. Serial No. 496,013.

In a machine of the class set forth, the combination of a motor truck or carriage provided with a mixer; a boom attached at one end portion to the motor truck or carriage by a hinge connecting means permitting the boom to swing laterally and also to have an up and down swing; a delivery hopper or receptacle for receiving material from the mixer and delivering the same at points more or less remote therefrom; a shifting connection between the delivery receptacle and the boom and movable along the latter in order to shift the position of the delivery receptacle in accordance with need; spring means interposed in connection between the motor truck or carriage and

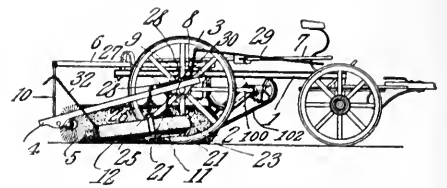


the boom and adapted to normally maintain the boom in level or substantially level position to provide a suitable track or way; and a prop or leg device attached and depending from the boom, the prop or leg device being clear of the ground when the boom is maintained in level or substantially level position by the spring means, and being of a length to engage and bear upon the ground and sustain the weight of the boom and the loaded receptacle when the boom is depressed by reason of its weight augmented by the weight of the loaded receptacle, the spring means being adapted to yield to an extent to permit said depression on the part of the temporarily weighted boom, but opposing such depression with an increasing spring resistance

suitable to restore the boom to its normal position after the boom has been suitably relieved of the weight of the load thereon.

990,322. ATTACHMENT FOR STREET-SWEEPERS. John Wless, Chehalis, and William McArthur, Tenino, Wash. Serial No. 536,255.

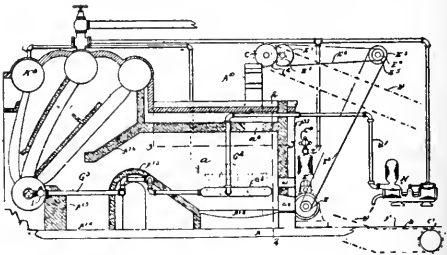
In a device of the class described, a sweeper comprising a frame; an axle carried by the frame; traction wheels mounted upon the axle; and an arm rearwardly extended



from one end of the axle upon the exterior of one wheel; a rotary brush journaled at one end in the arm; a pan suspended from the sweeper beyond the wheel and in close proximity to one end of the brush; and means mounted upon the arm for dumping the pan.

990,688. APPARATUS FOR TREATING GARBAGE. John G. Walker, New York, N. Y., assignor to John G. Walker, Seawaren, N. J., and Adolph Kern, New York, N. Y. Serial No. 410,235.

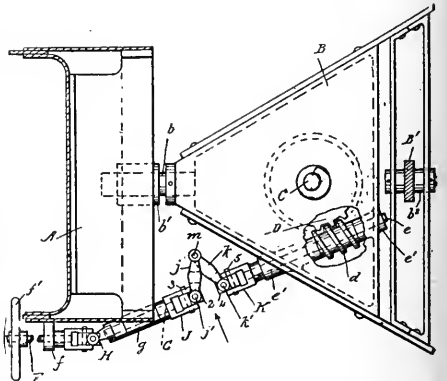
In a device of the class described, a furnace, a plurality of approximately flat grates one above the other within said fur-



nace, a high firebridge extending upward from the lowermost grate and in operable relation with both said grates, said firebridge being formed with a long inclined front face, a smoothly rounded top and a vertical rear wall, in combination with a curved and drooping arch above said firebridge and extending beyond the rear wall of said bridge, the whole arranged to provide a contracted passage for the gases, the product of combustion in said furnace.

990,794. STEERING MECHANISM FOR ROAD ENGINES. Gustaf Arvid Anderson, Waynesboro, Pa., assignor to The Geiser Manufacturing Company, Waynesboro, Pa. Serial No. 534,041.

In a steering mechanism, the combination, with stationary supports, of a rocking frame provided with pivots arranged horizontally and in line with each other and engaging with the stationary supports, a steering shaft journaled in the rocking frame crosswise, between the said pivots, an



intermediate shaft carried by one of the stationary supports and arranged at an angle to the axis of said pivots, an operating shaft journaled in the rocking frame and normally arranged in line with the said intermediate shaft, universal coupling-members secured on the adjacent end portions of the operating shaft and the intermediate shaft, links pivoted together and to the said universal coupling-members, and driving mechanism connecting the operating shaft with the steering shaft.

THE MUNICIPAL INDEX

In Which Are Listed and Classified by Subjects All Articles Treating of Municipal Topics Which Have Appeared During the Past Month in the Leading Periodicals

It is our purpose to give in the second issue of each month a list of all articles of any length or importance which have appeared in all the American periodicals and the leading English, French and German ones, dealing more or less directly with municipal matters. The index is kept up to date, and the month of literature covered each time will be brought up to within two or three days of publication. Our chief object in this is to keep our readers in touch with all the current literature on municipal matters. In furtherance of this we will furnish any of the articles listed in the index for the price named after each article, except that where an article is continued in two or three issues of the paper, the price given is for each of said issues. In addition to the titles, where these are not sufficiently descriptive or where the article is of sufficient importance, a brief statement of its contents is added. The length also is given, and the name of the author when it is a contributed article.

ROADS AND PAVEMENTS

Road Improvement in the United States in 1910 and 1911. Illustrated, 13 pp., Good Roads, April. 10 cts.

Highway Work in Saskatchewan. From annual report of F. J. Robinson. Illustrated, 5 pp., Canadian Engineer, April 27. 15 cts.

Highways in Massachusetts Illustrated, 7 pp., Public Officials' Magazine, March. 10 cts.

German Methods of Road Work. Paper before Iowa Engineering Society. By E. Schreiner. 1 1-2 pp., Good Roads, April. 10 cts.

Colinsville—East St. Louis Road. Paper before Illinois Society of Engineers and Surveyors. By A. N. Johnson. Illustrated, 1 1-2 pp., Good Roads, April. 10 cts.

Association, Road Improvement. Extracts from annual report. 1 1-2 pp., Surveying, April 21. 20 cts.

Commission, State Highway, and Trunk Lines. By W. W. Crosby. Illustrated, 3 pp., Southern Good Roads, April. 10 cts.

Road Question Viewed Generally. Paper before Second Irish Road Congress. By P. C. Cowan. 3 pp., Surveyor, April 21. 40 cts.

Highway Design, Relation Between Modern Traffic and the Alignment and Profile in. Paper before American Association for the Advancement of Science. By H. B. Drown. 2 1-2 pp., Canadian Engineer, April 6. 15 cts.

The Bond of a Road. By J. S. Robeson. 3 pp., Municipal Engineering, May. 25 cts. **Improvement of Highways to Meet Modern Traffic Conditions.** Paper before Institution of Civil Engineers. By J. Walker-Smith. 1 p., Surveyor, April 7. 40 cts.

Suggestions Regarding Road Improvement. Paper before New Jersey Association of County Engineers. By F. J. Eppel. 2 1-2 pp., Good Roads, April. 10 cts.

Wheel Loads and Tire Widths. Summary of regulations in different counties. 5 pp., Surveyor, April 21. 40 cts.

Traffic Census on Highways. Methods of Taking. Paper before the American Association for the Advancement of Science. By A. H. Blanchard and J. W. Patterson. 3 pp., Canadian Engineer, April 6. 15 cts.

Tamping Macadam Road Bases. 1-3 pp., Engineering Record, April 22. 10 cts.

Sand Clay Road, How to Build a. By M. G. Homes. 1 p., Southern Good Roads, April. 10 cts.

The First Sand Clay Road. By I. E. Watson. Illustrated, 2 pp., Southern Good Roads, April. 10 cts.

Bituminous Macadam, Gravel and Earth Object Lesson Roads Constructed by the U. S. Office of Public Roads. 3 1-2 pp., Engineering-Contracting, April 5. 10 cts.

Contract and Day Labor Methods of Doing Bituminous Road Work. From discussion before American Society of Civil Engineers. 3-4 p., Engineering-Contracting, April 26. 10 cts.

Road Construction with Bituminous Material by Mixing Methods. From discussion before American Society of Civil Engineers. 6 pp., Engineering-Contracting, April 26. 10 cts.

Some Details of Bituminous Macadam Construction. By J. T. Voshell. Paper before Ohio Engineering Society. 2 pp., Good Roads, April. 10 cts.

Tarring Roads and Eye Troubles. By Albert Scheible. 1-2 p., Municipal Journal, April 26. 10 cts.

Road Construction with Bituminous Materials by the Penetration Method. From discussion before American Society of Civil Engineers. 3 pp., Engineering-Contracting, April 19. 10 cts.

Present Status of the Use of Bituminous Materials in the Construction and Maintenance of Roads in the United States. Paper before American Association for the Advancement of Science. By A. H. Blanchard. 2 1-2 pp., Canadian Engineer, April 13. 15 cts. 2 1-2 pp., Good Roads, April. 10 cts.

Road Preservation and Dust Prevention by Surface Treatment with Tars, Heavy

Oils, etc. From discussion before American Society of Civil Engineers. 5 pp., Engineering-Contracting, April 12. 10 cts.

Tarring and Gritting of Road Surfaces. By Wm. Oxtoby. 2 pp., Surveyor, April 14. 30 cts.

Maintenance, Permanent, and Skilled Supervision of Roads. By Curtis Hill. Illustrated, 3 pp., Southern Good Roads, April. 10 cts.

Development of Road Maintenance System for Menominee County, Michigan. By K. I. Sawyer. 1 p., Good Roads, April. 10 cts.

Culverts for Highways, Concrete. By Paul Chesterton. Illustrated, 1 pp., Cement World, April. 15 cts.

Culvert Construction. Paper before Commissioners' and Supervisors' Convention of Nebraska. By Peter Campbell. Illustrated, 3 pp., Pacific Municipalities, March. 20 cts.

Tree Planting on Highways. Paper before Kansas Engineering Society. By E. F. A. Reinisch. 1 p., Good Roads, April. 10 cts.

Stone Testing Machine, A Suggested Road. By R. J. Kirwan. Illustrated, 1 p., Surveyor, April 21. 40 cts.

Specifications, Paving, Proceedings of the Association for Standardizing Paving Specifications. 1-3 p., Municipal Journal, April 12. 10 cts.

Recommendations for Use in Chicago Street Paving Specifications. Report to Chicago Commission on City Expenditures. By S. Whinnery. 1-2 p., Engineering News, April 20. 15 cts.

Granite Block Specifications. Standard of the Association for Standardizing Paving Specifications. Coal tar, asphalt or cement grout filler; one year guarantee. 1 1-2 pp., Municipal Journal, April 26. 10 cts.

Wood Block Paving, Specifications for. By S. Whinnery. 1 1-2 pp., Engineering News, April 27. 15 cts.

Notes on Creosoted Wood Block Pavement. By Paul E. Green. 1 1-2 pp., Engineering News, April 20. 15 cts.

Creosoted Wood Block Pavement at Minneapolis. 1-3 p., Engineering Record, April 8. 10 cts.

Nine Years' Experience with Creosoted Wood Block Pavement, Minneapolis. By E. H. Durham. Illustrated, 2 pp., Engineering-Contracting, April 19. 10 cts.

Concrete Street Paving in Mason City, Ia. Paper before Iowa Engineering Society. By F. P. Wilson. 1 1-2 pp., Cement Age, April. 15 cts.

Cement Concrete in Highway Construction. Paper before Canadian Cement and Concrete Association. By W. A. McLean. 2 pp., Canadian Engineer, April 13. 15 cts. 1 p., Good Roads, April. 10 cts.

Cement Street Construction. By F. W. Hagloch. Illustrated, 2 pp., Cement World, April. 15 cts.

Concrete Properly Laid. Has advantages over other paving materials. By C. P. Chase. 5 pp., Concrete, April. 15 cts.

Standard Paving Specifications. Adopted this year by Association for Standardizing Paving Specifications. Concrete pavements, foundations and sidewalks; wood block. 1 p., Municipal Journal, April 12. 10 cts.

Rock Asphalt for Street Purposes. Paper before Institution of Municipal Engineers. By Edward Walker. 1 1-2 pp., Surveyor, April 14. 40 cts. 2 pp., Surveying, April 14. 20 cts. 1 p., Contract Journal, April 5. 20 cts.

Brick Paving Specifications. Standard of the Association for Standardizing Paving Specifications. Preparing sand cushion; expansion joints; grout, pitch and asphalt fillers. Illustrated, 2 pp., Municipal Journal, April 19. 10 cts.

Cracking of Cement Grouded Brick Pavements. Paper before Michigan Engineering Society. By E. R. Whitmore. 4 pp., Cement, March. 25 cts.

Brick Country Roadway at Newman, Ill. Illustrated, 1 1-2 pp., Clay Worker, April. 25 cts.

Specifications for New Standard Brick Rattler. Illustrated, 2 1-2 pp., Good Roads, April. 10 cts.

Pavement Situation in New York. 2 pp.,

Bulletin of General Contractors' Association, April.

Prices, Average Unit, of Pavements Constructed in 1910 in a Number of American Cities. 3 pp., Engineering-Contracting, April 5. 10 cts.

Private Street Works under the 1892 Act. Notes on. By M. B. Bennett. 2 1-2 pp., Surveyor, April 7. 40 cts.

Street Plan, Mitigating the Gridiron. Some good effects achieved in New York City. By F. K. Winkler. Illustrated, 18 pp., Architectural Record, May. 25 cts.

Sidewalk Construction, Some Fallacies of. By J. B. Landfield. 1 1-2 pp., Cement Age, April. 15 cts.

Asphaltic Oils Economical Wood Preservers. By F. W. Cherrington. 3 pp., Municipal Engineering, May. 25 cts.

Analyzing Coal Tar Creosote. From Bulletin American Railway Engineering and Maintenance of Way Association. Illustrated, 1 p., Municipal Journal, April 12. 10 cts.

Methods of Testing Coal Tar and Refined Tars, Oils and Pitches Derived Therefrom. From Journal of Industrial and Engineering Chemistry. By S. R. Church. Illustrated, 7 pp., Municipal Engineering, May. 25 cts.

SEWERAGE AND SANITATION

Sewer Construction at Regina, Saskatchewan, Can. Paper before American Society of Engineering Contractors. By W. R. Harris. Illustrated, 3 pp., Canadian Engineer, April 13. 15 cts. Illustrated, 3 pp., Cement, March. 25 cts.

Sewer Construction in St. Louis. Large brick and concrete sewers in tunnel through rock and sand and in open cut; using shield and air pressure. Eight miles of sewer under internal pressure. Tumbling basin and tunnel. Illustrated, 5 1-2 pp., Municipal Journal, May 3. 25 cts.

Difficult Reconstruction of a Large Sewer in Washington. By A. E. Phillips. Illustrated, 1 2-3 pp., Engineering Record, April 15. 10 cts.

Intercepting Sewer and Sewage Pumping Station. Carrying large pipe sewers across creeks at hydraulic gradient; reinforced concrete pipe in tunnel; deep pump well. By Robert Hooge, city engineer, Chattanooga, Tenn. Illustrated, 6 pp., Municipal Journal, May 3. 25 cts.

Thirty-Eighth Street Sewer, Minneapolis. Illustrated, 1 1-2 pp., Engineering Record, April 8. 10 cts.

For Better Sewerage Construction. 3-4 p., Municipal Journal, May 3. 25 cts.

Municipal Health-Disease Politic. Pre-sumption versus scientific conclusion. By W. S. Rankin. 6 pp., Bulletin North Carolina Board of Health, February.

Methods and Cost of Deep Trenching by Machine at Glencoe, Ill. By D. E. Marsh. Illustrated, 1 1-2 pp., Engineering-Contracting, April 5. 10 cts.

Flow of Storm Water in Sewers, Maximum. Paper before Institute of Civil Engineers of Ireland. By P. H. McCarthy. 5 pp., Canadian Engineer, April 6. 15 cts.

Statistics of American Cities, Sewerage Reports for 1910 from sixty large cities. Sewerage systems, pumping and purifying; sewer assessments. 13 pp., Municipal Journal, May 3. 25 cts.

Catch Basin Designs. Gratings and special forms of gutters; gratings or bars for curb openings; connection to sewer. Illustrated, 1 p., Municipal Journal, May 3. 25 cts.

Catch Basins in Newport. 1-1 p., Municipal Journal, May 3. 25 cts.

Sewer Gas Interceptor. 1 p., Surveying, April 21. 20 cts.

Deodorizing Sewer Gas. Illustrated, 1-1 p., Municipal Journal, May 3. 25 cts.

Sewer Pipe, Standard Tests of Drain Tile and. Paper before Iowa Engineering Society. By A. Marston and A. O. Anderson. 1 1-2 pp., Cement Age, April. 15 cts.

Standard Specifications for Tests of Drain Tile and Sewer Pipe. 1 p., Concrete, April. 25 cts. 2 1-2 pp., Clay Worker, April. 25 cts.

Concrete, Action of Sewage on. 3 pp., Cement Age, March. 15 cts.

Pumping in Great Britain, Electrical Sewage. By J. A. Seager. Illustrated, 4 pp., Engineering-Contracting, April 5. 10 cts.
Outlet, Underground Storm Sewer. 1-1 p., Municipal Journal, May 3. 25 cts.
Pollution, Acid Mine Drainage and. From annual report, Altoona, Pa., Board of Health. 1-2 p., Municipal Journal, April 12. 10 cts.

Sewage Disposal Experiments. Conducted in Philadelphia during past few years. Screening and sedimentation; contact; sprinkling and intermittent filters; sludge disposal. 2-1-2 pp., Municipal Journal, April 12. 10 cts.

Report on Philadelphia Sewage Purification Experiments. 1-3-4 pp., Engineering News, April 27. 15 cts.

Philadelphia Report on Sewage Disposal Investigations. 2-3 p., Engineering Record, April 8. 10 cts.

Methods and Results of Sewage Purification Experiments, Philadelphia, Pa. 2-1-2 pp., Engineering-Contracting, April 19. 10 cts.

Methods and Results of Sewage Sludge Studies, Philadelphia, Pa. 1-1-2 pp., Engineering-Contracting, April 26. 10 cts.

Philadelphia Sewage Disposal Experiments. 1-3 p., Municipal Journal, April 12. 10 cts.

Sewage Clarification. Fine mesh screen lessens sludge and scum; effect of time; baffles and scum boards in sedimentation. Philadelphia experiments. Illustrated, 1-1-4 pp., Municipal Journal, April 19. 10 cts.

Sprinkling Filter Experiments, Philadelphia Experiment Station. Various kinds and sizes of media; growths on and in filter beds; effect of ventilation; clogging and unloading; hypochlorite as cure for clogging. Illustrated, 3 pp., Municipal Journal, May 3. 25 cts.

Sewage Disposal with Respect to Offensive Odors. Paper before Congress of Technology. By G. W. Fuller. 3 pp., Engineering Record, April 15. 10 cts. 2 pp., Engineering News, April 20. 15 cts. 5 pp., Municipal Engineering, May. 25 cts.

Question of Sewage Disposal. Paper before League of California Municipalities. By N. G. Baker. 4 pp., Pacific Municipalities, March. 20 cts.

Purification of Sewage. By M. A. Puech. Illustrated, 11 pp., La Technique Sanitaire, April. 50 cts.

Darfield Sewage Disposal Works. Illustrated, 1 p., Contract Journal, April 5. 20 cts.

Massachusetts Experiment Station. 1-4 p., Municipal Journal, April 19. 10 cts.

Results of the Electrolytic Process of Sewage Purification at Santa Monica, Cal. 1-1-2 pp., Engineering-Contracting, April 19. 10 cts.

Operation of the Reading Sewage Disposal Plant. Illustrated, 1-2 p., Engineering Record, April 22. 10 cts.

Rise and Progress of Aerobic Methods of Sewage Disposal. Paper before Association of Managers of Sewage Disposal Works. By W. J. Dibdin. 1-2 p., Surveyor, March 31. 40 cts.

Creek Improvement, Squaw. Rectifying the stream in Lawton, Okla. Open conduit lined with reinforced concrete; forms, expansion joints, in railing, bridges at street crossings. By Z. M. Seifres, city engineer. Illustrated, 2 pp., Municipal Journal, April 26. 10 cts. Illustrated, 2-1-2 pp., Municipal Engineering, May. 25 cts.

Health Boards, Functions of. Non-sanitary duties imposed upon them. Garbage disposal and plumbing inspection. 1-2 p., Municipal Journal, May 3. 25 cts.

Board of Health Records. 1-4 p., Municipal Journal, May 3. 25 cts.

Association of Georgia Health Boards. 1-4 p., Municipal Journal, May 3. 25 cts.

Public Health, Technology and the. By C. E. A. Winslow. 5 pp., Advance New England, April. 10 cts.

Profitable and Fruitless Lines of Endeavor in Public Health Work. Paper before Congress of Technology. By E. O. Jordan. 1-2-3 pp., Engineering Record, April 22. 10 cts.

Recent Advances in Sanitary Engineering. By N. D. Baker. 4 pp., Bulletin, North Carolina Board of Health, February.

Ordinances, Rules and Regulations Pertaining to Public Health, Municipal. 4 pp., Public Health Reports, April 7; 5 pp., April 14; 5 pp., April 21. 10 cts.

Dust, Prevention of Disease by the Elimination of. By F. L. Hoffman. 4 pp., American City, May. 10 cts.

Typhoid Fever at Lexington, Va., Epidemic of. Caused by leaks from sewer to water mains. By A. W. Freeman and Richard Messer. Illustrated, 1-1-2 pp., Engineering News, April 27. 15 cts.

Squirrels in California, Campaign Against Plague Infected. Illustrated, 5 pp., Public Health Reports, April 21. 10 cts.

Tuberculosis, Town and Its Relation to. 1 pp., Bulletin, North Carolina Board of Health, February.

Bacillus Carriers, How Shall We Guard Against. By H. E. Welch. 1 pp., Bulletin, Ohio State Board of Health, March.
Disinfecting Swimming Pools. Experiments and use of chloride of lime; danger of infection removed; economic advantages. By Melville C. Whipple. 1-1-2 pp., Municipal Journal, April 26. 10 cts.

WATER SUPPLY

Wells, Determining Yield of. Law of flow of ground water into wells; methods of making an actual test and results obtained. Paper before Illinois Water Supply Association. By A. N. Talbot. Illustrated, 1-1-2 pp., Municipal Journal, April 26. 10 cts.

Deep Drill Work in Nova Scotia. 2 pp., Canadian Engineer, April 6. 15 cts.

Reservoir, Progress on the Ashoken, New York Water Supply. Illustrated, 1-1-2 pp., Engineering Record, April 15. 10 cts.

Effects of Storage Reservoirs Upon Water Powers. By A. H. Perkins. Illustrated, 1-1-3 pp., Engineering Record, April 15. 10 cts.

Experiments in the Storage of River Water. Paper before Royal Institute of Public Health. By J. R. Currie. 8 pp., Journal, April. 60 cts.

Design of Reservoir Dams. Paper before Institute of Civil Engineers of Ireland. By F. C. Uren. Illustrated, 4-1-2 pp., Canadian Engineer, April 6. 15 cts.

Spillway, The. By C. A. Mees. Illustrated, 5 pp., Engineering Record, April 22. 10 cts.

Weirs on Porous Foundations and with Pervious Floors. By W. G. Blight. Illustrated, 1-1-2 pp., Engineering News, April 13. 15 cts.

Intake, Corrugated Iron Culvert Pipe Used for a Water Supply. Illustrated, 2-3 p., Engineering-Contracting, April 12. 10 cts.

The Relation of the Intake to Pure Water from the Great Lakes. Relative cost of long intakes, compared with purified supplies from short intakes. Paper before Illinois Water Supply Association. By C. B. Burdick. 1-2-3 pp., Engineering-Contracting, April 19. 10 cts.

Conduits, Material for Water. 1-3 p., Municipal Journal, April 12. 10 cts.

Steel Pipe for Water Main. 1-4 p., Municipal Journal, April 26. 10 cts.

Steel Pipes for Water Works. Paper before New England Water Works Association. By E. Kuichling. 5 pp., Canadian Engineer, April 13. 15 cts. 3-1-2 pp., April 20. 15 cts.

Rust in Service Pipes. 1-1 p., Municipal Journal, April 26. 10 cts.

Wooden Insulation Joints for Water Mains. By J. A. McKenna. Illustrated, 1-1-2 pp., Engineering Record, April 8. 10 cts.

Aqueduct Construction at the Ashoken Reservoir. Illustrated, 1-1-3 pp., Engineering Record, April 22. 10 cts.

Methods of Sinking a Wet Shaft on the Rondout Pressure Tunnel of the Catskill Aqueduct. From paper by J. P. Hogan before American Society of Civil Engineers. 5 pp., Engineering-Contracting, April 12. 10 cts. 1-1-3 pp., Engineering Record, April 8. 10 cts.

Shaft Sinking in Water Bearing Fissured Rock by Grouting the Fissures. 1 p., Engineering-Contracting, April 12. 10 cts.

Siphon, Foundry Brook Steel, Catskill Aqueduct Illustrated. 2 pp., Engineering Record, April 15. 10 cts.

Siphon Soilways in Europe. By Adolph Ludin. Illustrated, 2 pp., Engineering News April 20. 15 cts.

Methods Used in Obtaining Concrete of Maximum Density for the Westley Standpipe. Paper before Boston Society of Civil Engineers. By A. B. McMillan. 1-1-2 pp., Canadian Engineer, April 6. 15 cts.

Corrosion of Iron and Steel Pipes. By A. S. Cushman, F. N. Speller and M. J. Falkenburg. 1 p., Engineering News, April 27. 15 cts.

Standpipe, Reinforced Concrete, U. S. Naval Station, Key West. Illustrated, 1-2 p., Engineering News, April 27. 15 cts.

Specifications for Reinforced Concrete Water Tanks. From report to American Railway Engineering and Maintenance of Way Association. Illustrated, 1-1-2 pp., Engineering-Contracting, April 12. 10 cts.

Flow of Water in Clean Iron Pipes. By A. E. Guy. 3 pp., Power, April 4. 5 cts.

Water-Finders, Experiments with. Paper before Royal Society of Arts. By J. Wertheimer. Illustrated, 2-1-2 pp., Canadian Engineer, April 6. 15 cts.

Rural Water Supply, Depletion and Pollution of. By H. Lemmon-Cannon. 2-1-2 pp., Surveying, April 21. 20 cts.

Conservancy, Administrative Aspect of Water. Paper before Society of Engineers. By W. R. B. Wiseman. 3-1-2 pp., Surveyor, April 7. 40 cts. Illustrated, 4 pp., Surveying, April 7. 20 cts. 1-1-2 pp., Contract Journal, April 19. 20 cts.

Clean Water as a Municipal Asset. Paper before Central States Water Works Association. By G. C. Whipple. 4 pp., American City, April. 10 cts. 2-1-2 pp., Surveying, April 21. 20 cts.

Water Purification at Wilmington. Report of work done by new filtration plant; sponge filters for preliminary clarification; defective rate controlling device lowers efficiency; low cost of operation; sand cleaning machines. Illustrated, 1-2-3 pp., Municipal Journal, April 19. 10 cts.

Modern Methods of Purification of Public Water Supply. 3 pp., Canadian Engineer, April 27. 15 cts.

Portsmouth Water Works. New filter beds and covered reservoirs. Illustrated, 1 p., Surveyor, April 14. 40 cts.

Legislation Against Rapid Filtration. 1-3 p., Municipal Journal, April 19. 10 cts.

Ozone Plant at St. Petersburg, Russia. 1-3 p., Engineering Record, April 29. 10 cts.

Hypochlorite for Destroying Growth of Algae and Diatoms. By J. W. Ellms. 1-1-2 pp., Engineering Record, April 8. 10 cts.

Effect of Bleaching Powder upon Bacterial Life in Water. By J. W. Ellms. 2 pp., Engineering Record, April 29. 10 cts.

Operating Difficulties in the Hypochlorite Treatment. Illustrated, 1 p., Engineering Record, April 15. 10 cts.

Portable Emergency Hypochlorite Plant. Illustrated, 1-2 p., Engineering Record, April 22. 10 cts.

Disinfection of Water. By R. G. Perkins. 6 pp., Bulletin, Ohio State Board of Health, March.

Bacteriological Examination of Water, Properties of Some Culture Media Used in the. By J. F. Liverseege. 2 pp., Surveying, April 7. 20 cts.

Waste and Public Water Consumption. 1-3 p., Municipal Journal, April 26. 10 cts.

Depreciation in Water Works. By Leonard Metcalf. 2-1-2 pp., Public Service, April. 25 cts.

Delinquent Consumer, Town as a. 1-4 p., Municipal Journal, April 19. 10 cts.

Costs, Methods of Keeping, by the Engineers of the Pittsburg Filtration Work. 3-1-2 pp., Engineering-Contracting, April 12. 10 cts.

STREET LIGHTING AND POWER PLANTS

Street Lighting Investigation, Worcester. 2-3 p., Engineering Record, April 29. 10 cts.

Electric Street Lighting. By Albert Scheible. Illustrated, 1-1-2 pp., Electrical Review, April 22. 10 cts. 1-1-2 pp., April 15. 10 cts. 1-2-3 pp., April 8. 10 cts.

Public Gain from Improved Efficiency of Electric Lighting. By W. H. Blood, Jr. 4 pp., Municipal Engineering, May. 25 cts.

Gas Arc Street Lighting. Paper before New England Association of Gas Engineers. Illustrated, 1 p., American Gas Light Journal, April 24. 10 cts.

Decorative Public Lighting Grows in Public Favor. Illustrated, 11 pp., Illuminating Engineer, April. 20 cts.

Park Lighting. By E. L. Elliott. 4 pp., American City, April. 10 cts.

Lamps, New Metallic Filament. By G. S. Merrill. Illustrated, 24 pp., Journal Franklin Institute, April. 50 cts.

Electric Plant, Wallingford Municipal. 1-4 p., Municipal Journal, April 12. 10 cts.

Hygienic Aspects of Illumination and Recent Progress in Illuminating Engineering. Paper before Institute of Sanitary Engineers. By Leon Gaster. 2 pp., Surveyor, April 14. 40 cts.

FIRE DEPARTMENT

Fire Prevention as a Municipal Function. By R. Waldo. Commissioner New York Fire Department. 1-1-2 pp., Survey, April 8. 10 cts.

Fire Department, Sketch of Hartford. Illustrated, 1 p., Fireman's Herald, April 8. 5 cts.

Oklahoma City's Fire System. Illustrated, 3-4 p., Municipal Journal, April 19. 10 cts.

High Pressure, Philadelphia. By J. E. Codman. 2-1-2 pp., Insurance Engineering, March. 25 cts.

Fire Risks, Hamburg and Its. Illustrated, 2 pp., Fireman's Herald, April 15. 5 cts.

Boston's Fire Dangers. High pressure system recommended. 4 pp., Insurance Engineering, March. 25 cts.

New York City's Fires. Work of public department. 7 pp., Insurance Engineering, March. 25 cts.

Asch Building Disaster Investigation. 1 p., Fireman's Herald, April 22. 5 cts.

Report on the Asch Building Fire, New York. Illustrated, 1-1-3 pp., Engineering Record, April 15. 10 cts.

Fire Underwriter's Report on the Asch Building Fire. Illustrated, 1-2-3 pp., Engineering News, April 13. 15 cts.

Smoke Worse Than Fire. By H. M. Wilson. 3 pp., American City, May. 10 cts.

GOVERNMENT AND FINANCE

Public Service Commission, Work for Engineers in Connection with, 2-3 p., Engineering News, April 27, 15 cts.

Public Service Corporations and Politics, By E. N. Wrightington, 3 pp., Public Service, April, 25 cts.

Relations of a Public Utility Company to the Public, By S. Murdock, Paper before Indiana Gas Association, 1 1-2 pp., American Gas Light Journal, April 10, 10 cts.

Valuations of Public Service Properties, By H. P. Gillette, 2 pp., Public Service, April, 25 cts.

Primaries in Chicago, People's, 3 pp., Review of Reviews, April, 25 cts.

Outlying Districts, City's Control of, By J. H. Gundlach, 3 pp., American City, May, 10 cts.

Excess Condemnation and Public Use, By A. W. Crawford, 1 2-3 pp., Real Estate News, April, 25 cts.

Information Bureau, City, 1-3 p., Municipal Journal, April 26, 10 cts.

Budget, Importance of the Municipal, as a Means for the Control of Expenditures, By Anson Herrick, 5 pp., Journal of Accountancy, April, 25 cts.

Accounting, Ideal Municipal, Paper before League of California Municipalities, By Wm. Dolge, 4 pp., Pacific Municipalities, March, 20 cts.

Work of the Merriam Commission in Chicago, 1 1-2 pp., Engineering-Contracting, April 5, 10 cts.

Slow Pay, New York City, 1-4 p., Municipal Journal, April 19, 10 cts.

STREET CLEANING AND REFUSE DISPOSAL

Street Cleaning Machine for Removing Sweepings from Gutters, 1-4 p., Municipal Journal, April 19, 10 cts.

Street Dust and Street Cleaning in Relation to Health, Comfort and Economy, By J. H. Landis, 5 pp., Bulletin, Ohio State Board of Health, March.

Fuel Briquets from Street Rubbish, Practice at St. Ouen, France, Southwark, England, and Amsterdam, Holland, 1-3 p., Municipal Journal, April 12, 10 cts.

Energy from Municipal Waste, Technology of Combustion and the Production of, By Frederick Meyer, 3 1-2 pp., La Technique Sanitaire, April, 50 cts.

Ashes, Removal of Domestic, at Rochester, 1-3 p., Municipal Journal, April 19, 10 cts.

Garbage Disposal, Control of, 1-2 p., Municipal Journal, May 3, 25 cts.

Value of New York's Garbage, Method of treating it; amount handled; costs and prices paid, 1 p., Municipal Journal, May 3, 25 cts.

TRAFFIC AND

TRANSPORTATION

Transportation Problem of Greater Cleveland, Paper before Cleveland Engineering Society, By A. B. Dupont, Illustrated, 2 1-2 pp., Canadian Engineer, April 20, 15 cts.

West Side Freight Traffic Problem in New York City, Illustrated, 2 1-2 pp., Engineering News, April 13, 15 cts.

London Traffic, By H. R. Wilson, 1 1-2 pp., Engineering News, April 13, 15 cts.

Plan for Elimination of West Side Surface Tracks, New York City, Illustrated, 2 1-2 pp., Engineering-Contracting, April 26, 10 cts.

Subway Construction in New York City, By D. J. Hauer, Illustrated, 3 pp., Contractor, April 15, 15 cts.

Methods of Constructing and Sinking the Steel Tubes for the Traction Tunnel at La Salle Street, Chicago, Illustrated, 4 pp., Engineering-Contracting, April 5, 10 cts.

Proposed Shuttle System of Subways for Chicago, Illustrated, 1 p., Engineering News, April 20, 15 cts.

Trolley Transit, Trackless, By C. O. Burge, 1 p., Engineering Record, April 29, 10 cts.

Surface Contact System of Tramways in Torquay, The "Dolter," Paper before Institution of Municipal and County Engineers, By H. A. Garrett, 1 1-2 pp., Surveyor, March 31, 40 cts. 1 p., Contract Journal, April 5, 20 cts. 2 pp., Canadian Engineer, April 20, 15 cts.

BRIDGES

Quebec Bridge, Illustrated, 1 p., Engineering Record, April 22, 10 cts.

Designs for the New Quebec Bridge, and the Accepted Design, Illustrated, 2 1-2 pp., Engineering News, April 20, 15 cts.

Bridge Construction in America, Some Observations on Recent, By H. S. Jacoby, 12 pp., Cornell Civil Engineer, April, 25 cts.

Viaduct, The Dallas-Oak Cliff, By V. H. Cochrane, Illustrated, 5 pp., Engineering-Contracting, April 5, 10 cts.

Lift-Span of the Hawthorne Avenue Bridge, Portland, Ore., Illustrated, 1 1-3 pp., Engineering Record, April 8, 10 cts.

Masonry Bridge, Improving an Old, By J. H. Garrett, Illustrated, 2 1-2 pp., Surveying, April 21, 20 cts.

Concrete Truss Bridge with 80-foot Span, Illustrated, 1 1-3 pp., Engineering Record, April 15, 10 cts.

Adaptation of Concrete to Long Span Bridges, Paper before Canadian Cement and Concrete Association, By F. Barber, 3 pp., Canadian Engineer, April 13, 15 cts. 1 1-2 pp., Engineering-Contracting, April 26, 10 cts.

Characteristics of Long-Span Concrete Bridges, Paper before Canadian Cement and Concrete Association, By Frank Barber, 1 2-3 pp., Engineering Record, April 8, 10 cts.

Concrete Bridges and Culverts in Iowa, 1 p., Engineering Record, April 8, 10 cts.

Reinforced Concrete Arch Bridge with Separately Molded Members, Illustrated, 1 p., Engineering News, April 13, 15 cts.

Steel Bridges, Standard American Methods of Erecting, By F. W. Skinner, Illustrated, 13 pp., Cornell Civil Engineer, April, 25 cts.

Main Street Steel Arch Viaduct Over O. K. Creek Valley, Kansas City, Mo., By Kenneth Hartley, Illustrated, 1 1-2 pp., Engineering News, April 13, 15 cts.

Suspension Bridge with Flat Cable of Riveted Plate Construction, Illustrated, 1 p., Engineering News, April 13, 15 cts.

Centering for the 281-foot Concrete Arch, Monroe Street Bridge, Spokane, Wash., Illustrated, 1 1-2 pp., Engineering-Contracting, April 19, 10 cts. Illustrated, 1 2-3 pp., Engineering Record, April 29, 10 cts.

Steel Centering Used in the Construction of the Rocky River Bridge, Cleveland, O., Paper before American Society of Civil Engineers, By W. J. Watson, Illustrated, 9 pp., Proceedings, April, \$1.00.

Piers, Some Mistakes and Mishaps in Designing and Constructing Foundations for Bridge, Paper before Engineering Society of Western Pennsylvania, By E. K. Morse, 5 pp., Engineering-Contracting, April 19, 10 cts.

Ferro-Concrete Pier Construction, From paper before Concrete Institute, By C. Percy Taylor, 2 pp., Surveyor, April 14, 40 cts.

MISCELLANEOUS

Civic Advance, Albany's, By W. B. Jones, Illustrated, 5 pp., American City, April, 10 cts.

The Pageant of the Perfect City, By W. C. Langdon, Illustrated, 16 pp., Playground, April, 25 cts.

Bucarest: A New Modern City in the Making, Illustrated, 5 pp., American City, May, 10 cts.

Municipal Improvements in Mexico, Encouraged by Federal Government; practically all by United States contractors. Water supply a difficult problem. Paving and gas, By W. D. Hornaday, 1 p., Municipal Journal, April 26, 10 cts.

Municipal Work at Prahran, Melbourne, From city surveyor's report, Illustrated, 2 pp., Surveyor, April 7, 40 cts.

Municipal Engineering Works, Torquay, Paper before Municipal and County Engineers, By H. A. Garrett, Illustrated, 6 pp., Surveyor, March 31, 40 cts. Illustrated, 3 pp., Contract Journal, March 29, 20 cts.

Development of Des Moines, By R. F. Weirick, Illustrated, 7 pp., American City, May, 10 cts.

Building, Municipal, Trenton, N. J., Illustrated, 9 pp., Architecture and Building, March, 20 cts.

Park Entrance and Public Comfort Station, Ornamental brick and stone structure, under which are shower baths and toilet rooms; details of construction and arrangement, By Chas. C. Casey, Illustrated, 2 3-4 pp., Municipal Journal, April 12, 10 cts.

Water Terminals, Development of New York City's, Communication from Calvin Tomkins, Commissioner of Docks, 1 p., Engineering News, April 13, 15 cts.

House Crowding and House Limitation, By Raymond Unwin, Illustrated, 3 pp., Municipal Journal, April 15, 15 cts.

Playgrounds, Statistics of, 10 pp., Playground, April, 25 cts.

Current Development of Municipal Recreation, By E. B. Mero, Illustrated, 1 pp., American City, April, 10 cts.

Play and Recreation Movement, By E. S. Martin, 7 pp., Bulletin, Ohio State Board of Health, March.

Trees, City's Duty to Its, By Wm. Solotoff, Illustrated, 3 pp., American City, April, 10 cts.

Smoke Abatement Methods and Progress in Chicago, From report by Paul S. Bird,

city smoke inspector, 1 2-3 pp., Engineering Record, April 15, 10 cts. 1 p., Engineering Record, April 22, 10 cts.

Drinking Fountain in Cambridge, Cost of, 1-1 p., Municipal Journal, April 19, 10 cts.

Automobile, Municipal Regulation of the, Paper before Nova Scotia Union of Municipalities, By L. H. Fowerty, 11-2 pp., Canadian Municipal Journal, May, 10 cts.

Municipal Control of Motor Vehicles, Paper before Nova Scotia Union of Municipalities, By A. M. McGregor, 2 1-2 pp., Canadian Municipal Journal, May, 10 cts.

Mayors, State Conference of, 1-1 p., Municipal Journal, April 19, 10 cts.

Testing Laboratory for the City of New York, General, 1-2 p., Engineering News, April 27, 15 cts.

Contracting Practice, By D. V. Moore, 2 1-2 pp., Municipal Engineering, May, 25 cts.

Report of the Committee on Uniform Contracts to the American Society of Engineering Contractors, 10 pp., Journal, March.

Profitable Refinements in Contractor's Compressed Air Plants, By Frank Richards, Illustrated, 2 1-2 pp., Engineering News, April 20, 15 cts.

Foundations, Experience in Constructing Sub-Structures and, From paper before Engineers' Society of Western Pennsylvania, By E. K. Morse, 1 1-3 pp., Engineering Record, April 15, 10 cts.

Drilling, Novel Method of Diamond, Using Cement Grout Instead of Steel Casing, Illustrated, 2 pp., Engineering-Contracting, April 26, 10 cts.

Paint, Rust Proof Slag, By E. C. E. Lord, 1-3 p., Engineering Record, April 29, 10 cts.

Cost Keeping System, Some Notes on, 1 1-2 pp., Contractor, April 15, 15 cts.

Civil Engineers, Licensing of, Bill introduced in the Alabama Legislature, 9 pp., Proceedings Engineering Association of the South, March, 50 cts. Resolution adopted by the Board of Direction of the American Society of Civil Engineers, 11 pp., Proceedings Engineering Association of the South, March, 50 cts.

Engineering School Graduate; His Strength and His Weakness, Paper before Congress of Technology, By H. P. Talbot, 2-4 p., Engineering News, April 20, 15 cts.

Massachusetts Institute of Technology, 1-4 p., Municipal Journal, April 19, 10 cts.

BOOK REVIEW

Municipal Chemistry. A series of thirty lectures by experts on the application of the principles of chemistry to the city, delivered at the College of the City of New York, 1910. Edited by Charles Baskerville. McGraw-Hill Book Company, New York, 1911. Cloth, 6½ by 9½, 526 pp. Price, \$5.

The thirty lectures comprising the chapters of this work were open to the public as well as to students, the latter doing laboratory work in connection with them, hence are somewhat popular in their nature. They are extremely interesting to the student of city affairs, and he need not be deterred from reading them through lack of knowledge of any but elementary chemical principles. The science of municipal chemistry, as defined by this work, involves chemical work, but deals largely with engineering matters. An introductory lecture by the Editor explains how the growth of cities and the consequent density of population have brought about the new problems, which are explained in the later lectures. The importance of pure water supply is indicated by the choice of drinking water and disease as the first topic for discussion. The water supply of New York is described and methods of purification in use elsewhere. The milk question is discussed by T. C. Darlington, ex-Commissioner of Health, New York. Lectures on pure food and food adulteration naturally follow. The adulteration of drugs, methods of detecting it and drug-forming agents are given in three chapters.

Showing the wide scope of the work, comes the subject of streets, prevailing forms of pavement construction being described. This leads up to the discussion of street sanitation, street cleaning and the various methods of disposing of garbage. The topics treated in the rest of the book have less connection with each other. They are: Sewage disposal, illuminating gas, smoke, ventilation, personal hygiene, textile materials, combustibles and explosives, paint, corrosion of iron and steel, cement and concrete, parks, gardens and playgrounds. As nearly all of the lecturers were men connected in some way with the New York City government, the book is a fairly complete account of the practices in that city. The book should be a valuable one for the members of boards of health and other city officials.

THE WEEK'S CONTRACT NEWS

Relating to Municipal and Public Work—Street Improvements—Paving, Road Making, Cleaning and Sprinkling—Sewerage, Water Supply and Public Lighting—Fire Equipment and Supplies—Bridges and Concrete Work—Sanitation, Garbage and Waste Disposal—Police, Parks and Miscellaneous—Proposals and Awards.

To be of value this matter must be printed in the number immediately following its receipt, which makes it impossible for us to verify it all. Our sources of information are believed to be reliable, but we cannot guarantee the correctness of all items. Parties in charge of proposed work are requested to send us information concerning it as early as possible; also corrections of any errors discovered.

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREET IMPROVEMENTS				
Pennsylvania	Altoona	May 12, 3 p.m.	Constr. about 85,000 sq. yds. street asphalt, asphalt block and brick paving.	W. M. C. Craine, Pres. B. P. Wks.
Florida	Jacksonville	May 12, 2:30 p.m.	Grading, curbing and paving with vitrified blocks of some standard brand various streets.	Philip Prioleau, City Engr. Joint Board Commissioners.
Indiana	Rushville	May 13	Constructing gravel road 36,830 ft. long.	C. W. Shoemaker, Sec'y Comrs.
Ohio	Fort Meigs	May 13, 2 p.m.	Constr. tar macadam roadway and constr. concrete sidewalks.	O. F. Graves, City Clk.
Iowa	Harlan	May 15, 8 p.m.	Constructing about 7,000 lin. ft. of concrete curb and gutter; 15,000 sq. yds. concrete pavement.	H. Chatfield, City Clerk.
Kentucky	Catlettsburg	May 15, 6 p.m.	Improving portions of various streets, including 14,555 lin. ft. curb and gutter and 20,305 sq. yds. paving.	John J. Monaghan, City Clerk.
New York	Lackawanna	May 15, 8 p.m.	Paving with vitrified brick portion of Ridge Road.	City Clerk.
California	Lodi	May 15	Macadamizing streets, cost of work about \$42,432.65.	Chas. J. Duff, City Clerk.
Iowa	Council Bluffs	May 15, 5 p.m.	Constructing about 1,611 lin. ft. combination curb and gutter, concrete 6 inches thick.	Morgan R. Butler, City Engr.
North Dakota	Carrington	May 15	Grading roads for year 1911.	James V. Mahony, Secy. Bd. C. & S.
Michigan	Port Hope	May 15, noon	Constructing 5 lin. miles concrete sidewalks and crossings.	J. W. Sanders, Town Clerk.
Wisconsin	Waukesha	May 15	Constr. about 4,620 sq. yds. asphalt macadam pavement; 270 sq. yds. brick gutters; 170 lin. ft. storm sewers; 4,796 lin. ft. concrete curb and gutter.	A. J. McKenzie, City Engr.
New York	Yonkers	May 15, 3:30 p.m.	Regulating, grad. and otherwise improv. various streets.	C. L. Miller, City Clerk.
Missouri	Webb City	May 15, 5 p.m.	Constr. 8,865 sq. ft. concrete sidewalk; 4,556 lin. ft. concrete combined curb and gutter; 2,500 sq. yds. brick block pavement; 11,744 sq. yds. asphalt macadam pavement.	I. H. Daniels, Village Clerk.
Michigan	Kalamazoo	May 15	Constr. 9,100 sq. yds. brick pavement on 6-in. concrete.	W. W. Caldwell, Commissioner.
Ohio	Greenwich	May 16	Excavating about 3,435 cu. yds., paving 11,709 sq. yds. water-bound macadam.	Roger G. McGrath, Secy. B. P. Wks.
Pennsylvania	Harrisburg	May 16, noon	Paving various streets with sheet asphalt or vitrified brick; cost of work about \$80,400.	Jacob L. Bauer, County Engr.
Kentucky	Louisville	May 16, 2 p.m.	Improving portion of Fulton street & pav. with granite block.	Geo. C. Love, Comr. Dept. Sts
New Jersey	Elizabeth	May 16, 3:30 p.m.	Constructing 27,594 sq. yds. asphalt concrete, macadam or bitulithic pavements, 3,230 lin. ft. concrete retaining slab, and 600 tons crushed stone.	Francis G. Ward, Commissioner.
Tennessee	Memphis	May 16	Constructing 5.1 mi. gravel paving, 3.9 mi. tar macadam, 1.4 vitrified brick, 2.9 wood block or bit. and 1/2 mi. old stone.	Fred Cary, City Clerk.
Ohio	Columbus	May 17	Grading and macadamizing various roads in Franklin County.	H. W. Becker, Clk. Bd. Pub. Wks.
New York	Buffalo	May 17, 11 a.m.	Paving and repaving various streets and alleys.	Stanley Struble, Pres. Co. Comrs.
Minnesota	Little Falls	May 17, 8 p.m.	Paving with creosoted wood blocks the Boardway wagon bridge over Mississippi river.	Joshua C. Haines, Chm. Police Com.
Indiana	Ft. Wayne	May 18, 7:30 p.m.	Constr. cement sidw. in 14 sts.; and paving various streets.	Robt. W. Craig, Secy. Bd. Control.
Ohio	Cincinnati	May 19, noon	Constr. Compton rd. in Hamilton Co.; mac. exten. of Strubler rd.	H. B. R. Craig, City Engineer.
New Jersey	Camden	May 19, 8 p.m.	Constructing cement sidewalks and driveways.	A. P. Tripp, Town Clerk.
Arizona	Phoenix	May 20	Constr. territorial road from Tucson to Bisbee.	John F. Goldenbogen, Clk. B. C. C.
Ontario, Can.	Kingston	May 20, noon	Constructing 6,160 sq. yds. pavement; 2,276 lin. ft. curb and gut.	C. W. Handman, Business Manager.
New York	Chatham	May 20	Constructing a section of highway known as Rowe Hill.	J. S. Hanlon, City Clerk.
Ohio	Cleveland	May 20, 11 a.m.	Grading, draining and improving portion of Settlement Road.	F. W. Tean, County Auditor.
Ohio	New Philadelphia	May 22	Paving the New Cumberland Road with brick.	Budroe, Sec'y Bd. Pub. Service.
Ohio	Cincinnati	May 22, noon	Grade, cement park lot surrounding Public School.	The George Company, Ran. Bldg. Memphis, Tenn.
New York	Auburn	May 23	Constructing subways in portion of Washington street and paving same with vitrified brick.	A. G. Fisher, County Auditor.
Ohio	Bowling Green	May 23, 1 p.m.	Grading, draining and macadamizing county road.	
Ohio	Dayton	May 24, noon	Paving 16 streets and 2 alleys.	
Mississippi	Hazlehurst	June 1	Constructing 58 miles of gravel roads in Copiah County.	
Indiana	Monticello	June 7, noon	Construct. a rock road on County line bet. White & Carrol Cos.	
SEWERAGE				
N. B. Can.	St. John	May 12	Furn. vit. salt glazed sewer pipe for the village of Fairville.	Gilbert C. Murdoch, County Engr.
Alabama	Auburn	May 13, 8 p.m.	Constructing about 7,423 ft. 8-in. sanitary sewers.	J. W. Wright, Mayor.
New York	Batavia	May 13, 10 a.m.	Constructing sewage disposal plant.	K. B. Mathes, Chm. Bd. Sew. Com.
Oregon	The Dalles	May 13	Construct. a section of Dist. No. 1 sewer system, cost about \$225,000.	L. T. Boyle, City Engineer.
South Dakota	Aberdeen	May 15, 8 p.m.	Construct. 1,860 ft. of 8 and 12-in. pipe sewers.	F. W. Raymond, City Auditor.
Nebraska	South Auburn	May 15, 6 p.m.	Constructing about 1,400 ft. of 8-in. sewer.	City Clerk.
Indiana	Auburn	May 15, 7:30 p.m.	Constructing about 10,000 ft. of from 20-in. vitrified to 42-in. concrete storm sewer.	E. O. Little, City Clk.
Ohio	Xenia	May 15	Constructing sanitary sewer system on the new Greene Co. Children's Home grounds.	Walter L. Dean, County Aud.
Alta. Can.	Edmonton	May 15, 3 p.m.	Constructing in tunnel a concrete sewer 10 ft. 6 in. in internal diameter and about 3,290 ft. long.	A. J. Latonell, City Engineer.
New York	Fulton	May 15, 9 a.m.	Construct. 8,500 ft. of 8-in. vitrified pipe sewer; 900 ft. 10-in., 4,500 ft. 7.6-in., 20 manholes, 14 flush tanks, 400 Y branches.	Board of Public Works.
Ontario, Can.	N. Toronto	May 15, 6 p.m.	Constructing main sanitary sewer pipes, manholes, etc., in various streets.	A. J. Brown, Mayor.
Virginia	Norfolk	May 16, 12:30 p.m.	Installing 3 electrically driven sewer pumps, including electric apparatus, switchboard, etc.	W. T. Brooker, City Engr.
Wisconsin	Reedsburg	May 17	Constr. 3,000 lin. ft. of 18 and 30-in. trunk sewers.	A. H. Huebig, City Clerk.
Wisconsin	Antigo	May 17, 2 p.m.	Constr. 11,537 ft. of 10, 18, 20 and 24-in. pipe sewer and dis. plt.	G. O. Palmieri, City Clerk.
Wisconsin	Baraboo	May 17	Constructing trunk sewers, 3,000 lin. ft. 30 and 27-in. pipe.	A. H. Huebig, City Clerk.
New Mexico	East Las Vegas	May 17, 4 p.m.	Constr. 19,750 lin. ft. 8-in. vitrified sewer; 3,350 lin. ft. 10-in. and 100 lin. ft. 15-in.; 50 manholes; 12 single flush tanks com.	Chas. Tammie, City Clerk.
Ohio	F. Youngstown	May 22, noon	Constructing sanitary sewer.	J. P. Carney, Village Clerk.
Oklahoma	Muskogee	May 23	Constr. 21,200 ft. of 48-in. sewer pipe; 6,500 of 45-in. and 7,100 of 42-in. Alternate bids for two ring brick with vitrified invert and manufactured concrete pipe.	City Clerk.
Ohio	Amherst	May 23	Constr. a small sewer system and sewage disposal plant.	C. G. Aschenbach, City Clerk.
Maryland	Frederick	May 24	Constr. about 4,000 lin. ft. 6-in. to 42-in. sewers with inlets, m.h.	J. Edward Schell, Mayor.
Pennsylvania	Williamsport	May 24	Constructing storm water sewers in various streets.	J. J. Galbraith, City Clerk.
New York	Binghamton	May 24	Constructing sanitary sewers in various streets, about \$15,000.	Board of Contract and Supply.
Ohio	Dayton	May 24, noon	Constructing sanitary and storm sewers in various streets.	J. C. Ely, Dir. Pub. Service.
Kansas	Leavenworth	May 31, noon	Constructing main storm water drain in the college section.	Capt. John S. Winn, Act. Q., U.S.A.
New York	S. Glens Falls	June 1	Constructing a sewer system and disposal plant.	C. W. Skym, Village Clerk.
New York	Fort Hamilton	June 2, 11 a.m.	Constructing a sanitary sewer.	Constructing Quartermaster.
California	San Jose	July 3	Construct septic tank for County hospital.	City Clerk.

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
WATER SUPPLY				
Ohio	Rockport	May 12	Constructing water mains.	F. Feuchter, Clerk.
Iowa	Sioux City	May 13, 10 a.m.	Furnishing valves and hydrants.	G. B. Healy, Supt. P. & P. Prop.
Massachusetts	Holyoke	May 15, noon	Constr. a conc. dam across Manli. Brook in Southampton	Water Commissioners
Massachusetts	Pittsfield	May 15, 2 p.m.	Laying water pipes.	Board Public Works
Iowa	Tipton	May 15, 7:30 p.m.	Drilling an artesian well.	C. H. Foy, City Clerk
New York	New York	May 16, 11 a.m.	Construct. portions of the city tunnel of the Catskill aqueduct.	Chas. Strauss, Pres. Bd. W. Sup.
Minnesota	Eveleth	May 16	Furn. 12,500,000 gal. capacity, high duty pumping engine of the crank and flywheel type.	D. P. McIntyre, City Clerk.
California	Fort Mason	May 17, 11 a.m.	Constr. a 6,000,000-gal. reinforced concrete reservoir.	Col. Geo. McK. Williamson, Con. Q. M.
Michigan	Marquette	May 20	Building 2 concrete dams on Dead river and other improvements to the hydroelectric plant. Cost about \$100,000.	Chas. Retaille, Supt. L. & P. Com.
Ohio	Silverton	May 22	Laying a 6-in. water main in portions of several streets.	A. A. Sprague, Village Clerk.
Minnesota	N. Mankato	May 22, 7:30 p.m.	Constructing a water works system. Alternate bids on electric pumping equipment and gasoline. Separate bids on reservoirs, pump house, pumping equipment, water mains and well.	L. Donohue, Village Clerk.
California	San Diego	May 22	Furn. 8,536 lengths of 4 water pipe from 8 to 36-in.	P. E. Woods, Supt. Water Dept.
Illinois	Stanford	May 22	Constructing water works system.	W. C. Murphy, Village Clerk
New York	New York	May 23, 11 a.m.	Completing the Hudson siphon.	Board Water Supply.
Wisconsin	La Crosse	May 23, 2 p.m.	Furn. c. 1 pipe, hydrants, valves, etc.	Board Public Works.
Virginia	Ft. Meyer	May 25, 11 a.m.	Constr. about 2 miles of 10-in. water mains.	Capt. Warren W. Whiteside, C. Q. M.
California	Los Angeles	May 26	Furn. fabricated steel and rivets necessary to con. abt. 1,865 ft. of 9-ft. 3-in. and 8,313 ft. of 11-ft. riveted steel siphon.	Board of Public Works.
Ohio	Toledo	May 26, noon	Furn. rotary pump, 15,000,000 gals. daily; also bituminous coal gas producer and accessories, about 400 h.p. continuous capacity.	Fred Shane, Sec'y Bd. Pub. Service.
Ontario, Can.	Ottawa	May 29, 4 p.m.	Constr. a dam and spillway at Kipewa Village, Pon. Co., Quebec	R. C. Desrochers, Secy. D.P.W., Ott.
Brit. Col., Can.	Vancouver	May 31, 4 p.m.	Furn. steel pipe, 1 pipe; also 18-in. flexible joint c. i. pipe.	Wm. McQueen, City Clerk.
Wyoming	Ft. Yellowstone	May 31, noon	Constructing pipe line from Panther Creek to Ft. Yellowstone water system.	Constructing Quartermaster.
Ontario, Can.	Toronto	June 6	Furnishing vertically driven pumps.	C. H. Rust, City Engr.
BRIDGES				
New York	Richmondville	May 12, 1 p.m.	Construct. an iron, conc. arch, or stone bridge.	G. C. Shafter, Town Clerk.
Massachusetts	Barnstable	May 13	Constr. a reinforced concrete bridge over West Bay, 289 ft. long 20 ft. wide, with steel draw span.	F. C. Wales, Boston, Mass. Engr.
Ohio	Sidney	May 13, 10 a.m.	Constructing superstructure for one steel highway bridge, 75 ft. long, over Mosquito Creek.	H. T. Ruese, County Auditor.
Wisconsin	Milwaukee	May 15	Constr. the Oneida-Wells St. Bridge, cost about \$120,000.	L. J. Klug, Supt. of Bridges.
Ohio	Delaware	May 15, noon	Constr. east abutment of the Sunbury Pike bridge over Alum Creek in Berlin township.	W. H. Bodbetha, County Auditor.
Pennsylvania	West Chester	May 15, noon	Constr. a reinf. conc. bridge at Springdale station over Doe Crk	E. V. Phillips, Clk. Co. Comrs.
Ohio	Columbus	May 16, noon	Constr. the approaches and superstructure of the Wilson Bridge over Olentangy river.	F. M. Sayre, County Auditor.
Utah	Moab	May 20	Constructing a bridge over Grand river.	A. A. Neff, County Clerk.
Pennsylvania	Washington	May 22, 1:30 p.m.	Constructing four reinforced concrete bridges.	John H. Moffitt, Co. Comptroller.
Ohio	Lorain	May 22, 1 p.m.	Constr. substructure and superstructure of four bridges.	Chas. Chandler, Clk. Co. Comrs.
Ohio	Cincinnati	May 29, noon	Driving piling for the construction of substructure and miscellaneous work in connection with Gilbert ave. Viaduct.	John I. Wenner, Clk. Bd. Pub. Serv.
Pennsylvania	Pittsburg	June 1	Widening Smithfield Street Bridge, cost about \$150,000.	City Clerk.
New York	New York	June 1	Strengthening the end spans of the Williamsburg Bridge.	Kingsley L. Martin, Comr. of Br.
Pennsylvania	Pittsburg	July 1	Constructing one concrete arch, estimated cost \$85,000.	City Clerk.
LIGHTING AND POWER				
Manitoba, Can.	Winnipeg	May 15	Furn. and install. six 500 KW stepdown transformers for substation No. 1.	M. Peterson, Secy. Bd. Control.
Missouri	Columbus	May 16	Constructing an electric lighting and power plant.	John S. Bicknell, City Clerk.
California	Riverside	May 24	Franchise to run poles and line for conveying electric power on all roads of county.	County Supervisors.
FIRE EQUIPMENT				
Washington	Centralia	May 16, 5 p.m.	Furn. one combination chemical hose and ladder or chemical and hose, automobile.	W. H. Hodge, City Clerk.
California	Oakland	May 17, 11 a.m.	Furn. 3 combination chemical hose wagons; 3 third size steam fire engines; 1 motor driven pumping engine; 3 motor-driven combination chemical and hose wagons, and fire hose.	Jas. W. Nelson, Sec'y Bd. Pub. Wks.
Oregon	Astoria	May 27, 8 p.m.	Furn. 1,200 ft. 2 1/2" fire hose for Fire Dept.; 200 ft. for Street Dept.	C. E. Foster, Chief Fire Dept.
New Jersey	Princeton	July 5	Furn. auto pumping engine.	E. M. Updike, Chm. F. & W. Com.
MISCELLANEOUS				
New York	Albany	May 15, 3 p.m.	Installing police signal system.	Isidore Wachsman, Bd. Cont. & Sup.
New Jersey	Passaic	May 19, 8 p.m.	Install Police Signal, Fire Alarm and Mun. Tele. Exchange.	M. B. Matthews, Chm. Com. Pub. S.
Ohio	Mount Gilead	May 19, 11 a.m.	Furn. iron culvert pipe from 8 to 48-in. diameter.	Clint Sippe, County Auditor.
California	Oakland	May 22, 10-11 a.m.	Constructing City Hall Building, separate bids on 27 items.	James W. Nelson, Secy. Bd. Pub. W.
Ohio	Youngstown	May 23, 11 a.m.	Renewing part of the floor of the Market St. Viaduct.	Will B. Jones, County Auditor.
Ontario, Can.	Toronto	May 23, noon	Building dock in Ashbridge Bay.	G. R. Geary, Mayor.
Indiana	Indianapolis	May 25	Removing garbage.	Chris Schrader, Chm. Bd. Pub. Wks.
Indiana	Evansville	June 1	Furnishing plans for building to be erected in Sunset Park.	Simon A. Bartholme, Clk. B. P. C.

STREET IMPROVEMENTS

Fort Smith, Ark.—Council is considering paving of Garrison ave.; creosote block paving is favored.

Fullerton, Cal.—Consulting Engineer D. S. Halladay, Central Bldg., Los Angeles, has prepared plans for 13 miles of oil macadam roadway; cost \$178,000.

Oakland, Cal.—Plans have been prepared by City Engineer Turner for improvement of 7th st. from Bay st. to Fallon, the work to be done simultaneously with the improvement of the 7th st. line of Southern Pacific Co.

Oakland, Cal.—Council has adopted plans and resolutions of intentions for improving portions of eight streets.

Kissimmee, Fla.—City desires street paving material. Address C. W. Dann, Box 217, Chairman.

Danville, Ill.—Bids will be received until about May 15 by Board Local Improvements for 7,000 sq. yds. vit. brick pavement on Oakwood ave.—W. E. Wynn, City Engineer.

Peoria, Ill.—Board of Local Improvements is considering construction of cement sidewalks at cost of \$11,000.

Quincy, Ill.—Mayor John F. Gardner has recommended resurfacing streets.

Fort Wayne, Ind.—Board of Public Works has ordered plans for paving Clinton, Leith and Hoagland sts.

Marion, Ind.—County Commissioners are considering construction of gravel road in Fairmont Township.—Fremont Wilson, Engineer.

Princeton, Ind.—Council has instructed the City Engineer to make plans for widening four streets of the public square about 11 ft.

Lawrence, Kan.—Council has adopted ordinance for paving Lee st.

Lexington, Ky.—All bids for the construction of macadam streets on Clay, Ashland, Bryan, Kentucky and Oldham aves. from High to Euclid; Lexington ave. from Maxwell to Adams; Woodland ave., Euclid to Columbia, and Columbia ave., Rose st. to Woodland ave., have been rejected and the Mayor instructed to advertise again for bids; chairman of the Board of Public Works will advertise for bids for 7,000 tons of cracked rock and for 1,000 tons screenings, also bids for furnishing and spreading 100,000 to 175,000 gals. of oil for spreading on streets of city.

Baltimore, Md.—Citizens have voted \$5,-

000,000 loan for paving and \$2,500,000 for paving in annex.

Detroit, Mich.—Contracts will soon be let for paving Iroquois ave., Waterloo st. and alley between John and Brush sts.; cost about \$12,000.

Ludington, Mich.—Grant Township has voted \$9,000 bonds to build gravel roads.

Duluth, Minn.—Specifications have been prepared for paving Grand ave. and bids will soon be asked.

Little Falls, Minn.—All bids opened April 24 for paving with creosoted wood blocks the Broadway wagon bridge over the Mississippi River have been rejected; new bids will be received. Fred Cary, Clerk.

Bozeman, Mont.—Council has adopted specifications and will at once ask bids for cement work for city during coming year.

Columbia, Mo.—City Engineer J. Russell Ellis will prepare plans for 4,000 to 5,000 sq. yds. of brick pavement; also several thousand sq. ft. of concrete sidewalks.

Linneus, Mo.—Linn County has voted \$18,000 bonds for road improvements.

Hastings, Neb.—Council has ordered paving of St. Joe ave. with brick and asphalt.

Elizabeth, N. J.—Council is considering paving of Monroe ave., Julia st. to North ave.

Englewood, N. J.—Council has decided to pave Dean and Eagle sts. and Palisade ave. Haddonfield, N. J.—Needed street paving is estimated at 210,219 sq. yds. by Remington & Sartori, Borough Engineers.

Jersey City, N. J.—Board of Finance is considering \$45,786.60 appropriation for repaving of Summit ave., Five Corners to Secaucus road, \$51,666.80 for widening same thoroughfare and \$7,195.25 for repaving Sherman pl.; Street and Water Board has approved specifications for improvement of St. Paul ave., Summit to Skillman ave.

Lakehurst, N. J.—State Road Commissioner Stevens has approved specifications for Brown's Mills and Lakehurst gravel road; work will be begun at early date.

Plainfield, N. J.—Borough Engineer H. C. Van Emburgh has estimated cost of widening Somerset st., Jackson ave. to Johnston's Drive, at \$21,000.

Trenton, N. J.—Bids will be asked for macadamizing Behm st.—H. B. Salter, City Clerk.

Woodbridge, N. J.—Township Committee has received from Engineer Forest L. Smith plans for the macadamizing of Holton st. and Cliff road, Seward; Ridgedale and Prospect aves., Edgars, and Mutton Hollow road at High Hill.

Albany, N. Y.—Council is considering paving of portion of Mercer, Sherman and Providence sts.

Herkimer, N. Y.—Board of Trustees has adopted resolution favoring paving of South Washington st.

Little Falls, N. Y.—Council has ordered paving of South st., Albany and East Main sts.

Whitesboro, N. Y.—Town Board has apportioned highway money from State among various roads as follows: The Utica-Rome road, running west from Whitesboro corporation line through Oriskany to town line, \$1,000; Madden road, running from Clark Mills to Whitesboro, \$800; stone road to Oriskany, \$300; the road running from the Utica-Rome road to Westmoreland line, \$300.

Marble, N. C.—Bids will be received by the Highway Commission for \$12,000 bonds.—J. M. Kilpatrick, Secretary.

Wilmington, N. C.—New Hanover County will vote May 31 on \$50,000 of bonds for road and bridge improvements and construction.—D. McEachern, Chairman County Commissioners.

Akron, O.—Market st. from Canal st. to High st. is to be paved with stone block.

Baker City, Ore.—Paving of Washington st. is being considered.

Eugene, Ore.—Council has ordered mile of street paving.

Hillsboro, Ore.—City Council has informally accepted plans for street improvements and sewers submitted by City Engineer; estimated cost of the work is a little over \$142,000.

St. Johns, Ore.—Council has adopted specification providing for the paving of Jersey ave. with westrumite at cost of \$29,000.

West York, Pa.—Furnishing stone for borough streets, to Myers & Gise, 82½¢ per perch of 2,500 lbs. for sizes 1, 2, 3, and 75¢ per perch for spalls.

Germantown, Tenn.—Citizens will vote on \$3,000 bond issue for street and sidewalk improvements, bridge construction, etc.

Farmersville, Tex.—Citizens have voted \$10,000 bonds for permanent street improvements.

Tyler, Tex.—Smith County will vote on \$10,000 road improvement bond issue.

Boynton, Va.—Mecklenburg County will vote June 17 on \$50,000 bonds for road improvements in Lacrosse Magisterial District and \$50,000 for road improvements in South Hill District.

Marion, Va.—Rich Valley District will issue \$100,000 bonds for good roads.

Newport News, Va.—Council has adopted following appropriations for street improvements: Curb and gutter, 25th st., West and Washington aves., \$225; curb and gutter, 25th st., Washington ave. and Huntington ave., \$400; curb and gutter and macadamize West ave., 25th st. to 35th st., \$3,000; putting crushed stone on Warwick ave., 22d st. to 25th st., \$1,200.

Newport News, Va.—Additional improvements to the city streets are provided for in recommendations made to Finance Committee by Council Committee on Highways, and Sewers.

Petersburg, Va.—Council has decided to ask for bids for 10,000 sq. yds. of additional sidewalk paving.

Bellingham, Wash.—Bids will be asked for building concrete sidewalks on Grand st. at cost of \$7,000.

Ellensburg, Wash.—Council has decided to pave with asphalt Pearl and 4th st. districts at cost of \$61,271.

Raymond, Wash.—Pacific County Commissioners will ask bids for completion of State aid road between Frances and Wallace; distance 5½ miles; \$30,000 available.

Spokane, Wash.—Plans for 16 new street improvements, estimated to cost \$217,771, have been completed by City Engineer Merion Macartney and submitted to Commissioners for approval by Commissioner of Public Works D. C. Coates.

Lumberport, W. Va.—Town is considering issuance of \$10,000 bonds for street improvements.

CONTRACTS AWARDED

Los Angeles, Cal.—Improving Bonnie Brae st., First st. to Ocean View ave., to Barber Asphalt Paving Co., \$12,786; improving 16 streets between Figueroa st., to Benjamin E. Ford, \$11,142; Micheltoreno st., between Sunset Blvd. and Ellie st., to Walter Overell, \$11,335; Sunset Blvd., between Marion ave. and city line, to Chas. H. Mattern, \$16,500; Flower st., from Temple to 3d st., to the Barber Asphalt Paving Co., \$34,377; Crenshaw Blvd., between Pico and Washington sts., to Fairchild, Gilmore, Wilton Co., \$24,522; 16th st., between Figueroa st. and Pacific ave., to Barber Asphalt Paving Co., \$53,479.

Washington, D. C.—To Cranford Paving Co., 2620 E. st. N. W., for asphalt resurfacing and repairing.

Jacksonville, Fla.—Resurfacing a portion of Lem Turner road, to the Engineering and Paving Co., city; bid submitted was as follows: Grading with teams, 21c. per cu. yd.; with shovel, 15c.; paving and curbing complete, \$1.29 per sq. yd.; other bidders: Atlantic Bitulithic Co., paving \$3.20 per cu. yd., with asphalt; grading, \$45. 20c. per cu. yd.; resurfacing, No. 1, \$1.08; No. 2, \$1.15; No. 3, \$1.35 per sq. yd.; J. C. Rock, Philadelphia, asphalt macadam, \$2 per cu. yd.; grading, 17c. per cu. yd.; resurfacing, 99c. and \$1.11 per sq. yd.; Alabama Paving Co., Birmingham, paving with brick, \$1.24 per sq. yd.; grading, \$27.15 per yd. and 18c. for vit. per lin. ft.; Continental Asphalt and Engineering Co., asphalt macadam, \$2.25, flint rock, per cu. yd.; grading, \$20.12 cu. yd.; resurfacing, \$1.04, \$1.15 and \$1.33 per sq. yd.

East St. Louis, Ill.—Improving 35th st., to Meyer Construction Co., \$16,473.50.

Harvard, Ill.—To A. E. Rutledge, Rockford, for paving with brick 12,560 sq. yds., \$22,899.

Macomb, Ill.—Paving with brick Adams st., to P. H. Tiernan, \$1.22 per sq. yd.

Emporia, Kan.—Paving 12th ave. and Rural st., to E. C. Bollweg & Co., \$68,021.

Wichita, Kan.—Paving with wood block Washington st., to Jersey Paving Co., \$2.74 per sq. yd. for using block of Barber Asphalt Paving Co., and \$3.01 per sq. yd. for using United States Wood Preserving Co.'s block.

Maysville, Ky.—To H. H. Kapps, Portsmouth, O., for building 5,700 sq. yds. of brick streets, \$1.89 per sq. yd.

Mt. Sterling, Ky.—Council recommended to Street Paving Commission to accept bid of the J. H. Spaul Co., of Dayton, O., to brick 12,000 sq. yds. of street in business section.

Louisville, Ky.—Construction of vit. block streets, to cost about \$35,000, by the Board of Public Works: 28th st., Market to Jefferson, to L. R. Figg & Co., \$1.78 per sq. yd.; 17th st., Payne to Oak, to G. W. Gosnell, \$1.85 per sq. yd.; Payne st., to G. W. Gosnell, \$1.80 per sq. yd.; Market st., 34th to city limits, to Jefferson County Construction Co., \$1.85 per sq. yd.

New Orleans, La.—For subsurface, etc., on Hancock st., Burgundy to St. Claude, to C. Hyland, \$1,526.20; other bidders: Standard Paving and Contracting Co., \$4,841.80; Barber Asphalt Co., \$5,087.90; paving Hancock st., in the same area, to Standard Paving and Construction Co., \$6,456; subsurface drains, etc., on Dryades st., St. Andrew to Philip, to C. Hyland, \$5,251.20; other bidder: Barber Asphalt Co., \$5,369.50; paving Dryades, in the same area, to Barber Asphalt Co., \$16,325.

Baltimore, Md.—Paving, to Martin J. Beach for vit. blocks on north side of O'Donnell st., \$13,499; to Wm. Elder, 229 St. Paul st., for asphalt on Edmondson, Carrollton aves., Mulberry, Oliver, High, Aisquith sts., \$46,106; with vit. blocks, Fulton ave., Hollis st., \$24,750; with granite, Fremont, Barre, Lombard sts., \$33,763.

Fall River, Mass.—Paving blocks for use of the highway department for the year as follows: No. 1 blocks, to George Ross, 30,000; to Henry Savoie, 100,000; to Cote & Desrosiers, 50,000; to Jerry H. McCarthy, 30,000; to Willard M. Pettey, 15,000. No. 2, to Flavien Cote, 30,000. No. 3, to Henry Savoie, 50,000.

Jackson, Mich.—To Kneal & Ryan, Lansing, for paving Horton and Mechanic sts., \$21,000; Nelsonville block will be used.

Jackson, Miss.—By Hinds County Commissioners, to Worthing Construction Co., to construct 20 miles of roads.—Mayes Cooper, Engineer.

Moorestown, N. J.—Macadam roads on Central ave. and on N. Church road, to J. F. Stanley Co., Philadelphia, Pa., \$7,587

Newark, N. J.—South 13th st., from Avon to Madison aves., with bitulithic, to Standard Bitulithic Co., \$5,466; Ave. A, from Emmet to Palmer st., \$12,561; and Branford st., from Elizabeth to Frelinghuysen ave., \$8,050, to the Jersey Paving Co.; for grading, curbing and flagging Woodside ave., from Elwood to Delavan ave., at \$3,591, to Philip and Peter Jannarone; for grading, curbing and flagging Mead st., from Silver to Ocean ave., \$2,087, and Ave. C, from Emmet to Vanderpool st., to Maher McNicholas, \$2,621.

Perth Amboy, N. J.—Paving with bitulithic Davidson ave. and Sheridan st., to Standard Bitulithic Co.; excavation, 86c. per cu. yd.; concrete, \$5.50; new curbing, 7c. per lin. ft.; Warren bitulithic paving, \$1.45 per sq. yd.

Trenton, N. J.—To McGovern Construction Co., lowest bidder, for paving following streets with fibertine: Charles, from Anderson to Division; Perry, from water power to Fair; Prospect, from Lutherford to Reading Railroad; Mercer, from Montgomery to Market; Whittier, from Stuyvesant to Parkside; Genesee, from Dye to Cedar; Hoffman, from Stuyvesant to Reading Railroad; Allen, from Broad to Montgomery.

West New York, N. J.—Furnishing all material and labor required for grading and constructing streets and sidewalks upon the property of the West New York Improvement Co., to Joseph Murphy & Son, Inc., 308 Charles st., West Hoboken, \$65,000.

Albany, N. Y.—Improving streets, to Goldsmith C. Stephens: West Lawrence st., Kent st. to Central ave., \$11,947.69; West st., \$7,593.30, and West Lawrence st., Western to Madison ave., \$1,942.75.

Albany, N. Y.—County Highway No. 495, Monroe County, to Hucknall Contracting Co., Albion, \$51,200; No. 497, Monroe County, to Monroe Roads Co., Pittsford, \$16,000; No. 502, Monroe County, to Monroe Roads Co., \$52,705; No. 538, Monroe County, to Julius Frederick Co., Rochester, \$77,900; No. 573, Monroe County, to A. J. Rockwood, Rochester, \$62,190.18; No. 394, Orleans County, to Hucknall Construction Co., Albion, \$21,300; No. 395, Orleans County, to Rhody Tyler, Albion, \$45,000; No. 5118, Orleans County, to Hucknall Construction Co., \$20,616.60; No. 5119, Part 3, Jefferson County, to Burns Bros. & Haley, Watertown, \$30,978; No. 5120, Part 2, Madison County, J. H. Widman, Syracuse, \$35,100; No. 5121, Chenango County, to Thomas F. Shaughnessy & Co., Albany, \$65,400; No. 840, Oneida County, to Thomas F. Shaughnessy & Co., \$56,400; No. 5122, Tompkins County, to Thomas F. Shaughnessy & Co., \$36,400; No. 5123, Montgomery County, to Olin T. Benedict, Pittsfield, Mass., \$41,000; No. 5124-5125 combined, Montgomery County, to James E. Martin, Poughkeepsie, \$88,983; No. 5126, Montgomery County, Thomas Karr, Troy, \$25,470; No. 5127, Wayne County, to Chambers & Truesdale, Rochester, \$27,990.

Canajoharie, N. Y.—Paving Church st., to Acme Engineering and Construction Co., Schenectady, \$14,800.

Long Island City, L. I., N. Y.—Repairing asphalt pavements from April 15 to Dec. 15, to Warren Quinlan Asphalt Co., \$13,245, and for grading, curbing and laying sidewalks on Radde st., to Astoria Contracting Co., \$5,113.

Lockport, N. Y.—Building sandstone curb and gutter, two streets, to C. N. Stainthorpe & Co., \$1,390.

Poughkeepsie, N. Y.—To C. W. Crockett, Torrington, Conn., for laying 44,000 sq. ft. of cement walk, 17c., and 1,900 lin. ft. of curb, 54c.; other bidders: John Martin, 17c. and 65c.; Concrete Construction and General Contracting Co., 16c. and 55c.

Rochester, N. Y.—Bloss st. asphalt pavement, to Rochester Vulcanite Pavement Co., \$17,966; Gillette st. cement walks, to Wm. Baker, \$897, and Burrows st., \$335.75; Sylvester st., to John J. Regan, \$1,326; Sherwood ave. asphalt pavement, to Rochester Vulcanite Co., \$8,709.50.

Schenectady, N. Y.—General repairs to city streets, to Schenectady Contracting Co.; new concrete, 6 in. deep 64c. per sq. yd.; surface patching, \$2.16 per sq. yd. for holes less than 100 sq. yds. and \$1.80 for holes of 100 yds. or over; paving Chrysler ave., from Ostrander pl. to city line, to the Union Paving Co.; excavation, 45c. per yd.; asphalt, \$2.20 per yd.; curbing, 82c. per ft.; water taps, \$6.50; water and sewer connections, 55c. per ft.; catch basins, \$95 each; 8-in. sewer pipe, laid, at 45c. per ft.; to Valley Stone Co. for crushed stone, \$1.15 per ton for all sizes and 95c. per ton for screenings.

Windsor, N. Y.—Furnishing traction engine, to Monarch Co., Graton.

Yonkers, N. Y.—To Kearns & Hart for asphalt paving repairing, by Board of Contract and Supply, \$2.51 per sq. yd. for class A, \$1.61 per sq. yd. for class B, and \$1.25 per sq. yd. for class C.

Bowling Green, O.—Constructing road two miles long between Henry and Wood counties, to Goetschins Stone Co., \$11,214.

Cincinnati, O.—To Warren Bros. for completing paving of Clifton ave., approximate area of 5,000 sq. yds., \$2.30 per sq. yd.

Oklahoma City, Okla.—Paving, to Western Paving Co., for Ave. D, Walton to Robinson, \$12,656.25; to Cleveland Trinidad Co., Ohio ave., A to E; Walker, from D to G; Hudson, from 4 to 9; Agnew, from C to Central; A from Stiles to Robinson; Stiles, from A to E; C, from Blackwelder to Walker, \$365,465.76.

Medford, Ore.—Paving 250,000 sq. yds., to Clark & Heney Construction Co., about \$500,000.

McKeesport, Pa.—Improving 5th and 6th aves., to Bowmen Bros. Co., \$11,895.50 and \$2,917.52.

Chattanooga, Tenn.—By Board of Public Works, for paving number of streets in Ninth Ward, to West Construction Co., \$93,172.16.

Dallas, Tex.—Paving three streets, to F. O. Brown, \$7,381.30; Oak lane, \$1,836.30; 2d ave., \$12,971.33; material will be of asphaltic macadam.

Petersburg, Va.—Laying 10,000 yds. concrete sidewalk pavements, to Coleman Construction Co., \$1.01 per sq. yd.; paving roadway of West Table st. with Belgian block, to Perkinson & Finn, \$2.97 per sq. yd.

Everett, Wash.—Improvement of Districts 243 and 245, to Atlas Construction Co., \$26,415 and \$9,990.

Brantford, Ont., Can.—Laying vit. block pavement with cement base between and on each side of car rails, to P. H. Secord & Sons, Ont., \$2.24 per sq. yd.

Brandon, Man., Can.—To Ontario Asphalt Block Co. for 32,351 sq. yds. asphalt block, \$109,669, excavation included; other bidders: Shepley & Fielding, \$108,375 for 3-in. wood block; Bloomer Co., \$82,495 for granitoid and \$95,435 for bitulithic; National Paving Co., sheet asphalt, \$87,347; Boc Mac, \$54,996.—R. E. Speakman, City Engineer.

Simcoe, Ont., Can.—Furnishing road roller, to Messrs. Cameron & Son, for 10-ton Waterous double-engine road roller, \$2,750.—W. C. McCall, Town Clerk.

BIDS RECEIVED

Wilmington, Del.—Building road from Lower Brandywine Presbyterian Church to State line; road is less than three miles, but it is difficult to get the material for building; local stone with a binder, Stewart & Donohoe, \$47,726.48; B. F. Wickersham, \$44,375; J. Frank Stewart, \$43,604.48; John F. O'Neill, \$44,700.

Jacksonville, Fla.—Resurfacing a portion of the Atlantic blvd., extending from city limits of South Jacksonville, about one mile east; Atlantic Bitulithic Co., Richmond, Va., preparing foundation, consisting of rock in place; resurfacing, No. 1 mixing method, \$1.08 per sq. yd.; No. 2, \$1.15; No. 3, \$1.35; grading by shovel, 20c. per cu. yd. and grading, 45c.; George R. Foster, Jacksonville, preparing foundation, consisting of rock in place, \$2.90 per cu. yd.; resurfacing, Nos. 1 and 2, \$1.17; No. 3, \$1.29; Continental Asphalt and Equipment Co., Chicago, preparing foundation, consisting of rock in place, \$2.35 per cu. yd.; resurfacing, No. 1, \$1.04; No. 2, \$1.15; No. 3, \$1.33; Joseph C. Rock, Philadelphia, grading by shovel 17c.; by team 34c.; preparing foundation consisting of rock in place, \$3 per cu. yd., resurfacing, No. 1, 99c.; No. 2, \$1.11; No. 3, \$1.38; Logan Concrete and Engineering Co.; grading by shovel, 19c. per cu. yd.; by team, 28c.; preparing the foundation with rock in place, \$4 per cu. yd.; resurfacing, Nos. 1 and 2, \$1.17; No. 3, \$1.24; Mattair & Young, Jacksonville, grading by shovel, 15c.; by team, 20c.; preparing foundation with rock in place, \$3.33 cu. yd.; resurfacing, No. 1, \$1.15; No. 2, \$1.28; No. 3, \$1.34; F. W. Long & Co., grading, 21 and 43c. per cu. yd.; preparing foundation, etc., \$4.10; resurfacing, \$1.24.

Jacksonville, Fla.—Resurfacing St. John's ave., from city limits to McTirt's Creek bridge, with asphalt macadam; George R. Foster, Jr., per cu. yd., \$3.90; per sq. yd., No. 1, \$1.12, and No. 2, \$1.24; Atlantic Bitulithic Co., per sq. yd., \$3.20; No. 1, sq. yd., \$1.08; No. 2, \$1.15, and No. 3, \$1.35; F. W. Long & Co., per cu. yd., \$3.95, and per sq. yd., No. 1, 94c., and No. 2, \$1.04; Mattair & Young, per cu. yd., \$3.78, and per sq. yd., No. 1, \$1.31, and No. 2, \$1.49; Logan Concrete and Engineering Co., per cu. yd., \$3.31; per sq. yd., \$1.09, and No. 2, \$1.16; J. C. Rock, Philadelphia, Pa., per cu. yd., \$4.12, per sq. yd., No. 1, \$1.06, No. 2, \$1.21, and No. 3, \$1.45; Continental Asphalt and Equipment Co., Chicago, per cu. yd., \$3.50, and per sq. yd., No. 1, \$1.07; No. 2, \$1.22, and No. 3, \$1.47.

Bay City, Mich.—By Board of Public Works for sidewalk work for city for the ensuing year: Jas. Meagher, Second District, 8 1/2c. per ft.; I. G. Meagher, First District, 8 1/2c.; Albert Boston, Third District, 8 3/4c.; Dateson Bros., First District, 10 1/2c., Second 10c., Third 9 1/2c.; J. M.

Fehrenbach, First District, 10c.; Fred Kehmus, First District 10c., Second 9 1/2c., Third 9 1/2c.; Wm. Green, Third District, 8 3/4c.; Theo. M. Gaffney, First District 9c., Second 9c., Third 9c.; P. Ryan, Jr., First District 8 1/2c., Second 9 1/2c., Third 9 1/2c.; Hugh Campbell & Son, First District, 9 1/2c., Second 10c., Third, 9 1/2c.; John Dardas, First 9 1/2c., Second 8 1/2c., Third 8 3/4c.; Frank Hoyt, First District 10 1/2c., Second, 9 1/2c.

New Brunswick, N. J.—Redressing surface of Livingston ave., city, between Constock and George st., W. L. Konover, Trenton, amesite, 88c. per sq. yd.; K. S. Stanley & Co., Jersey City, trapite, \$1.35 per sq. yd., with one year guarantee; \$1.40 per sq. yd. for two year guarantee; Thomas F. Dunigan, Woodbridge, asphalt, \$1.01 per sq. yd.; Standard Bitulithic Co., New York City, on their product, \$1.45 per sq. yd.

Canajoharie, N. Y.—Paving Church st., J. E. Martin, Poughkeepsie, \$16,987; Robert A. Probst, Canajoharie, \$16,064; Acme Engineering & Construction Co., Schenectady, \$15,556; A. M. Banker, Johnstown, \$15,404.

Dunkirk, N. Y.—Paving, lowest bidders, (a) 6th st., (b) King st., (c) Lion st.; John McCormick & Son, Erie, Pa., on sheet asphalt with concrete curb and gutter, (a) \$18,852, (b) \$23,376; J. M. Boyle, Erie, Pa., same pavement with stone curb, (a) \$18,648, (b) \$23,314, (c) \$12,701; it also bid lowest on sheet asphalt, concrete curb and gutter on (c) \$13,046; Dunkirk Construction Co., Dunkirk, lowest on brick on concrete or brick on ballast, with concrete curb, (a) \$18,487, (b) \$23,067, (c) \$12,311; James McNamara, Dunkirk, lowest on brick on concrete and brick on ballast, with stone curb, (a) \$18,907, (b) \$23,541, (c) \$12,503.—John M. Hackett, City Engineer.

Hudson, N. Y.—Repairing Warren st. with vit. brick: Robert I. Gleason, Troy, for city portion, 10,514 sq. yds., from \$2.35 to \$2.47; railroad's share, 3,277 sq. yds., from \$2.59 to \$2.71; Wilsey & Rigney, Rensselaer, \$2.29 to \$2.39; John B. Dover, Ballston Spa, for city \$2.35, for railroad \$2.70; Crane & Veeder, Schenectady, for city \$2.63, for railroad \$2.86; Pietro Luciano, White Plains, for city \$2.22, for railroad \$2.55; Patrick W. Mulderry, Albany, for city \$2.17 to \$2.29, for railroad \$2.49 to \$2.60; Dennis Hester & Son, Hudson, for city \$2.34 to \$2.41, for railroad \$2.92 to \$3.20; Foley & Bannon, Kingston, for city \$2.10 to \$2.22, for railroad \$2.51 to \$2.61; Dollard & Heenan, Albany, for city \$2.15 to \$2.21, for railroad \$2.26 to \$2.32; Jersey Paving Corporation of Newark, for city \$2.30, for railroad \$2.75; price per lin. ft. for relaying curbing ranged from 15c. to 30c. per ft. for new curbing, 70c. to \$1.10.

Long Island City, L. I., N. Y.—Regulating, grading, curbing, recurbng, reflagging and paving with asphalt block on concrete foundation in 2d ave., from Jackson ave. to Flushing ave., First Ward: (a) Barber Asphalt Co., 50 Church st., New York City, (b) Hastings Pavement Co., 25 Broad st., New York City: 2,000 cu. yds. earth excavation, (a) 99c., (b) 80c.; 2,600 lin. ft. old concrete curb reset, (a) 90c., (b) 35c.; 300 lin. ft. cement curb, (a) 95c., (b) \$1.10; 4,000 sq. ft. old flag relaid, (a) 11c., (b) \$5.80; 8c.; 6,650 cu. yds. concrete, (a) \$1, (b) \$5.80; 39,800 sq. yds. asphalt block pavement, outside railroad area, (a) \$1.75, (b) \$1.75; 8,920 sq. yds. asphalt block pavement, within 920 sq. yds. asphalt block pavement, within railroad area, (a) \$1.75, (b) \$1.75; 1,500 cu. yds. concrete, within railroad area, \$6, (b) \$5.80; totals, (a) \$139,325, (b) \$125,690.

New York, N. Y.—Paving as follows: Repairing with wood block on concrete foundation southern blvd., E. 133d st., from 3d ave. to Alexander ave., U. S. Wood Preserving Co., lowest bidder, 3,200 sq. yds. completed wood block pavement and keeping same in repair for 5 years from date of acceptance, \$2.52; 1,820 sq. yds. completed wood block pavement, not to be kept in repair, \$2.52; 855 cu. yds. concrete, including mortar bed, \$5.10, and 1,810 lin. ft. new granite curb, furnished and set in concrete, \$1.23; total, \$21,757; total of other bids: Republic Construction Co., \$23,368; Mack Bros., \$22,921; Barber Asphalt Paving Co., \$22,775. Regulating, grading and paving with asphalt blocks on concrete foundation, E. 192d st., from Creston ave. to Kingsbridge road, set curb, etc., lowest bidder, Hastings Pavement Co., 1,375 cu. yds. earth excavation, 75c.; 550 cu. yds. rock excavation, \$2.75; 850 lin. ft. new curb, furnished and set in concrete, \$1; 105 lin. ft. old curbstone, reset in concrete, 35c.; 2,750 sq. ft. new flag, 28c.; 1,545 sq. yds. completed asphalt block pavement and keeping same in repair for 5 years, \$1.71; 225 cu. yds. concrete, including mortar bed, \$5.92; total, \$8,352; Barber Asphalt Co. bid for this work \$8,517. Paving with sheet asphalt and set curb, etc., lowest bidder, Barber Asphalt Pavement Co., 6,620 sq. yds. com-

pleted asphalt block pavement, and keeping the same in repair for 5 years from date of acceptance, \$1.65; 9,270 sq. yds. completed sheet asphalt pavement, and keep the same in repair for 5 years from date of acceptance, \$1.14; 2,705 cu. yds. concrete, including mortar bed, where required, \$5.50; 1,500 lin. ft. new curb, furnished and set in concrete, \$1c.; 7,900 lin. ft. old curb, rejoined, recut on top and reset in concrete, 32c.; total, \$49,199; the Hastings Pavement Co. bid for this work, \$44,163. Paving with granite block pavement on sand foundation, Canal pl., from E. 138th st. to E. 144th st., and setting curb, lowest bidder, Burnside Construction Co., 5,779 sq. yds. new granite block pavement on a sand foundation, laid with sand joints, and keeping same in repair for one year from date of acceptance, \$2.46; 500 lin. ft. new curb, furnished and set, 6c.; 2,880 lin. ft. old curb, reset, 25c.; 100 sq. ft. new bridgestone for crosswalks, furnished and laid, 65c.; 785 sq. ft. old bridgestone, rejoined and relaid, 8c.; total, \$15,342. Regulating, grading, setting curbs, etc., in Laychester ave., between Boston road and Pellam Bay Park, lowest bidder, W. J. Rodgers, as follows: 7,800 cu. yds. earth excavation, 20c.; 1,500 cu. yds. rock excavation, \$1.30; 205,000 cu. yds. fill, exclusive of material sinking below surface of marsh, 31c.; 16,000 lin. ft. new curb, 70c.; 61,200 sq. ft. new flag, furnished and laid, 23c.; 9,600 sq. ft. new bridgestone for crosswalks, 40c.; 1,900 cu. yds. dry rubble masonry, in retaining walls, culverts and gutters, \$1.75; 75 cu. yds. of rubble masonry, in mortar, \$3; 390 cu. yds. of Class "A" concrete, \$7; 250 lin. ft. vit. stoneware pipe, 12-in., \$2; 1,250 lin. ft. vit. stoneware pipe, 15-in., \$5; 230 lin. ft. vit. stoneware pipe, 18-in., \$4; 26 M. ft. lumber, furnished and laid, \$20; 10,200 lin. ft. new guard rail, 20c.; 8,100 lin. ft. of piles, 30c.; 26,000 lbs. of steel bars for reinforcing concrete, 3c.; 10 inlets, type "A," complete, \$50, and 6 inlets, type "B," complete, \$45; total, \$121,598. Regulating, grading, setting curb, etc., on other streets in Bronx, lowest bidders as follows: Westchester ave., from Main st. to Eastern blvd., Watson Contracting Co., \$61,578. White Plains ave., Morris Park ave. and Walker st., J. B. Malatesta, \$19,171; Findlay ave., from E. 164th st. to 165th st., W. McPherson, \$5,091, and Van Cortlandt ave., from Mosholu Parkway south to Jerome ave., J. Di Menna, \$4,739.

Dayton, O.—Grading and graveling 12 streets, low bidders were as follows: J. I. Geiger, for grading and graveling and setting curb on Gaines st., Dakota to Kammner ave., \$1,559; J. I. Geiger and Cliff Hoolihan, North Bend st., Casper to alley east of Hall st., \$522; Smith st., Cincinnati to western terminus, \$1,723.60; Greencastle st., Germantown st. to southern terminus, \$1,960; David A. Onkst, Benjamin st., from Wheatley st. to Darr ave., \$3,252.25; Santa Clara ave., Richmond ave. to Wheatley st., \$3,757.49; John F. Cooke, Findlay, from the C. I. & D. Railroad to canal feeder, \$5,378.75; Bayard st., from Perry to Longwood, \$1,033.50; Kirchlner & Co., Beth ave., Huston st., for hydraulic race, \$1,691.50; bid received for grading and graveling of Highland ave., from St. Charles to Wyoming st., was above the Engineer's estimate; no bid was received for grading and graveling Calm st., between H. mestead ave. and Pontiac st.; two latter jobs will be re-advertised.

Butler, Pa.—Street improvements: Mercer st., from end of present paving to intersection of Maryland ave., N. J. Boyer, excavating, 30c.; Butler Brick and Tile Co. brick, \$1.12; F. E. McQuiston, excavating, 30c.; paving, \$1.12 to \$1.12; Tony Morelli, excavating, 15c.; paving, \$1.32 to \$1.45; East Penn st., Monroe to Oak, F. E. McQuiston, excavating, 40c.; paving, \$1.29 to \$1.51; N. J. Boyer, excavating, 30c.; paving, \$1.09 to \$1.31; Tony Morelli, excavating, 25c.; paving, \$1.07 to \$1.30; Mitchell ave., from Clay to Penn, F. E. McQuiston, excavating, 40c.; paving, \$1.21 to \$1.15; N. J. Boyer, excavating, 30c.; paving, \$1.10 to \$1.31; Tony Morelli, excavating, 25c.; paving, \$1.07 to \$1.30; Miller st., from Clay to Penn, F. E. McQuiston, excavating, 10c.; paving, \$1.21 to \$1.45; N. J. Boyer, excavating, 30c.; paving, \$1.10 to \$1.31; Tony Morelli, excavating, 25c.; paving, \$1.07 to \$1.30.

Galveston, Tex.—Roadway from western city limits at Broadway to the causeway: H. Freund, shell for paving, 13,400 cu. yds., \$1.61 per cu. yd.; soil for surfacing, 9,000 cu. yds., \$1.52 per cu. yd.; creosoted lumber for bulkheading, 60,000 ft., \$58.50 per M; all in place, on the same work and material Homson Sons bid \$1.61; on shell, \$1.51; for surfacing, \$59.50 for lumber, J. C. Kelso bid \$1.69 for shell, \$1.11 for surfacing, \$30 per M ft. for the lumber; Suderman & Dolson bid \$1.61 for shell, \$1.49 for surfacing and \$60 for lumber; Freund agrees to do the work in five months, Handson Sons by Oct. 1, Kelso by Sept. 30 and Suderman & Dolson by Dec. 1.

SEWERAGE

Oakland, Cal.—Council has adopted recommendation of Drainage and Sanitary Committee that City Engineer be directed to prepare plans and specifications for sewerage of 30th st., between Union and Peralta sts.

Riverside, Cal.—Cost of constructing Arlington trunk line sewer to the disposal works has been estimated at \$30,000.

San Francisco, Cal.—Board of City Supervisors has adopted ordinances for construction of sewers in Section L of North Point main sewer, cost not to exceed \$55,000.

San José, Cal.—Citizens will vote in June on \$100,000 bonds for sewers.

Marletta, Ga.—Citizens have voted \$15,000 bonds to complete sewer and water system.

Mountain Home, Ida.—Bids will soon be asked for installation of sewer system; bonds have been sold.

Aurora, Ill.—Bids will be received in about 40 days for construction of 9-in. to 30-in. pipe sewer and 42-in. to 48-in. concrete sewer; approximate cost, about \$120,000.—M. J. Tarble, City Engineer.

Park Ridge, Ill.—City will construct 7,000 ft. of 6-ft. concrete sewer; C. N. Roberts, C. E., 105 Clark st., Chicago, is preparing plans.

Fort Wayne, Ind.—The Metcalf and Eddy Engineering Co., Boston, has been retained to prepare plan for changing of city sewage system to admit of parking of river banks.

Rockport, Ind.—Council is considering plans and specifications for sewerage system for this city.

Valley Junction, Ia.—Bids will soon be received for construction of a sanitary sewer system and disposal plant; approximate cost about \$45,000.—Iowa Engineering Co., Clinton, Ia., Engineer; J. W. Mullane, City Clerk.

Lexington, Ky.—Improvement Committee has decided to construct sewers on West and East Short and Walnut sts.

Baltimore, Md.—Citizens have voted \$10,000,000 additional loan for sewers.

Princess Anne, Md.—Bids have been asked for construction of sewer system.

Cadillac, Mich.—City will install pumping apparatus to elevate sewage from lower sections of city to disposal plant.

Cold Spring, Minn.—City Engineer S. S. Chute, St. Cloud, is preparing plans for sewer system.

Paris, Mo.—Citizens have voted \$15,000 bonds for installation of sewerage system.

Elizabeth, N. J.—Council is considering construction of sewers in Mack and Pennington sts.

Trenton, N. J.—Council has passed ordinances for sewers in six streets.—H. B. Salter, City Clerk.

Canastota, N. Y.—Village Board is considering installation of 8-in. sewer.

Herkimer, N. Y.—Plans have been prepared for extension of sewerage system.

Port Chester, N. Y.—Village proposes to install sewage disposal plant, to cost \$100,000.—F. S. Odell, Engineer; Wm. C. Ling, Village Clerk.

Yorkville, N. Y.—Board of Trustees has purchased site for proposed sewage disposal plant.

Clayton, N. C.—Plans are being prepared by Gilbert C. White, Durham, for sewerage and water works.

Thomasville, N. C.—Town has decided to issue bonds for sewerage and water works.

Springfield, O.—City Engineer H. G. Horton has been instructed to prepare plans and specifications and estimates of cost of construction of Sewer District No. 25, Section No. 2.

Wadsworth, O.—Council has ordered City Engineer to ascertain cost of necessary enlargement of disposal plant.

Tulsa, Okla.—Citizens will soon vote on \$200,000 bonds for sewer extensions and construction.

Eugene, Ore.—Citizens will receive bids June 5 on \$28,000 sewer bonds.

Hillsboro, Ore.—Council has informally accepted plans by the City Engineer for proposed sewer and street work to cost about \$142,000.

Weatherly, Pa.—Plans have been prepared by Surveyor Moose and presented to Council for installation of sewer system at cost of \$13,000.

Burlington, Vt.—Street Commissioners will prepare plans for proposed sewer in Park ave.

Seattle, Wash.—All bids have been rejected for constructing Interbay District North trunk sewer for 138-in. circular concrete sewer, Grant Smith & Co., city, lowest bidder, at \$1,064,845, and for 138-in. concrete rectangular sewer, Erickson Construction Co., \$1,098,515; work includes 760 lin. ft. 12 or 15-in. pipe sewer, 153 lin. ft. 36-in. brick sewer, 186 lin. ft. 48-in. concrete sewer, 920 lin. ft. 48-in. c. l. sewer, including outlet; 151 lin. ft. 108-in. concrete sewer, 1,190 lin. ft. 138-in. concrete sewer, 1,700 lin. ft. 138-in. concrete sewer,

special circular, or rectangular, 12,035 lin. ft. 114-in. concrete sewer, 30 manholes, 180 lin. ft. manholes, extra depth; 500 6-in. side connections, 24,000 lin. ft. piling, 1,000 cu. yds. extra concrete, 1:8; 50,000 lbs. extra steel, 15,000 lin. ft. subdrains, 8-in., 10-in., 12-in., etc.

Port Washington, Wis.—Bids will be received June 6 for \$35,000 bonds for sewer system.—W. B. Krause, City Clerk.

Kasmack, Sask., Can.—Installation of sewerage and water system is being considered.

Melville, Sask., Can.—Ratepayers have passed \$5,000 by-law for storm water sewers.

CONTRACTS AWARDED

San Francisco, Cal.—Constructing sewers in Mission st. and Mt. Vernon ave., to C. J. Harney, 158 Sanchez st., \$61,206.

Pensacola, Fla.—Construction of storm water and sanitary sewers, to J. W. Gurley & Co., of Mobile, Ala., by the Board of Bond Trustees at cost of \$77,232.90.

Westfield, Mass.—Furnishing sewer pipe for year, to Warner-Miller Co., New York.

Cloquet, Minn.—Building sewers and water main extensions, to Pastoret & Lawrence Co., Duluth, \$23,398.

Winona, Minn.—To Otis Abell for a storm water sewer on Johnson, Belleville and Mill sts., \$5,750.

St. Louis, Mo.—Constructing sewers in Washington Heights, to P. J. Clifford Contracting Co., \$31,397.

Rochester, N. Y.—Building Division 3 of storage disposal system, to Ripton & Murphy, \$169,834; contract involves nearly one mile of tunnel work in addition to trenching.

Utica, N. Y.—Building sewers: Sunset ave., to N. D. Peters, \$972; Canal st., to A. W. Fitch, \$1,943.45; and Linden st., to same, \$357.95.

Springfield, O.—To Huonker & Williams to lay Elmwood sewer and construct the Mill Run arch in Washington st.; company bid \$13,893 for Elmwood sewer, which specifies 8 and 12-in. vit. pipe, and 24 and 30-in. reinforced pipe; second bid was \$14,065, by M. J. Cooney; Mr. Cooney bid on 8, 12 and 24-in. vit. pipe and 30-in. reinforced pipe.

Central Point, Ore.—To Jacobson-Bade Co. for construction of sewer system, \$64,496.25; work includes 16,263 ft. of 8-in. pipe, 3,415 ft. of 10-in. pipe, 1,985 ft. of 12-in. pipe, 3,372 ft. of 16-in. pipe, 1,670 ft. of 20-in. pipe, 1,576 ft. of 22-in. pipe, 2,978 ft. of 24-in. pipe, 1,388 ft. of 50-in. pipe, 101 manholes, 8 inlets and 25,725 cu. yds. of excavation; other bidders: Jeffrey & Buf-ton, \$64,793.99; Haydon Bros., \$65,736.16; Geo. Gordon, \$66,489.95; Northwest Municipal Constructing Co., \$74,846.54; Jahn Contracting Co., \$77,650.66; M. A. Jones, \$76,953.65; Vincent & Boper, \$65,984.86.—J. W. Jacobs, City Recorder.

Rock Hill, S. C.—Building sewerage system, to Sullivan, Long & Hagerty, Bessemer, Ala., \$52,654.10; other bidders: John J. Cain, Columbia, \$53,586.50; Robertson Construction Co., Charlotte, N. C., \$53,633.15; P. J. Curran, Knoxville, Tenn., \$54,326.549.40; Johnson & Matthews, Florence, \$56,535.25; Guild & Co., Chattanooga, Tenn., \$57,211.25; Meek Construction Co., Atlanta, Ga., \$56,779.30; Greenwood Hardware Co., Greenwood, \$57,458; McCoslin Construction Co., Birmingham, Ala., \$57,641.65; H. S. Basler, Chattanooga, Tenn., \$59,668.50.

Richmond, Va.—To I. J. Smith & Co. for deep sewer on Broad st.

WATER SUPPLY

Columbiana, Ala.—Citizens will vote May 15 on \$7,000 bonds for construction of water works.

Imboden, Ark.—George Dutton has purchased from People's Bank water works and electric light systems and contemplates extension and improvement.

Oxnard, Cal.—Estimates will be prepared on cost of constructing water works and for paving of all streets.

Colorado Springs, Col.—Citizens have voted \$175,000 bonds to extend water system.

Olathe, Col.—Bids will soon be asked for installation of a municipal water system; estimated cost, \$58,000.—George H. Sethman, Denver, Engineer; Mattie A. Burns, Town Clerk.

Marietta, Ga.—Citizens have voted \$15,000 bonds for completing water and sewer system.

Thomaston, Ga.—Citizens have voted \$50,000 water works and sewerage bonds.

Clinton, Ind.—Council is considering building and equipping new water works plant.—William Hamilton, President Water Works Board.

Burden, Kan.—Rollins & Westover, Kansas City, Mo., are preparing plans for water works to cost \$15,000.—L. G. Crawford, City Clerk.

Cherryvale, Kan.—J. S. Worley, Kansas City, Mo., is preparing plans for water works.—E. E. Bellamy, City Clerk.

Homer, La.—Water Works Superintendent is now engaged at surveying town preparatory to laying pipes and mains for system of water works.

Baltimore, Md.—Grand Jury, D. M. Wylie, Foreman, has recommended erection of modern filtration plant.

La Plata, Md.—Town has voted \$15,000 bonds to establish water system.—P. E. Sasser, Town Commissioner.

Boston, Mass.—Metropolitan Water and Sewerage Board will soon lay approximately 15,000 ft. of 24-in. water pipe in order to supply Hyde Park, which has voted to join the Metropolitan Water District.—Henry H. Sprague, Chairman.

Shelburne Falls, Mass.—District has voted \$75,000 for installation of gravity water system; authority will be asked to take Fox and Houghton brooks as source of supply.

Detroit, Mich.—Council has authorized issuance of bonds by Water Commission for the following improvements: Completing the new 48-in. high pressure force main in Forest and Bewick aves., \$302,000; 48-in. force main through central part of city in Charlevoix, Berlin, Erskine and Alexandrine aves., \$1,152,000; completing 48-in. main in High, Baker and Dix aves., \$536,000; 42-in. main in Jefferson ave. West, from Solvay to Home sts., \$81,000; 48-in. main in Michigan ave., from Vinewood to Livernois, \$172,000; 24-in. main in Holbrook ave., \$35,000; 24-in. main in Carbon, Forman and Fort sts., \$68,000; 24-in. main in Hazelwood and Holcomb aves., from Russell to 3d st., \$48,000; 42-in. main in Canfield and Bethune aves., from Helen ave. to North Grand Blvd., \$28,000; improvements at pumping station, \$1,631,769.—J. J. Haarer, Commissioner of Public Works.

Courtland, Minn.—Village Council is considering installation of water works, including well, large tanks and 1,000 ft. of mains.

St. Charles, Mo.—Citizens have voted \$30,000 bonds for improvement of water works by laying 4,000 ft. of additional 12-in. water main and constructing two concrete reservoirs, capacity 1,000,000 gals. each.—Carr Edwards, City Engineer.

St. Charles, Mo.—Mayor John N. Olson has recommended improvements to city water system.

Cascade, Mont.—Installation of water works system is being considered.

Anselmo, Neb.—Citizens will vote on installation of water works and electric lights.

West Orange, N. J.—Town Council is considering \$15,000 bond issue for extension of water system and purchase of auto fire apparatus.

Tucumcari, N. M.—Citizens have voted for municipal ownership of water works; \$10,000 will be spent at once on extending three miles of mains into suburban district, erecting standpipe and installing about 65 fire plugs.

Fredonia, N. Y.—Board of Village Trustees has called election on May 15 on improving present water works system of the village; plans have been prepared by Engineer Wilder for system of improvements which it is claimed will insure clear water in addition the plans call for enlargement of the present reservoir to capacity of 180,000,000 gals.; estimate of cost of installing improvements is \$16,400.

Clayton, N. C.—Gilbert C. White, Durham, is preparing plans for water works and sewerage.

Mandan, N. D.—Citizens have voted \$80,000 bonds for construction of water works.—Burns & McDonnell, Kansas City, Mo., Engineers.

New Berlin, O.—Citizens have voted \$15,000 bonds for water works and \$20,000 for sewers.

South Charleston, O.—Village has defeated proposition to issue \$22,000 bonds for installation of water works.

Vian, Okla.—Citizens have voted \$20,000 water works bonds.

Weleetka, Okla.—Citizens have voted \$45,000 bonds for water works and electric light plant.

Blaine, Pa.—Citizens have defeated proposition to expend \$7,000 in enlarging water supply.

North Wales, Pa.—Establishment of filtration plant is being considered and committed is inspecting plant. Messrs. Morris, Kriebel and Baston are interested.

Bradley, S. D.—Citizens have voted \$4,000 bonds for erection of pumping house and \$10,000 for extension of mains.

Nashville, Tenn.—Nearly eight miles of new water mains will be placed this year by the City Water Works Department, according to plans now mapped out.

Kasmack, Sask., Can.—Installation of water and sewerage system is being considered.

Melville, Sask., Can.—Ratepayers have passed \$63,000 by-law for water works.

Ridgetown, Ont., Can.—F. W. Farncombe, London, has prepared plans for proposed water works system; supply from artesian wells; \$35,000 voted.

Welland, Ont., Can.—Ratepayers have carried by-law providing for \$75,000 for extensions and additions to the water works.—G. H. Burgar, Clerk.

CONTRACTS AWARDED

Anaheim, Cal.—By Anaheim Water Co., to Charles Schendler, city, for constructing 6,000 ft. of reinforced concrete pipe for the company's system.

Escondido, Cal.—By the Escondido Water Co., to A. S. Bent, Central Bldg., Los Angeles, for constructing 2,400 ft. of 8-in. cement pipe; to A. G. Thornton, Colton, for 4,000 ft. of 12-in. cement pipe.

San Francisco, Cal.—Constructing reinforced concrete viaduct on Mission st., to Healy-Tibbitts Co., \$104,200; other bidders were: Rickon Ehrhardt, \$113,950; Contra Costa Contracting Co., \$112,000; American Contracting Co., \$116,670.

Alamosa, Col.—To Marshall Bros., Las Animas, for building water works, \$74,000.

Bridgeport, Conn.—Furnishing 25 4-in. Fairbanks hydrants, to Hunter & Havens, and 25 5-in. hydrants, 50 hydrants and 50 boxes and caps, to R. D. Wood & Co.

Norwich, Conn.—Building Section 1 of pipe line, to Archibald Torrance, and Section 2, to Thos. Dodd.

Washington, D. C.—Furnishing 90 tons c.-i. water pipe and specials, to the Standard Cast Iron Pipe and Foundry Co., Bristol, Pa., \$51.50 per gross ton, and 2,411 tons c.-i. water pipe, to the Cast Iron Pipe and Foundry Co., New York, N. Y., \$22.84 per gross ton.

Sparta, Ga.—To Walton & Wagner, Atlanta, for construction of 3½ miles of from 4-in. to 8-in. water mains, two 750,000-gal. pumps, air compressor, boiler, power house, 100,000-gal. brick reservoir, 80,000-gal. tank on a steel tower, and for construction of 3 miles of sewers and purification plant.

Chicago, Ill.—By L. E. McGann, Commissioner of Public Works, to Gindele Bros., Chicago Opera House Block, for materials, labor, etc., necessary for pumping out sections 1 and 2 Southwest Land tunnel, constructing one 11-ft. shaft in earth and rock and constructing 250 lin. ft. of 9-ft. tunnel in rock and other work, \$47,700.

Owensboro, Ky.—To R. P. Farnsworth and L. M. Booth for construction of the proposed water softening plant; cost about \$25,000.

Alexandria, Minn.—Construction of water main on 6th st., to Wm. B. Bosworth, Ada, about \$2,100.

Chokio, Minn.—Water works system, Oscar Claussen Engineering Co., Nat. German-American Bank Bldg., St. Paul, Engineer; alternative bids on (a) air compressor system, consisting of 3,300-gal. reinforced concrete reservoir, about 5,600 ft. of 6-in. and 4-in. c.-i. pipe; pumping plant and accessories, including 15-hp. gasoline engine; 8-ft.x36-ft. compression tank, air compressor and air lift; 25-ft.x40-ft. power house; (b) gravity system consisting of 40,000-gal. steel tower and tank, about 5,600 ft. of 6-in. and 4-in. c.-i. pipe; 5-hp. gasoline engine, a deep well, pumping head and 14-ft.x16-ft. pump house; to J. G. Robertson, St. Paul, (a) \$3,776, (b) \$9,159; other bidders: Cook Construction Co., Des Moines, Ia., (a) \$9,460, (b) \$9,993; C. W. Roland Co., Des Moines, Ia., (a) \$9,560, (b) \$9,560; Gilbert W. Haggart, Fargo, N. D., (a) \$10,500; (b) \$10,600; Des Moines Bridge and Iron Co., Des Moines, Ia., (a) \$9,690, (b) \$8,895; Blackhawk Construction Co., Waterloo, Ia., pipe line \$4,541, steel tower and tank \$4,896; Minneapolis Steel and Machinery Co., Minneapolis, steel tower and tank, \$3,500; Maguee Johnston, Minneapolis, pipe line, \$5,611; Chicago Bridge and Iron Co., Chicago, Ill., steel tower and tank, \$4,025.

Cloquet, Minn.—Building water main and sewer extensions, to Pastoret & Lawrence Co., Duluth, \$23,398.

Minneapolis, Minn.—Furnishing special castings for the filtration plant, to James B. Clow & Sons, 350 Franklin st., Chicago, Ill., \$117 per ton, total amount \$3,805; to Rensselaer Valve Co. at \$1,822 for furnishing valves, and to Venturi Meter Co. for one 60-in. and one 6-in. meter.

Moberly, Mo.—Reconstruction of the water works plant; General contract to Commercial Construction Co., Kansas City, Mo., \$23,223, and \$1 per cu. yd. for extra concrete, and 40c. per cu. yd. for extra earth excavation; power house to G. A. Sinclair, city, \$9,191.

Kearney, Neb.—Supplying city with meter tops and cement boxes; tops to Kearney Iron Co. and boxes to W. T. Scott.

Wells, Nev.—To P. J. Moran, Salt Lake City, Utah, for building an 80-ft. dam in Bishop Creek District, about \$100,000.

Skillman, N. J.—To Harrison Construction Co., Newark, for extension of the

water system at New Jersey State Village for Epileptics, \$9,883.

Albany, N. Y.—To Eddy Valve Co., Waterford, for supplying hydrants for Water Department, \$2,462.50.

Cleveland, O.—Furnishing 25,000,000-gal. pumps, to Holly Mfg. Co., Roberts ave., Buffalo, \$112,769 each; for 3 to 24-in. c.-i. pipe, to the U. S. Cast Iron Pipe and Foundry Co., Cleveland, \$21.35 per ton; for 3 to 16-in. specials, to same, at \$53 per ton; for 20 to 24-in. specials, to Bowker Foundry Co., \$58.75 per ton; for miscellaneous castings, to same, at \$18.75 per ton; for 1 to 6-in. hydrants, to Florence Iron Works, \$21.75 and \$40.75, respectively; for valves, to Fairbanks Co., at the following prices: 24-in., \$163; 20-in., \$105; 16-in., \$53; 12-in., \$26.85; 10-in., \$21; 8-in., \$14.75; 6-in., \$9.45; 4-in., \$5.80; 3-in., \$4.20.

Toledo, O.—To Watters & Tansley, Toledo, to lay high pressure main water system, to give better fire protection to the district extending from Washington to Cherry st. and from the river to Michigan st., \$117,578.25; other bidders were Breymann & O'Neill, city, \$118,887.80, and M. O'Hearn Co., Pittsburg, \$117,937.40; Engineer's estimate was \$121,000; work is to be completed within five months; pumping station will cost probably \$75,000 additionally.

Pittsburg, Pa.—By Department of Public Works, to William Kerr's Sons, Lewis Bldg., city, for constructing Mission st. pumping station, \$93,200.

Somerset, Pa.—Construction of concrete reservoir, borough to furnish all iron work, to W. G. Ferner, city, \$4,191.

St. Catharines, Ont., Can.—To National Iron Works, Toronto, Ont., for supply of 3,763 tons of standard piping, \$30.50 per ton, and 55 tons of special castings, \$59.

Winnipeg, Man., Can.—Wooden stave conduit for extension of water pipe line, to J. W. Astley, Engineer of Construction, \$7,40 per lin. ft., \$31,080.—M. Peterson, Secretary Board of Control.

LIGHTING AND POWER

Imboden, Ark.—George Dutton has purchased from People's Bank electric light and water works system and contemplates extension and remodeling.

Bakersfield, Cal.—Western Water Co. has been organized, capital \$200,000, to construct two large pumping plants, one to be equipped with two 200-hp. gasoline engines and two pumps of 25,000-bbl. capacity; the other plant to have one unit of same capacity; plants will supply water to west side oil fields.

Merced, Cal.—Merced River Land Co., Los Angeles, has purchased site and will in the near future install electric pumping plant.—W. O. Huse, Manager.

Patton, Cal.—State Engineer Nathaniel Ellery, Sacramento, has prepared plans for gas and electric plant to be installed at State Hospital; \$55,000 is available for this work.

San Francisco, Cal.—Great Western Power Co. will expend \$1,000,000 in improvements at its generating station at Las Plumas on the Feather River.

Jacksonville, Fla.—Electrical Committee of Bond Trustees has rejected all bids for the erection of foundations, superstructure and pier bulkheads of the municipal electric light power station; bids are as follows: Building superstructure which includes brick work, roofing, mill work, plumbing, heating, etc., F. W. Long & Co., Jacksonville, \$45,325; Logan Concrete and Engineering Co., Jacksonville, \$51,400; excavations, driving piling and putting down the foundations for the superstructure, together with necessary concrete work, F. W. Long & Co., Jacksonville, \$106,940; Logan Concrete and Engineering Co., Jacksonville, \$104,887; bid of the Foundation Co. of New York, in addition to foundation work, also covered construction of the pier bulkhead, which was only one received for pier.

Key West, Fla.—Council has voted to grant gas franchise for city to Starr & Reed.

Marietta, Ga.—Citizens have voted \$20,000 bonds for installation of electric light plant.

Kendallville, Ind.—Council has asked bids for 400-kw generator for electric light plant; cost about \$25,000.

Oakland City, Ind.—Bids will be asked for in near future for the construction of 8-in. pipe line to connect and supply natural gas to Oakland City, Winslow, Petersburg, Francisco and Princeton. B. Ayers, W. M. Frazee and J. H. Henley are interested.

Zionsville, Ind.—The Zionsville Water and Electric Light Co. is considering the installation of either oil engines or producer gas plant in place of present steam plant.—W. H. Palmer, Manager.

Lansing, Ia.—Council has granted franchise to Upper Iowa Power Co., Decorah, for installation of electric light plant.

Webster City, Ia.—Citizens will vote May 22 on \$25,000 bonds for new equipment at light and power plant.

Fort Scott, Kan.—Fire has completely destroyed plant of Fort Scott Gas and Electric Co., leaving city in total darkness.

Quenemo, Kan.—I. C. Bushong, Ottawa, has been selected to prepare plans for electric light plant; cost \$6,900.

Liberty, Ky.—Herren & Cundiff are considering erection of electric light plant.

Bangor, Me.—Substation of Bangor Railway and Electric Co., which furnished light to city, has been destroyed by fire.

Morris, Minn.—S. Stewart is planning installation of 209-hp. engine, new dynamo and other improvements at electric light plant.

Great Falls, Mont.—Great Falls Gas Co. will lay about three miles of gas mains in near future.—R. D. Dennison, Manager.

Anselmo, Neb.—Citizens will vote on installation of electric lights and water works.

Salem, N. J.—Council has under consideration plans of better method of lighting streets.

Tucumcari, N. M.—I. G. La Fite, Denver, Col., has purchased the local electric light plant from W. B. Buchanan, W. A. Jackson and W. H. Fuqua; about \$10,000 will be spent in improvements.

New Hartford, N. Y.—Village Council is considering establishment of municipal electric light plant; contract with Utica Gas and Electric Co. expires May 31.

Smithtown, L. I., N. Y.—Long Island Lighting Co. and Port Jefferson Electric Light Co. have petitioned for franchise.

Utica, N. Y.—Plans have been prepared and will be considered by Board of Contract and Supply for construction and extension of city's electric subways.

Durham, N. C.—Southern Power Co., Charlotte, has decided to build a distributing station.

Cleveland, O.—The Euclid Doan Power Co., Cleveland, has been incorporated to erect power house for the generation of electricity for commercial purposes.—S. H. Selbert, Joseph Morgenstern, F. Ethel Whipp, Sidney S. Harvey and A. J. Harvey, Incorporators.

Dayton, O.—Bids will be received until noon May 26 for \$25,000 bonds to light city.—G. W. Bish, City Auditor.

Greenspring, O.—Village Council is considering proposition for electric light plant.

Weleetka, Okla.—Citizens have voted \$45,000 bonds for electric light plant and water works.

Morrisville, Pa.—Establishment of municipal electric light plant is being considered.

Brenham, Tex.—O. C. Orbeck, of Clifton, has asked for franchise for gas plant.

Floresville, Tex.—A. B. Crawford, San Antonio, is considering installing of electric light plant.

Falls Church, Va.—Arlington Electric Co. desires prices on transformers, lamps, cross-arms, pins, insulators, poles, etc., for probably territory of 7½ to 10 miles.

Newport News, Va.—Citizens will vote June 24 on \$150,000 bonds to build and operate electric light plant.

Chehalis, Wash.—Franchise has been granted to the Twin City Light and Traction Co. and building of power house is being considered; cost \$75,000.—Frank Crown, Chief Engineer.

Goldendale, Wash.—The Pacific States Electric Co., Portland, has purchased electric light plant of this city from H. W. Fellows; system will be extended and improved by the new owners this spring.

Winona, Wash.—M. W. Peckler, Winona, has purchased site and will build power plant to supply Endicott, La Crosse and Winona with light and power.

Magog, Que., Can.—Electric light and power plant will be constructed at cost of about \$100,000.—Pringle & Sons, Montreal, Engineers.

Melville, Sask., Can.—Ratepayers have passed \$23,000 by-law for electric lights.

Sandwich, Ont., Can.—Franchise has been granted to Robert Stuart to build transmission line through city streets.

CONTRACTS AWARDED

Springfield, Mass.—By Municipal Building Commission for electric equipment of the new central heating and lighting plant, to the M. B. Foster Co., Boston, \$10,500.

Plymouth, Pa.—Lighting streets, alleys, etc., of township for seven years, to Luzerne County Gas and Electric Co.

Ogden, Utah.—To new Merchants' Light and Power Co., an organization of Ogden business men, for furnishing electricity for 80 street lights, \$1.75 a month per light.

BIDS RECEIVED

Barberton, O.—Lighting of city streets, Sun Vapor Street Lighting Co., Canton, only bidder; present contract with Mohican Oil and Gas Co. expires in June; bidder agrees to install 60 gas or gasoline lights of the latest design and 100 candle power for \$19.81 per year for each lamp providing they are given a three-year contract.

FIRE EQUIPMENT

Helena, Ark.—Mathews & Fry have prepared plans for erection of \$6,000 fire station.—Hugh Martin, Mayor.

Pasadena, Cal.—Citizens have voted bonds for fire department purposes, including purchase of engine.

San José, Cal.—Citizens will vote in June on \$6,000 bonds for fire and police department.

Hartford, Conn.—Fire Committee has accepted plans by F. W. Whiton and John J. McMahon for erection of fire station at Market and Temple sts. for Engine Co. No. 3.

Norwich, Conn.—Board of Fire Commissioners has recommended purchase of auto combination chemical and hose wagon to cost \$5,500.

East St. Louis, Ill.—Mayor Lambert has recommended establishment of four engine houses.

Wellsburg, Ia.—Fire department has been organized.—J. H. Kelly, Chief.

Bangor, Me.—Fire Chief Mason is urging need of 10,000 ft. of fire hose.

Lewiston, Me.—Board of Fire Commissioners has recommended purchase of auto truck.

Palmer, Mass.—Town needs fire alarm system.

Westfield, Mass.—Town will purchase fire auto.

Saginaw, Mich.—Board of Estimate has allowed \$8,000 for purchase of auto fire engine.

Englewood, N. J.—Council is favorably considering purchase of auto apparatus for fire department. Councilman Wm. Conklin is interested.

West Orange, N. J.—Town Council is considering \$15,000 bond issue for purchase of auto fire apparatus and extension of water system.

Albany, N. Y.—Erection of fire station for Steamer No. 2 is being urged.

Herkimer, N. Y.—Board of Trustees is favorable to improvement of apparatus of fire department.

Syracuse, N. Y.—Board of Contract and Supply has adopted resolution directing Secretary John J. Halloran to advertise for proposals to install apparatus for central office fire alarm system.

Portland, Ore.—City will sell bonds for building \$125,000 steel fireboat; plans being prepared.

Oxford, Pa.—Addition will be erected to fire engine house.

Reading, Pa.—Rainbow Fire Co. has purchased building which will be remodeled for use of Volunteer Firemen's Association.

CONTRACTS AWARDED

Sacramento, Cal.—City Trustees have decided to buy from Bowers Rubber Co. 3,000 ft. of hose and 80 poles for wires of the police and fire alarm system from R. E. Swain.

Pensacola, Fla.—Furnishing \$1,500 worth of hose, to Frank Griffith, special agent for Eureka Hose Co., New York.

Evansville, Ind.—Furnishing hose, to the Gutta Percha Co., 500 ft., 85c.; to the Chicago Fire Hose Co., 1,000 ft., \$1, and to New York Belting and Packing Co., 500 ft., \$1.10.

Springfield, Mass.—Erecting addition to Pine st. fire station: General contract, O. C. Rivest, \$21,700; heating, George H. McClean, \$1,340; electric, Foster Electric Co., Boston, \$968; plumbing, J. J. Cotter Co., \$1,693.

Bozeman, Mont.—Furnishing 95-hp. auto fire engine, to Webb Fire Apparatus Co., St. Louis, Mo., \$6,500.

Poughkeepsie, N. Y.—Furnishing 2,000 ft. Keystone hose, to Fabric Fire Hose Co., A. D. Francker, representative.

Cincinnati, O.—Building fire house on Eastern ave., to Cottler Building Co.

Bradford, Pa.—Furnishing motor truck for Chief of the Department, to Garford Co., Elyria, \$2,900.

Harrisburg, Pa.—Building Camp Curtin fire house on N. 6th st., to Thos. Ferree, \$7,110.

Tacoma, Wash.—Furnishing fire hose: To Washington Rubber Co., Inc., 2,000 ft., \$1,800; to The C. C. Fire Hose & Rubber Co., 2,000 ft., \$1,800; to Hunt & Mottet Co., 2,000 ft., \$1,800; to Palace Hardware Co., 1,000 ft., \$1,000. To the International Power Co., for purchase and delivery of one-third size Amoskeag steam fire engine, with heavy oscillating platform, \$4,850.

BIDS RECEIVED

Sacramento, Cal.—Furnishing automatic aerial truck, motor-driven, for the Fire Department: Graham-Murdoch-Williams Co., truck to cost \$12,150; Gorham Engine and Fire Apparatus Co. offered machine for \$11,375; third bid was for truck to be drawn by horses.

BRIDGES

Hollister, Cal.—County Surveyor A. M. McCray has estimated cost of repairs to county bridges and the construction of two new bridges at \$100,000.

Pasadena, Cal.—Citizens have voted bonds for erection of bridge.

San José, Cal.—Citizens will vote in June on \$55,000 bonds for bridges and improvement of creeks.

Vacaville, Cal.—Bids will be received May 16 for the purchase of \$15,300 bonds for concrete bridge and \$2,500 for septic tank.—P. A. Steiger, Benicia, Engineer.

Mayo, Fla.—Boards of this and Severance counties have decided to build bridge across Suwanee River at Dowling Park; bids being asked.

Jesup, Ga.—Wayne County will vote \$100,000 bonds to construct bridge across Altamaha River and build roads.

Westernport, Md.—Bids will be received May 23, noon, for \$5,000 bonds to erect concrete bridge across George's Creek.—J. P. Miller, Chairman Finance Committee.

Mantua, N. J.—Turnpike Co. has instructed Engineer Cattel to prepare plans for concrete bottom bridge to be erected over Mantua Creek.

Massena, N. Y.—Bridge over the Raquette River on Depot road has been condemned by State Highway Department; estimates for concrete structure are being prepared; cost about \$30,000.

Niagara Falls, N. Y.—Niagara Town Board has approved plan for bridge over the Cayuga Creek, concrete structure for which \$3,500 has been set aside.

Whitesboro, N. Y.—State Highway Department has prepared plans for steel bridge, concrete pier and roadway over Sauquoit Creek.

Wilmington, N. C.—New Hanover County will vote May 31 on \$50,000 of bonds for bridge and road improvements and construction.—D. McEachern, Chairman County Commissioners.

Dayton, O.—Bids will soon be asked for constructing the Wolf Creek bridge at the confluence of Miami River and Wolf Creek; cost is estimated at \$17,000.—William A. Budroe, Clerk Department Public Service.

Toledo, O.—Plans will be prepared by the City Engineer for erecting bridge over Lake Shore Railroad on Summit st.

Altoona, Pa.—Commissioners of Blair County have appropriated \$3,000 for repairs to seven county bridges.

Coatesville, Pa.—Chester County Commissioners are considering erection of bridge over Brandywine Creek.

Pittsburg, Pa.—County Commissioners have decided to erect \$12,000 bridge across Pine Creek on Butler plank road in Shaler Township.—S. D. Foster, County Road Engineer.

York, Pa.—County Commissioners have decided to rebuild stone bridge at the mouth of Fishing Creek, between the Townships of Lower Windsor and Chanceford; plans are being prepared by W. R. Smith, County Engineer.

Germantown, Tenn.—Citizens will vote on \$3,000 bonds for bridge construction, street and sidewalk improvement, etc.

CONTRACTS AWARDED

Jacksonville, Fla.—Repairing bridge over Big Pottsburg Creek, to J. E. Ivanoski, \$2,700.

Boston, Mass.—To Lawler Bros. for building temporary draw at Dover st. bridge, \$2,079; other bidders: George T. Rendle, \$2,203.79; W. H. Ellis, \$2,611; Engineer's estimate, \$2,500.

Jersey City, N. J.—Building bridge over Morris Canal at Communipaw ave., by the Board of Freeholders, to Stillman, Delehanty and Ferris, \$7,620; other bidders, Cement Paving Construction Co., \$9,850; Joseph H. Cutley, \$10,650; Bond & McNally, \$10,800; F. W. Schwyers, \$12,450.

Scranton, Pa.—Building nine new bridges and repairing another, by County Commissioners: Over Spring Brook Creek in Moosic, to York Bridge Co., \$2,745; over Sulphur Creek, Mayfield, to T. C. Cummings, \$580; over Mother Harding's Creek, Mayfield, to J. W. O'Brien & Son, \$820; over creek near Glenburn Pond, Glenburn, to W. E. La Rue, \$995; over Lily Lake Creek, Dalton, to W. E. La Rue, \$395; over Kennedy's Creek, on road from Dalton to East Benton in North Abington, to Dingleberry & McLaughlin, \$510; over outlet of Bassett's Pond, near George C. Gibbs' residence in Benton, to George H. Nichols, \$500; over Gardner's Creek, near W. J. Biesecker's, Newton, to W. E. La Rue, \$295; over Depew's Creek in Covington, to Edward Wise, \$680; for repair of bridge over Wardell's Creek in Covington, to Edward Wise, \$400.

Petersburg, Va.—Building four concrete bridges, to Coleman Construction Co.

MISCELLANEOUS

Huntsville, Ala.—Citizens have voted \$100,000 bonds for erection of municipal hotel.

Auburn, Cal.—Board of Trustees is considering bonding of city for permanent improvements.

Oakland, Cal.—Citizens will vote June 6 on \$500,000 bonds for purchase of site and erection of infirmary building.

Pasadena, Cal.—City Commissioners have voted \$1,000 for establishing of a summer playground at Wilson School.

Pasadena, Cal.—Citizens have voted bonds for erection of addition to city hall.

Sacramento, Cal.—City Trustees have decided to advertise for bids for construction of a bandstand in the City Plaza to cost about \$1,200.

Sacramento, Cal.—Mayor M. R. Beard has recommended erection of city jail.

San José, Cal.—Citizens will vote in June on \$110,000 bonds for improvement of Alum Rock Park, \$2,000 for public comfort stations, \$50,000 for incinerator and \$60,000 for police and fire department.

Pueblo, Col.—Need of 50-hp. auto police patrol is being urged.

Washington, D. C.—Argentine budget for 1911 makes provision for expenditure of about \$42,500 on various public works, principal items with estimated cost being as follows: Purchase of two suction dredgers for port of Buenos Aires, \$580,000; purchase of dredging plant for certain rivers, \$550,000; building and furnishing of new Law Courts, \$2,550,000; construction of new General Post Office, \$430,000; new port at Mar del Plata, \$2,960,000; construction work on various railways and purchase of rolling stock, etc., \$19,325,000; construction of military barracks, \$850,000; construction of port of Quequen, \$775,000; extension of water supply and drainage works in Buenos Aires, \$3,830,000; water supply and sanitary works in several towns in Provinces, \$2,550,000; and construction of immigrants' hotels and homes, \$1,375,000. Address No. 6659 Bureau of Manufactures.

Jacksonville, Fla.—City Engineer Philip Prioleau has submitted detailed plans for proposed improvements in Ingleside Park, Riverside; \$2,500 available.

Freeport, Ill.—Chief of Police Root has asked for police telephone system and auto runabout.

Boston, Mass.—Council is considering \$50,000 appropriation for court house and police station for Charlestown and \$65,000 for court house for Boston.

Newark, N. J.—Upon recommendation of Finance Committee Council has voted to issue bonds to erect almshouse on a new site, building for the Board of Health, city dispensary and clinics, central fire station with accommodations for two companies housed at present in Branford place, police station in Sixth Precinct, fire truck house in the Sixteenth Ward, house for nurses of the City Hospital and public baths to cost \$125,000.

Trenton, N. J.—Council has adopted resolution permitting Harbor Board to issue \$50,000 bonds to carry out plans for acquiring land along Delaware River front for establishing docks and harbors.

Albany, N. Y.—Council is considering purchase of site for addition to Police Station No. 1, Arch and Broad sts.

New York, N. Y.—Plans have been filed by Architects Hoppin & Koen, 244 5th ave., for erection of four-story police station for Eighth Precinct at corner of Beach and Varick sts.

Philadelphia, Pa.—Mayor Reyburn has asked Councils to authorize him to engage an architect and execute contract for the erection of municipal convention hall in Fairmount Park.

Henning, Tenn.—City has decided to erect jail.

Omak, Wash.—Town is considering bond issue for public improvements.

CONTRACTS AWARDED

Waycross, Ga.—Erecting county jail, to Pauly Jail Co., St. Louis, about \$34,000.

Boston, Mass.—Building wooden landing piers in Charles River, Lower Basin, Boston, to Lawler Bros., Charlestown, \$7,380.

Bozeman, Mont.—Sprinkling Main st., to S. Collett, \$113.50 per month.

Hightstown, N. J.—Sprinkling streets for coming season, to J. Ely Robbins, 37c. per hour.

Cincinnati, O.—To C. F. Runck, Jr., for building Elm st. concrete steps, \$3,074.

Cincinnati, O.—Shelter house and comfort station, by the Board of Park Commissioners, to William Miller & Son, Pearl and Martin sts., city, \$9,373.

Reading, Pa.—By Board of Public Works, to John A. Rauhen to clean streets for five years.

Galveston, Tex.—Installation of a garbage crematory here, to the Speclalty Engineering Co., Houston, \$8,500.

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MIXING WITH STANDARD CONCRETE MIXER, SECTION NO. 5

THE BRONX EXPERIMENTAL ROAD

Methods of Laying and Cost of Each of Eighteen Sections—Conditions after Six Months' Use—
Bituminous Pavements—Hand and Machine Mixing and Penetration Method

THE BRONX experimental road, laid by the Commissioner of Public Works, Borough of Bronx, New York City, a brief account of which was given in the MUNICIPAL JOURNAL, November 10, 1910, has now been subjected to traffic for about six months and some of the conclusions which it was the purpose of the construction to ascertain can already be drawn. The purpose of the laying of the eighteen kinds of pavement in a single continuous stretch was to ascertain what sort of construction would meet the needs of that part of the city and the cost of which would not bear so hard on property owners as would the standard types of pavement laid in the lower portions of the city. In fact, a legislative act was passed providing for the laying of pavements, temporary in character, the cost of which would be charged to property owners and credited to them later when a higher class pavement should be laid. In this respect the results were satisfactory and a

number of the types of pavement laid experimentally will be constructed, perhaps in large areas, during the coming season.

The experimental pavements were laid on the White Plains road, a suburban thoroughfare leading to Mount Vernon and other cities. Sections of about 325 feet were laid of each pavement, the total length of the 18 kinds being 4,120 feet. The road is a wide one with two car tracks and the paved strip on the east side of the road is about 20 feet wide. A traffic census taken under the direction of William H. Connell, assistant commissioner of public works, who also was responsible for the laying of this experimental road and had charge of its construction, shows that about 300 vehicles a day used the road. The figures were doubtless correct, but on the day that the accompanying photographs were taken the traffic appeared to be much greater than this. The number of heavy two- and even four-horse loads using the road at that time gave it the

appearance of carrying what would generally be considered as a fairly heavy traffic. At any rate, the number of automobiles and heavy steel tired trucks was sufficient to severely test the wearing qualities of any type of construction. (Mr. Connell stated to the writer, since the above was written, that the traffic is now three times as heavy as in the fall, when the census was taken.)

There has been sufficient traffic to develop faults, if any of the sections were actual failures, but the general surface of the paved sections throughout is good. In most instances the surface is closing up well, indicating that the pavements will withstand winter conditions. Whether any of them will form waves in summer cannot as yet be foretold.

As regards costs, not many conclusions can be drawn, although a close examination of the items, with consideration of all the conditions, furnishes some comparative cost data. In general, the opinion of assistant commissioner Connell may be quoted. He gives it as his opinion that in work of considerable extent the costs would be from 20 to 30 per cent less than the actual cost of the experimental sections. It would hardly be fair, though, to assume that the ratios between costs of large work would be the same as those between these sections. The items of chance and management figure very largely in small pieces of work. The question of thickness of bituminous material is of the utmost importance in controlling costs. In small areas of work done in cold weather the material is laid thicker than under ordinary conditions when things are moving smoothly on a large job. A bituminous stone mixture weighs about 110 pounds per square yard one inch thick. A bituminous sand mixture weighs about 100 pounds per square yard one inch thick. These figures should be born in mind when examining the cost details and thickness of material used.

As regards conclusions to be drawn later, it should be borne in mind that the possible inferiority of any one of these pavements need not necessarily condemn it, if evidence favorable to it can be found elsewhere; for the mixture might be out of balance, be too rich or too dry, or have too much or too little fine material. However, as the work was all carefully done under expert supervision the presumption will naturally be that tests are fairly representative.

Two kinds of foundations were used on the Bronx experimental road—cement concrete and bituminous concrete. Each of these has advantages and disadvantages peculiar to itself. The bituminous concrete foundation has a great advantage in cost. About four inches of bituminous concrete cost about 30 cents on the average and 4½ inches of Portland cement concrete cost nearly 60 cents. On large work, with perhaps a half-inch reduction in thickness, it would seem that the concrete ought to be laid for about 40 or 45 cents, while the bituminous base could hardly be reduced below 25 cents even on a large job. As regards rigidity the concrete has the advantage. The pavements laid on the bituminous base in a number of instances show that the rolling settled the stone or pushed it out of place. This was partly due to an error in construction; a ten-ton tandem roller would have been better for this work than the heavier macadam rollers. This fact was appreciated at the time the work was going on, but it was impossible to obtain a tandem roller. The bituminous base, in spite of its cheapness, is, in the opinion of most asphalt experts, better in one respect than the concrete base (although the extent of the superiority has not been determined) in that the bitumen in the base stone acts as a reservoir of light bituminous oils, and as these disappear from the surface material by evaporation or disintegration their place is supplied by the oils from the base. This gives the surface coat a longer life than it has when laid on concrete. Moreover a surface might wave, due to lack of bond with the concrete, which would not slip on a bituminous base. On the other hand, when a pavement is cut into the repairs are most perfectly made if the base is of cement concrete. In this road, where both kinds of base are used, time may shed some light on this puzzling question.

The pavements of the experimental road can be classified into two general divisions according to the method of construction employed—the penetration and mixing methods. Three sections do not come in either class; they are cement concrete laid by the Hassam method, a section of plain water bound macadam and a strip of macadam with road oil poured over the surface. The sections of macadam, one treated with rod oil and the other not, are interesting as both of them at the present time show signs of disintegration, but each by different kinds of traffic. The difference in the wear caused by automobiles and by steel tires is coming to be clearly distinguished. Simple and economical methods of construction which will resist one kind of wear do not stand the other. Plain water bound macadam stands the wear of steel ties but ravel under automobile traffic. Macadam treated with oil will stand automobile traffic, but steel tired wheels cut it up. In the White Plains road, the plain macadam section shows signs of raveling; the oil treated section is badly cut up by steel tires.

The sections of pavement laid by the penetration method cost less than those laid by mixing methods. In general their appearance is excellent. In fact it is impossible to distinguish by superficial examination, with absolute certainty, between mixed and penetration pavements. Unquestionably, however, the difference is there, could be clearly seen by digging into the pavement, and will probably show in time in the lower cost of maintenance of the mixed materials. If there is any exception to this apparent equality it is in favor of the tar penetration pavements. On account of its slight viscosity when hot, tar mixes with the stone much better than does the more viscous asphalt. This makes it impossible to distinguish superficially between a tar penetration and a tar mixed roadway. As there is generally more tar in a poured than in a mixed pavement it is possible that this excess may outweigh in importance the imperfections in mixture of the former and that a tar penetration pavement may last as long as a tar mixed pavement. This is another undetermined factor which the Bronx experimental road may in time help to determine.

Among the samples of mixed bituminous pavements are some mixed by hand. The results both as regards cost and quality are such as almost to eliminate hand mixtures from practical consideration in work of any considerable extent. The ordinary plant charges on any piece of work of a mile or so in extent should not exceed 10 cents per square yard. The excess cost of hand mixtures over machine on this work was much more than that amount. In hand work the labor and fuel cost of heating is high and would not be reduced much on large work. Moreover an excess of asphalt is very apt to be used in hand work. If the stone is a little cold more asphalt has to be used to facilitate mixing, although there is probably no advantage in using the excessive quantity and there may be a disadvantage in that the mixture might be too soft in summer. At any rate machine mixed stuff is more uniform; whatever percentage of bitumen is believed to be desirable can be put in and properly mixed. Also more fine material can be used in machine mixed stuff and hence the pavement is firmer. These theoretical considerations can be confirmed by close inspection of the White Plains road on a hot day.

On one section of this road cold stone was used, the mixing being done by an ordinary concrete mixer. The economical results in this instance were very satisfactory. It was necessary, however, to omit the screenings from this mixture, but as a very viscous Texas asphalt was used, the result will very likely be satisfactory. Still it seems probable that somewhat better results might be obtained by heating the stone and adding some finer aggregate. Another section of the road was laid using the Sicilian Company's asphalts, which apparently is a sand mixture and looks very much like any asphalt pavement.

The pavement which is regarded by the city officials as the most satisfactory is No. 2, Bronx specifications for bituminous macadam mixture, laid on concrete, the surface mixture made in a plant. Owing to litigation over the Warren patents it is probable that this kind of pavement will not be laid during the coming season.

A considerable amount of pavement not exactly like any of the experimental sections probably will be laid to meet the requirements of the conditions created by the new law. This is simply a four-inch Portland cement foundation, over which will be laid 1½ or 2 inches of asphalt and sand mixed in accordance with ordinary specifications for standard asphalt pavements.

This leads up to a consideration of the merits of sand and stone for surface mixtures of bituminous pavements. It seems to be generally assumed that for road work stone is better than sand and doubtless it has advantages. There are however no published data proving that the stone mixture is more durable than the sand mixtures. As regards cost, the questions of thickness and percentages of bitumen, to say nothing of different relative costs of sand and stone in different localities, are so complicated that it cannot be stated definitely that one pavement is cheaper than the other. If it could be stated definitely what thickness of sand-bitumen mixture would wear as long, under the same traffic conditions, as a certain thickness of stone-bitumen mixture, then the problem could be answered for any locality. Reliable data regarding this, however, do

A detailed description of the 18 sections of the road and some of the items of cost follow.

Sections 1 to 10—Mixing Methods

SECTION 1

Bituminous Pavement Mixing Method Laid by the Barber Asphalt Company

Foundation Course—A concrete foundation was laid to a finished depth of 4½ inches in proportions of 1:3:6.

Surface Course of Paving Mixture—The paving mixture consists of the following mineral aggregate by weight: 73 per cent paving gravel, 10½ per cent sand, 1½ per cent dust and 5.4 per cent Bermudez asphalt, 55 penetration. The mixing was done at the Barber asphalt plant, then laid at a temperature of 220 degrees and rolled to a finished depth of 1¾ inches with a 10-ton roller.

Seal Coat—From 0 + 00 to 1 + 52, ¼ gallon of asphaltic cement to the square yard was applied, over which sand was spread.

Cost Per Square Yard

Concrete Foundation.....	\$0.639
Surface Course	0.715
Seal Coat	0.085
	<hr/>
	\$1.439



COMPLETED SECTION OF WHITE PLAINS EXPERIMENTAL ROAD
Section No. 8 in foreground

not exist. Perhaps the laying of experimental roads may in time supply the deficiency. If a bituminous stone base is sufficient to carry the traffic, the stone mixture has the advantage that it can be laid directly on the base and the result is a cheap pavement. If a concrete base is required, and an asphalt-stone binder used as in standard asphalt pavement, the cost runs up into high figures. If this binder be omitted, then the question as to durability of the pavement arises.

The photographs accompanying this article were taken of sections of the street located about 6 feet from the margin of the pavement. In all cases portions of the street were selected where no seal coat had been applied, as it is believed that the best idea of the texture of the pavement is obtained by photographing such sections. (In this connection it may be stated that, owing to the cold weather and high wind during construction the application of the seal coat was not as successful as it would have been in warm weather.) The method of taking the photographs was as follows: A 3-A folding pocket kodak was suspended between two tripods, resting firmly on the broad flat top of one of them. The lens of the camera was about 3½ feet from the pavement and a portrait lens was placed over the regular lens to secure proper focus. The opening in the lens was varied from 32 to 64 and the time of exposure was from a quarter of a second to a second, according to the varying light.

The surface was laid by the Barber Asphalt Paving Company at a price agreed on.

The gravel used in the mixture was of a siliceous nature. Most of the pebbles on the surface appear to have been crushed by the roller. In some spots the gravel appears to have separated from the bitumen and fine material, having an excess of gravel, which shows some signs of ravelling, or breaking up. The general surface, however, is excellent.

SECTION 2

Bituminous Pavement Mixing Method Laid in Accordance with Borough of The Bronx Specifications

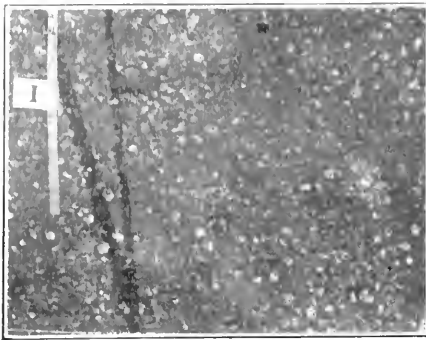
Foundation Course—1½-inch crushed trap rock was spread and thoroughly rolled with an 18-ton roller to a finished depth of about 3¾ inches.

Surface Course or Paving Mixture—The paving mixture is composed of two parts crushed trap rock passing through a 1¼-inch ring and not containing more than 5 per cent dust, 1 part sand and 7.4 per cent by weight of Bermudez asphalt, 55 penetration. The mixing was done at an asphalt plant and the paving mixture laid at a temperature of 220 degrees and rolled to a finished depth of 2½ inches with a 10-ton roller.

Seal Coat—From 3 + 25 to 4 + 78, ¼ gallon of asphaltic cement to the square yard was applied, over which chips were spread and rolled.

Cost Per Square Yard

Base Course	\$0.283
Surface Course	0.751
Seal Coat	0.081
	<hr/>
	\$1.115



BARBER ASPHALT CO.



BRONX SPECIFICATIONS



BERMUDEZ, PLANT MIXED

Cost of Surface Course

	Total.	Per Sq. Yd.
Mixing at plant.....	\$110.48	\$0.144
Labor, Field.....	51.25	0.067
Hauling.....	93.84	0.122
Asphalt Cement, 1,600 gals., at \$0.131.	209.60	0.273—2.09 gals. per sq. yd.
3/4-inch Trap Rock, 54 cu. yds., at \$1.25	67.50	0.088
Sand, 30 1/2 cu. yds., at \$0.75.....	22.87	0.030
Dust, 2,760 lbs., at \$3.50.....	4.83	0.006
Grit, 3 cu. yds., at \$1.25.....	3.75	0.005
Coal, 8,030 lbs., at \$3.00.....	12.05	0.016
767 sq. yds., at \$0.751.....	\$576.17	\$0.751
Weight of surface mixture per sq. yd.....		290 pounds

This is an excellent section, and much similar work would have been done this year if it were not for litigation over patent rights.

SECTION 3

Foundation Course—A concrete base was laid under the supervision of C. I. Williams, of Utica, N. Y., to a finished depth of 4 3/4 inches, 1 1/2-inch stone was spread to a depth of 6 inches; then screenings and cement mixed dry in proportions of 3-1 were spread, rolled, and sprinkled with water, the operation was repeated until the voids were filled. An eighteen-ton roller was used.

Paving Mixture or Surface Course—The paving mixture is composed of two (2) parts crushed trap rock passing through a 1 3/4-inch ring and not containing more than 5 per cent. dust, 1 part sand, and 8 per cent. Bermudez asphalt, 55 penetration. The mixing was done at an asphalt plant and the paving mixture was laid at a temperature of 220 degrees and rolled to a finished depth of 2 inches with a ten-ton roller.

SECTION 4

Bituminous Pavement Mixing Method Laid Under the Supervision of the Standard Oil Company

Foundation—1 1/2-inch crushed trap rock was spread and thoroughly rolled with an eighteen-ton roller to a finished depth of about 3 3/4 inches.

Surface Course or Paving Mixture—The paving mixture consists of the following mineral aggregate by weight: 58 per cent. 3/4-inch trap rock, 20 per cent. 3/8-inch chips, 15 per cent. sand and 7 per cent. Standard Oil Company special asphalt binder. The binder, trap rock and sand were heated on the ground and mixed by hand on mixing boards, the mixture was spread and rolled to a finished depth of 2 3/4 inches with an eighteen-ton roller.

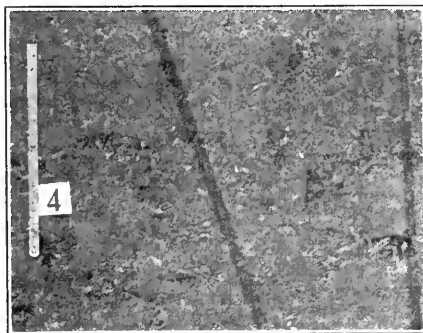
Seal Coat—From 9+95 to 10X66, 1/3 gallon to the square yard was applied, over which chips were spread and rolled.

Cost Per Square Yard

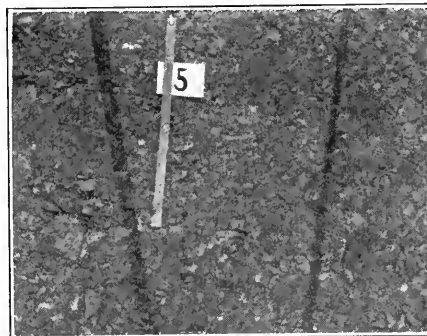
Base Course.....	\$0.283
Surface Course.....	0.964
Hauling Binder.....	0.009
Fuel.....	0.063
Asphalt and Stone Heaters.....	0.004
	\$1.323

Cost of Surface Course

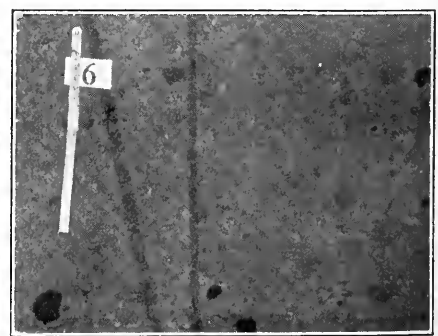
	Total.	Per Sq. Yd.
Labor.....	\$368.14	\$0.480
3/4-in. Trap Rock, 60 cu. yds., at \$1.80.....	108.00	0.140
Chips, 18 cu. yds., at \$1.90.....	34.20	0.045
Sand, 12 cu. yds., at \$1.21.....	14.52	0.019
Binder, 2,688 gals., at \$0.08.....	215.04	0.280—3.5 gals. per sq. yd.
767 sq. yds., at \$0.964.....	\$739.90	\$0.964
Weight of surface mixture per sq. yd.....		346 pounds



STANDARD OIL CO., HAND MIXED



TEXAS BINDER, MACHINE MIXED



AMIESITE

Seal Coat—The surface coat was painted with about 1/4 of a gallon of asphaltic cement to the square yard, over which chips were spread and rolled.

Cost Per Square Yard

Concrete Foundation.....	\$0.502
Surface Course.....	.90
Seal Coat.....	.08
	\$1.482

Cost of Surface Course

	Total.	Per Sq. Yd.
Mixing at Plant.....	\$105.14	\$0.297
Labor, Field.....	32.06	0.090
Hauling.....	40.80	0.115
Asphalt Cement, 742.5 gals., at \$0.13..	96.52	0.273—2.1 gals. per sq. yd.
Trap Rock, 22.5 cu. yds., at \$1.25.....	28.12	0.079
Sand, 9.0 cu. yds., at \$0.75.....	6.75	0.020
Dust, 1,440 lbs., at \$3.50.....	2.52	0.008
Coal, Soft, 5,300 lbs., at \$3.00.....	7.95	0.022
Coal, Hard, 400 lbs., at \$6.00.....	1.20	0.003
354 sq. yds., at \$0.907.....	\$321.06	\$0.907
Weight of surface mixture per sq. yd.....		260 pounds

SECTION 5

Bituminous Pavement Mixing Method Laid Under the Supervision of the Texas Co.

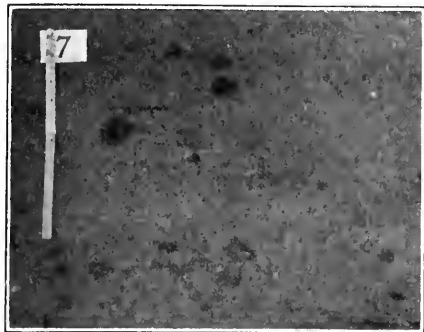
Foundation Course—1 1/2-inch crushed trap rock was spread and thoroughly rolled with an eighteen-ton roller to a finished depth of about 3 3/4 inches.

Surface Course or Paving Mixture—The paving mixture consists of 3/4-inch trap rock and 6.7 per cent by weight of Texas macadam binder. The binder was heated and mixed with the cold stone in a standard concrete mixer on the ground. The paving mixture was spread and rolled with an eighteen-ton roller to a finished depth of 2 3/4 inches.

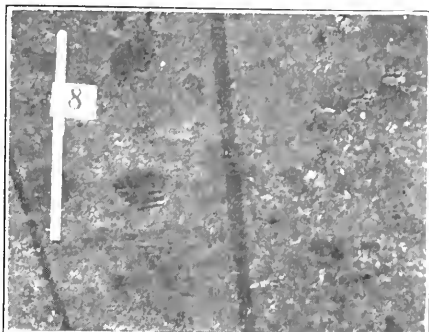
Seal Coat—From 12+36 to 13+03, a seal coat of Texas 55 special, about 1 1/4 gallons to the square yard, was applied, over which chips were spread and rolled.

Cost Per Square Yard

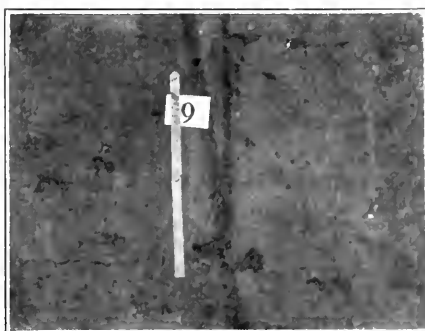
Base Course.....	\$0.283
Surface Course.....	0.721
Tar Heater.....	0.001
Fuel.....	0.021
Hauling Binder.....	0.006
	\$1.032



ASPHALTO, PLANT MIXED



TARVIA X, HAND MIXED



BERMUDEZ ASPHALT, HAND MIXED

This is one of the most interesting sections in the whole work. The stone shows plainly, owing to lack of fine material. The surface is extremely uniform throughout. The feeling of the pavement under the feet is distinctly soft or rubber-like, in spite of the fact that the stone shows on the surface more plainly than in any other asphalt-mixed section. Signs of wrinkling and cracking under the roller, perhaps due to soft foundation, are evident in places. A slight tendency in this direction may be noted near the foot of the ruler in the illustration No. 5.

Cost of Surface Course

	Total.	Per Sq. Yd.
Labor	\$182.86	\$0.234
3/4-in. Trap Rock, 81 cu. yds., at \$1.80	145.80	0.186
Binder, 1,728 gals., at \$0.12	207.36	0.265—2.2 gals. per sq. yd.
Concrete Mixer (rent), 7 days, at \$1.00	28.00	0.036
782 sq. yds. at \$0.721	\$564.02	\$0.721
Weight of surface mixture per sq. yd.		300 pounds

SECTION 6

Amiesite Laid Under the Supervision of the Amiesite Co.

Foundation Course—1 1/2-inch crushed trap rock and sufficient screenings to fill the voids was spread and rolled with an eighteen-ton roller to a finished depth of 3 1/2 inches.

Surface Course of Paving Mixture—The paving mixture was shipped from the Amiesite plant and laid in two courses, the first course was composed of 1 1/2-inch stone with binder, etc., laid and rolled to a finished depth of 2 inches. The second or wearing course was composed of 5/8-inch trap rock, binder, etc., laid and rolled to a finished depth of 1 inch. The paving mixture therefore had a finished depth of three inches. An eighteen-ton roller was used.

Surface is very close, hardly distinguishable from a standard asphalt surface, especially where travel has been heaviest.

SECTION 7

Sicilian Asphalt Laid by the Sicilian Asphalt Co.

Foundation Course—Consists of 1 1/2-inch crushed trap rock laid and rolled with an eighteen-ton roller to a finished depth of 4 1/2 inches.

Surface Course of Paving Mixture—The paving mixture is called Asphalt and was mixed at the Sicilian Asphalt Company's plant and hauled to White Plains avenue and spread. The paving mixture was not rolled until comparatively cool with a Sicilian asphalt ten-ton grooved roller, to a finished depth of 1 1/2 inches. A light layer of cement was then sprinkled over the surface.

This is evidently a mixture containing sand and considerable fine dust. It is a secret but not a patented mixture. Spots in the illustration are oil dropped from automobiles.

SECTION 8

Bituminous Pavement Mixing Method Laid Under the Supervision of the Barrett Manufacturing Co.

Foundation Course—1 1/2-inch crushed trap rock and screenings was spread and rolled with an eighteen-ton roller to a finished depth of 3 3/4 inches.

Surface Course or Paving Mixture—The paving mixture consists of 3 parts 3/4-inch trap rock, 1 part chips and 6 1/2 per cent. by weight of Tarvia X. The trap rock and Tarvia X were heated on the ground and mixed by hand on mixing boards, spread and rolled with an eighteen-ton roller to a finished depth of 2 3/4 inches.

Seal Coat—About .6 of a gallon to the square yard of Tarvia X was applied, over which chips were spread and rolled.

Cost Per Square Yard

Base Course	\$0.305
Surface Course	0.913
Seal Coat	0.137
Hauling Binder	0.009
Tar and Stone Heaters	0.002
Fuel	0.063
	\$1.429

Cost of Surface Course

	Total.	Per Sq. Yd.
Labor	\$206.60	\$0.421
1 1/2-in. Trap Rock, 6 cu. yds., at \$1.65	9.90	0.020
3/4-in. Trap Rock, 43 cu. yds., at \$1.80	77.40	0.157
Chips, 14 cu. yds., at \$1.90	26.60	0.054
Binder, 1,344 gals., at \$0.095	127.68	0.261—2.7 gals. per sq. yd.
491 sq. yds., at \$0.913	\$448.18	\$0.913
Weight of surface mixture per sq. yd.		310 pounds



HAND MIXING ON SECTION NO. 4 WHITE PLAINS EXPERIMENTAL ROAD.

SECTION 9

Bituminous Pavement Mixing Method

Foundation Course—1½-inch crushed trap rock and screenings were spread and rolled to a finished depth of 3¾ inches.

Surface Course or Paving Mixture—From 22+75 to 23+02, the binder consists of a mixture, tar and 10 per cent. of refined Bermudez asphalt. From 23+02 to 24+00, the binder consists of a mixture of tar and 15 per cent. of Bermudez asphalt of 60 penetration. From 24+00 to 24+40, the binder consists of a mixture of tar and 15 per cent. of Bermudez asphalt of 110 penetration. From 24+40 to 24+50, Bermudez asphalt of 110 degrees penetration was used for a binder. The paying mixture consists of 3 parts ¾-inch trap rock, 1 part chips and 7 per cent. by weight of bitumen. The stone and binder were heated on the ground, mixed by hand on mixing boards, spread and rolled with an eighteen-ton roller to a finished depth of 2¾ inches.

Seal Coat—About .6 of a gallon of asphalt per square yard was applied, over which chips were spread and rolled.

Cost Per Square Yard

Base Course	\$0.305
Surface Course	1.034
Seal Coat	0.146
Fuel	0.063
Hauling Binder	0.009
Tar and Stone Heaters.....	0.002
Mixing Binder	0.076
	\$1.635

Sections 11-18 Penetration or Other Systems

SECTION 11

Barrett Manufacturing Co.'s "Modern Pavement"

Foundation Course—1½-inch crushed trap rock was spread and rolled to a finished depth of 3 inches.

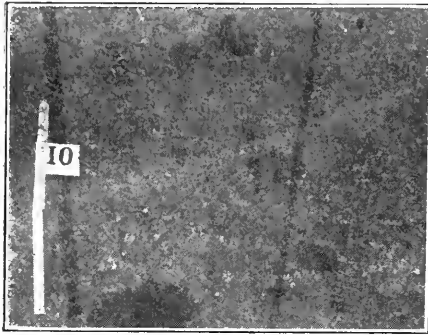
Surface Course or Paving Mixture.—A sufficient quantity of sand was spread to fill the voids and laid about ½ inch in thickness on top of the foundation course, over which about 1 gallon of Tarvia X to the square yard was applied. 1½-inch crushed trap rock was then spread and lightly rolled to a depth of 3 inches. About 2 gallons of Tarvia X to the square yard was then applied by the penetration method. A layer of ¾-inch stone was spread and rolled. An eighteen-ton roller was used.

Seal Coat—About 1 gallon to the square yard was applied, over which course sand was spread and rolled.

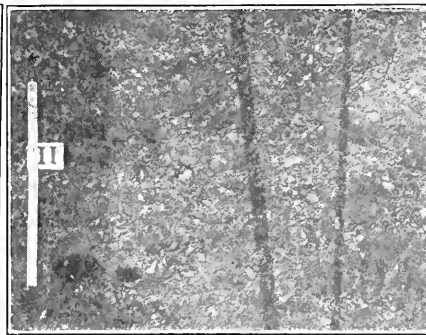
Cost Per Square Yard

Base Course	\$0.305
Surface Course	0.698
Seal Coat	0.219
Hauling Binder	0.010
Tar Heater	0.003
Fuel	0.021
	\$1.256

The presence of large stone in the mixture is apparent. They are firmly bound in place by finer material.



REFINED TAR, HAND MIXED



BARRETT "MODERN PAVEMENT"



PENETRATION METHOD

Cost of Surface Course

	Total	Per Sq. Yd.
Labor	\$197.84	\$0.479
1½-in. Trap Rock, 5 cu. yds., at \$1.65	8.25	0.181
¾-in. Trap Rock, 37 cu. yds., at \$1.80	66.60	
Chips, 12 cu. yds., at \$1.90.....	22.80	0.055
Binder, 1,115 gals., at \$0.118.....	131.57	0.319—2.7 gals. per sq. yd.
413 sq. yds., at \$1.034.....	\$427.06	\$1.034
Weight of surface mixture per sq. yd.....		380 pounds

SECTION 10

Bituminous Pavement Mixing Method

Foundation Course—1½-inch crushed trap rock and screenings were spread and rolled to a finished depth of 3¾ inches.

Surface Course or Paving Mixture—The paving mixture consists of 3 parts ¾-inch trap rock, 1 part ½-inch trap rock chips and 6 per cent. by weight of refined tar. The binder and stone were heated on the ground and mixed by hand on mixing boards, spread and rolled with an eighteen-ton roller to a finished depth of 2¾ inches. The binder used was refined tar made up in accordance with specifications drawn up by the Office of Public Roads, U. S. Dept. of Agriculture.

Seal Coat—About .6 of a gallon to the square yard was applied, over which chips were spread and rolled.

Cost Per Square Yard

Base Course	\$0.305
Surface Course	0.868
Seal Coat	0.135
Fuel	0.063
Hauling Binder	0.008
Tar and Stone Heaters	0.003
	\$1.382

Cost of Surface Course

	Total	Per Sq. Yd.
Labor	\$308.91	\$0.377
¾-in. Trap Rock, 82.5 cu. yds., at \$1.80	148.50	0.181
Chips, 27.5 cu. yds., at \$1.90.....	52.25	0.064
Binder, 2,016 gals., at \$0.10.....	201.60	0.246—2.46 per sq. yd.
819 sq. yds., at \$0.868.....	\$711.26	\$0.868
Weight of surface mixture per sq. yd.....		380 pounds

SECTION 12

Bituminous Pavement Penetration Method

Foundation Course—1½-inch crushed trap rock and sufficient screenings to fill the voids was spread and rolled to a finished depth of 3½ inches.

Surface Course or Paving Mixture—1½-inch crushed trap rock was spread and lightly rolled to a depth of 2¾ inches. From 29+00 to 30+50 about 1½ gallons of Sanford & Strains asphalt binder was applied and a layer of ¾-inch trap rock was spread and rolled. From 30+50 to 31+00, the Standard Oil Co.'s special binder was used.

Seal Coat—¾ of a gallon to the square yard was applied, over which coarse sand and chips were spread and rolled. An eighteen-ton roller was used.

Cost Per Square Yard

Base Course	\$0.329
Surface Course	0.501
Seal Coat	0.123
Hauling Binder	0.006
Tar and Stone Heaters.....	0.003
Fuel	0.021
	\$0.983

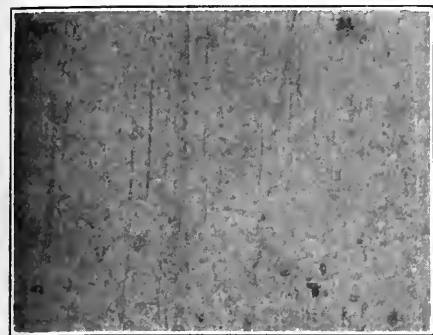
SECTION 13

Hassam Concrete Pavement

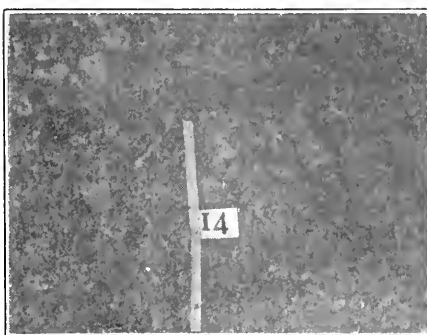
1½-inch trap rock (crushed) was laid and rolled with an eighteen-ton roller to a finished depth of 6 inches. Sand and cement were mixed in proportions of 1¾ sand to 1 of cement and forced into the voids of the stone by means of a special pressure machine used by the Hassam Paving Company.

	Total	Per Sq. Yd.
Labor	\$110.40	\$0.234
1½-in. Trap (total) 111.6 cub. yds., at \$1.65..	184.14	0.390
Sand, 33.0 cu. yds., at \$1.21.....	39.93	0.085
Cement, 535 bags, at \$1.35 per barrel.....	180.56	0.382
Hauling Sand, Cement and Tools—		
6 teams, 80 hrs., at \$0.625 per hr.....	50.00	0.118
2 men, 20 hrs., at \$0.28½ per hr.....	5.62	
472 sq. yds., at \$1.209.....	\$570.65	\$1.209

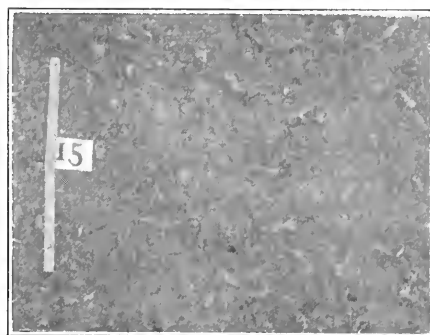
This section is cracked clear across in three places. The pavement seems harsh and noisy, but there is no indication of chipping or friability.



HASSAM CONCRETE



WATER-BOUND MACADAM



TARVIA, PENETRATION METHOD

SECTION 14

Water Bound Macadam

1½-inch crushed trap rock and sufficient screenings to fill the voids were spread, sprinkled and rolled with an eighteen-ton roller to a finished depth of 6 inches.

Cost Per Square Yard

Labor	Total.	Per Sq. Yd.
1½-in. Trap Rock (total) 83.7 cu. yds., at \$1.65	\$107.11	\$0.303
Screenings, 16.7 cu. yds., at \$1.65.....	138.10	0.390
	27.55	0.078
354 sq. yds., at \$0.771.....	\$272.76	\$0.771

This section is very dusty. Signs of ravelling are apparent. Close inspection of the illustration shows this.

SECTION 15

Bituminous Pavement Penetration Method

Foundation Course—1½-inch crushed trap rock and screenings were spread and rolled to a finished depth of 3½ inches.

Surface Course or Paving Mixture—1½-inch crushed trap rock was spread and lightly rolled to a depth of 2½ inches. 2.3 gallons to the square yard of Tarvia was then applied, after which a layer of chips was spread and rolled.

Seal Coat—About ¾ of a gallon of Tarvia to the square yard was applied, over which chips was spread and rolled. An eighteen-ton roller was used.

Cost Per Square Yard

Base Course	\$0.305
Surface Course and Seal Coat	0.735
Fuel	0.021
Hauling Binder	0.008
Tar Heater	0.002
	\$1.071

SECTION 17

Bituminous Pavement Penetration Method

Surface and Base Course Spread in One Course—1½-inch crushed trap rock was spread and rolled to a depth of 6 inches. 1⅓ gallons to the square yard of Standard Oil Co.'s Binder "B" was then applied, over which a layer of ¾-inch trap rock was spread and rolled.

Seal Coat—1.1 gallon to the square yard of Binder "B" was applied, after which chips was spread and rolled. An eighteen-ton roller was used.

Cost Per Square Yard

Surface and Base Course.....	\$0.648
Seal Coat	0.177
Fuel	0.021
Hauling Binder	0.006
Tar Heater	0.001
	\$0.853

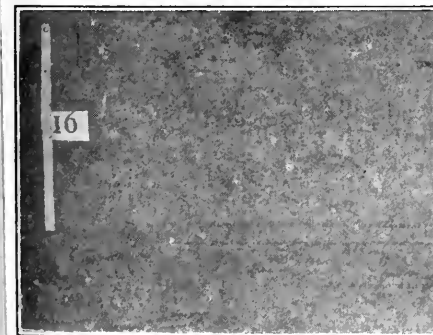
SECTION 18

Standard Oil Co.'s Sand Surface Method

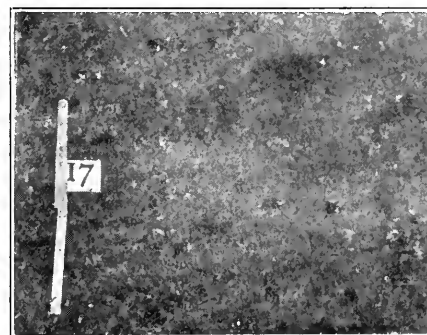
Application of Oil and Sand—This was an old strip of water-bound macadam which was swept, after which ¾ gallon to the square yard of Standard Oil Co.'s Binder "A" was applied, over which sand was spread about one inch thick and lightly rolled.

Cost Per Square Yard

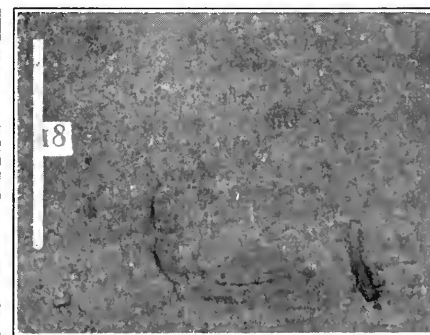
Sand Course	\$0.178
Hauling Binder	0.002
Tar Heater	0.001
Fuel	0.021
	\$0.202



BERMUDEZ, PENETRATION METHOD



BINDER B, PENETRATION METHOD



SAND SURFACE METHOD

SECTION 16

Bituminous Pavement Penetration Method

Foundation Course—1½-inch crushed trap rock and screenings were spread and rolled to a finished depth of 3½ inches.

Surface Course or Paving Mixture—1½-inch crushed trap rock was spread and slightly rolled to a depth of 3 inches. 1½ gallons to the square yard of Bermudez road asphalt was then applied, after which a layer of chips was spread and rolled.

Seal Coat—½ gallon to the square yard of Bermudez was applied, over which chips was spread and rolled. An eighteen-ton roller was used.

Cost Per Square Yard

Base Course	\$0.305
Surface Course	0.519
Seal Coat	0.123
Hauling Binder	0.005
Tar Heaters	0.002
Fuel	0.021
	\$0.975

Marks of horse's shoes show plainly in the illustration. In the more heavily traveled portion of the road the bituminous layer has been picked up, rolled about and is a bad mess. Travel is too heavy for this class of work.

A comparison of the accompanying photographs with the reproductions of the surfaces of the Ohio experimental road published in the MUNICIPAL JOURNAL January 4, 1911, will show that the stone in the Bronx road is not so plainly evident. In the latter the large stones in those mixtures which contain them—many of the mixtures have no stones larger than ¾ inch—are more completely bound in with bitumen and fine material. This more complete binding is a merit in itself, if the pavements are not too soft in summer. An additional reason why the stone does not show so plainly in the Bronx work is that the color of the trap rock in this is dark gray, making it inconspicuous as compared with the light colored Ohio stones.

SPECIFICATIONS FOR MICHIGAN HIGHWAYS

Construction Necessary for Receiving State Reward—Specifications for Clay-Gravel, Gravel, Stone-Gravel, Gravel-Stone and Stone Roads—Why Gravel Roads Are Popular—Care of Clay and of Sand Roads

THE laws of 1909 of the state of Michigan provide for a payment or "reward" by the state to townships for roads built by them which conform to certain requirements. The state department has set forth plainly what these requirements are, and in its 1910 report has also given specifications for roads using the various local materials found within the state. It is required that roads to receive state reward should be well graded, that the steepest grade should not exceed 6 per cent and that the width should not be less than 18 feet between side ditches; that it shall be properly drained and have a wagonway or travel track not less than 9 feet wide. It is also provided that both shoulders and metaled track be properly crowned so as to shed water quickly to the side ditches. Such roads if of sand-clay and gravel receive a state reward of \$250 a mile. Two-layer gravel roads receive \$500 a mile. A layer of broken stone covered with a top course of gravel receives \$750 a mile. A bottom course of gravel or slag and a top course of crushed stone receives \$750 a mile. Two-course macadam received \$1,000 a mile. Not more than two miles in any one township will be granted a reward in one year.

The clauses of the specifications for grading, drainage and shoulders are common to all roads and provide that the finished road should be not less than 18 feet between side ditches and have a cross section oval in form, with an average rise of one inch to the foot from the inner edge of the ditch to the center line of the road. The Highway Department recommends that for heavily traveled roads the distance between ditches be made at least 20 feet. The side ditches are to have sufficient incline to cause a free and uniform flow of water to the nearest natural outlets, which outlets must be so improved, where necessary, as to carry the water quickly away from the highway.

Shoulders of suitable material are to be formed not less than nine feet apart and extend to the side ditches or gutters at the same grade and curvature as required for the finished road. Where the road grade is high the shoulders may be formed by moving earth from the center of the present road grade to the sides, or, if the grade is low, by crowning the present road grade by scraping earth from the sides toward the center; or, if sufficient suitable material cannot be had along the roadway, it can be brought from other places. The bed thus formed must be crowned to conform to the grade and section of the finished road and 8 inches below the finished surface.

CLAY-GRAVEL

A good quality of clay is then to be spread upon the road to a uniform depth of 3 inches and rolled sufficiently to crush the lumps, if there are any, and then harrowed until thoroughly pulverized. Immediately after harrowing, three inches of sand, which may be scraped from the sides with the scraping grader, should be spread upon the clay and carefully leveled. The road must then be harrowed again (a disc harrow is preferable) until the sand is uniformly covered with the clay, when the road will again be rolled until thoroughly compacted and hard, and everywhere five inches below the grade and section of the completed road. This mixing can be done much better when the clay is thoroughly wet.

The clay course is then covered with a layer of gravel of such thickness as will make a uniform depth of five inches after compacting, or six inches loose measure. The gravel must be clean bank gravel, not less than 60 per cent by weight of which should be pebbles retained on a screen of $\frac{1}{8}$ inch and passing a screen of $1\frac{1}{2}$ inch mesh. The gravel should contain not more than 20 per cent of clay, otherwise it will form mud. The gravel course is then harrowed with a spike-tooth harrow and rolled until no further compacting is possible; the final rolling being done while the road is well wet from sprinkling it after rains. Any hollows which may develop during rolling

must be filled with the same kind of gravel, and the road kept properly crowned with a grader or drag and the rolling continued until the entire surface is uniform and hard and everywhere conforms to the proposed grade and cross section.

Rolling must at all times begin at the sides of the road, rolling lengthwise but gradually working toward the center. The shoulders are to be smoothed where necessary so that the whole roadway shall be in good surface and so that water will flow from it into the side ditches without obstruction.

GRAVEL ROADS

The inner slope of the side ditches must be not steeper than 2 horizontal to one vertical and the outer slope not steeper than $1\frac{1}{2}$ horizontal to one vertical. In clay soils trenches must be cut through the shoulders to furnish outlets into the side ditches for water that may collect in the gravel bed during construction and afterward before the surface becomes hard and waterproof. These trenches must be not more than 100 feet apart, must be 8 inches or more in width and slightly deeper than the gravel bed, and filled with coarse gravel when the first layer of gravel is being applied.

The sub-grade and shoulders are to be formed as provided for clay gravel roads. The sub-grade is then to be rolled, any hollows developing being filled with suitable material and rolling continued until the sub-grade is firm and everywhere parallel to the finished roadway and eight inches lower. A layer of gravel is then spread 6 inches deep (compacting to five inches); this gravel being good, clean bank gravel, not less than 60 per cent by weight of which is pebbles retained on a screen of $\frac{1}{8}$ -inch mesh and passing a screen of $2\frac{1}{2}$ -inch mesh. There should be no more than enough clay to coat the pebbles—no free lumps. This gravel is to be harrowed with a spike-tooth harrow and rolled until no further compacting is possible; this rolling being done only when the gravel is thoroughly wet. Depressions should be filled with the same material and rolling continued until the surface is uniformly smooth and hard and three inches below the finished surface.

The top course consists of clean gravel 60 per cent of which is retained on a $\frac{1}{8}$ -inch mesh and passes a $1\frac{1}{2}$ -inch mesh screen. This is spread about four inches thick (compacting to three inches) and is harrowed and rolled to a smooth hard surface. The rolling is to be done as specified for clay-gravel roads. It may be done with a power roller, a heavy horse roller, a traction engine followed by a weighted field roller, or by a weighted field roller alone if one of suitable strength to bear weighting to three or more tons can be obtained.

STONE-GRAVEL ROADS

These are prepared as to grading, drainage and side shoulders as for gravel roads. Then crushed stone or slag is spread to a uniform thickness of five inches (compacting to four inches); this being either crushed clag, limestone, cobbles or trap rock which has passed over the $\frac{3}{4}$ -inch section and through the 3-inch section of the crusher screen. Care should be taken to prevent the stone segregating, but the different sizes should be kept well mixed.

The stone or slag is to be rolled two or three times with a roller weighing not less than ten tons, after which it is to be covered to a uniform depth of from $\frac{1}{2}$ to $\frac{3}{4}$ inch with stone screenings or bank gravel, the amount of this binder being somewhat less than enough to fill the voids. This is then to be rolled, water being used sparingly, if it seems desirable, and the rolling continued until the binder is worked into the crevices of the larger stones and the stones cease to sink or creep beneath the roller. Stone screenings, which are preferable to gravel, may be that part of the crusher-product passing through the $\frac{3}{4}$ -inch section of the crusher screen. The gravel, if used, should be similar to that specified for top course of gravel road.

On the lower course will then be placed a layer of gravel four inches thick, to compress to three inches, this being similar to the gravel specified for the top course of gravel roads. This course is to be floated until the surface is smooth and even, then sprinkled and rolled until no further contracting is possible. Any hollows that may develop in the gravel top during the process of rolling are to be filled with the same kind of gravel and the rolling continued until the surface is uniform and hard, and everywhere conforms to the proposed grade and cross section of the road. The manner of rolling is that prescribed for the top course of other roads.

GRAVEL-STONE ROADS

The grading, drainage, shoulders, sub-grade and lower course of gravel are as specified for gravel roads. Instead of gravel, slag may be used for the lower course, this consisting only of that part of the crusher product passing over the one-inch section and through the three-inch section of the crusher screen; the slag being bonded with gravel or stone screenings smaller than one inch, and then being sprinkled and rolled.

On this is to be placed a layer of crushed stone 4 inches thick, to compress to 3 inches, the stone being crushed limestone, cobbles or trap rock, using only that part of the crusher product which passes over the $\frac{3}{4}$ -inch section and through the 2-inch section of the crusher screen. This stone must be placed on the road uniformly mixed, with no patches of alternately large and small stones. After this has been spread and rolled two or three times with a roller weighing not less than ten tons it is to be covered with $\frac{3}{4}$ inch of stone screenings. Enough screenings which have passed the $\frac{3}{4}$ -inch section of the crusher screen should be used to slightly more than fill the voids in the larger stones. Water is then to be applied with a horse sprinkler and the road rolled and watered until it becomes so hard that a piece of rock will crush beneath the roller before penetrating the surface. If depressions are formed they should be filled with the smaller stones of suitable grade and not with screenings. More screenings must be added, however, wherever these disappear from the surface in the road.

STONE ROADS

After grading the road and preparing the ditches, shoulders and sub-grade as previously, the first course is composed of a layer of crushed stone $4\frac{1}{2}$ inches deep, loose measure, to compress to $3\frac{1}{2}$ inches; which stone may be crushed limestone, cobbles or trap which has passed over the $\frac{3}{4}$ -inch section and through the 3-inch section of the crusher screen. This is then to be rolled two or three times and covered to a uniform depth of $\frac{1}{2}$ to $\frac{3}{4}$ inch with stone screenings and re-rolled; the amount of screenings being somewhat less than enough to fill the voids in the stone. The rolling must continue until the binder is worked into the crevices of the larger stones and the stones cease to sink or creep beneath the roller. The top course will then be laid as specified for the top course of gravel-stone roads, except that the stone is placed $3\frac{1}{2}$ inches deep instead of 4 inches, and compressed to $2\frac{1}{2}$ inches instead of 3 inches. Binder is applied and the road rolled as previously specified.

About 7,000 miles, or approximately one-tenth of the total road mileage of Michigan, is surfaced with gravel. Since the state reward road law became operative there have been built about 350 miles of gravel roads approved by the Highway Department, which roads have cost ordinarily from \$1,000 to \$3,000 per mile. Gravel roads are popular in Michigan because they are durable and satisfactory; because they are easily built and easily repaired, requiring no expensive machinery; because the first cost is low; because they draw a relatively large state reward—frequently one-third or more of their cost; and because they are a labor proposition from start to finish and keep at home all the money spent in their construction.

In his annual report the highway commissioner gives instruction for the improvement or maintenance of unimproved sand roads, in which he states that moisture should be conserved in every way possible, especially by the liberal planting of shade trees, particularly on the south and west sides of the roadway. Temporary relief can be had by covering the roadway with

straw, sawdust, shavings, cedar bark, leaves or almost any kind of vegetable matter. Such material forms a temporary covering which wheels cannot easily cut through, and conserves the moisture. Frequent scraping of sand roads with a road grader or other scraper is not only a loss of time and money, but is a positive injury, as it only helps the wheels to cut into it that much deeper. In short, except for the application of vegetable matter, as above suggested, a sand road is best left to care for itself until it can be covered with clay, gravel or macadam.

In caring for clay roads or any soil which will pack under travel and become reasonably firm in dry weather, they should be properly crowned and thoroughly drained, even to the extent of using tile drains to remove ground water. After having been drained and graded and crowned, the log drag or plank float is sufficient to keep them in good condition. The drag should be used in the spring when the frost has left the ground and the road has begun to dry out but is still muddy. It should also be used after every prolonged rain throughout the season, and in the fall just before the ground freezes. Also if the frost should leave the ground at any time during the winter advantage should be taken of this to use the drag to smooth out the ruts.

ROAD WORK IN MASSACHUSETTS

Surface Treatment Recommended for Light Traffic—Heavy Oils Heated for Surface Preservation—Oil and Sand "Building-Up" Process

DURING the year 1910 the Massachusetts Highway Commission built 54.5 miles of road, 18 of which was waterbound macadam, about 15 was gravel with the top course bound with bituminous material, 7 was sand bound with oil, 6 was gravel, and $2\frac{1}{2}$ was bituminous macadam with a surface binder of asphaltic oil.

Nearly a half million dollars was spent in maintenance of roads, including oiling. Many miles of roads have been successfully maintained in the last two years by a surface treatment of tar or asphaltic oil and Commissioner Parker and Chief Engineer A. W. Dean believe that this method of treatment will keep the roads in good condition where traffic is light. But without some such treatment many of the macadam roads are found to go to pieces in less than a year. It is believed therefore that bituminous surface treatment will be necessary over a large percentage of the State roads. This treatment costs from \$500 to \$1,200 per mile, depending upon the width of roadway treated and the condition of the road, and the length of haul for both bituminous material and metal. During 1910 more than 1,300,000 gallons of various tars, tarvias and asphaltic oils were used in maintenance and construction on about 250 miles of road. Of this length 219 miles was given a bituminous surface coat, and a bituminous binder was used in the top surface of 30 miles.

One method adopted by the Commission for using asphaltic oils was to heat sand or gravel, mix it with the oil and spread it upon a road which had been prepared by shaping and rolling. In other cases the so-called "building up" process has been used, in which the oil is heated before being applied and then about $\frac{3}{4}$ -gallon per square yard is applied to the dressed surface of the road and is covered with as much sand as is required to absorb all the oil. Another coating of the same amount is then applied and this again covered with sand. It seems to be difficult to secure perfect uniformity in this work, probably because of uneven distribution of the oil, and holes or irregularities appear in the surface which make it necessary to reshape the road, in places adding more oil and sand and rolling the whole to a firm surface again. This reshaping is usually left for the second season. This method has enabled the commission to prepare a fairly satisfactory road at a much less cost than that of a stone or gravel road, especially where such materials are not to be found near by. Where travel is light and gravel or stone can be obtained only by long hauls, a

built-up road costs only one-half to one-third as much as a macadam, and can be shaped from time to time with less difficulty than can a clay road, and will give quite satisfactory service. The same method of construction has also been found to give excellent results where gravel which is obtainable is of a loose and sandy nature and does not cement together readily. The oldest road of this construction was one built in Eastham in 1905. Ruts have occasionally developed in this road and holes worn in the top surface, but it has been reshaped from time to time by harrowing, scraping and rolling and each year has improved in condition, the asphaltic oil seeming to retain its adhesiveness. The cost of this road for the five years has been about 17 cents for original construction and 19½ cents for maintenance, or a total cost of \$3,400 per mile 16 feet wide. The commission in its report pays special attention to this class of road because it will enable localities where either absence or suitable material or lightness of travel make a macadam road too expensive to provide a fairly satisfactory road at much less cost.

The commission believes from its experience that the surface application of oil is to be recommended for dust suppression, but that to preserve the surface from wear a heavy bituminous material should be used and heated before application. It is found that where this material contains a large percentage of asphalt all the dust and dirt should be thoroughly removed from the surface of the road before application and the stones should not be extremely dry but should be rather moist, otherwise the oil will not adhere to the road metal. Two coats of one-quarter gallon per square yard each will produce more uniform and durable results than one coat of one-half gallon. A few days should elapse between the two applications. The commission has tested some English machines for distributing oil under pressure and believes that, while the penetration is not increased to any great extent by their use, the distribution is much more uniform, and it prefers this method to allowing the oil to flow on by gravity.

Most of the oil used last year by the commission was purchased under the following specifications:

The oil should be of a uniform color, appearance, general character and viscosity and must fulfill the following requirements:

- a. It shall have a specific gravity of at least 0.97.
- b. It shall contain not over 0.5 per cent of dirt or adventitious mineral matter.
- c. It shall contain not over one per cent of matter insoluble in carbon bisulphide.
- d. It shall be of such viscosity that 60 c.c. measured at room temperature (78 deg. Fahr.) shall when at 100 deg. C. be not less than 250 seconds nor more than 500 seconds in passing a Lawrence viscosimeter, or 200 c.c. measured and tested at the same temperature shall not be less than 900 seconds nor more than 1800 seconds in passing the Engler viscosimeter.
- e. When 20 grams are heated in a flat-bottomed dish 3 inches in diameter for 21 hours in a well-ventilated oven kept at a temperature of 250 deg. C. the loss in weight shall not be greater than 15 per cent.
- f. When subjected to a number of heatings at 250 deg. C. in a well-ventilated oven with intermediate separations of asphaltine and matter insoluble in carbon bisulphide until the final petroleum ether extract is not more than 10 per cent by weight of the original sample, it shall show the following results, assuming also that this final 10 per cent has the same composition as the 90 per cent of the material examined:

The total loss shall not be more than 35 per cent by weight; the amount of asphaltine in the original sample shall not be greater than 6 per cent by weight, and the amount of asphaltine formed by this treatment plus that in the original samples shall be at least 58 per cent by weight of the original sample. The amount of matter insoluble in carbon bisulphide as a result of this treatment shall not be greater than 5 per cent.

In applying oil the commission always treats one side of the road, and leaves the other untreated and open for traffic until the first has absorbed the oil and been put in such shape for traffic that the oil will not track or be objectionable in any way. While this commission has been systematically experimenting and noting results for a number of years, it is not confident that it or any one else either in this country or abroad can state with certainty what the final results will be from the

adoption of these comparatively new methods of treatment. It appears probable, however, that the cost of maintenance where these bituminous methods are employed will be no greater with the heavy automobile traffic than is the cost of maintaining water-bound macadam. It has been found both in United States and in England and on the continent that it costs from \$250 to \$600 per mile per year to properly maintain a macadam road in country districts and considerably more where the traffic is heavy.

OHIO STATE ROAD LABORATORY

The State Highway Department of Ohio, James C. Wonders commissioner, has a laboratory for testing road building materials which, while it is hampered by a small appropriation, is still a very creditable one. The equipment of the laboratory comprises a standard brick rattler, a Deval abrasion machine of four cylinders, Case jaw crusher, Ilers disc pulverizer, each of the above with its own motor. Also a stone shaker; diamond core drill; Page diamond saw; carborundum wheel grinder, with motor; Dorry grinding machine for hardness, with motor; sifter, with motor; hydraulic briquette molding machine; standard impact testing machine for toughness; trip-hammer model motor machine for cementing value; drying oven; scales, etc. The apparatus for cement testing consists of Riehle briquette machine, Vicat needle, Gilmore needles, gang molds, damp closet, specific gravity flasks, sand scales, etc. That for bituminous materials: One analytical balance, one New York testing laboratory penetrometer, one Engler viscosimeter, one Westpals specific gravity balance, one electric oven, one sheet steel asphalt heater and mixer, brass mold and asphalt flow plates, one closed flash tester, three hydrometers, four thermometers, three dissicators, and accessories such as platinum and porcelain crucibles, flasks, graduates, funnels, piquettes, etc.

The tests made for brick are the abrasion or rattler test, and that for absorption. The stone is tested for abrasion, hardness, toughness, slaking, cementing value, absorption and specific gravity. In testing cement the specific gravity, fineness, setting qualities, soundness and tensile strength are ascertained. The tests for bituminous materials are for specific gravity, water-soluble material, viscosity at 25 degrees C. and 100 degrees C., loss on heating five hours at 170 degrees C., loss on heating five hours at 205 degrees C., penetration of residue (from above evaporations), melting point of normal material, melting point of residue (from above evaporations), fixed carbon, ash, solubility in carbon disulphide, solubility in carbon tetrachloride, solubility in naphtha, percentage of paraffine scale present, fire point, percentage of coke left upon distillation, and special tests.

MISSOURI'S DIVERSIFIED ROADS

While most of the roads in New England are of hard rock macadam, many of those in the Carolinas are of sand clay and most of the States or sections have their own peculiar kind of road, depending upon the geological features. Missouri, for the same reason, has adopted many kinds of roads in different sections of the State: sand, clay, gumbo, chert, gravel and different kinds of rock being the different materials available. Among the rocks used is the so-called "silica," which is a local name for a rotten rock running high in silica found in Cape Girardeau county and vicinity and which makes excellent roads for light or medium travel. Chert, gravel and rock are found in Green county, and each of these is used where most accessible. Convicts furnish the labor to a large extent, especially on the stone macadam roads. In St. Louis county most of the roads are macadam or Telford macadam. There are hundreds of miles of river bottom lands where sand and gumbo mixed seem to be the only practicable road material, and excellent roads for farm wagons have been constructed with them on the principle of the sand clay roads.

STREET WORK IN MADISON, WIS.

Tar Bound Macadam Petitioned for—Protecting Gutters while
Applying Oil—Oiling Lessens Cost of Cleaning
Catch Basins

DURING the year 1910, in the city of Madison, Wis., the citizens on at least two streets were so desirous of obtaining a street paving in front of their property which would be less dusty than the ordinary macadam, that they petitioned that the contracts for ordinary macadam, which had already been let, be changed so as to provide for using bituminous binder in the upper two inches, offering to stand the additional expense involved. In one of these, tar was used as a binder and in the other, asphalt. City Engineer John F. Icke says in his report: "The contractor took particular pains to get a good job and as a result we have the best tar-bound macadam thus far built in the city." The additional cost of the tar over the original contract price for water-bound macadam was about 28½ cents per square yard. We imagine that this would probably have been less if it had not been added as an extra to the original contract, this being the common experience as to extras in most cases.

The contracts for asphalt pavement last year provided for a five-year guarantee period and the retention of 10 per cent of the contract price as a guarantee, the company receiving 4 per cent interest on the money so retained. Concerning this Mr. Icke says, "I think the provision in the contract for the retention of a definite sum of money is a wholesome one and far superior to the guarantee of any surety company, especially in the matter of getting good results when it becomes necessary to make any repairs under the guarantee."

Street trees are now planted as a part of the permanent street work, in certain cases, at least. On West Washington Avenue are trees which have been in during three seasons, and owing to the efforts of the Park Department nearly all interfering trees on this street have been removed and in a few years the avenue will present an object lesson in the shape of a continuous arch of elm trees throughout the length so planted.

In 1910 oil was tried for the first time in Madison as a dust layer on macadam roads. It was purchased in tank-car lots at 4¼ cents per gallon, F. O. B. Madison. Any depressions were filled with crushed stone and rolled with the steam roller about a month before the oil was applied. The best results were obtained on streets where the macadam was in good condition or on those washed clean after a heavy rain. One idea which we believe is not common but which would seem worthy of trial elsewhere, was that of cleaning the surface of the macadam by sweeping all the dust into the gutter, where it was left until after the oil had been applied. The dust thus served to protect the curb from disfigurement by the oil and also to absorb that which flowed into the gutter, thus avoiding the unsightly and unpleasant pools of oil so frequently found along the sides of freshly oiled roads. In some cases the sweepings were thrown back onto the road, while in others they were removed from the gutters after the oil had stopped running off the surface. The tank cars were placed on a siding, which is on an embankment, thus making it possible to unload the oil from the tank cars into the oil sprinkling wagon by gravity. The oil was heated to about 150 degrees before being run out of the tank cars, this being effected by steam supplied by a traction engine owned by the city, which was run along side of the tank car and connected with it.

Concerning the use of oil the city engineer's annual report says:

"The short time that we have used oil on our macadam has shown how effective it is as a dust layer and as a protector to our macadam. One of the heaviest rains last season followed shortly after we had applied some of the oil. The rain did nothing more than to wash the oiled surface clean, but along the edges of the gutter and on the streets where no oil had been applied, the screenings were washed away, exposing the crushed stone.

"The cost of cleaning catch basins on the oiled streets has been materially lessened, as the rains no longer can erode the macadam and wash it into the basins. The heavy demand upon the water works system during the sprinkling season will be decreased materially, which in itself will be a great benefit.

"In order to get the best results we have learned that the macadam should be swept thoroughly, exposing the sharp edges of the stone; that the oil should be applied in warm weather; that traffic should be kept off from the streets until the oil has been practically all absorbed; that the gutters should be well covered with screenings to prevent the oil from spreading over them and soiling them."

ROAD IMPROVEMENTS IN WEST VIRGINIA

A State Department of Public Roads was created in West Virginia in 1909. The first work of the commissioner was to hold public meetings in order to inform the people concerning the aims of the department and to arouse interest in its work. It was also necessary to prepare standards for maps, plans, contracts and specifications; also to aid the county road engineers in systematizing their work and improving the standard of maintenance, at the same time reducing the cost. A meeting of the county road engineers was held in December, 1909, at which more than forty counties were represented. Previous to this it had been decided to establish the standard scale for county maps at 4,000 feet to the inch, these to show the districts, important towns, railroads, streams and all public roads. In addition standard plans are provided for having a scale of 100 feet to the inch for recording surveys of public roads.



OLD AND IMPROVED ROADS IN WEST VIRGINIA

The law of 1909 required each county to appoint a road engineer, and so far only one county has not met this requirement. By the end of 1910 2,454 miles of county roads had been surveyed, 12,371 miles had been measured, and maps had been made of 18 counties.

In addition to this preliminary work some actual road improvement has been performed. The accompanying illustration, showing a section of the original road running off to the left, gives a good idea of the necessity for improving both the grades of the roads and the general character of the same in many of the mountain districts of this State.

An idea of the preliminary construction work being done may be given by the report for Fayette county. This county has an area of 730 square miles and contains about 933 miles of public roads. "The roads in Fayette are being completely overhauled, consisting of cutting the brush and weeds, blasting out the ridges of rock that cross the roads in so many places, opening up good side ditches and crowning the roads well, so they can be maintained with the road drag. Seven miles radiating from Fayetteville are being worked with convicts at a cost of \$25 per mile, and 475 miles have been let by contract at an average cost of \$75 per mile. The remainder of the roads are being kept up by the supervisors working under the county road engineer. Three and a half miles of road will be constructed with convicts. The maximum grade of the present road is 16¾ per cent and the maximum grade of the new road will be 5 per cent."

OIL MACADAM SPECIFICATIONS

We have received from J. B. Marcellus, of Boise, Idaho, the tabulation given below of the principal items of the specifications for oil macadam pavement used by several California cities, the State of New Jersey and the City of Boise. In some respects the several specifications are seen to be very similar, but in others quite dissimilar. The placing of the pavement upon rolled earth as a foundation is quite common, and the use of a ten-ton roller for rolling. The thickness of the pave-

ment, however, varies from 3/4 inch to 7 inches. The size of material used in the top stone varies from between dust and 1/2 inch as a minimum, to from 1/2 to 1 1/2 inches as a maximum. The total amount of oil used per square yard also is quite variable, the maximum being 3/4 gallon and the minimum 3/8 gallons. Asphalt oil, 70% to 90%, is required by all except the New Jersey specifications. The other similarities and differences are quite apparent from an inspection of the table.

COMPARISON OF CERTAIN SPECIFICATIONS FOR OIL MACADAM PAVEMENT

City.	Foundation.	Roller.	Final Thickness of Pavement	FIRST COURSE.		SECOND COURSE.		TOP COURSE.	
				Size Stone.	Thickness.	Size Stone.	Thickness.	Size Stone.	Thickne s.
Long Beach.....	Rolled Earth	10 ton	5"	3/4" to 3"	2 1/2"	3/4" to 2"	2"	1/4" to 3/4"	1/2"
Los Angeles.....	Rolled Earth	10 ton	According to amount of traffic.	1 1/2" to 3"	..	3/4" to 1 1/2"	..	1/4" to 3/4"	..
San Monica.....	Earth mixed with oil—3 mixings.	250 lbs. per in.	2" to 4" of gravel	(See Foundation)		Dust to 1"	1 1/2"	Dust to 1/2"	1/2"
Berkerly.....	Rolled Earth	250 lbs. per in.	3/4"	Earth subgrade raveled with harrow then 3/4" layer of gravel.		..	..	0" to 1/2"	1/2"
Santa Barbara.....	Rolled Earth	10 ton	5" at gutter 7" at crown	1 1/2" to 2 1/2" with screenings	3" (gutter) 5" (crown)	..	..	1/2" to 1 1/2" and screenings	2" (gutter) 3" (crown)
Bakersfield.....	Rolled Earth	10 ton	2" at gutter 3 1/2" at crown	Earth pulverized for 6" below gravel.		1/2" to 3"	2" (gutter) 3 1/2" (crown)	1/2" pea gravel	..
Sacramento.....	Rolled Earth	300 lbs. per in.	6"	1 1/4"-2 1/2" with screening and water	4"	3/4"-1 1/2" with screenings and water	2"	Screenings and sand to fill voids.	
New Jersey (state)....	Rolled Earth	10 ton	..	2" to 3" with screenings	..	1" to 2" with sand to fill 50% of voids	..	3/4" 50% Dust 50%	..
Boise.....	Rolled Earth	10 ton	6"	1 1/4" to 2 1/2" with screenings and water	4"	3/4" to 1 1/4" with screenings and water	1 1/2"	1/4" to 3/4" with screenings and water	1/2"

COMPARISON OF CERTAIN SPECIFICATIONS FOR OIL MACADAM PAVEMENT—(Continued)

City.	OIL				Amount Rolling.	Remarks.
	Temp.	Character.	Total Amount.	How Applied.		
Long Beach.....	+175°	90% asphalt S.G. 10°-11° B.	1 1/2 gal. per sq. yd.	1 gal. on 2nd course 1/2 gal. on top course	Unyielding Sprinkle each course	Lay undisturbed 48 hrs. before top course is added
Los Angeles.....	150°-300°	80% asphalt	1 1/2 gal. per sq. yd.	1 gal. on 2nd course 1/2 gal. on top course	Sprinkle and roll till loaded wagon does not disturb.	Stone dry for 1" deep before any oil applied. Lay undisturbed for 12 hrs. before top course is added.
San Monica.....	300°	70° asphalt S.G. 10°-12° B.	3 to 3 1/2 gal.	2 gal. in earth 1 1/2 gal. on 2nd course	Sprinkle as oil is mixed with earth. Roll top solid.	.....
Berkerly.....	+150°	78% asphalt	3/4 gal.	3/4 gal. on gravel. Let stand 5 days	Sprinkle top course and roll solid.	.....
Santa Barbara.....	+180°	75% asphalt	1 1/2 gal.	3/4 gal. on 1st course 3/4 gal. on top course	Sprinkle and roll solid	Lay undisturbed 24 hrs. before top course is added.
Bakersfield.....	+175°	70% asphalt	2 gal.	1 gal. in earth 5/8 gal. on 2nd course 3/8 gal. on top course	Rolling tamper on 1st course till unyielding Smooth roller on top course till unyielding	.....
Sacramento.....	+150°	75% asphalt S.G. 10°-12° B.	2 1/2 gal.	1 3/4 gal. 2nd course 3/4 gal. top course	1st course 3 rollings 2nd course 5 rollings Top course 2 rollings	Stone dry 1 1/2" deep before oil is applied. Undisturbed 2 days.
New Jersey (state)....	150° to 200°	99 1/2% bitumen S.G. 13.5° B.	.....	On 2nd course and top in 2 applications	Unyielding	Stone perfectly dry when oil is applied—not even dew.
Boise.....	200°-250°	75% asphalt S.G. 10°-11° B.	1 3/4 gal.	3/4 gal. on 1st course 3/4 gal. on 2nd course 1/4 gal. on top course	Unyielding	.....

ROAD METHODS IN GREAT BRITAIN

Road Board "Directions and Specifications" for Surface Tarring, Tar Macadam and Pitch Grouted Macadam
—Specifications for Tars from Gas Works and Tar Distillers, Pitch and Tar Oils

THE ROAD Board of Great Britain has just made public "general directions and specifications" prepared for it by its advisory engineering committee, which probably contains the latest authoritative conclusions derived from several years' experience and experiments in that country. These are divided into six heads, the titles of which are: "General Directions for Surface Tarring," "General Directions for Surfacing with Tar Macadam," "General Directions for Surfacing with Pitch-Grouted Macadam," "Specifications for Tar No. 1," "Specifications for Tar No. 2," "Specifications for Pitch."

These specifications and directions are of such importance that, although in certain respects, chiefly that of climate, conditions are different in Great Britain from those in this country, it seems worth while to reproduce them; omitting certain sections which are of local application, which are duplicated in the several sections, or which are generally recognized in this country as common and desirable practice. In connection with differences of climate it may be mentioned that the differences between England and the north Atlantic sea board of this country is probably less than that between the eastern and the western or between the northern and the southern sections of the United States. The selected portions of the Road Board's Report are as follows:

NO. 1.—GENERAL DIRECTIONS FOR SURFACE TARRING

1. Surface tarring may be advantageously applied either to an old road surface in good condition or to a new surface after it has been consolidated and dried, but the tarring should never be carried out unless the road is thoroughly dry.

If there are any depressions, pot-holes, waves, grooves, or other irregularities, these should as far as practicable be made good before tarring is commenced, so as to provide an even surface.

2. Painting and spraying machines get through the work of tarring more rapidly than application by hand, and consequently are to be recommended; but hand work gives satisfactory results, and the selection of the method to be employed must be largely determined by the available supply of efficient labor.

3. If it is intended to tar an old surface it is advisable to take advantage of the early months of the year to scrape or brush the road during wet weather as a preparation for subsequent tarring, and especially to keep the road free from caked mud.

6. The road while being tarred should be closed to traffic over half its width, or, where practicable, over its whole width.

7. The road should be thoroughly brushed and cleaned before application of the tar. Wet brushing should be used some time previous to dry brushing, if there is any caked mud. Any method of brushing may be used which will scour and clean the road thoroughly, the best being horse brushing, followed by hand brushing.

9. The tar should be heated to its boiling point at convenient positions on the works, and should be applied as hot as possible, so that it may flow freely. The desired temperature will be generally found in practice to lie between 220 deg. and 240 deg. Fahr. for Tar No. 1 and between 260 deg. and 280 deg. Fahr. for Tar No. 2.

10. In order that the tar should be applied to the road as hot as possible, it is advisable, if the method of application is by hand, to use flexible pipes to convey the tar from the boiler to the point of application. If these are not available, it will be found convenient in case of hand-pouring to use 3-gallon cans specially constructed for the purpose, fitted with spouts leading direct from the bottom of the cans, and being not less than 1½ inches in diameter at the orifice.

11. Immediately on application the liquid tar should be brushed so far as necessary, to ensure regularity in thickness of the coating.

12. The quantity of tar required will vary according to the physical conditions of the road, but generally, in the case of a road to be treated with tar for the first time, the quantity should be one gallon to coat from 5 to 7 square yards.

13. If the road must be opened for traffic before the tar has set hard, grit should be spread on the surface to prevent the tar from adhering to the wheels of vehicles, but gritting should be delayed as long as possible, and the quantity of grit-

ting material to be spread should be no more than sufficient to prevent the tar from adhering to wheels. Stone chippings, crushed gravel, coarse sand, or other approved material (free from dust) not larger than will pass through a ¼-inch square mesh should be used for gritting, in quantity not exceeding one ton for 300 to 350 square yards if grit is used, and one ton for 200 to 250 square yards if coarse sand is used.

Caution—While Tarring in Progress Cyclists Advised to Walk

It is specially desirable to place warning notices at points in the neighborhood of the work where other roads join or cross the road being tarred, to enable motorists and cyclists to avoid the obstructed road by taking any available alternative route.

16. On heavily traveled roads it is advisable to apply a second coat to either the whole width, or from 9 to 12 ft. of the centre of the road, in quantity of one gallon to coat from 8 to 10 yards square about two to three months after the first application.

17. Surface tarring should be renewed annually on all important roads, and as required on roads with light traffic. On such recoatings the quantity of tar to be applied will vary with the extent to which the previous coating of tar has been removed by weather or by traffic.

18. Two or more samples of the tar used should in all cases be kept in quart tin cans, and be carefully labelled, including particulars fixing the locality or length of the road on which the tar was used. The Road Board will arrange with the National Physical Laboratory to submit a selection of these samples to a series of chemical and physical tests with a view to the results being recorded for future reference, and surveyors will from time to time be invited to send samples for the purpose.

19. In all cases careful record should be kept of the condition of the road surfaces in winter and summer, both before and after tarring, the quantity and quality of tar used, the superficial area covered, the state of the weather when the work is being done, the time occupied in actual work and in waiting while work is stopped owing to wet weather, the number of men employed, and full details of the cost of labor and material.

20. Surveyors are invited to send records to the Road Board to be classified and published for general information. Forms for these records will be supplied by the Board.

NO. 2.—GENERAL DIRECTIONS FOR SURFACING WITH TAR
MACADAM

1. Any road which is to be surfaced with tar macadam should have a proper foundation or sub-crust of adequate thickness to bear the traffic likely to use it.

2. Before laying a new surface of tar macadam the thickness of the old crust, including foundation, should be ascertained by opening trial trenches at intervals averaging about 150 yards, extending from the haunch of the road to the centre, such trenches to be made alternately on opposite sides of the road.

3. The thickness of the surface coating of tar macadam when consolidated by rolling should be from 2 to 3 inches, according to traffic requirements. For a greater thickness than 3 inches the material should be applied in two coats.

4. In the case of naturally hard sub-soils, not materially softened by infiltration of surface water, the total thickness of the road crust, including foundation, if any, after consolidation of the new surface of tar macadam by rolling, should not under ordinary circumstances be less than 6 inches, unless the sub-soil is so hard as in itself to act as a good foundation, in which case the thickness of the road crust may be reduced to 4 inches. In the case of clay or other yielding sub-soils the total thickness should not be less than 11 inches.

5. The finished surface should have a cross-fall of about 1 in 32.

If the crust is not sufficiently thick at the crown to enable this cross-fall to be obtained with a new coating of the thickness above mentioned, then the old surface should be left intact and unscarified and the thickness of the new coat of tar macadam increased as far as may be necessary.

If the crust is of sufficient thickness for the purpose, the regulation of the cross-fall should be carried out by scarifying the surface and removing material from the crown to the sides previous to the application of the new coating. The material loosened by scarifying should be screened and all finer material than ½ inch should be thrown aside.

6. The aggregate of the new surface of tar macadam should be composed of broken stone of approved quality, or selected slag of approved quality, and should contain at least 60 per cent. broken to the size of 2½ inches, not more than 30 per cent. of from 2½ to 1¼ inches, and 10 per cent. of ¾ to ½ inches for closing. The last mentioned size should be kept separate and used as top dressing during rolling operations.

7. The stone used must be thoroughly dried before being coated with tar.

8. For making tar macadam, tar should be used which complies with Road Board Specification Tar No. 1, or Road Board Specification Tar No. 2, the choice being determined by the circumstances of each case.

If Tar No. 1 has been used for tarring the stone, care should be taken, especially in hot weather, that the tarred material has been allowed to stand for a sufficient length of time to allow the tarred surface of the stones to become partially hardened and in a tacky condition.

If Tar No. 2 has been used for tarring the stone, the macadam should be laid soon after being tarred, and if the tar be of the heavier grade of this quality, the stone coated with such tar should only be laid when the road is quite dry and in warm, sunny weather.

9. The quantity of tar used to coat one ton of stone should be approximately from 9 to 12 gallons, varying according to the sizes of the stone, the grade of tar used, the method of mixing and other conditions.

10. The tar-macadam, after having been spread and levelled, should be rolled into a smooth surface, but too much rolling should be avoided.

Less rolling is required than in the case of water-bound macadam.

A ten-ton roller is a suitable size for use in most cases, but good results can be obtained by using a six-ton roller and finishing with a ten-ton roller.

11. In order to get the best results from the use of tar macadam, it is advisable to apply a coating of tar to the surface after the road has been used by traffic for several weeks. This tar should comply with the provisions of Road Board Specification for Tar No. 2, and should be poured or sprayed on the surface at a temperature of about 270 deg. Fahr.

12. Stone chippings, crushed gravel, coarse sand, or other approved material (free from dust), not larger than will pass through a ¼-inch square mesh, should be used for gritting in quantity not exceeding one ton for 350 to 400 square yards if grit is used and one ton for 200 to 250 square yards if coarse sand is used.

NOTE.—These general directions are not intended to displace or to discourage the use of proprietary articles, of which there are several of proved value.

No. 3.—GENERAL DIRECTIONS FOR SURFACING WITH PITCH-GROUTED MACADAM

3. The thickness of the surface coating of pitch-grouted macadam when finished and consolidated by rolling should be 2½ to 3 inches (except on very light-traffic roads, when the thickness may be 2 inches) for single-pitch grouting, and from 4 to 4½ inches for the double-pitch grouting hereafter described.

8. It is important that the pitch should not be poured if the surface of the stone is wet. The stone may be protected by tarpaulins, or, if wet, may be dried *in situ* by portable blowers, or other means.

9. The quantity of pitch required to grout a single coating is approximately, for a consolidated thickness of 2 inches, 1¼ gallons per yard square; for 2½ inches, 1½ gallons per yard square, and for 3 inches, 2 gallons per yard square; but these quantities may vary with different materials, and care must always be taken to fill the voids adequately.

10. The aggregate after having been spread must be rolled down dry until the surface is formed, but without the addition of any small material.

11. The pitch, after being carefully melted, as described in Clause 18, must be raised to a temperature of 300 deg. Fahr. Clean, sharp sand must be heated on sand heaters to a temperature of 400 deg. Fahr. A dandy, or portable mixing vessel, is then to be filled with equal parts, by measurement, of the heated pitch and the hot sand, and the mixture, hereafter called the matrix, is to be kept well stirred while it is being emptied from the dandy or portable mixing vessel into pouring cans of from 2 to 3 gallons capacity, which are used for pouring matrix onto the roadway. Not only during the process of mixing, but afterwards, right up to the time of actual pouring, the matrix must be kept well stirred. The matrix prepared with pitch in the quantities specified in Clause 9 should be sufficient to fill the voids of the aggregate.

12. The final rolling should be commenced immediately after pouring the pitch matrix, and carried on rapidly before the matrix has time to set. The 5 per cent. of graded chippings should be spread over the grouted surface in part pre-

viously to and the remainder during the process of rolling. The traffic may be allowed onto the finished surfaced as soon as the surface has cooled to the normal temperature.

Double Pitch-Grouting

13. When the traffic is so heavy that a consolidated thickness of from 4 to 4½ inches of pitch-grouted macadam is required, it is desirable, in order to obtain the best and most economical results, to divide the coating into two layers, the bottom layer to be the thicker one and to consist of large stones, the two layers being rolled down and grouted separately. Any local stone which can be procured cheaply may, if suitable in quality for foundation work, be used for the bottom layer graded from 3-inch gauge down to 2-inch gauge. No chippings are required for finishing the rolling of the bottom layer. The aggregate for the upper layer should consist of hard road stone of approved wearing quality, broken to 1½-inch gauge, and 5 per cent. of chippings of the same stone used for the upper layer, graded from ½ inch down to ¼ inch, should be added before and during the process of rolling, and rolled down so as to form the finished surface of the road.

14. In pouring the pitch on the bottom layer the surface of the pitch should not be brought to the surface of the stone, but should lie about ½ inch below such surface, with the object of providing a key for the upper layer.

16. The quantity of pitch required for double pitch-grouting is approximately, for a considerable thickness of 4 inches, 3¼ gallons per yard square, and for 4½, 3½ gallons per yard square; but these quantities may vary with different materials, and care must always be taken to fill the voids in the surface coating adequately.

17. For the purpose of accurately ascertaining the proportions necessary for the matrix, it is essential that portable weights, scales and measures be provided, and all materials used in the preparation of the matrix should be accurately proportioned by weight or measurement.

Instructions for Melting the Pitch

18. The pitch boilers of from 2 to 3 tons capacity should be charged with pitch and about one-half of the proper proportion of tar oils. The fire should then be lighted, and thereafter a steady fire, with fire doors closed, should be maintained, when, in from four or five hours, the pitch should be thoroughly melted. A bright fire should be kept until the pitch reaches a temperature of 300 deg. Fahr., when the remainder of the oils should be added, and the mixture thoroughly stirred; the fire doors should then be opened and the temperature of the melted pitch permitted to fall to 250 deg., or 270 deg. Fahr. The pitch should then be ready for use, and in all cases should be thoroughly well stirred before being drawn off.

In the event of bad weather stopping the work of grouting, the fire door should be left open, the damper closed and the temperature of the pitch allowed to fall to 200 deg. Fahr. It can be kept at this temperature for long periods with banked fires consuming 7 lbs. of coke per hour.

It is recommended that a suitable Fahrenheit thermometer with metal protection should be at hand to indicate the temperature of the melted pitch. Whenever the weather is favorable for the recommencement of the work the pitch must be again raised to 270 deg. Fahr. by closing the doors and sharp firing.

It is desirable that the boiler should be kept air-tight when the pitch is being melted, by the use of air-tight covers properly packed, so as to make an air-tight joint.

NOTE.—These general directions are not intended to displace or to discourage the use of proprietary articles, of which there are several of proved value.

No. 4.—SPECIFICATIONS FOR TAR NO. 1

1. *General*—This tar is suitable for the surface tarring of roads.

As to the use of this tar for making tar macadam, see "Road Board's General Directions for Surfacing with Tar macadam."

2. *Boiling*. The tar should be applied as soon as the boiling point is reached, and over-boiling should be avoided. The desired temperature will be generally found in practice to lie between 220 deg. and 240 deg. Fahr. in the boiler.

3. *Source of Tar*. The tar shall be derived wholly from the carbonization of bituminous coal, except that it may contain not more than 10 per cent. of its volume of the tar (or distillates or pitch therefrom) produced in the manufacture of carburetted water gas.

4. *Specific Gravity*. The specific gravity of the tar at 15 deg. C. (59 deg. Fahr.) shall be as nearly as possible 1.19, but in view of the great variation in specific gravity of the tars produced in various parts of the country, the specific gravity may be as low as 1.16, or as high as 1.22, provided that in other respects it complies with the provisions of the specification.

5. *Freedom from Water*. The tar shall be commercially free from water—i. e., it shall not contain more than one per

cent. by volume of water or ammoniacal liquor, which water or liquor (if present) shall not contain more ammonia, free or combined, than corresponds to 5 grains of ammonia per gallon (= 70 milligrammes per litre) of the tar.

6. *Phenols.* On vigorous agitation for a quarter of an hour with twenty times its volume of water at 21 deg. C. (70 deg. Fahr.), the tar shall not impart to the water more than 5 grains of phenoloid bodies, reckoned as phenol, per gallon of water (= 70 milligrammes per litre).

Tar from Gasworks

The provisions in the following Clause 7, 8 and 9 apply to tar supplied direct from gasworks.

7. *Source of Tar.* The tar shall be solely the natural by-product of the manufacture of illuminating gas (coal-gas with or without admixture of carburetted water gas), and shall have been subjected to no other or further treatment than may be necessary for the abstraction of water or ammoniacal liquor and light oils.

8. *Fractionation.* On distillation the tar must yield, below 170 deg. C., not more than one per cent, and between 170 deg. C. and 270 deg. C., not less than 16 per cent and not more than 26 per cent of distillate (exclusive of water).

9. *Free Carbon.* The free carbon shall not exceed 16 per cent of the weight of the tar.

Tar from Tar Distilleries

The provisions in the following Clauses 10 and 11 apply to tar supplied from tar distilleries.

10. *Fractionation.* On distillation the tar must yield, below 170 deg. C., not more than one per cent, and between 170 deg. C. and 270 deg. C. not more than 26 per cent of distillate (exclusive of water). The distillate shall remain clear and free from solid matter (crystals of naphthalene, etc.) when maintained at a temperature of 30 deg. C. for half an hour. The distillation shall be continued to 300 deg. C. and the residual pitch thus obtained shall not amount to more than 73 per cent of the weight of the tar.

11. *Free Carbon.* The free carbon shall not exceed 16 per cent of the weight of the tar.

12. *Taking of Temperatures.* The temperature during distillation shall be taken by a thermometer of which the bulb shall be opposite the opening to the side tube of the distillation flask, and the quantities of distillates and free carbon shall be stated in percentages by weight of the portion of tar submitted to distillation.

13. *Dehydrated Tar.* A tar prepared by simple dehydration fulfilling the provisions of this specification may be used with satisfactory results in most cases, but tars from which the naphthalene has been extracted are superior for the purposes of surface tarring.

Note.—This specification is not intended to displace or to discourage the use of proprietary articles, of which there are several of proved value.

SPECIFICATION FOR TAR NO. 2

1. *General.* This tar is suitable for surface tarring, and is specially recommended for re-tarring; but if the heavier grades of the tar are used, care should be taken to apply it only when the road is dry and well warmed by the sun's rays, otherwise it will not flow freely.

As to the use of this tar for making tar macadam, see "Road Board General Directors for Surfacing with Tar Macadam."

2. *Boiling.* The tar is to be applied as soon as the boiling point is reached, and over-boiling should be avoided. The desired temperature will be generally found in practice to lie between 260 deg. and 280 deg. Fahr. in the boiler.

3. *Source of Tar.* The tar shall be derived wholly from the carbonization of bituminous coal, except that it may contain not more than 10 per cent of its volume of the tar (or distillates or pitch therefrom) produced in the manufacture of carburetted water gas.

If pitch be added to the tar in order to secure the specific gravity and proportion of residual pitch referred to below, the pitch so added must also have been derived from tar of the foregoing description.

If oil be added to heavy tar or pitch in order to secure the specific gravity and proportion of residue referred to below, the oil so added must be derived from tar of the foregoing description and must be practically free from naphthalene and tar acids or phenols.

4. *Specific Gravity.* The specific gravity of the tar at 15 deg. C. shall be as nearly as possible 1.21, and in no case shall it be lower than 1.18 or higher than 1.24.

5. *Phenols.* (Same as 6 of Specification for Tar No. 1.)

6. *Fractionation.* The tar shall be free from water and on distillation shall yield no distillate below 140 deg. C., nor more than 3 per cent of distillate up to 220 deg. C., which distillate shall remain clear and free from solid matter (crystals of naphthalene, etc.), when maintained at a temperature of 30 deg. C. for half an hour.

Between 140 deg. and 300 deg. C. it shall yield not less than 15 per cent, nor more than 21 per cent of the weight of the tar.

7. *Free Carbon.* The free carbon shall not exceed 18 per cent of the weight of the tar.

8. *Taking of Temperatures.* (Same as 12 of Specifications for Tar No. 1.)

Note.—This specification is not intended to displace or to discourage the use of proprietary articles, of which there are several of proved value.

SPECIFICATION FOR PITCH

1. *General.* This pitch is suitable for pitch-grouting. See "Road Board's General Directions for Pitch-grouting."

2. *Preparation.* The pitch is obtained by softening the material known as commercial soft pitch, as specified below, by the addition of tar oils, also specified below.

COMMERCIAL SOFT PITCH

3. *Source of Pitch.* The pitch shall be derived wholly from tar produced in the carbonization of bituminous coal, except that it may contain not more than 10 per cent of pitch derived from tar produced in the manufacture of carburetted water gas.

4. *Fractionation.* On distillation the pitch shall yield, below 270 deg. C., not more than one per cent of distillate; between 270 deg. C. and 315 deg. C., not less than 2 per cent and not more than 5 per cent of distillate.

5. *Free Carbon.* The free carbon should not exceed 22 per cent of the weight of the pitch, but if it be found difficult or unduly expensive to obtain this quality of pitch, a quality containing as much as 28 per cent of free carbon may be used with a reduced proportion of sand as filler.

6. *Taking of Temperatures.* (Same as 12 of Specifications for Tar No. 1.)

TAR OILS

7. *General.* The tar oils to be used shall be derived wholly from tar produced in the carbonization of bituminous coal, or from such tar mixed with not more than 10 per cent of its volume of tar produced in the manufacture of carburetted water gas.

8. *Specific Gravity.* The specific gravity of the tar oil at 20 deg. C. shall lie between 1.065 and 1.075.

9. *Freedom from Naphthalene.* The tar oils after standing for half an hour at 20 deg. C. shall remain clear and free from solid matter (crystals of naphthalene, etc.).

10. *Fractionation.* The tar oils shall be commercially free from light oils and water—i. e., on distillation shall yield not more than one per cent of distillate below 140 deg. C.

The amount of distillate between 140 deg. C. and 270 deg. C. shall lie between 30 per cent and 50 per cent.

11. *Taking of Temperatures.* (Same as 12 of Specifications for Tar No. 1.)

12. *Proportions.* The proportions by weight in which the pitch and tar oils are to be mixed shall be as follows:

Pitch 88 per cent to 90 per cent.

Tar oils 10 per cent to 12 per cent.

Note.—This specification is not intended to displace or to discourage the use of proprietary articles, of which there are several of proved value.

ROAD IMPROVEMENT IN NOVA SCOTIA

NOVA SCOTIA possesses, according to official figures, some 18,000 miles of highways, divided into road districts much as in the United States, and under the superintendence of the road commissioner of the Province. Of this total it is estimated that 10,000 miles are fairly good road for driving and automobiling, and every year many miles of graveled road are being added. During the year ended September 30, 1910, work to the amount of \$163,512 was done, and other work undertaken or mapped out, calling for an additional expenditure of \$21,951. This aggregated an outlay of approximately \$185,463 per county, which is about the usual average in this Province.

The revenue for road repair in Nova Scotia is derived from taxes upon property (a certain per cent of the whole going to the road fund) and from a poll tax, these being paid either in cash or labor at the prevailing wage rate per diem. The property tax for the fiscal year 1910 amounted to about \$95,000 in the 18 counties of the Province, and the poll tax to more than \$80,000, making a total of \$175,000, and this was pro rated among the several counties according to their requirements. Of this sum 70 per cent was paid in labor—"worked out." as it is called.

During the year 25 road machines were imported from the United States at a cost of \$5,375; one grader, also from the United States, and some other machinery were likewise pur-

chased, a total of nearly \$10,000 having been expended for new machinery. There are now about 75 road machines and 20 graders in the Province. During the last five or six years road machinery to the value of over \$20,000 has been purchased, much of it from the United States.

It is estimated that there are 72,000 culverts in Nova Scotia, ranging from 6 feet in width down to one foot. Practically all of the culverts constructed up to a short time ago were of wood, costing on an average \$7 each, but some concrete, hard or vitrified brick, and stone culverts have been built in the last few years. Concrete culverts can be put in for an average cost of \$20 or \$25. They last several times longer than a wooden structure and require less attention and repair.

ROAD BRIDGES IN COLORADO

A PECULIAR style of bridge called a "flush" bridge has been built by the Colorado State Highway Commission, which is certainly unusual in that it is laid on the bed of the creek rather than spanning it. This creek is one of those which are more or less numerous in that section of the country, which seldom contain any water (visible upon the surface at least), but are subject to heavy floods. The creek is of a sand which it was impossible to haul a heavy load through, but an ordinary road constructed on it would have been washed away by the first flood. Under these conditions this so called flush bridge was built, being anchored to piles driven into the bed of the creek. These piles were built in sets of three across the roadway, which was 13 feet wide, the sets or bents being spaced 12 feet between centers. The heads of the piles were cut off a little below water level in the bed of the creek and capped with reinforced concrete sills whose top surfaces were brought up about flush with the surface of the sand. These sills support reinforced concrete slabs which are anchored to them by the reinforcement. There are two of these bridges or roadways, each of them about 400 feet long. The entire structure has sufficient strength to carry a 15-ton road roller or traction engine without receiving any support from the sand under the slabs.

At another creek crossing a reinforced concrete slab floor is supported upon reinforced concrete piles; the use of wooden piles being considered objectionable in that "wooden piling would not endure above water level." The longest of the piles are 54 feet in length.

HOME-MADE ROAD APPLIANCES

THE third biennial report of the State Highway Commissioner of Michigan for the years 1909 and 1910 contains descriptions of simple devices which can be cheaply manufactured by road commissioners or others for use in making gravel roads; together with instructions for constructing such roads. One of these is a contrivance for screening gravel at the bank. This consists of a screen so attached to the side of the cart which is to haul the gravel that the gravel is screened and deposited in the cart without any rehandling. This wagon screen is described as follows:

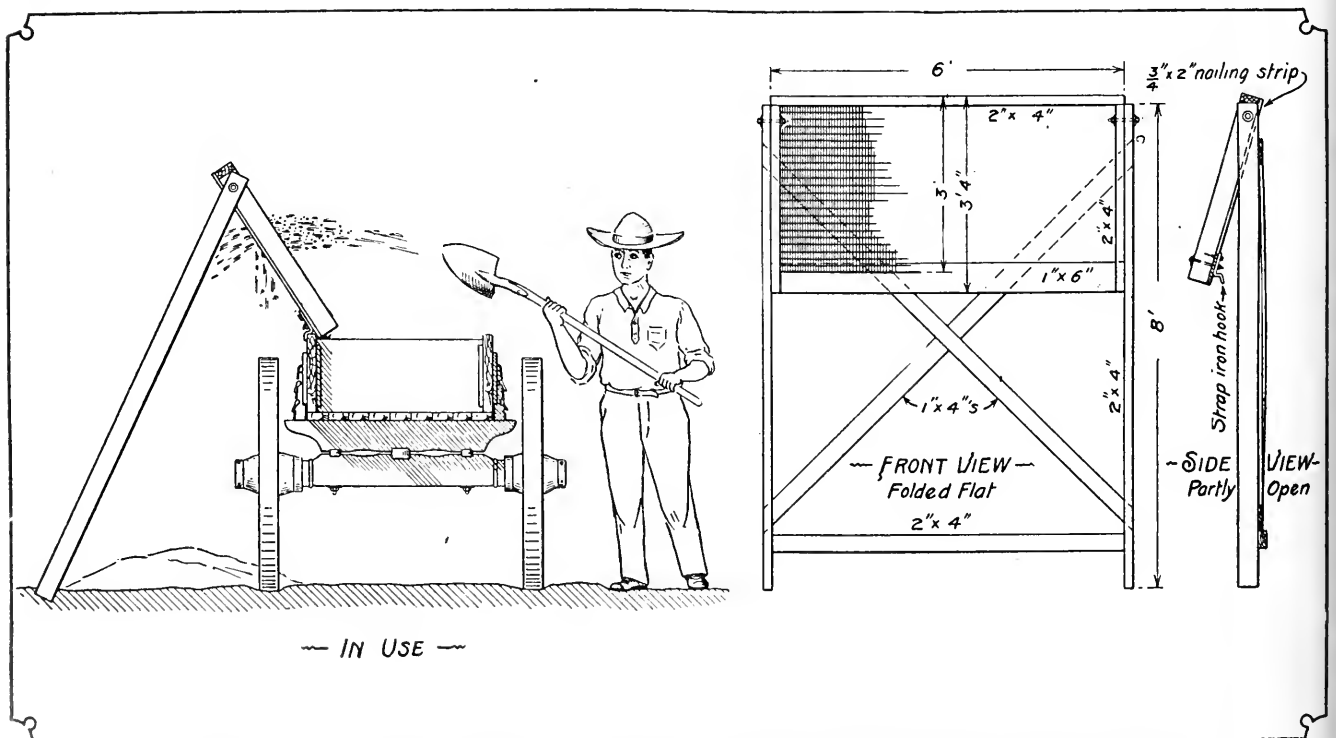
This is a long screen about the length of the wagon box and three feet wide, which is attached to the far side of the box. The gravel is shoveled over the box against the screen, allowing the pebbles to slide back into the wagon while the sand falls through the screen onto the ground on the opposite side.



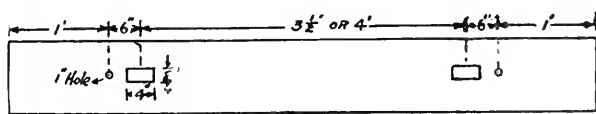
WAGON SCREENING DEVICE IN USE

Hand screening is more expensive [than portable power screening plants], frequently costing as much as 40 cents per cubic yard for the screened product. Wherever the screening of sandy gravel has been tried the quality of the roads has been so much improved that the people are satisfied that the extra cost is a good investment.

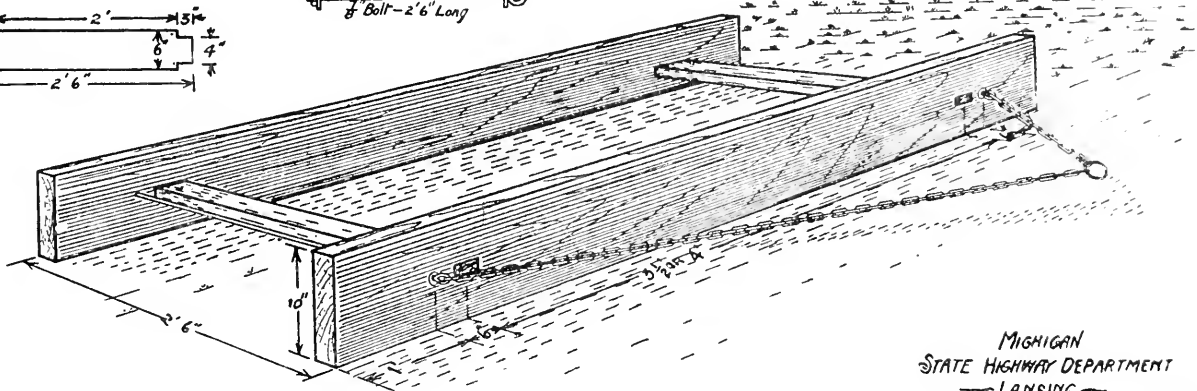
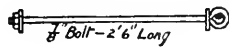
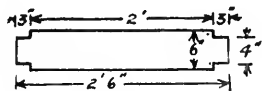
For rolling either gravel or dirt roads the commissioner suggests a method of constructing a five-ton roller at a cost of about \$50. "Purchase a boiler shell 4 ft. 6 in. long and 3 ft. 9 in. in diameter. Set it upon end, put a shaft in the center



WAGON SIDE GRAVEL SCREENING DEVICE, MICHIGAN STATE HIGHWAY DEPARTMENT.



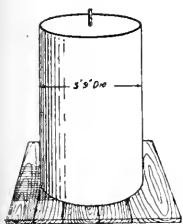
PLANK ROAD FLOAT



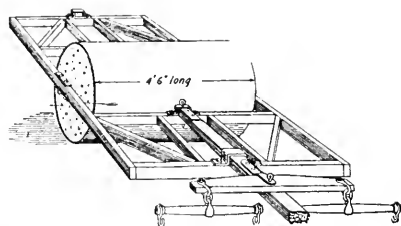
MICHIGAN STATE HIGHWAY DEPARTMENT LANSING

DETAILS OF PLANK ROAD FLOAT.

and fill the shell with concrete. Make a frame like the one illustrated and you will have a five-ton road roller at a cost of about \$50."



CONCRETE ROAD ROLLER



is not so well known and is described in this report as follows:

The plank float can be made from an ordinary bridge plank by sawing it in two in the middle. The two planks forming the sides should be at least 2 inches thick, preferably 2 1/2 or 3 inches, from 10 to 12 inches wide and 6 1/2 or 7 feet long, and of hard wood. A platform of inch boards, loosely nailed to the cross pieces allows the driver to ride whenever the float does not move enough earth. He also varies the weight on different parts of the float, as may be required, by shifting his position.

The float is made more lasting by bolting a steel plate 1/4-inch thick and 3 inches wide on the front of each plank. However, if this is not done, the float can be used, both sides forward and both sides up, thus wearing off all four edges of each plank before it has to be thrown away.

The ring or eye in the long bolt should be large enough to readily permit a log chain to slip through. A 3/4-inch or 5/8-inch bolt will usually be large enough. The cost of these floats, lumber and labor, all told, should not exceed \$2.50 or \$3 each.

The log drag has been generally described by papers of all classes, so that it is thoroughly familiar. The "plank float"

SPECIFICATIONS FOR MACADAM ROADS

Bituminous Macadam and Bituminous Concrete Paving—Complete Standard Specifications of the Association for Standardizing Paving Specifications—Asphalt and Coal Tar Cements—Mixing and Laying

The specifications given below are those adopted by the Association for Standardizing Paving Specifications at their meeting in January of this year. These cover macadam with a bituminous binder and bituminous concrete, which latter the committee defined as "Any mixture suitable for paving purposes composed of broken stone, sand and bituminous cement, mixed together before being laid, and which is laid while in a plastic condition. If the stone is spread in place and the bituminous cement or binder applied afterward, the resulting product is bituminous macadam." Strictly speaking the so-called specifications for the bituminous concrete pavement are not specifications but rather a description of the method recommended for constructing such a pavement. These recommendations, however, can be used as the basis for formal specifications. On a number of points the committee presents alternative methods depending upon conditions of traffic, materials available, etc.

Concerning the use of bituminous concrete the committee stated in their report: "It is the belief of your committee that bituminous concrete may be successfully used as a paving mate-

rial under a great variety of conditions and traffic; that it is especially adapted to use on a well constructed macadam base, either new or old, plain or bituminous, and finds an especial field in providing a permanent wearing surface on old macadam."

The committee decided to recommend only methods, proportions and materials which had been tried successfully and considered only the bituminous cements which retained their original consistency for mixing and laying, excluding from consideration emulsions, oils volatile in character and cements softened with light fluxes so that they can be worked cold or at low temperatures. The cements specified are practically solid at ordinary atmospheric temperatures and required to be hot while being mixed with the stone and sand.

Concerning the range of penetration for asphaltic cements the committee stated: "A penetration of 40 will give a hard and stable pavement, while 100 will give a pavement too soft for heavily traveled streets. The choice should be made to meet conditions and the specifications applying to any particular case

drawn closer within the limits named for penetration, working temperatures, etc."

The committee which prepared the specifications for macadam pavement consisted of J. L. Darnell, chairman, consulting engineer, Kansas City, Mo.; E. H. Thomes, vice-chairman, assistant engineer Bureau of Highways, Borough of Queens, New York City; W. G. Leininger, assistant superintendent of street, Department of Public Works, Chicago, Ill.; A. C. Schrader, superintendent and engineer, West Park Commissioners, Chicago, Ill.; C. L. Hutchinson, member Board of Public Works, Indianapolis, Ind.; W. T. Brooke, city engineer, Norfolk, Va.

That which prepared the specifications for bituminous concrete pavement was as follows:

Linn White, chairman, engineer South Park Commissioners, Chicago; J. M. Burrows, assistant civil engineer in charge of street construction, Des Moines; Henry M. Milburn, city asphalt chemist, Omaha; G. F. McGonagle, city engineer, Salt Lake City; L. W. Rundlett, commissioner of public works, St. Paul; W. J. Hardec, city engineer, New Orleans; J. C. Ely, director of public service, Dayton; W. H. Connell, assistant commissioner of public works, Borough of Bronx; James A. Hooke, assistant sewer commissioner, St. Louis; M. R. Shererd, chief engineer Department of Public Works, Newark.

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MACADAM PAVEMENT

ROADBED SUB-GRADE

The full width of the roadbed shall be brought to the proper line, grades and cross section indicated on the plans by excavating, filling and thoroughly rolling with an approved road roller weighing at least ten tons; all soft or spongy ground shall be removed and refilled with gravel or other approved material which will pack, and the rolling shall be continued until the roadbed is thoroughly consolidated and shaped to the satisfaction of the engineer. A wooden templet, shaped to the proper size and crown of —inch per foot from center to side, or other equally satisfactory methods shall be used to obtain the required contours of all the courses.

Note.—The crown may be from $\frac{3}{8}$ to $\frac{3}{4}$ inch per foot, to be determined by the engineer for each particular case.

DRAINAGE

(Insert specifications for transverse and longitudinal pipe or stone drains and Telford or large size stone macadam foundation to meet local conditions.)

Upon the properly prepared foundation shall be placed the specified crushed stone macadam laid in two courses.

STONE

(Insert specifications for character and quality of stone to best meet local requirements.)

The product of the stone crusher shall be separated into three grades or sizes by any satisfactory method or by means of a stone screen having circular openings of the following diameters: $\frac{3}{8}$ of an inch, one (1) inch, and three (3) inches. These grades shall be hereinafter designated as screenings, $\frac{3}{8}$ -inch stone and 2-inch stone respectively.

The above specification is designed to utilize all the product of the rock crusher; the 2-inch stone to be used for both the top and bottom courses, the screenings to fill the voids in the lower course and the $\frac{3}{8}$ -inch stone to fill the interstices in the top course and form part of the wearing surface.

This clause is open to suggestions, criticisms and further modifications. At the present time, stone is specified by a minimum and maximum length, by a maximum diameter in passing through the circular openings of a revolving stone screen, by an average of the diameters of the openings of the screens and by arbitrary designation of sizes or numbers; also by variable combinations and percentages of the above, and by proportions between the maximum, minimum and average length. It is recommended that this Committee confer with the committees of this Convention on Concrete and Bituminous Concrete and later take up the matter with committees of similar organizations and with quarrymen and manufacturers of stone crushing and screening machinery, with a view of standardizing the grades and sizes of crushed stone. By such standardization along practicable commercial lines, stone plants can be operated more advantageously, the stock sizes can be prepared and stored in slack times, orders can be filled quicker, competition will be encouraged and the price of stone will be reduced, together with other advantages.

LOWER COURSE

The lower course shall consist of run of crushed stone, which shall pass a three (3) inch and be retained on a one (1) inch screen. The stone shall be laid upon the properly prepared foundation to a depth of four (4) inches when compacted. The depth of the loose stone in all cases shall be fixed by laying upon the sub-grade cubical blocks of wood of the proper size and spreading the stone evenly to conform thereto. This course shall be thoroughly rolled until the stone does not creep or wave ahead of the roller. Stone screenings or sand shall then be uniformly spread over the surface in small quantities by shovels from carts or piles of filler alongside the road and the rolling continued, sweeping in the screenings meanwhile until no more will go in dry, when the surface shall be well sprinkled by an approved sprinkler to fill the voids, screenings being added where necessary and the rolling continued until the surface is satisfactory finished. No filler shall be left on the surface, but the surface shall be left with the clean stone projecting for a bond, leaving the lower voids thoroughly filled.

NOTE.—Upon a poor foundation or where a finished depth of stone of more than 4 inches is deemed advisable, the stone shall be laid in two layers and treated as above described. Good results may be obtained without filling the voids in the lower course, but upon a sandy soil or a well-drained roadbed better results seem to be obtained by thoroughly filling the voids in the stone. Stone screenings, sand, or other suitable material may be used as a filler. Good results may be obtained by a sand filler, and results are also obtained when a small quantity of stone screening dust is used on top of the sand to fill the voids in the sand. The voids may be filled without application of water if all the materials are dry; but a firmer foundation seems to be secured when the course is well puddled with water. In some cases properly screened gravel may be used as a bottom course and as a filler in the top and bottom courses.

TOP OR WEARING SURFACE COURSE

Upon the bottom course shall be evenly spread crusher-run stone which shall pass a three (3) inch ring and be retained upon a one-inch screen, to a finished depth of two and one-half ($2\frac{1}{2}$) inches. This course shall be dry rolled with the steam roller hereinbefore mentioned only until the individual fragments have keyed together; the surface, while even and conforming to the required crown, being left open or porous in order to allow the penetration of the hot bituminous binder.

BITUMINOUS BINDER

The bituminous binder shall comply with the following requirements:

NOTE.—Insert specifications for binder best suited to meet the local conditions.

The binder shall be heated in an approved heater equipped with a fixed or portable thermometer which will clearly and accurately indicate the temperature of the binder. The bituminous binder shall be heated to a temperature of not less than 250 degrees Fahr., nor more than 350 degrees Fahr., and shall be uniformly distributed over the macadam by suitable appliances at a rate of not less than one and seven-tenths (1.7) gallons to the square yard. Directly after application, clean trap rock or equally satisfactory stone chips, free from dust and consisting of fragments which will pass a one-inch ring, but be retained upon a three-eighth ($\frac{3}{8}$) inch screen shall be spread over the surface in sufficient quantities to fill the surface voids and prevent the binder from sticking to the wheels of the roller. Care shall be exercised not to apply more stone chips than will just fill the interstices, and any surplus material shall be swept from the surface as directed. The road shall then be rolled until solid, more stone chips or screenings being applied as required in order to maintain satisfactory conditions.

A seal, flush, paint or squeegee coat of the hot binder shall be uniformly distributed over the surface at a rate of at least one-half ($\frac{1}{2}$) gallon to the square yard. Clean stone chips or screenings such as previously described shall then be spread over this seal coat in just sufficient quantity to take up all excess of binder and form a smooth, well-bonded surface when rolled. The road shall be rolled until smooth and firm and to the proper lines and grades.

The stone must be dry and free from dirt or dust at the time of applying the bituminous binder. The application of binder shall not be made when the atmospheric temperature is below 50 degrees Fahr., unless specially permitted by the Engineer.

BITUMINOUS CONCRETE PAVEMENT

NEW MACADAM FOUNDATION

If the pavement is to be laid on a new macadam foundation it shall be built according to the standard specifications for macadam, as follows:

Construct the first course of macadam about $1\frac{1}{2}$ inches less

in thickness than the intended thickness of the completed foundation, thoroughly rolling and bonding the stone by the use of screenings or screenings and coarse sand and water. When this is done spread the second course, consisting of an even layer of about 1½-inch stone without screenings or other fine bonding material, and roll until the particles of stone lie firm and even. If the second course is applied before the first is completely dried out, the layer of 1½-inch stone will be partially imbedded, some of the fine material working up from below and holding it in place. Care should be taken, however, to see that the first course is not soft enough, either from lack of sufficient rolling or excess of water, to completely imbed or fill the second course of stone.

When the bituminous concrete wearing surface is applied to a base thus prepared, it will, under the roller, enter the interstices of the upper layer of stone, completely filling them and bonding the foundation and wearing surface together. This condition is necessary to secure the best results in a bituminous concrete pavement, the base and wearing surface acting together as one homogeneous structure, and not as a pavement made up of foundation and wearing surface acting as two separate layers.

The thickness of the macadam base should vary somewhat, according to the traffic and character of subgrade.

On a well-drained and firm subgrade eight inches of macadam is sufficient for a foundation under any but the very heaviest of city traffic. For streets or roads of medium traffic and good subgrade conditions four to six inches is sufficient.

As an alternate form of construction, when desired, the second course of 1½-inch macadam stone may be poured with a bituminous filler, using not quite enough to fill the voids. Over this there should be spread a light layer of ¾-inch stone, using enough to about half cover the surface, and then giving it a light rolling. This is necessary to put the foundation in a condition to be worked over, as the base thus treated should be disturbed as little as possible.

The bituminous filler used for pouring the base should be of the same character as the bituminous cement in the wearing surface, but in consistency it may be somewhat softer and lighter for the purpose of securing better penetration. Thus when asphaltic cement is used in the surface the base should be poured with a filler or binder of asphaltic origin, and when tar cement is used in the surface a tar should be used for pouring the base. If, however, the asphaltic cement has an original penetration as low as 60 the binder for the base should have 60 or higher. With asphaltic cements higher than 60 penetration the same material may be used as binder for the poured base.

On a foundation thus prepared a somewhat thinner layer of bituminous concrete may be used with safety, though the economy of this construction is somewhat doubtful unless the expected traffic is light, in which case the wearing surface of bituminous concrete may be made quite thin, composed of a fine aggregate, as hereinafter specified, and the pavement be considered finished without a seal coat.

OLD MACADAM FOUNDATION

If the pavement is to be laid on an old macadam, base the surface shall be thoroughly swept and cleaned of all fine material that may be caked upon the surface of the stone or lying loose as dust, thereby exposing the clean, coarse stone for the reception of the bituminous concrete.

If the old macadam does not present the desired coarse, grainy surface, or is not at proper and satisfactory grade after cleaning, it shall be spiked up and redressed to the desired crown and grade, the coarse stone being brought to the top by harrowing or otherwise, or new stone added when in the opinion of the engineer in charge it is needed to give the necessary grainy surface or thickness of foundation. It shall then be thoroughly rolled with the use of as little water as possible, so the surface of the macadam does not flush up smooth.

It is not practicable to pour an old macadam base with a bituminous filler unless a complete new surface of stone is provided, in which case it may be treated as specified for new macadam.

CONCRETE FOUNDATION.

If a hydraulic concrete foundation is desired it should be laid according to the standard specifications for concrete foundation.

CURB

If a curb or curb and gutter is used, the face against which the paving material will be laid shall be painted with a coat of the hot bituminous cement in advance of the pavement.

A curb or curb and gutter should be used in all cases of a street devoted to miscellaneous uses and where there is occasion for many vehicles to stop at the curb line, but in the case of a park driveway or a suburban highway a bituminous concrete pavement may be successfully used without a curb. No other protection for the edge of the pavement is required except to provide a coarse, grainy base into which the paving material is rolled.

WEARING SURFACE

On the foundation, as heretofore specified, shall be laid the bituminous concrete wearing surface, which shall consist of a mineral aggregate mixed with bituminous cement and laid as hereinafter specified.

This wearing surface shall have a thickness of inches after thorough compression with a roller.

For heavy traffic a thickness of two inches is sufficient for all practical purposes, and in some cases will afford greater stability than a greater thickness.

For moderate and light traffic one and one-half inches, or for light traffic one inch will be sufficient thickness for the wearing surface when laid on a well-constructed macadam base, as specified above.

MINERAL AGGREGATE.

The mineral aggregate shall consist of a mixture of broken stone and sand, to which in some cases may be added a small quantity of stone dust or Portland cement.

Any sound, durable stone, either trap rock, limestone or granite, usually considered suitable for macadam, may be used. It should be broken as nearly cubical as practicable. It should not show distinct planes of cleavage or crystalline faces, and should not readily crush or split under the roller when being rolled in the pavement. Between two kinds of stone, choice should generally be made of the one showing the greatest toughness, rather than hardness. A certain percentage of absorption, such as is shown by the better grades of limestones, is a desirable quality, as the bonding strength of the cement is somewhat improved thereby.

The stone shall vary in size from a maximum of about half the thickness of the wearing surface to the smallest particle retained on the finest mesh screen commonly used on crushing plants. That is, the minimum screen should be one-fourth inch for dry stone and one-half inch for wet stone. For a two-inch wearing surface the stone would vary in size from that passing a one and one-fourth-inch screen to as small as that held on a one-fourth-inch screen, and for one-inch wearing surface from that passing a three-fourth-inch screen down to the same minimum.

The dust or fine screenings should be removed from the stone, as it usually is excessive and irregular in quantity and necessitates the use of a greater amount of cement.

The sand shall be similar in character to that commonly used in sheet asphalt mixtures. It shall be hard-grained, moderately sharp, free from loam or other foreign material and varying in size from that passing a ¼-inch screen to dust passing a 200-mesh screen. There shall not be over 5 per cent passing the 200-mesh screen and there should not be over 30 per cent held on the 10-mesh screen.

The dust which may be added to the mixture shall be either a Portland cement or ground limestone. Its purpose is to act as a filler and stiffen or harden up the paving mixture to meet conditions of heavy traffic or to add stability to a tar cement or an asphaltic cement having high ductility and readily affected by change of temperature.

Its use lessens the resiliency of most bituminous concretes, and should be used with discretion. Not over 4 per cent by weight should be added to any bituminous concrete mixture and a screening of the combined aggregate should show not over 6 per cent of 200-mesh material. If an asphaltic cement is used having finely divided mineral matter self-contained this should be taken into consideration in the determination of total dust.

BITUMINOUS CEMENT

The bituminous cement may be either asphaltic cement or refined coal tar.

Asphaltic Cement

The asphaltic cement may be prepared from the following asphalts, combined with flux as hereinafter specified if flux is necessary: (1) From refined natural asphalt; (2) from the residue obtained in the careful distillation, either with or without oxidation, of asphaltic or semi-asphaltic petroleum; (3) from any uniform combination of the preceding materials, together with a suitable flux, if flux be necessary, such combination being subject to the approval of the engineer.

Each bidder must state the nature and origin of the bitumen to be used by him, and, further, shall submit samples of the bitumen with his proposal.

The asphaltic cement shall pass the requirements designated below:

(1) It shall have a penetration of from 40 to 65 at 77 degrees Fahr. for use on streets where there is much heavy traffic and where it is desired to have a hard, exceedingly stable pavement. The penetration shall be from 50 to 100 at 77 degrees Fahr. for use on streets or roadways where the traffic is medium and where a resilient, non-slippery pavement is an important consideration. (The above penetrations are measured in hundredth centimeters with a No. 2 needle weighted with 100 grams acting for 5 sec.)

(2) When 20 grams of the cement are maintained at a temperature of 325 degrees Fahr., for five hours in a tin box 2½

inches in diameter, there must not be volatilization of more than 3 per cent by weight of the bitumen present, nor shall the original penetration be reduced thereby over one-half.

(3) The bitumen of the asphaltic cement shall give upon ignition not more than 15 per cent of fixed carbon for asphaltic cement of penetration between 65 and 100, and not more than 16½ per cent for asphaltic cement between 40 and 65.

The method of test employed is that recommended by the committee on coal analysis of the American Chemical Society.

(4) Of the bitumen of the asphaltic cement which is soluble in carbon disulphide, 0.8½ per cent shall be soluble in carbon tetrachloride. In this test for carbones the asphaltic cement to be tested should be allowed to stand over night covered with purified carbon tetrachloride. The test to be performed in subdued light.

(5) At 32 degrees Fahr. the bitumen of the cement shall have a penetration of not less than 8 when tested one minute with the needle weighted to 200 grams.

(6) The cement shall not flash at a less temperature than 350 degrees Fahr., New York State closed oil tester.

Flux

The fluxing material may be a paraffine, a semi-asphaltic, or an asphaltic residuum which shall be tested with and found suitable to the asphalt to be used.

The residuum must have a penetration greater than 350 degrees with a No. 2 needle at 77 degrees Fahr. under fifty grams weight for one second.

A natural maltha may be used if it passes the heat and flash tests specified under "a."

(a) The paraffine residuum shall have a specific gravity of 0.92 to 0.94 at 77 degrees Fahr. It shall not flash below 350 degrees Fahr. when tested in the New York State closed oil tester, and shall not volatilize more than 5 per cent of material when heated five hours at 325 degrees Fahr. in a tin box 2½ inches in diameter, as officially prescribed.

(b) Semi-asphaltic residuum shall have the same general characteristics as paraffine residuum except that it shall have a specific gravity of 0.94 to 0.98 at 77 degrees Fahr.

(c) Asphaltic residuum shall have the same general characteristics as paraffine residuum except that the specific gravity shall be not less than 0.98 nor more than 1.04 at 77 degrees Fahr.

Coal Tar Cement

The coal tar cement shall be residue of the distillation of coal tar only, and shall be refined for the special purpose of making a paving cement.

No mixture of hard pitch with the lighter oils of coal tar will be permitted.

Its specific gravity shall be not less than 1.20 nor more than 1.20 at 60 degrees Fahr.

It shall contain not less than 20 per cent nor more than 35 per cent of free carbon insoluble in benzol.

It shall be free from water as determined by distillation and shall show upon ignition not more than ½ per cent of inorganic matter.

No distillate shall be obtained lower than 338 degrees Fahr. and up to 600 degrees, not less than 10 per cent and not more than 25 per cent of distillate shall be obtained. The distillate shall be of a gravity of not less than 1.03 at 60 degrees Fahr.

The residue shall have a melting point of about 165 to 170 degrees Fahr. In making this distillation an 8-ounce glass retort shall be used and the thermometer suspended so that before applying the heat the bulb of the thermometer is ½ inch above the surface of the liquid. The melting point of the pitch shall be determined by suspending a ½-inch cube in a beaker 1 inch above the bottom. The temperature shall be raised 9 degrees per minute from 60 degrees Fahr. The temperature recorded the instant the pitch touches the bottom shall be considered the melting point of the pitch.

PROPORTIONS

The proportions of the various ingredients composing the bituminous concrete shall be approximately three parts of stone to two parts of sand, to which shall be added from 7 per cent to 10 per cent by weight of the bitumen. If stone dust or Portland cement is added to the mixture it shall be in such quantities that a screening of the whole aggregate shall not show more than 6 per cent by weight passing a 200-mesh screen.

The dust or Portland cement should be used only in the following cases: (1) When the traffic is heavy and it is desired to harden and stiffen up the paving mixture, in which case the percentage of bitumen should be increased to about 9 to 10 per cent by weight of the whole mixture; and (2) when a bituminous cement of great ductility and short range of temperature is used, in which case the percentage of bituminous cement should not exceed 9 per cent.

In general, the percentage of bituminous cement used should be varied according to the varying characteristics of the mineral aggregate—the more fine material there is in the mixture the greater the percentage of bituminous cement—and the resulting product should be a tough, pliable, well-filled and waterproof mixture.

METHOD OF MIXING

The aggregate shall be dried and heated in properly designed driers before mixing with the bituminous cement. The driers shall be of the revolving type, thoroughly agitating and turning the materials during the process of drying. When the aggregate is thoroughly dried and heated to a temperature of from 200 to 350 degrees Fahr., depending upon the bituminous cement used, it shall be immediately, before cooling or exposing to moisture, mixed with the hot bituminous cement as hereinafter specified. If stone dust is used it shall be introduced directly into the mixer without passing through the drier.

The bituminous cement shall be melted in a tank arranged so the heat can be properly and easily controlled and regulated. When melted and raised to a temperature of from 200 to 350 degrees Fahr., depending on the bituminous cement used, it shall be combined in the proper proportions with the hot aggregate and immediately mixed in a properly designed mixer with revolving blades until a thorough and intimate mixture of the ingredients has been accomplished, and the particles composing the aggregate evenly and thoroughly coated with the bituminous cement. The mixer shall not be exposed directly to the action of fire.

METHOD OF LAYING

While still hot from the mixer the paving mixture shall be spread evenly on the foundation with hot iron rakes and shovels, so that when compressed with the roller it shall have the thickness specified, with the surface even and true to grade. Along the curb and around manholes, catch basins and other obstructions in the street, where the roller cannot reach, the compression shall be secured by the use of hot iron tampers. The rolling and tamping shall be done as quickly as possible after the material is spread, while still hot and pliable. When the paving mixture is hauled on the street in dump wagons it shall be, when ordered by the Engineer, kept covered with canvas to retain heat, dumped on platforms and shoveled into place and raked to the proper grade. As soon as spread the paving mixture shall be rolled with a tandem steam roller weighing at least five tons and the rolling continued, working lengthwise and diagonally of the street. When the pavement is to be subjected to heavy traffic additional compression in the wearing surface should be secured by the use of a 10-ton roller. Rolling must be steadily kept up and continued until all roller marks shall disappear, and the surface gives indications of no further compressibility.

The paving shall be done continuously, so the number of joints between the hot and cold material may be reduced to the minimum. When it is not practicable to lay it continuously and a joint is unavoidable, the edge of the cold material shall be trimmed down to a rough feather edge, and the surface, where the joint is to be made, painted over with bituminous cement, the hot material raked over the feathered edge and thoroughly rolled. Instead of trimming the cold material, joint strips may be used consisting of strips of canvas about 18 inches wide, with three parallel lines of ¾-inch ropes sewed on the under side about 3 inches apart. The joint strips shall be laid on the feather edge of the freshly raked material with the upper rope at the line where the thickness begins to decrease and the rolling completed on top of the canvas as for finished pavement. A square faced may be used when in the opinion of the engineer it is desirable. The faces of the curb and gutter, iron castings, etc., shall be painted with the bituminous cement before the paving mixture is laid.

SURFACE FINISH

As soon as possible after the rolling of the mixture is finished, and while the surface is still fresh and clean, and, if possible, while warm, a seal coat of bituminous cement of proper consistency to be flexible when cold shall be spread over the surface. It shall be applied while at a temperature of from 200 degrees to 350 degrees Fahr., depending on the bituminous cement used, and evenly spread with rubber squeegees. Only a sufficient coat shall be spread to flush the surface voids without leaving an excess. Immediately over this a top dressing of torpedo sand, fine gravel or stone chips free from dust, which must be thoroughly dry and heated in cold weather, shall be spread and thoroughly rolled into the surface. A small surplus shall be left to be worn in or worn away by the traffic.

In the case of park drives and roadways not subjected to heavy, constant traffic, and where a more grainy and coarse surface is desired, the surface finish specified above may be omitted and the following method of finishing adopted:

As the bituminous concrete is raked to grade and just before the roller comes on it, spread dry stone chips evenly with swinging motions of a shovel, until the surface is barely covered one stone chip deep. Then roll thoroughly as specified in the preceding paragraph relating to method of laying. If bare spots appear under the roller, sprinkle more chips and continue the rolling until the whole surface is fairly covered.

After the sand or stone chips have worn into the surface the street shall be swept, all excess of surfacing material removed and the street left clean.

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S. W. HUME, President

J. T. MORRIS, Manager. A. PRESCOTT FOLWELL, Secretary

A. PRESCOTT FOLWELL, Editor

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MAY 17, 1911

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Modern Road Experiments

During the past year the systematic study of the various new methods of building roads and a comparison of these with the better grades of water-bound macadam, have been carried on very generally in all parts of this country as well as in Europe. On January 4th we described experiments which are being conducted by the State of Ohio, and from time to time we have referred to those being carried on by the general government in several parts of the country. This week we give at some length the conclusions which may be drawn from a few months' experience on an experimental road in Greater New York.

Possibly of even more value than special experimental roads is the collection of accurate data concerning roads built in the ordinary run of department work, but concerning the construction of which a careful record was kept, and whose durability and serviceability are noted by frequent inspection. Some of the

features of experimental roads which are apt to be misleading are referred to in the article concerning the Bronx road; these including a tendency to excessive use of bituminous material and unreliability of cost figures. An excellent idea is that of the Road Board of Great Britain, (see page 703) which requests road engineers to keep careful record of construction methods and conditions of surfaces, details of construction, etc., offering to test bituminous materials used in their construction and submit analyses of them to be recorded as a part of the data for each road.

Association for Highway Improvement

An organization known as the "American Association for Highway Improvement" was organized at Washington, D. C., Nov. 22, 1910, and the headquarters of the society are in that city. The purposes of the organization are stated to be:

To correlate and harmonize the efforts of all existing organizations working for road improvement.

To arouse and stimulate sentiment for road improvement.

To strive for wise, equitable and uniform road legislation in every State.

To aid in bringing about efficient road administration in the States and their sub-divisions, involving the introduction of skilled supervision and the elimination of politics from the management of the public roads.

To seek continuous and systematic maintenance of all roads, and classification of all roads according to traffic requirements, payment of road taxes in cash, and adoption of the principle of State aid and State supervision.

To advocate the correlation of all road construction so that the important roads of each county shall connect with those of the adjoining counties and the important roads of each State shall connect with those of adjoining States.

The Association is not designed to supplant any existing meritorious organizations, but it desires to be looked upon as the clearing-house wherein every organization, from the village improvement club to associations national in their scope, may give each of the others the benefit of their experience, their ability and all the facilities at their command.

Road Building in Delaware

Road work in Delaware is under county supervision, but of the three counties most of the work has been done in New Castle county. During the past two years there has been built 37.94 miles of improved roads in this county. About one mile of these was Amiesite; about one-fourth mile was limestone with a top course bound with heavy asphaltum residuum applied by the penetration method, and about 700 feet was the same with Tarvia X substituted for asphaltum. The first named is reported by Commissioner Francis A. Price to have been satisfactory, and the other two to have only one fault—that in places the material comes to the top too freely and makes the surface slippery. Asphaltum oil has been applied to the surface of some roads and allowed to penetrate as it would, and has produced good results in some cases, while in others the road went to pieces under traffic. Calcium chloride applied experimentally to a limestone road was very satisfactory for several months after application.

South Carolina Roads

There are about 46,000 miles of public highways in South Carolina, of which nearly 150 are surfaced with stone, about 3,100 with gravel and about 4,000 with sand-clay. In addition there are a few miles of shell roads. During 1909 and 1910 most of the work was done by convict labor under the direct control of county supervisors. The state makes no direct appropriation whatever for highways.

Sand-clay roads 30 feet wide can be constructed at a maximum cost of about \$450 per mile, and are maintained by a floating gang of five convicts going over the roads once a month, making the monthly cost of up-keep per mile about \$10.00.

STATE AID IN THE SEVERAL STATES AND TERRITORIES

State.	Name of Official or Department in Charge.	AMOUNT SPENT IN 1910.		LENGTH OF ROADS BUILT IN 1910.		AMOUNT APPROPRIATED IN 1911.		WORK DONE IN 1910.		Remarks.
		On State Roads.	In State Aid to Towns or Counties.	By State Miles.	With State Aid Miles.	For State Roads.	For State Aid.	Nature of	Average Cost.	
Alabama	No State aid									Bill passed providing for a State Highway Commission.
Alaska	Board of Road Commissioners.	260,000		1843				Wagon roads, winter sled roads & trails.		
Arizona	Territorial Engineering Department.	200,000						Bridges; locating and grading roads near larger towns.		
Arkansas	County Courts	None	None					Mountain roads	\$5,000 per mile.	
California	State Dept. of Engineering.	50,000 ^c	None	20 ^c	None	\$140,000 ^d	None			
Colorado	State Highway Commission.		\$46,500				\$50,000			Commission created in 1910.
Connecticut	State Highway Department.	1,809,530 [§]		223.28 [§]		<i>h</i>	<i>h</i>			
Delaware	Co. State Highway Comm'rs.		22,000 ^{§**}		37.94 ^{§**}					
Florida	No State aid or control.									
Georgia	State Geologist.		Convict labor							
Idaho	State Engineer.			None	None	23,750	2,000			Good roads law of 1909 declared unconstitutional. State furnishes only broken stone and engineering.
Illinois	Highway Department.		65,000		60 ^l			Plain macadam. Bit. macadam.	0.60 0.85	
Indiana	Co. Comm'rs.									
Iowa	State Highway Commission.	500						300 feet of earth road.	881 per mile.	\$10,000 a year for office maintenance only. Iowa State College acts as commission.
Kansas	State Highway Engineer.									No State appropriation for road improvements.
Kentucky	County Courts.									No State aid, except convicts.
Louisiana	State Board of Engineers.									Under new law State will pay one-half cost of roads.
Maine	State Highway Department.	66,689.81 ^e	363,948.93 ^f	7.99	112.33	250,000 ^k		Block, 2,920 sq. yds. Macadam, 79,396 sq. yds. Bit. macadam, 19,280 sq. yds. Stone macadam Gravel. Bit macadam.	1.64 0.58 1.33	Gravel, 88.89 m., \$2,623.59; earth, 14.75 m., \$2,502.98;
Maryland	Chairman, State Roads Commission.	1,512,443.62	243,922.08	84	51.13	1,050,000	200,000	18 mi. water bound macadam; 9 mi. bit. macadam; 6 mi. gravel; 14.75 bi. gravel; sand, oil binder; 27.2 mi. "small town" roads.	.90 .47 1.10	Surface treatments, 3 to 8c.
Massachusetts	State Highway Commission.	505,000 [*]		81.7		500,000 [*]		Gravel, 54.5% Macadam, 43% all other 2%.		
Michigan	State Highway Department.		137,327		204.38		140,000	Earth roads, macadam, 5 mi. Rock. Gravel.	1.797 4.529	
Minnesota	State Engineer.		80,000				80,000			
Missouri	State Board of Agriculture.		75,000				300,000 ^o			
Mississippi	County Supvs.									
Montana	County Supvs.									
Nebraska										No State aid except for bridges.
Nevada	State Engineer.						20,000			Laws for highways just going in effect.
New Hampshire	H. C. Hill, State Engineer.	39,757.29	517,866.66	none ^a	194.2	40,000	375,000	Macadam, 57... Gravel, 135.8... Bit. macad., 1.4	6,538.65 3,353.50 7,708.72	
New Jersey	Dept. Pub. Rd. Department		825,148		84.9		400,000			
New York	Department of Highways.	6,000,000 [†]		531		8,000,000 [†]		350 mi. bit. macadam. 150 mi. water bound macad. 4 1/2 mi. gravel. 23.7 mi. brick. 2.5 mi. earth.	11,430 10,000 15,840 25,300 2,000	
New Mexico	Territorial Eng.									
North Carolina										No State assistance except engineering advice by Geological Survey.

* Each county repays total cost of roads within its borders in 4 to 6 years. Maintenance paid by automobile tax (estimated at \$350,000 for 1911) and \$200,000 appropriation.

† For maintenance and repairs, \$1,800,000 in 1910; \$1,500,000 appropriated for 1911.

‡ For maintenance, \$68,147.84 in 1910, \$80,000 in 1911.

§ For biennial period of 1909-1910.

** New Castle County only.

^a Amount spent for maintenance. ^b Proposed. ^c Estimated. ^d All bills not signed yet. ^e \$39,779.74 furnished by State. ^f \$171,701.57 furnished by State. ^g For supplies and equipment. ^h Appropriation not yet made. ⁱ Tax of 25 cts. per h.p. on all automobiles. ^k Not definite whether for State Roads or State Aid. ^l Stone furnished by State f.o.b. penitentiaries. State machinery used for 30 miles.

STATE AID IN THE SEVERAL STATES AND TERRITORIES—Continued

State.	Name of Official or Department in Charge.	AMOUNT SPENT IN 1910.		LENGTH OF ROADS BUILT IN 1910.		AMOUNT APPROPRIATED IN 1911.		WORK DONE IN 1910.		Remarks.
		On State Roads.	In State Aid to Towns or Counties.	By State. Miles.	With State Aid. Miles.	For State Roads.	For State Aid.	Nature of Work Done.	Average Cost.	
North Dakota.....	No State control	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ohio.....	State Highway Department.	.....	\$558,654	.....	47.7	.....	.....	.....	.....	.....
Oklahoma.....	Highway Dept. (Just created.)	.....	.....	.....	.....	.....	i	.....	.....	.....
Oregon.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	No supervision over road construction or appropriation.
Pennsylvania.....	State Highway Commission.	None	919,531.98	None	73.7	\$2,000,000 ^b	\$1,000,000 ^b	Macadam.....	\$11,645.71	.....
Rhode Island.....	State Board of Public Roads.	\$327,897 [‡]	36.5	.....	200,000 [‡]	Bit. macadam.....	15,648.84	.....
South Carolina.....	Dept. of Agriculture, Commerce and Industries.	.....	.....	.....	.....	.....	.....	Brick.....	13,320.10	.....
South Dakota.....	.....	.....	.....	.....	.....	.....	.....	23.6 mi. water bound macadam; 12.9 mi. bit. macadam.	.....	Advisory and statistical only.
Tennessee.....	Highway Commission.	.....	.....	.....	.....	.....	.....	.....	.....	.....
Texas.....	County Comrs.	.....	.....	.....	.....	.....	.....	.....	.....	.....
Utah.....	State Road Commission.	.....	100,631	.....	125.4	.....	190,000	1.14 mi. macadam.	3,797	.....
Vermont.....	Highway Department.	.....	250,000	.....	150	.....	300,000	110 mi. gravel.	.....	.....
Virginia.....	State Highway Commissioner.	.....	450,000	.....	290	.....	300,000	40 mi. telford.	.....	.....
Washington.....	Highway Department.	300,000	.....	97	.....	790,000	.....	Macadam, 12 ft. wide.....	4,734.79	.....
West Virginia.....	State Commissioner of Public Roads.	.....	6,000	None	2 [‡]	None	Gravel, 12 ft. wide.....	1,219.65	.....
Wisconsin.....	Highway Div., Wis. Geological and Nat. History Survey.	.....	.....	.....	.....	.....	.....	Sand, clay.....	730.63	.....
Wyoming.....	State Engineer.	.....	.....	.....	.....	10,000 ^g	.....	6.5 mi. water bound macadam; 5.5 mi. bit. macadam; 17.4 mi. gravel; 67.4 mi. earth.	.....	.....

[‡] For maintenance, \$68,147.84 in 1910, \$80,000 in 1911. ^b Proposed. ^g For supplies and equipment. ⁱ Tax of 25 cents per h. p. on all automobiles.

DATA CONCERNING STATE AID

The above table has been compiled from the latest data obtained directly from the road officials of the several States. In many of the States the appropriations for 1911 have not yet been made, although such delay is adverse to effective and economical work by a highway department. Of the 49 States and Territories, 13 neither give aid to or exercise control over any roads; two aid only by giving services of convicts, and one by giving convict broken-stone; 5 give nothing but engineering services or advice. The other 28 give more or less direct aid; New York State gives almost as much as all the others combined. In 1910 State aid and State construction totaled about \$17,000,000, the mileage being 4,278. The work so aided varied from mere grading to bituminous macadam and brick pavements.

PARK ROADS

Construction and Maintenance of Park Roads by Metropolitan Park Commission of Massachusetts—Detail Costs

The work of road construction and maintenance by the Metropolitan Park Commission, which has charge of the State park system in the vicinity of Boston, Mass., is of special interest because the commission was one of the first municipal bodies to adopt treatment of roads with tar and asphalt. In respect to the mileage of roads under its charge the work compares in extent with that of an ordinary city. The problem differs, however, from that of a city in that the work is spread over a wide area. Altogether the commission has 80 miles of formal roadways open to automobiles and other classes of pleasure travel. In addition, there are within the woods reservations almost as many more miles of roadways which are restricted to use by horse-drawn vehicles.

In his annual report for 1910 Chairman William B. de las Casas says that for mere reasons of economy it is necessary to keep the roads in as nearly perfect condition as possible. The increased use of automobiles has so changed the character of

the wear and tear upon road surfaces that those rebuilt a few years ago have required entire resurfacing. On account of a public demand the commission withdrew, from November 15 to March 31, its prohibition of the use of roadways by automobiles with chains, and in consequence has made an increased allowance of \$14,000 for road repairs.

Chief Engineer John R. Rablin, in his report states that the work of reconstruction, repairs and maintenance of roadways has been carried on upon the same general lines as hitherto by the use of refined tars, residual asphalts and asphaltic oils. The results, he says, have been generally satisfactory.

Some of the items in the accompanying table, taken from the annual report, require a little explanation. Calcium chloride was used for the most part on roads that were shaded by trees. Item No. 30, cost \$0.931, is a section of Revere Beach Parkway where the subgrade was very spongy. It was excavated, underdrained and reconstructed with 12 inches of gravel screenings under the macadam surfacing.

Item 22, cost \$0.287, is a portion of Middlesex Falls Parkway. The old macadam was scarified, covered with 2 inches of gravel and treated with asphaltic oil, 3/4 gallon to the yard, the work being done by direct employment of labor.

Item No. 2, Blue Hills Parkway, cost \$0.511, an old macadam roadway; it was scarified and new stone added to crown and shape the surface. Tar was applied by a gravity distributor attached to the rear of a tank wagon; temperature of tar 175° F.; work done by the commission by day labor.

CONCRETE ROADS IN MICHIGAN

Concrete macadam roads have been built in Wayne and Saginaw counties in an attempt to secure roadways which will not ravel under automobile travel nor rut under heavy trucking. The former county has been building these for two years and now has nearly eight miles of two-course concrete

macadam roadways. The bottom course or layer is made of limestone concrete mixed one Portland cement, two sand and five broken limestone; the top layer being one Portland cement, two sand and three of crushed cobbles. The combined depth of the two courses is 6½ inches when compacted. The roads are made 15 to 19 feet wide. Saginaw county is constructing several miles of similar roads in which the bottom layer of concrete is mixed 1:2:5, and the top layer 1:2:4, with limestone used in both layers.

Wayne county has built more than five miles of gravel concrete roads laid in one course, the concrete being mixed one cement, two sand and four of gravel.

SUMMARY OF COST OF ROAD REPAIRS AND MAINTENANCE IN 1910, METROPOLITAN PARKS

Parkway or Reservation.	Length (Ft.)	Width of Roadway (Ft.)	Square Yards.	COST PER SQUARE YARD IN DETAIL.							Total Cost. Cts.	Total Amount.	Remarks.
				Labor. Cts.	Gravel. Cts.	Brok'n Stone Cts.	Sand. Cts.	BITUMINOUS BINDER OR DUST LAYER.					
								Kind of Material	Galls. per Sq. Yd.	Cost. Cts.			
1 Blue Hills Parkway.	7,600	36	30,400	.008	..	..	*..	Asphaltoilene (Good Roads Improvement Company).	.21	.016	.024	\$ 735.20	Surface treatment
2 Blue Hills Parkway.	1,650	26 & 30	5,500	.103	..	.160	..	Tarite - asphalt (American Tar Company).	2.55	.248	.511	2,811.65	Resurfacing
3 Blue Hills Parkway.	2,000	26	5,778	.118	..	.114	..	Tarite (American Tar Company).	2.43	.200	.432	2,493.58	Resurfacing
4 Charles River Reservation.	9,200	60 & 40	54,220	.022	.002	..	..	Calcium chloride..	..	.013	.037	1,996.47	Surface treatment
5 Charles River Reservation.	2,100	45	9,578	.031	..	.031	..	Tarvia (Barrett Manufacturing Company).	.60	.053	.115	1,100.06	Surface treatment
6 Fresh Pond Parkway.	2,700	40	12,000	.020	..	..	..	Calcium chloride..	..	.016	.036	427.42	Surface treatment
7 Furnace Brook Parkway.	7,750	36 & 40	31,010	.001	..	..	..	Calcium chloride..	..	.008	.009	292.02	Surface treatment
8 Lynn Fells Parkway.	2,600	40	11,500	.006	..	..	..	Calcium chloride..	..	.030	.036	411.55	Surface treatment
9 Lynn Shore Reservation.	5,900	40	24,256	.004	..	.016	..	Asphalt-oil (Texas Company and Indian Refining Company).	.61	.040	.060	1,457.04	Surface treatment
10 Middlesex Fells Reservation.	2,200	19	4,644	.096	.021	..	..	Liquid asphalt (Indian Refining Company).	.21	.017	.041	204.00	Surface treatment
11 Middlesex Fells Reservation.	..	..	5,777	.008	..	..	..	Calcium chloride..	..	.029	.037	211.55	Surface treatment
12 Middlesex Fells Reservation.	..	..	1,777	.008	..	..	..	Calcium chloride..	..	.011	.019	34.12	Surface treatment
13 Middlesex Fells Reservation.	..	..	6,000	.009	..	..	..	Calcium chloride..	..	.039	.048	289.35	Surface treatment
14 Middlesex Fells Reservation.	..	..	3,400	.007	..	..	..	Calcium chloride..	..	.011	.018	61.02	Surface treatment
15 Middlesex Fells Parkway.	1,450	36	5,800	.037	..	.016	..	Tarvia.....	.64	.055	.108	629.02	Surface treatment
16 Middlesex Fells Parkway.	3,200	36	12,800	.004	..	..	.016	Liquid asphalt...	.327	.027	.047	603.80	Surface treatment
17 Middlesex Fells Parkway.	4,650	25	12,917	.011	..	..	.025	Liquid asphalt...	.40	.032	.068	875.92	Surface treatment
18 Middlesex Fells Parkway.	1,360	32	4,836	.025	..	.020	..	Tarvia.....	.22	.018	.063	305.03	Surface treatment
19 Middlesex Fells Parkway.	2,200	19	4,645	.012	..	..	.020	Liquid asphalt...	.49	.040	.072	335.16	Surface treatment
20 Middlesex Fells Parkway.	1,400	19	2,955	.063	.225	..	.020	Liquid asphalt...	.49	.040	.350	1,034.25	Resurfacing.
21 Middlesex Fells Parkway.	1,000	26	2,889	.094	..	.082	.007	Tarite.....	2.14	.153	.336	971.05	Resurfacing.
22 Middlesex Fells Parkway.	3,400	24	9,067	.066	.206	..	..	Asphalt oil (Standard Oil Company).	.34	.015	.287	2,603.76	Resurfacing.
23 Mystic Valley Parkway.	1,600	36	5,700	1.301	.183	.162	.009	Liquid asphalt...	.34	.027	.682	3,890.34	Reconstruction.
24 Mystic Valley Parkway.	3,850	36	15,400	.179	.245	.179	.008	Liquid asphalt...	.31	.025	.636	9,787.96	Reconstruction.
25 Mystic Valley Parkway.	2,750	36	11,000	.021	..	..	.008	Liquid asphalt...	.31	.025	.054	597.14	Surface treatment
26 Nantasket Beach Reservation.	3,760	40	24,935	.018	.002	..	..	Calcium chloride..	..	.021	.041	1,035.05	Surface treatment
27 Neponset River Parkway.	2,750	26	7,944	.003	..	..	..	Asphaltoilene...	.33	.023	.026	209.50	Surface treatment
28 Quincy Shore Reservation.	11,800	21 & 40	37,155	.002	..	..	..	Calcium chloride..	..	.014	.016	616.30	Surface treatment
29 Revere Beach Parkway.	4,560	36	18,240	.024	..	.026	..	Tarite-asphalt...	.60	.048	.098	1,786.54	Surface treatment
30 Revere Beach Parkway.	1,200	36	4,800	1.330	..	.411	..	Tarite-asphalt and Tarvia.	2.38	.190	.931	4,467.62	Reconstruction
31 Revere Beach Reservation.	6,100	40	25,078	.003	..	.006	..	Liquid asphalt...	.16	.013	.022	544.37	Surface treatment (patching)
32 Revere Beach Reservation.	2,000	40	7,556	.013	..	.012	..	Tarite-asphalt...	.43	.039	.064	485.34	Surface treatment
33 Stony Brook Reservation.	13,075	16	23,247	.012	..	..	..	Asphaltoilene....	.27	.021	.033	764.88	Surface treatment
34 Winthrop Shore Reservation.	5,700	36	20,900	.040	..	.009	..	Tarvia.....	.60	.045	.094	1,966.36	Surface treatment
35 Winthrop Shore Reservation.	400	26	1,022	.180	..	.160	..	Tarvia.....	.78	.060	.400	409.34	Reconstruction.

Included in labor. †Includes hauling away dead material and rolling subgrade, and laying 712 feet of 6-inch underdrain. ‡Includes excavation and filling for subgrade.

NEWS OF THE MUNICIPALITIES

Current Subjects of General Interest, Under Consideration by City Councils and Department Heads—Streets, Water Works, Lighting and Sanitary Matters—Fire and Police Items—Government and Finance

ROADS AND PAVEMENTS

Will Oil Roads Next Month

Pittsburg, Pa.—The dry and summer-like weather of the past few days has made the macadamized county roads unpleasantly dusty, and as the roads are used by many autoists, homes fronting on these highways are coated inside and out with pulverized limestone. The nuisance was unusually pronounced on Washington and Shannon roads in the Mount Lebanon district, where these roads are lined with fine homes. County Engineer S. D. Foster says that in a few days a carload of calcium chloride will be delivered at Castle Shannon, to be used in front of homes along the county roads in the Mount Lebanon district. Mr. Foster says that will overcome the dust until next month, when a general road-oiling campaign is to be inaugurated. The oiling cannot be started earlier because to make it successful warm days and nights are needed to keep the oil from lumping.

Street Oiling to Stop Dust

Waterbury, Conn.—The first oiling of the streets of Waterbury for the present year will probably be done next week when those in the high service will be treated by the Street Department. The lack of rain has placed many city streets in bad condition, dust an inch thick prevailing on some streets, and a high wind causes much discomfort.

Oiling of City Streets Begun

Providence, R. I.—The work of oiling the macadam streets upon which the street cars operate has been started by the Daniels Road Oiling Company, of East Providence, which secured the contract for the work at a recent session of the Board of Contract and Supply.

Property Owner Objects to Narrowing Street

Atlantic City, N. J.—City Council's recent action in reducing the width of Maine avenue has been taken into court under certiorari proceedings brought by Watson R. Lewis, owner of a large-sized property in the square where the avenue has been vacated or narrowed. Mr. Lewis wants to have the ordinance, which cuts off 40 feet from the east side of Maine avenue between Madison and Melrose avenues, set aside on several grounds, one of which is that real estate owned by him on the west side of the particular square involved will be depreciated in value by making the avenue narrower. Mr. Lewis contends that one of the chief features of the attractiveness of his property was the 100-foot wide avenue in front of it and that there was no necessity for reducing the width.

Street Must Be Raised to Make Sewer Possible

McKeesport, Pa.—In planning for sewers for the East End district, especially between Riverton and Lincoln Way, City Engineer Smith finds that the city is up against a proposition, and to overcome it the city will sooner or later be compelled to expend between \$300,000 and \$400,000. Fifth avenue, between the points mentioned, is so low that the usual high waters of the Monongahela River flood it. To overcome this is the problem that now confronts the city. Engineer Smith, reporting to the Street Committee of Councils, says it will be a useless expenditure of money to put down a main sewer in Fifth avenue between these two points, and to repave the thoroughfare as is contemplated. He says the sewer can be put down, but that it will be flooded, and of little use, every time there is a high river. He believes the city should arrange to overcome this. In order to give the committee and Councils something to work on the engineer has prepared a plan, showing Fifth avenue, between Riverton and No. 2 fire station, elevated above the flood stage. At some points the street is shown 13 feet above the present grade, but the engineer says this is necessary. He predicts that sooner or later the city will be compelled to make this improvement.

Oil Sprinkling Given Test

Texarkana, Ark.—The combination oil and water sprinkler recently purchased by philanthropic citizens and business men of the East Side has been used for several days and is giving entire satisfaction. A tank car of heavy oil, purchased by the same men, has been spread over portions of the different streets, furnishing Texarkanians with ample evidence that oiling the streets is one sure way of abolishing the dust nuisance and at the same time improving the road.

Paving Pointers for Fort Smith

Fort Smith, Ark.—Mayor Bourland, City Engineer Reed and Aldermen Howell and Blocker have returned from a trip to Little Rock, Memphis, Shreveport and Dallas to inspect the paving, gather data on the cost and durability of the various kinds of paving and also get data upon municipal government. In describing the different pavements inspected, Mayor Bourland said: "In three of the four cities they are using creosote block to the exclusion of all other kinds of paving material. We were taken over Dallas by the Commissioner of Lights and Water, and find they are giving more attention to their highways in the suburbs than any of the cities we visited. They are tearing up asphalt to put down creosote blocks. Shreveport and Dallas are both using creosote blocks. We saw some that had been down many years, and they were in better shape than the new. The unevenness of the surface of new paving had worn away and the paving was as smooth as the floor of my office. Little Rock is using an asphalt combination they call cement-asphalt, that makes a pretty street, and they say it is very durable. We had a block of it shipped here. I like it equally as well as the creosote block, and it has the additional feature of costing only about one-half as much as the blocks."

Demand for Paving Embarrasses City

Indianapolis, Ind.—"Never before has the demand for street improvements been what it is this year," says City Civil Engineer Henry W. Klausmann. "There may be necessary a special levy, provided for by the new street intersection law, to pay for intersections before the year ends. If not, many of the petitioned improvements cannot be made, because the city treasury will not withstand the cost of all the intersections involved. Several years ago the city government practically had to force street improvements upon the people affected, but now the value of the improvements is realized and they are being demanded faster than the city can supply them." For several months petitions have been pouring into the office of the Board of Public Works for improvements of various kinds in all parts of the city, and it has been found difficult to obtain sufficient money to pay for the street intersections, \$25,000 appropriated a few weeks ago already being exhausted, and another \$25,000 will be necessary. Mr. Klausmann deplored the passage of the law requiring that street intersections be paid out of the general fund of the city, insofar as it applies to Indianapolis. "For fourteen or fifteen years property owners within half a block of each street intersection have had the cost of that intersection assessed among them," he said, "and now through the new law they are being required to help pay for street intersections throughout the entire city. It is not equitable. Had the city always paid the cost of intersections it would be a different matter; but now property owners who already have paid for all street intersections affecting their property directly must contribute to the cost of street intersections in all parts of the city. Of course the city will not always be so greatly hampered in making street improvements because of lack of funds for street intersections as it is this year, for hereafter a special levy can be made to provide sufficient funds for this expense. But this year the law caught the city without any provision for this additional expense and with considerable more than \$100,000 to be spent for street intersections."

New York's Street Commissioner Speaks in Minneapolis

Minneapolis, Minn.—That the condition of a city's streets were of its own making—clean or dirty according to the co-operation of its citizens, and that no cleaning system in the world was efficient unless the people themselves made it possible, was declared by William Edwards, Street Commissioner of New York City, at a luncheon of Publicity Club members at Hotel Radisson.

There was no trace of the "Billy" Edwards, football hero of the nineties, in the serious and dignified consideration of an important municipal subject in his address.

It was a city official speaking whereof he knew, from an experience of ten years in the active service of giving clean streets to the 4,500,000 people of New York.

"Clean streets are like clean houses," said Mr. Edwards; "they depend upon the people themselves. If people are public-spirited enough not to throw rubbish about, the acquiring of clean thoroughfares is not difficult, but it does necessitate a system.

"To my mind the best system in the world is the flushing system, such as I am told prevails here and which is impossible in New York.

"In the early morning hours street litter should be swept into the gutters. Hand labor is necessary, of course, to arrange the litter into piles for carting away. This hand labor should continue through the day in the busier sections. Of course the rotary or revolving broom is of little use, unless the streets are wet before it is used. The Board of Estimate in New York is at present considering the installation of a vacuum cleaner or pickup, such as is now used in some cities of Germany.

"Litter pails or deposit boxes in every block are necessary if one would have a clean residence district. People would soon learn to use these and refrain from throwing things on the streets, and pride in the neighborhood would result."

City Makes Fine Showing in Paving

Galveston, Tex.—Nothing adds to the general appearance of a city more than clean, well-lighted and paved streets, good drainage, well-kept and uniform sidewalks.

The improved condition of the streets in Galveston during the past few years is remarked on by almost every visitor. The home people, who witness the changes as gradually made, fail, as a rule, to observe anything out of the ordinary.

The City Engineer's Department has just completed a statement showing the expenditures by the city for public improvements from Jan. 1, 1903, to Feb. 28, 1911, as follows:

Jan. 1, 1903, to Feb. 29, 1904.....	\$115,277.53
Year ending Feb. 28, 1905.....	88,088.77
Year ending Feb. 28, 1906.....	123,892.52
Year ending Feb. 29, 1908.....	156,170.56
Year ending Feb. 28, 1909.....	222,441.08
Year ending Feb. 28, 1910.....	333,553.48
Year ending Feb. 28, 1911.....	331,357.17

Total\$1,491,961.40
Of this sum \$251,970.65 was expended for vitrified brick pavement and \$297,243.51 for mudshell and crushed rock roadways.

Over 6¼ miles of brick paving was laid and 40 miles of mudshell streets. For concrete and vitrified drains \$228,897.58 was expended. Grade raising and filling in addition to Goedhart & Bates contract called for \$300,122.61. Creosoted wooden box drains in the west end cost \$25,699.02. Of the above \$563,433.37 was paid out of the current revenues.

Commissioner Makes Tour Inspecting Roads

Syracuse, N. Y.—"There has been a marvelous improvement in the highways of the State since a year ago, and they were never in nearly as good condition as they are today," declared Deputy Commissioner Frank D. Lyon, of the State Department of Highways, last week. Mr. Lyon is traveling through the State by automobile making an inspection of road work, giving inspection to highways that are being cared for by the towns. He has been from Buffalo through the southern tier of counties, from Albany to Binghamton and from Binghamton to Syracuse, by way of Ithaca and Cortland. About 1,000 miles were covered.

SEWERAGE AND SANITATION

Drinking Fountains for School

Bay City, Tex.—The Civic Club recently made formal presentation to the high school of the sanitary drinking fountains, which have been installed for some time. These fountains are handsome fixtures.

Will Enforce Sanitary Provisions Regarding Cold Storage

Indianapolis, Ind.—Pure milk, pure cream, pure butter, pure cheese and pure cold storage products will be insured to the people of Indiana hereafter if the stringent rules adopted by the State Board of Health at a recent meeting at the State House are enforced to the letter, as the Board contemplates they shall be. The Board adopted three rules which bear on the enforcement of the cold storage law passed by the last Legislature. One of the most important acts of the Board was the defining of a cold storage or refrigerating warehouse, to which the terms of the new cold storage law shall apply. By the ruling of the Board the law will apply to all hotels, restaurants and other places of business employing refrigerating machinery or ice for the purpose of preserving food. In regard to all food kept in cold storage and the length of time it may be kept, it was decided that all such food shall be marked; all marking and stamping or tagging shall be plainly legible and shall show the day, month and year of the date of entrance and removal, in letters and figures not less than three-eighths of an inch in height and of a style known as 36-point Gothic No. 8. The letters or figures shall be in black or purple ink, and if the goods are tagged the tag shall be securely fastened on the package by tacks, nails, strings or glue in such fashion that it cannot be detached. All goods on hand at the end of nine months shall be reported to the State Board of Health and inspected and passed as suitable for food in accordance with the provisions of the pure food law before being withdrawn. Such inspection shall be made by the inspectors of the State Board of Health or by other persons designated by the State Food and Drug Commissioner to make such inspection.

Will Inspect a Sewage Plant

McKeesport, Pa.—Arrangements are being made by President Lysle, of Common Council, to take a party of city officials and Councilmen to Washington, Pa., to inspect the sewage disposal plant at that place. This is to be done so that the city fathers will be able to get some idea as to what will be necessary here when the city builds disposal plants, which will be within the next few years. City Engineer Smith has had designed a disposal plant, the work having been done by Leo Hutson, who is drafting plans of the city's sewage system, and the Councilmen will see how these compare with the Washington plant. The trip planned by Mr. Lysle will be made in automobiles and at no expense to the city.

Sanitary Expert Is Probing Rochester

Rochester, N. Y.—Caroline Bartlett Crane, of Kalamazoo, Mich., a sanitary expert, is visiting the city. The primary object of Mrs. Crane's visit is to make what she terms a "sanitary survey of the city." She will also study various phases of life and habits in Rochester.

When interviewed Mrs. Crane said she was not sure she would find anything to criticize there, adding: "Rochester has the reputation of being a very fine city, well conducted and well groomed. If everything is like the little I have seen, there will not be much to comment upon adversely."

Mrs. Crane will remain about 10 days and an informal report of her findings here will be made at a mass meeting to be held in Convention Hall next week. Later she intends making a written report, in which the minutest details will be covered, to the Women's Educational and Industrial Union, upon whose invitation she is in the city.

A Correction

Oil City, Pa.—We desire to apologize to Oil City, Pa., for a statement which appeared in our issue of May 3. The State referred to was Louisiana, but the "La." was changed to "Pa." by the printer, and the mistake escaped our attention.

WATER SUPPLY

Prepares Chart of the Water Supply

Dayton, O.—Consummating a great deal of tedious technical research and figuring, Charles K. Kline, of the City Engineer's Department, has turned over to Service Director Ely a chart of Dayton's water pressures at all of the local elevation points. The chart, or scale, is based upon the unit of 60 pounds pressure at the altitude at which this pressure was found to be nothing at all. This is an elevation of 159 feet. According to these figures, which have been worked out with scientific accuracy, it is found that numerous parts of the city are inaccessible to water service without auxiliary boosters. This situation will be entirely remedied when the new reservoir is placed in operation. Engineer Kline's chart can then be used by simply taking cognizance of the additional pressure which the new supply will afford. The chart was prepared at Director Ely's request to assist builders in making their calculations for water service.

Municipal Water Works Makes Good Showing

Montgomery, Ala.—The Water Works Department, of which Commissioner E. B. Joseph is at the head, announces a collection of nearly \$18,000 for the month of April from consumers, which is the biggest showing ever made by the department in a single month since the municipal plant was erected. Commissioner Joseph also announces a cut in expenses of the monthly payroll of this department. The office of superintendent was abolished a short time ago, but the Commission retained his services for a short time until the new order of things is straightened out. When the Superintendent retires from service this will mean a reduction of another \$200 a month for the department, bringing the grand total up to \$625 per month.

Pure Water by First of June

Montpelier, Ind.—People of this city are delighted that the drilling on the first well put down by the light and water company is coming on so rapidly. The first well is completed. The second one has been begun and the work on both it and the third will be rushed, and it is hoped that by the first of June the pure water can be turned into the mains, and Montpelier for the first time in years have pure water for domestic purposes.

Site Selected for Big Reservoir

Fort Worth, Tex.—The city's big surface reservoir with a capacity of 10,000,000 gallons, will be located on the west fork of the Trinity, one mile above Morgan's bridge and about six miles west of the heart of the city. This recommendation of J. D. Trammell and Dr. T. U. Taylor, of the board of expert engineers appointed to investigate and select a site, was unanimously adopted by the City Commission. The city will at once begin condemnation proceedings to obtain possession of about 3,000 acres of land for the basin itself and the drainage area.

Will Employ Expert for Water Improvements

South Bend, Ind.—Clinton S. Burns, of Burns & McDonald, consulting engineers, of Kansas City, Mo., is expected to return to South Bend soon with a report on water works conditions in the city.

Although all but minor improvements have been held up awaiting a report from the Kansas City man, there is little doubt but that another water works plant will be added to the equipment of the department in the near future. A plot of ground in Portage Park, the property of the city, has been mentioned as a probable site for the new station. Plans for preliminary improvements to north and central pumping stations have already been put into effect in an effort to give the city a sufficient supply of water during the approaching dry season.

Probably the most important improvement expected to result from Mr. Burns' investigations is the building of a thoroughly modern pumping station. The long contemplated improvement was discussed several months ago by the Board of Public Works, but plans were halted when it was decided to allow the Kansas City man to investigate the needs of the system before further action was taken.

Money Received for Filtration Plant Construction

Minneapolis, Minn.—Drafts for \$504,015, the proceeds of the sale of water works bonds, have been received by C. A. Bloomquist, City Treasurer. The total represents \$500,000, the par value of the bonds, a premium of \$15, and \$4,000 interest accrued from February 1 to April 13. The buyers were allowed \$2,500 to defray the costs of issuing the bonds. The receipt of the money has eased the situation in financing the filtration plant construction and permits of immediate progress in the big construction undertaking.

Big Increase Shown in Water Plant Earning

Knoxville, Tenn.—The books of the Knoxville Water Works Commission show that the net earnings of the plant have increased and the expenses of operating the plant have been reduced. The earnings and expenses for the first four months of 1910 and that of 1911 were compared by William Marfield, treasurer of the commission, so the taxpayers of the city could know whether the plant is a paying proposition to the city. The net income for the first four months of 1911 shows an increase over that of 1910 of nearly \$5,000, and the decrease in expenditures during the same period of 1911 and same under 1910 period is \$2,866.98.

Given Five Years to Remove Pipes

Columbia, S. C.—The city of Columbia will be given five years to remove the pipes across the Columbia canal, as a result of a resolution passed by the last General Assembly and consented to by Attorney General Lyon. The Attorney General brought action against the city of Columbia to require that the pipes which convey the city water be removed from across the canal. He secured an order in the Supreme Court. Upon petition, the time for removing the pipes was placed at seven months. Appearing before the court, Attorney General Lyon stated that he had consented to the order as provided for by the concurrent resolution. He called the attention of the court to the fact that obstructions across the streams of the State were forbidden by the constitution.

Special Rate in Water

Hutchinson, Kan.—It has been announced at the office of the water company that special reduced rates will be allowed patrons for four months beginning June 1 for sprinkling purposes. It has been the custom of the company to allow special rates during the hottest summer months for the benefit of patrons who want to do a great deal of sprinkling on their lawns. However, heretofore the rate has been regulated so that only the users of a great deal of water are benefited by it, while the majority of the patrons are comparatively small users. It is probable that the company will submit for the approval of the commission a rate that will give a benefit of the reduced rate to the small water user.

To Read Meters Monthly

Denison, Texas.—With a view of eliminating numerous complaints from water consumers and promoting co-operation between the Water Department and the consumers in the city, Superintendent Berry, of the Water Department, is making arrangements to have his men read every water meter in the city every month beginning this month. Heretofore meters have been read quarterly and water bills have been paid quarterly. The bills will continue the same as in the past, but the readings will be made every 30 days. Superintendent Berry has also devised a plan whereby each consumer will know the exact amount of water consumed each month. After the meter reader finishes his work he will fill out a card for the consumer containing a regular form. This card will show exactly how much water has passed through the meter during the month just closed and also the amount consumed during the month previous. At the third reading, or end of the quarter, different colored cards from the two previous months will be given the consumer and the key on the card will allow him to figure just how much his quarterly bill will amount to. It is the belief of Superintendent Berry that this system will in time lessen the number of complaints of overcharge that are made each month to the Council.

LIGHTING AND POWER

Gas Rates Lowered by Ordinance

Jackson, Tenn.—Right to charge consumers a maximum of \$1.50 per 1,000 cubic feet for gas for illuminating and fuel purposes, provided a 10 per cent cash discount is allowed the consumer on cash payment of bills at the gas company office on or before the 10th of the month, was granted the Citizens' Gas Light Company by the City Council at its regular monthly meeting. The privilege was conferred by a unanimous passage of an ordinance containing the required provisions. The cost of illuminating gas to the consumer is reduced by the new ordinance from a maximum charge of \$2 per 1,000 cubic feet to \$1.50. The maximum cost of fuel gas is increased 15 cents per 1,000 feet, but this increase is counteracted by the 10 per cent cash discount clause. The object of the gas company in inaugurating the new policy is to discontinue the two-meter system. A decrease in the cost of operating the plant is realized, and the consumer is thus made to share in the economy plan.

Ornamental Lights for City Park

New Britain, Conn.—The Housatonic Power Company has men at work drawing cables through the underground pipes in Walnut Hill Park to connect up the new lights on the ornamental iron poles which have been placed about the park. The poles are the same design which is used in Bushnell Park at Hartford, and they will work in well with the Park Commissioners' plan to beautify and improve the park each year. Eight of the iron poles have been erected at various locations on the park lawn. Seventy-five watt incandescent lights will be suspended from the poles. The current for the lights will be supplied from the high potential street lighting circuit, which is supplied to New Britain and adjacent towns.

Engineer to Estimate Cost of City Electric Plant

Shreveport, La.—The City Council last week, through recommendation of Commissioner John McCullough, of the Department of Public Utilities, selected Anderson Offutt, electrical engineer, of New Orleans, to make a thorough investigation and estimate the cost of establishing a municipally owned light plant here. He is expected to begin work immediately. The filing of his report will likely result in an election on the question of issuing bonds to build the city a plant as suggested by the citizens' committee, which demanded the employment of an expert to prepare an estimate of the cost.

FIRE AND POLICE

Councils Equip City Auto School for Firemen and Police

Wilkes-Barre, Pa.—Members of the Police and Fire Committees of Councils are to open an automobile school. This decision was arrived at last week when the members of the latter committee agreed to defray half of the expenses incident to purchasing a second-hand auto to be used for instruction purposes in the Police and Fire Departments. In addition to this, the Fire Committee reported favorably the measure recently introduced in Councils by A. C. Laning, requiring that in the future all buildings within the fire limits of the city be erected of either brick, stone or concrete.

Work on Pressure Mains Will Start at Once

Toledo, O.—Service Director Cowell and the Waters & Tansey Company have signed the contract for the high pressure service for fire mains. Piping has been ordered by the contractors and work on the power plant will be started as soon as it arrives.

Fire Department Makes Good Showing

Butte, Mont.—Many interesting and important figures about the Butte Fire Department are contained in the report of Fire Chief Peter Sanger, which was made public last week. The loss by fire during the past year was \$35,816, while the amount of property involved was \$2,226,460. The cost of maintaining the department during the year was \$71,500, just \$35.93 more than the appropriation made by the Council.

New Auto Engine Will Be Put Through Trial Tests

Macon, Ga.—The new automobile fire engine has arrived in the city. The car containing the apparatus was placed as soon as possible and unloaded. It is a very fine machine, something like the one now used by the department, with additional improvements. The new engine will be kept at headquarters and the old one sent to the new fire station in Vineville.

Life Saving Squad New Advance Step

Springfield, Mass.—A squad of fire fighters to be known as the life saving crew, which will be sent to fires in the fastest piece of apparatus in the department, was decided upon by the Fire Commission last week. A new car, equipped with three scaling ladders and a life net, will be obtained by an exchange of apparatus and a money consideration from the Knox Automobile Company. The machine will be a "Model M" 50-horsepower, with dual pneumatic tires, in appearance much like the Squad B car, and will be able to carry a squad of 12 men. These men, Chief Daggett said, would be picked especially for the work for which the new machine is designed. It will be stationed at the Chestnut street house, and, with its speed in excess of any other in the department, will be expected to reach fires in its territory in advance of any other apparatus. Its speed will make it possible for the squad to be on hand ready for life saving work if that is found necessary, and also, the men will be expected to do the regular firemen's work if the saving of lives is not required. The Commission considers the move in keeping with its policy to be not only up to date in its fire fighting methods, but ahead of the times as well. The new piece of apparatus will be the only thing of its kind in existence, and is expected to more than prove its value once it goes into commission.

Police Will Help City Beautifiers

Houston, Tex.—Chief of Police Duff Voss has announced the inauguration of a police campaign to enforce the city's ordinances requiring proper disposition of trash and garbage, the maintenance of clean walks and premises, and the ordinance governing the placing of signs in and over the public streets. The order was passed around among the officers at police headquarters and the police have been notified to warn all violators of the law and to arrest where citizens persist in violations. It is the intention of the department to force the cleaning up of the streets and alleys, and to help officially in the "beautifying" campaign inaugurated by public-spirited citizens.

Prevention of Fire Booklet

Rochester, N. Y.—The first edition of 3,000 copies of the booklet on the Prevention of Fire, gotten up by Assistant Secretary Ralph Barstow, of the Chamber of Commerce, has been received at the chamber. The booklets are for free distribution, and will be sent to members of the chamber, the public schools, churches, retail stores, manufacturing and wholesalers.

Mine Rescue Men to Drill Firemen

Birmingham, Ala.—With the official announcement that the firemen of Birmingham would be drilled free by the Bureau of Mines Rescue Corps in their smoke rooms is indicated an entirely new benefit that will probably be derived from the location of that institution in this city. A. R. Brown, foreman of the rescue station, announced that he would make an offer to Chief Bennett soon, and that he hoped the firemen would be permitted to take advantage of it. "We drill classes in smoke-filled rooms about once every week," said Mr. Brown. "If the firemen care to, we will drill them free in the work of entering smoke-charged rooms equipped with Government rescue helmets. This service would be beneficial for the reason that at almost any time the firemen may be called upon to enter buildings so filled with smoke as to suffocate them if they are unprotected. If, on the other hand, they are equipped with smoke-proof helmets with air sufficient to last two hours, they can fight fire without danger, and at the same time rescue any persons who may be unconscious from smoke and bring them to fresh air and safety." Mr. Brown said that absolutely no expense would be attached to the drilling, as the Government was interested in drilling firemen the same as miners.

GOVERNMENT AND FINANCE

Progress in Work for Equal Suffrage

Pasadena, Cal.—To some citizens by far the most important results of last week's election was the test vote, or rather expression of opinion on the suffrage question—extending the franchise to include women. It was the first and only opportunity afforded voters of the State to indicate probable action in the pending constitutional amendment known as Senate Bill No. 8, introduced by Senator Charles W. Bell and pushed vigorously and persistently by Assemblyman H. G. Cattell. To say the advocates of equal suffrage are pleased with the result would hardly express the situation: they are more than gratified and surprised that nearly 1,000 voters of this city under trying circumstances freely and enthusiastically signed a pledge to work and vote for success October 10.

Mayor Will Investigate Charter Conditions

Schenectady, N. Y.—Mayor Duryee has concluded that the city charter question needs very thorough investigation, and he has decided to appoint a commission of citizens to investigate the question and to report its conclusions and recommendations to him. Mayor Duryee will appoint a committee of possibly 10 citizens to make a thorough investigation, so that intelligent action can be taken at the proper time. While this committee will be unofficial in character, its recommendations will undoubtedly attract attention both here and in other cities throughout the State. All forms of charters, including the commission plan, will be discussed at the coming conference of Mayors to be held at Poughkeepsie May 25, 26 and 27, and Mayor Duryee is of the opinion that much valuable information will be the result.

STREET CLEANING AND REFUSE DISPOSAL

Would Sprinkle Streets with Disinfectants

Atlanta, Ga.—That disinfectants be used in the big street sprinklers, which both clean the streets and flush the gutters, was the suggestion made at a recent meeting of the Second Ward Civic Improvement Club. They all thought so well of the idea that the resolution will be sent to Council with an urgent request that it be carried out.

Cistern Water for Streets

Beverly, Mass.—The Beverly Street Department, in order to conserve the water supply in Wenham Lake, which furnishes Beverly and Salem with water, pumped water from the old fire cisterns last week to water the streets. An engine from the central fire station was put in commission, and after all the water from the cistern at the Town Hall had been drawn into the watering carts the water in the cistern near the depot was used. As soon as possible a power plant will be installed at Bass River to furnish the water for the Street Department.

Gets Complaints About Street Sprinkling

Syracuse, N. Y.—Complaints have already been made as to the manner in which sprinkling is being done in a number of the streets, and after a conference with some of the Aldermen, Commissioner of Public Works Frank M. Westcott stated that the contracts would be rescinded unless the work is done properly.

To Provide for Disposal of Refuse

Indianapolis, Ind.—Dr. C. S. Woods, secretary of the City Board of Health, and C. A. Schrader, president of the Board of Public Works, have taken up the question of controlling the dumping of waste material and rubbish in the city. It is likely an ordinance will be drawn designating public dumping grounds and providing when waste is to be dumped on private property that a permit must first be obtained, and stipulating that only certain kinds of material may be used. The Board of Public Works has ordered dumping in Fall Creek at Indiana avenue to be stopped, and has ordered Gemmer & Henry, city ash contractors, to remove any ashes they may have dumped at that point. The channel of the stream threatens to be narrowed at that point, but the city is having difficulty in handling the situation, owing to the absence of a law on the subject.

Officials Getting Ready to Take Over Street Cleaning

Washington, D. C.—Preparations for a dustless city are being made as rapidly as possible at the District Building, where J. W. Paxton, Superintendent of Street Cleaning, and Captain Mark Broke, Assistant Engineer Commissioner, are getting ready to take over, as a part of the municipal activities, the entire system of street cleaning now in the hands of contractors. Already the white wing section of the city—that is, the downtown district—is being washed and "squeegeed" just twice as often as it was formerly, and when the District does its own cleaning, without the aid of contractors, it is believed that the entire city will have its streets washed. The appropriation, which becomes available July 1, has an item of a quarter of a million dollars for the cleaning work, and authorizes the Commissioners to do without contractors. As the work will have to continue July 1 right where it left off the night before, horses and apparatus are being bought now. With some of the horses now on hand the "squeegee" machines are being worked in double shifts, while the downtown streets are getting the benefit. District officials believe that the washing and scrubbing treatment is the best thing for asphalt streets and believe that the city will be much better cleaned when the entire District can be treated in that way than it has been by the rotary brush treatment.

Montclair to Install New Garbage System

Montclair, N. J.—A sanitary concrete garbage receptacle is being erected under the direction of Engineer Gerardo Immediato on the Garretson farm in Upper Montclair, which it is thought will, when completed, prevent the escape of all disagreeable odors. It is expected that the improvement will be ready for use within 10 days or two weeks. A water pipe is being laid to the new dump. It is proposed that after the last load is brought to the place each night, whatever residue is left in the tank, not taken by the farmers, will be removed and buried in trenches. The tank and platform will then be washed and covered with a sprinkling of quicklime. It is believed that in this way there will be no possibility of either foul odors or flies. For several years the Montclair officials have contemplated the erection of a garbage incinerating plant. A plot of ground near the center of the town has been secured and may eventually be used for the purpose.

Salt Water to Lay Dust

Atlantic City, N. J.—Salt water taken from the meadow streams will be used by the County Board of Freeholders to rid the county roads of the dust nuisance. The efficacy of salt water was discovered after they had expended thousands of dollars in experiments with oily concoctions. It is said the water from certain sections of the meadows has a hardening effect on the road surface.

Municipal Housecleaning Day at Saratoga

Saratoga Springs, N. Y.—Municipal housecleaning days in Saratoga Springs this year are May 26 and 27. On these days the citizens of Saratoga Springs, in fact, each individual who owns property or occupies it, must have his gutter, lawn, yard and surroundings in general in a neat appearance and in harmony with the laws of cleanliness and decency. By having a municipal housecleaning day Saratoga Springs is taking its place beside the long list of cities, towns and villages that have already established this system and are working it to such a degree of perfection as is largely responsible for the good condition and neat appearance of their streets.

Want Streets Cleaned at Night

Chester, Pa.—Committees representing the Edgmont Avenue Business Men's Association, the West Third Street Business Men's Association and the Board of Trade held a joint meet last week for the purpose of forming a joint committee with instructions to confer with Mayor Johnson relative to the project of having the principal streets flushed at midnight. It was stated that in Baltimore, Scranton and a number of other cities the streets were flushed from the fire hydrants at midnight every night, and as a consequence the highways always presented a strikingly neat appearance and were always in a sanitary condition.

RAPID TRANSIT

School Children May Take Two Rides for Five Cents

Shreveport, La.—President W. F. Dillon, of the Shreveport Traction Company, has announced voluntarily that street car tickets hereafter would be sold to school children at the rate of 2½ cents instead of 3 cents each as heretofore. This reduction was one of the concessions mentioned in the company's transfer proposition, which was defeated at the polls recently.

Trolley Line Gets Franchise Over Mayor's Veto

Chattanooga, Tenn.—An ordinance granting to C. E. James and associates and to his and their heirs, executors, administrators and assigns, the right and privilege to construct, equip and maintain street railway tracks and to run and operate by electricity cars thereon on certain streets in the city of Chattanooga, was passed by the City Council last week over the Mayor's veto. The Mayor's message of veto contained five objections, the first of which was to placing a third track on Walnut street. He says that granting the right for a third track on this street is practically abandoning the street to street car lines. The second objection of the Mayor to the ordinance was the placing of a third track on Market street. The third objection stated was that all franchises for the use of streets should provide that the wires be placed underground. The fourth ground of objection was that the ordinance failed to contain a provision against sale or consolidation and to reserve the right to the city to hereafter grant a franchise for a competing line to operate over the tracks provided for in the ordinance, upon the payment of reasonable charges for such service. The fifth objection was that the ordinance does not guarantee to the city interurban lines.

MISCELLANEOUS

Board Urges Five Playgrounds

Syracuse, N. Y.—Action to facilitate the purchase of sites for five playgrounds was taken by the Board of Education at its meeting last week. It is estimated that about \$30,000 will be required to purchase the required properties, and Mayor Edward Schoeneck has declared that he will support any reasonable outlay. In urging the passage of the resolution asking the city to buy the properties on which options have been obtained, or are needed, President Church said that a child had recently been killed near one of the schools where pupils were compelled to play in the streets. This, he declared, was a strong argument for providing playgrounds without further delay.

To Rebuild Famous Bridge

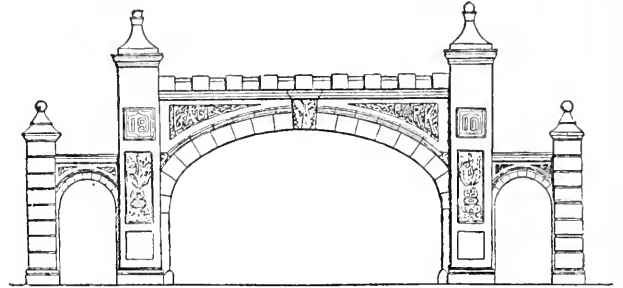
Tarrytown, N. Y.—William Rockefeller has proposed to the taxpayers of North Tarrytown that if they will vote to improve North Broadway he will give \$10,000 to pay part of the expense, and will also give \$10,000 for rebuilding the famous Pocantico Bridge, known all over the world as the "headless horseman's bridge," made famous by Washington Irving. Mr. Rockefeller has long lived in Irving's country—Sleepy Hollow—and he believes that something should be done in his memory. Next year is the hundredth anniversary of Irving's birth.

City Officials Plan an Exhibit

New Orleans, La.—A conference of the heads of various city departments and organizations was held in the big committee room at the City Hall recently regarding the representation of the city at the Chicago International Municipal Congress to be held in the fall at Chicago. Mayor Behrman had been invited to have the city represented and would have acted on the matter sooner if he had not been ill. However, the various heads had been notified and had the matter in their minds. Mayor Behrman explained the idea of the exhibit that is to be given at Chicago, saying that the various cities will have displays that will represent the different phases of municipal progress. The City Council has authorized Mayor Behrman to arrange for an exhibit from this city, and the meeting was for the purpose of arranging details.

Stone Gateway to Park Completed

Topeka, Kan.—The last stone in the construction of the new \$5,000 entrance to Gage Park was laid last week and the archway and mammoth pillars are now ready for public approval. The side wings are yet to be erected. When these are completed the entrance to Gage Park, it is claimed, will surpass that of any park in the West. Even in Chicago the park entrances are inferior when compared to Topeka's new Gage Park structure. In the construction of the new entrance seven cars of cut Bedford stone were used. Some of the massive stones weigh several tons.



NEW STONE GATE FOR TOPEKA PARK

The architecture of the new entrance is beautiful and the high class of workmanship and the finish of the stone gives the entrance a most attractive appearance. The big arch has a 30-foot opening for a driveway, and between the great stone pillars at either side are to be built five-foot arches for the walks. To the east of the entrance is to be built a wing wall of masonry 140 feet in length. This wing will be of Bedford cut stone five feet above a 30-inch concrete foundation. To the west of the entrance will be a shorter wing, but larger stone will be used here. The west wing has a semi-circular effect.

Municipal Ownership of Telephones Endorsed

Ogden, Utah.—At a meeting of the Ogden Chamber of Commerce a unanimous vote was taken in favor of the municipal ownership of local telephones, and a resolution was adopted requesting the City Council to compel the Utah Independent Telephone Company to live up to its franchise, recommending that a copy of the franchise be published in the local papers that subscribers might know to what they are entitled. Another resolution adopted by unanimous vote was in favor of legislative enactment making telephone companies common carriers in Utah.

Boston-1915 Launches Project to Make Civic Center

Boston, Mass.—Boston-1915 has taken up the project of the erection of a building or group of buildings to be centrally located in the city as headquarters for organizations engaged in civic, philanthropic, social or fraternal work. In a letter on this subject that has been issued by James P. Munroe, executive director of Boston-1915, he states that there is a widespread call in Boston for such a building to contain offices, committee rooms, halls and luncheon and dining facilities. Among the organizations interested in such a project he mentions those devoted to business, to civic work and labor interests, improvement associations, fraternal orders, mutual benefit societies, charities, correctional agencies, educational institutions and medical, legal, scientific, engineering and other professional organizations.

Official Gazette Costs City Dear

Spokane, Wash.—The City Commissioners have approved a recommendation for an appropriation of \$5,200 for getting out the official gazette for the remainder of 1911. On this basis the gazette will cost the city about \$7,000 a year if its circulation does not increase, and in addition the city will have to provide for advertising in newspapers as formerly. Much of the advertising must still be printed in newspapers under the State law. The \$5,200 authorized for the gazette includes a salary of \$110 a month for nine months for the editor and for 36 issues of the publication at a total cost of \$4,210.

LEGAL NEWS

A Summary and Notes of Recent Decisions—Rulings of Interest to Municipalities

Contracts—Performance—Extras

Douglas & Varnum vs. Village of Morrisville.—In assumpsit for extras under a dam construction contract in filling a fissure in the bed of the stream, the declaration sufficiently pleaded waiver of a provision of the contract requiring a written order for extras, where it alleged that the extra work was not contemplated when the contract was made and was treated by the parties as an independent undertaking, and that the owner knew of such extra work while it was being done and when the dam was accepted, etc. If one party to a contract knowingly leads the other, even by silence, to believe when he executes the agreement that a certain construction will be put upon it, he is estopped thereby from gainsaying that construction to the prejudice of the other party. A village could waive a provision in a construction contract requiring a written order for extras. A declaration in assumpsit for extras in building a dam is not bad for failing to show compliance with a provision of the contract that disputes should be referred to the owner's engineer, whose decision should be final, where the contractor counts on a subsequent independent verbal agreement concerning the extras. A provision in a construction contract for submission of disputes to the owner's engineer for final decision does not cover disputes not concerning the work itself, but only whether the owner is bound to pay for the work after having received and accepted it. A declaration, under a construction contract, declaring upon an independent subsequent agreement for extra work in consideration of a reasonable price to be paid plaintiffs by defendant is equivalent to an allegation of express promise to pay.—Supreme Court of Vermont, 79 A. R., 391.

Fiscal Management—Warrants—Action

First National Bank of Central City vs. City of Port Townsend, Wash.—The Washington rule that in case of refusal of the treasurer of a municipal corporation to pay a municipal warrant the holder may not maintain an action to recover a judgment on the warrant, but is limited to mandamus to compel the levy of a tax sufficient to pay his claim, is not binding on the federal courts sitting in that State, in which the holder, if entitled to sue therein, may recover a judgment at law as preliminary to enforcement of its warrants by mandamus. A complaint on certain municipal warrants alleged their issuance and the city's refusal to pay the same for lack of funds and averred that the city had neglected to levy in any year since the warrants were issued more than a small fraction of the tax which it was authorized to levy to supply the indebtedness fund with money to pay the warrants and had neglected to levy any tax whatever for that fund in 1909. It did not allege, however, what amount of tax had been collected nor the amount uncollected. Held, that since, under Code, all moneys collected on and after February 1, 1908, for taxes for 1896 and prior years, together with the penalty and interest thereon, were required to be paid into the indebtedness fund, the complaint did not show that the city had broken its contract, or that plaintiff was entitled to mandamus to compel a higher levy to pay the warrants.—United States Circuit Court of Appeals, 184 F. R. 573.

Telephone Franchise—Acceptance

Cumberland Telephone & Telegraph Company vs. City of Mount Vernon.—A city granted to a telephone company a franchise imposing sundry obligations, but for about seven years the company made no attempt to construct or operate a telephone system in the city. An agent was present at the meeting of the City Council which adopted the ordinance, and he requested that it should pass, but it was not shown that he was authorized by the company to accept the conditions of the ordinance. Held, that the company did not accept the ordinance, and an assignment of its franchise passed no rights to the assignee.—Supreme Court of Indiana, 94 N. E. R., 714.

Nuisance—Charcoal Kiln—Abatement

Richards vs. City of Seattle.—That officers of defendant city's health department notified plaintiff that he must cease operating his charcoal kilns unless he installed condensers or retorts within a certain time and posted on the kilns notices to the effect that they were unsanitary, and unless put in a sanitary condition would be destroyed, whereupon plaintiff ceased to use the kilns, did not give him a cause of action for damages, it not appearing that the kilns were destroyed, since if the kilns were not a nuisance the notices were of no effect, and if they were defendant would not be liable for abating them. That charcoal kilns located in a city gave off quantities of smoke and at times poisonous gases of itself established prima facie that the kilns were a nuisance. That there were other nuisances or mills located in the same vicinity in a city which gave off the same gases as, and more smoke than, certain charcoal kilns, did not prevent the city from proceeding to abate such kilns.—Supreme Court of Washington, 114 P. R., 896.

Ordinance Regarding Obstruction of Sidewalks

City of New York vs. Leef et al.—New York City Code of Ordinances, enacted by the Board of Aldermen under Greater New York Charter, prohibits any person from obstructing a sidewalk, except as provided in section 262, without written permission from the Borough President; and section 262 prohibits the placing of merchandise, etc., at a greater distance than three feet in front of a store, except goods being loaded or unloaded, and requires a free passageway for pedestrians. Held, that obstructions must be reasonable with reference to the rights of the public, as well as necessary to the business of the person maintaining them, to be justified under the ordinances.—Supreme Court of New York, 128 N. Y. S., 676.

Restraining Diversion of Water—Laches

Wilson, Attorney General, vs. East Jersey Water Company.—Where municipalities have the right to divert the waters of the streams of the State for municipal purposes, the State is not barred by laches from restraining diversion of water of a stream merely because it stood by for many years and allowed a corporation without objection to acquire riparian lands, establish a filter plant and reservoirs, and lay pipes to supply water to municipalities and to divert the water for the municipalities under contracts to supply them with water; the State not having notice of the contents of unrecorded contracts between the municipalities and the corporation.—Court of Chancery of New Jersey, 79 A. R., 441.

Defective Streets—Definition of Negligence

Stokes vs. Sac City.—An instruction that negligence is the doing of an act which an ordinarily prudent person would not do in like circumstances is erroneous, as ignoring the fact that negligence may consist in careless omission to act.—Supreme Court of Iowa, 130 N. W. R., 787.

Interference with Access to Street

Webb et al. vs. Baltimore & Ohio Railroad Company.—Municipal authorities must preserve to abutting land owners as a constituent part of the general public the beneficial enjoyment of streets by access thereto. An abutter suing for interference with access to his property caused by occupation of a street by a railway company must show the extent of his loss as a basis for assessing damages beyond nominal damages. The right of access is the test of an abutter's right of action for occupation of a street by a railroad. A proper method of ascertaining damage resulting to abutters by obstruction of access to their property through occupation of a street by a railroad was to ascertain what it would cost to restore the means of access by devoting part of the property to that purpose.—Court of Appeals of Maryland, 79 A. R., 193.

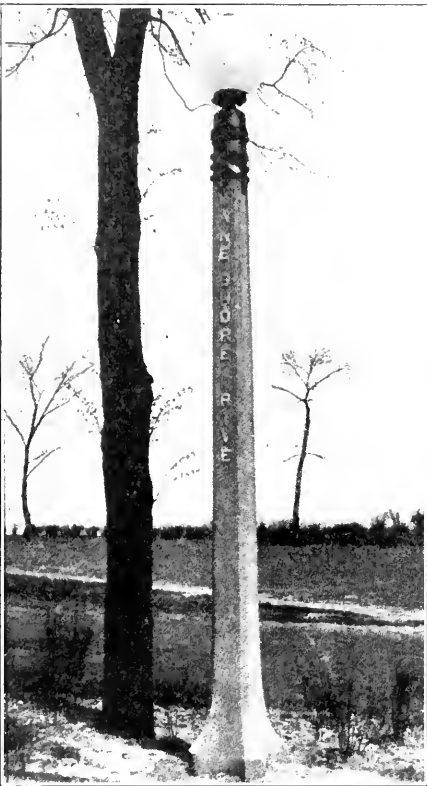
Special Assessment—Installment

Cooney vs. City of Atlanta et al.—An abutting land owner, upon whose property a street assessment is made, is not entitled as a matter of right, under section 150 of the Code of Atlanta, to have his assessment divided into installments, unless the same has been transferred to the contractor doing the work.—Supreme Court of Georgia, 70 S. E. R., 950.

MUNICIPAL APPLIANCES

Concrete Electrolier

M. H. West has recently resigned the position of General Superintendent of the Lincoln Parks System, Chicago, Ill., and has placed on the market through the Western Gardening and Forestry Company, Steinway Hall, Chicago, Ill., a concrete electrolier which he designed. This electrolier, shown in the cut, is artistic, practical and comparatively inexpensive. It has a pleasing, stone-like finish which is permanently retained without the expense of painting. The danger from electrically charged metal is eliminated and the street-marking problem is effectively solved. In parkways especially attractive effects are secured by allowing vines to climb on the posts. The post measures 14 feet from the ground line to the base of



ELECTROLIER AND STREET SIGN

the 20-inch globe, is 9 inches square at the top and 22 inches at the bottom. Aside from the 2-inch pipe conduit, reinforcement is furnished by longitudinal rods conforming with the contour of the post. The globe holder and street-sign letters are of bronze. Either arc lamps or incandescent clusters may be used, the special opalescent globe effectually obscuring the mechanism of the lamp, without perceptibly diminishing the lighting efficiency.

Perfection Oil Distributor

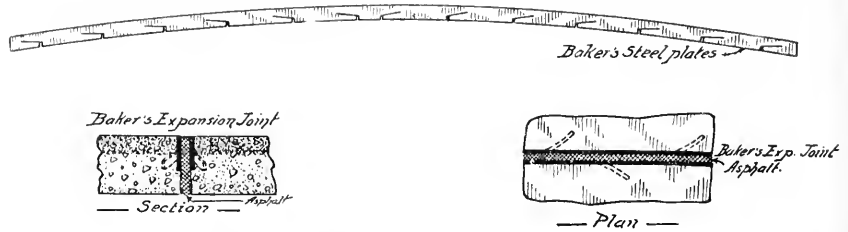
The Perfection oil distributor, placed on the market by the Good Roads Machinery Company, Marathon, N. Y., consists of an inner tank made of heavy boiler plate, enclosed in an outer case. Between the tank and the outer case on all sides and ends there is a fire space varying from 2 inches to 12 inches. All the distributing pipes and

aprons are enclosed in a case and surrounded by heat which keeps up the temperature until the material strikes the stone. Wheels and channels are of iron. The rear wheels have an 8-inch and the front wheels a 6-inch tire, thus affording a rolling surface of 28 inches on the road, which enables carrying the load over the work without tearing up

and forming a bond with it. Asphalt is poured between the plate and the edge of the blocks of concrete on both sides. The result is that expansion is provided for and the steel prevents chipping.

Harrow and Scraper for Roads

The Root Combination Spring Harrow and Scraper, manufactured by the Root Spring Scraper Co., Kalamazoo, Mich., is a device for leveling and smoothing roads. It is especially valuable for use on roads which it is de-



DETAILS OF BAKER ARMORED JOINT FOR CONCRETE PAVEMENTS

the stone and causing ruts. The manufacturers state that by actual test this machine will distribute 300 gallons of material in 30 seconds. The fuel cost of operation per day is about one dollar. The distributor can be regulated for covering any width roadway and for distributing from 1/2 to 2 gallons of material per square yard. Weight of machine, about 2,400 pounds.

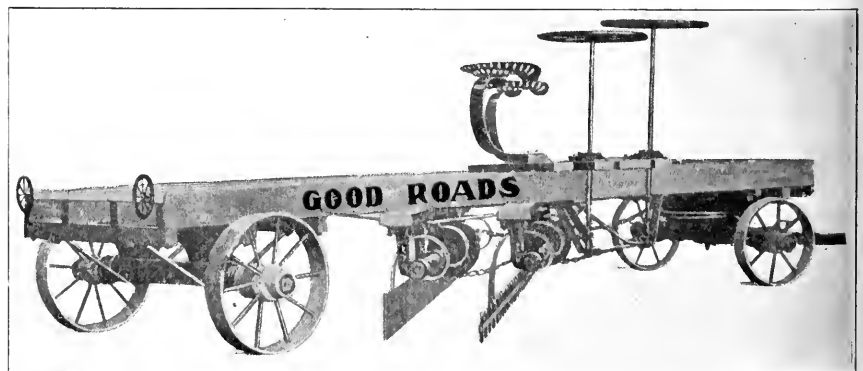
Armored Concrete Pavement

The Thomas Steel Reinforcement Company, Majestic Building, Detroit, Mich., construct a reinforced concrete pavement with specially protected joints which are designed to avoid cracking of the general surface by frost or other causes and prevent chipping from the effects of traffic at the joints that are made to take up expansion. The reinforcing bars of the system are placed at 2-ft. centers at the top of the pavement and at 4-ft. centers at the bottom. At the junction of the 4-ft. spaced rods is a device called the Thomas support and fastener. These supports and fasteners hold the bars firmly in their proper positions.

At the expansion joints are placed Baker armored joints, shown in the illustration, made by the R. D. Baker Company, 73 Home Bank Building, Detroit, Mich. The Baker armored joints may also be used without the reinforcement. The armor plate consists of a band of steel, the upper edge of which conforms to the contour of the street. Narrow strips or tongues are cut from plate, the free ends being bent alternately to right and left, extending into the concrete on both sides of the joint

sired to keep up to a high standard of excellence, for it smoothes out the short waves in the roadway. For such work it is said to be very economical, the claim being made by the manufacturers and confirmed by people who have used it that it saves half of the ordinary labor. The illustration shows the general outlines of the machine. The frame carrying the scraper and harrow is 20 feet long. The wheel base is about 18 feet. The scraper blade is 9 feet long, set on an angle of 45 degrees and held in position by springs. The pressure on the springs forcing the blade down is regulated by chains and a wheel in easy reach of the driver. The harrow is operated in the same way. Both can be used together or separately. For light work on ordinary roads one team and a man are all that are required to operate the machine. Where both scraper and harrow are needed at the same time four horses should be used. The hand wheels at the rear of the machine are attached to truss rods and are used for raising or lowering the same and for holding the frame rigid and level. The hand wheels for operating the harrow and scraper are 24 inches in diameter. Any pressure required can be applied to either, as desired, according to the condition of the road.

These machines are used by the cities of Kalamazoo, Mich., Dayton, O., the Detroit Driving Club, Detroit Mich.; Troy Driving and Speedway Association, Troy, N. Y.; the Orange County Driving Park Association, N. Y.; Michigan United Railway Company, Jackson, Mich., and others.



HARROW AND SCRAPER FOR HIGH-CLASS WORK

Signalphone Fire and Police Alarm System

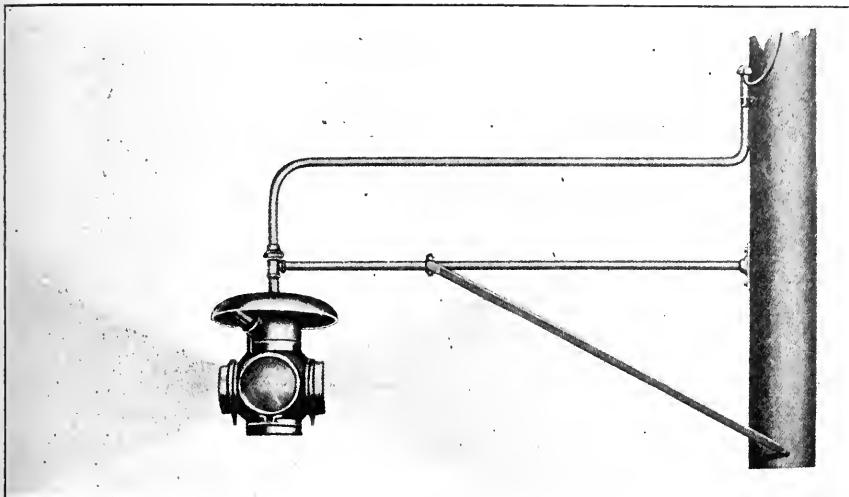
The Signalphone Alarm Company, Milwaukee, Wis., manufacture and install separate or combined fire and police alarm systems. Their Bell-light is a device shown in the illustration to provide means for getting into quick communication with patrolmen on their beats, without waiting for them to make their regular hourly or semi-hourly reports. The Bell-light consists of a four way target signal lamp, in

door hinges; heavy solid brass clock work mechanism, of material which will not deteriorate from the effects of heat, cold or dampness and treated with a coat of finish to prevent corrosion; electro-mechanism protected by a separate dustproof inner case, the face of which is covered with heavy plate glass; mechanism protected against injury from abnormal currents or lightning; means for preventing dangerous electric currents from penetrating exposed metal parts of the in-

Hydraulic Press for Crushing Tests

The Watson-Stillman Company has placed on the market a hydraulic press suitable for testing construction materials, such as hydraulic cement concrete and bituminous concrete, for crushing strength.

This new machine, which we illustrate, is of a common type of hydraulic press, and weighs only 425 pounds, as compared with 3,400 pounds, the weight of material necessary to build the common beam type of machines of equal capacity. The base measures 12 in. by 16 in. and the press is 27 in. high. The cylinder is a steel forging machined to fit down into the reservoir and the pump cylinder is of bronze. This type of testing machine can be carted from place to place on a truck and is also superior to the ordinary compression machines in that all observations can be made by the operator of the pump. He can watch the compression specimen, the pressure gauge and handle the pump simultaneously. This permits rapid work and no waste of time. The operator can also apply the load as rapidly or as slowly as he wishes by corresponding manipulation of the lever. The gauge is graduated to give both the fluid pressure in pounds per square inch and the pressure of the ram on the specimen in tons. A feature of the machine is the ease and quickness with which the ram can be moved to and from the work by means of the lever and connecting links at the left. The small handle at the right furnishes sufficient power where only light pressures are required, while the extension lever applied to this same arm develops pressures up to 30 tons. The platen face is 8 in. square; the platens are 8 in. apart at maximum opening, and the ram movement is 4 in. The machine will therefore accommodate compression cubes or cylinders varying from 4 in. to 8 in. The size to be tested must be left to the discretion of the testing engineer, as it depends upon his estimate of the strength of the mix. A 4-inch cube, which would have to hold 3750 pounds per square inch under a load of 30 tons, is a convenient size for cement and concrete mixtures. The same size would be suitable for asphalt paving mixtures in which sand is the aggregate.



BELL-LIGHT FOR CALLING POLICE OFFICERS

which is located a powerful incandescent light which is controlled from police headquarters. The Bell-lights are also provided with gongs to be sounded in the daytime or foggy weather. The bell serves as a rain-protector for the instrument. The lenses of the light may be green or red; they are 4½ in. in diameter and are located in reflectors on the four sides of the signal lamp. These lights can be installed without a complete police alarm system.

The specifications for the Type 102C fire and police alarm box, shown in the illustration, are as follows: Alarm boxes capable of being used for both departments, each equipped with one headquarters telephone; boxes equipped with trap lock, two keys furnished with each box. All keys uniform; box shells of heavy cast iron, coated with weather-proof enamel paint, having solid brass

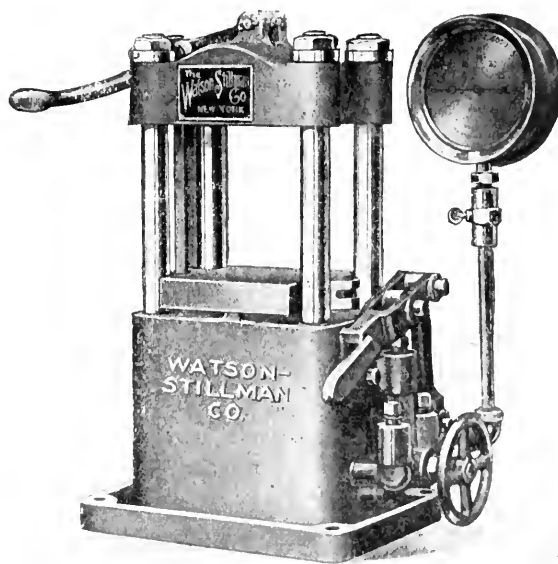
instrument with which users may come in contact; instruments to have a high current carrying capacity; means for obtaining instant telephone communication, without depending upon the signaling mechanism; instruments provided with a trip pull hook, encased in a glass covered compartment, and signaling arrangement which can be operated from the outside of the box, without opening the door, which signal is known as the emergency or patrol wagon call; means for transmitting a signal to distinguish the emergency call from other signals; instruments, equipped with a variable speed changer and regulator, so that transmission of fire alarms may be timed to conform with the receiving capacity of such instruments as may be used in connection with the service. Boxes arranged so that means at headquarters may be operated to automatically record fire alarms at both fire and police stations simultaneously.

The register indicator for engine house service made by this company is a fine instrument. Fire alarm signals are plainly indicated in Morse characters by ¼-inch holes punched in register paper two inches wide. A permanent record of alarms is thus preserved for future reference.

The register is enclosed in a mahogany case with glass front.



COMBINATION ALARM BOX



PRESS FOR CRUSHING TESTS

NEWS OF THE SOCIETIES

National Conference on City Planning.—A booklet was issued describing the leading points of interest along the route of the automobile tour of Philadelphia which took place May 15, the first of the three days' session of the third national conference. The booklet is printed with alternate blank pages on the right-hand side for the convenience of the members in jotting down memoranda. A list of the officers of the conference is printed first, then the members of the local committee on entertainment. Then, in addition to city officials, are representatives of the various civic societies. Automobiles for the tour assembled at the Bellevue-Stratford at 9 a. m. The Parkway, from City Hall to Fairmount Park, already in course of construction, was first visited. Other points of interest were visited in order, as follows: Reading Railroad Tunnel, by which grade crossings on 17 streets were eliminated, and other structures eliminating grade crossings; Fairmount Park; Wissahickon Valley; Walnut Lane Bridge; Cresheim Valley; Main Street, Germantown; Pelham; the Chew House; Wyck; Germantown Academy; Happy Hollow Playground; attention will be called to the prevailing type of two-story house which gives Philadelphia the name of "city of homes"; Torresdale Boulevard.

Intermountain Good Roads Association.—The annual convention will be held in Pocatello, Ida., June 22-24. A conference of the State board of road commissioners, in conjunction with the good roads committee of the Salt Lake Commercial Club and representatives of the Utah Development League, was recently held in the offices of Governor William Spry. The following members of the State board are in charge of the campaign for good roads: Governor William Spry, chairman; Caleb Tanner, state engineer, secretary; R. R. Lyman, vice-chairman; J. W. Jensen of Logan and David Mattson of Ogden.

International Firemen's Tournament. The Department of State is in receipt of a dispatch from the American ambassador at Rome, dated April 5, 1911, transmitting a translation of a letter to him from the mayor of Turin inviting American firemen to take part in the international contest to be held in Turin in the Summer during the exposition. In transmitting this communication the ambassador expresses the opinion that possibly some enterprising manufacturer of fire engines may be induced to send over a modern fire engine with a competent force to work it, which might lead to an extensive and profitable foreign trade.

The letter from Senator Theophile Rossi, mayor of Turin, to Ambassador Leishman follows:

"On my last visit to Rome I had the honor of explaining to your secretary the desire of our municipality to have at Turin American firemen on the occasion of the International Fireman's Tournament, which will take place during our exposition.

"For this tournament we are already assured the participation, among others, of French, English and German firemen, and we should be delighted to admire among them firemen of your nation, whose courage and modern system have such a brilliant reputation among us."

Massachusetts Highway Association.—Engineers and superintendents of street construction and maintenance from all sections of the State gathered in Springfield, Mass., May 11 on the occasion of the quarterly meeting of the association. The session was held in the Hotel Kimball, where dinner was served at 1.30 o'clock, followed by a paper and discussion, after which the members were given automobile trips about the city. About 150 members of the association were in attendance. It had been planned to have the meeting in connection with the annual New England conference on street cleaning that is to be held here this month, but the date of the latter was postponed until May 17.

The highway association members convened in Worcester during the morning and made the trip from Worcester to this city in automobiles. About a dozen autos from Springfield were taken to Worcester in the morning to meet the guests and 15 or more cars were provided there, all coming through without mishap. They left Worcester just before 10 o'clock and the advance guard arrived at Springfield about 12:30 o'clock, all being accounted for by 1 o'clock.

Members of the State Highway Commission were in the party and all viewed with satisfaction the good work that has been done the last year on the State roads between Worcester and this city. In Palmer a stop was made to witness a demonstration of an oil distributor on the State highway easterly of the railroad station.

The affair was limited to members of the association, the only guests at the dinner being Alderman Edward S. Goldthwaite and Councilman Edward T. Broadhurst, representing the local board of supervisors. Arthur A. Adams, until recently superintendent of streets, has been a prominent member of the association and was instrumental in having the quarterly gathering held in Springfield, for which he made the arrangements.

Harold Parker, of Lancaster, president of the association, presided at the dinner. The program which followed consisted of a paper by James H. Sullivan, superintendent of streets of Boston.

Halifax County, N. C., Good Roads Association.—At the recent meeting at Weldon the following officers were re-elected: President, John L. Patterson, Roanoke Rapids, N. C.; vice-president, Geo. C. Green, Weldon, N. C. The president outlined the work the association had accomplished during the past year in part as follows: The holding of several meetings, changing the road law, securing a law authorizing a bond issue of \$300,000, securing lecturers for three addresses on road building, personal work in creating interest in good roads. The president suggested that a map of the county be made, of the expense of which the State and Federal governments will each bear one-quarter.

Natural Gas Association.—The seventh annual convention will be held in Pittsburg, May 16-18. The National Tube Company has arranged for an excursion for the members, May 18, on the steamer Sunshine, visiting the plant at McKeesport. The party will return in the evening so as to give the guests an opportunity of seeing the illuminations from the furnaces and mills along the banks of the river.

Playground Association of America.—The fifth annual meeting was held in Washington, D. C., May 11-13. Playgrounds experts from cities in all parts of the country are gathered to attend the meeting. The secretary's report indicated that playgrounds generally from one end of the country to the other had attracted more attention and received more financial backing than during any previous year of the association's existence. Thirty-two cities now employing 643 workers are actively engaged in playgrounds work. In the past twelve months about \$3,000,000 was spent in 184 cities for the improvement and establishment of playgrounds.

The name of the association was changed by a unanimous vote of the attending delegates to the Playground and Recreation Association of America. The change in title was brought about through the efforts of the association's officers for the reason that simply as the Playground Association the organization has outgrown its sphere of work. The association's work now embraces everything pertaining to recreation, in addition to the control and establishment of playgrounds.

The following officers and directors were elected for the ensuing year:

Honorary president, Theodore Roosevelt; president, Joseph Lee; first vice-president, Harold F. McCormick; second vice-presidents, Mrs. Lovell White and William D. Kent; third vice-president, Robert Garrett; treasurer, Gustavus T. Kirby. Directors—Mrs. Caroline B. Alexander, Hoboken, N. J.; Mrs. Samuel A. Ammon, Pittsburg, Pa.; Otto T. Bannard, New York City; Mrs. Emmons Blaine, Chicago, Ill.; Thomas F. Cooke, Buffalo, N. Y.; George W. Ehler, Madison, Wis.; Lee F. Hanmer, New York City; George E. Johnson, Pittsburg, Pa.; Representative William D. Kent, Kentfield, Cal.; Joseph Lee, Boston, Mass.; T. S. Lippy, Seattle, Wash.; Joseph E. Raycroft, Chicago, Ill.; Myron T. Scudder, New Brunswick, N. J.; Seth T. Stewart, Brooklyn, N. Y.; John Wanamaker, Philadelphia, Pa.; Edward J. Ward, Madison, Wis.

International Municipal Congress and Exposition.—An event of interest to officials of cities, contractors and manufacturers who sell goods to cities and citizens who are interested in the way their municipalities are run is promised in the Congress and Exposition in Chicago September 18-30 next. Enterprising citizens of that progressive city have issued a call for all students of city government to assemble at the congress for full discussion of the problems with which cities find themselves confronted. In connection with this the exposition has been arranged at which the foremost cities of the world will exhibit features of their administration and at which equally important exhibits will be shown by manufacturers of every variety of article used in the government of a municipality.

Chicago itself will have an important exhibit. New York will display its budget exhibit. There will be stereopticon views of Berlin. Paris and London will exhibit. Boston, Philadelphia, Cleveland, Toledo and Detroit have arranged to take space. Des Moines will have stucco models of its civic center and river front. Denver, Memphis and New Orleans will be represented. The California League of Municipalities will give a demonstration of what its cities are doing. Spokane and Seattle will exhibit. Moving pictures of Winnipeg will be shown.

Calendar of Meetings

- May 18-19.**
Ohio Society of Mechanical Steam and Electrical Engineers.—Annual Convention, Youngstown.—F. E. Sanborn, Secretary, Ohio State University, Columbus.
- May 23-25.**
National Fire Protection Association.—Annual Meeting, New York City.—F. H. Wentworth, Secretary, 87 Milk St., Boston.
- May 23-26.**
National Good Roads Association.—Fourth National Good Roads Congress, Birmingham, Ala.—J. A. Rountree, Secretary, Birmingham, Ala.
- May 25-26.**
League of Second and Third Class Cities of New York.—Poughkeepsie, N. Y.
- May 29-June 2.**
National Electric Light Association.—New York City.—T. C. Martin, Secretary, 31 West 39th St.
- June 5-14.**
National Probation Officers' Association.—Boston, Mass.—Roger N. Baldwin, Secretary, 903 Security Building, St. Louis, Mo.
- June 6-8.**
Engineers' Society of Pennsylvania.—Annual Meeting at State College, Pa.—E. R. Dasher, Secy., P. O. Box 704, Harrisburg, Pa.
- June 6-10.**
American Water Works Association.—Thirty-first Annual Convention, Powers Hotel, Rochester, N. Y.—John M. Diven, Secretary, 14 George street, Charleston, S. C.
- June 7-14.**
National Conference of Charities and Correction.—Boston, Mass.—Alexander Johnson, Secretary, Ft. Wayne, Ind.
- June 7.**
National Association for the Study and Prevention of Tuberculosis.—Denver, Col.—Dr. Livingston Farrand, Executive Secretary, 105 East Twenty-second street, New York City.
- June 11-16.**
International Association of Chiefs of Police.—Eighteenth Annual Convention, Rochester, N. Y.—Major Richard Sylvester, Superintendent of Police, Washington, D. C., President.
- June 13-18.**
New York State Association of Chiefs of Police.—Annual Convention, Rochester, N. Y.
- June 13-16.**
American Society of Civil Engineers.—Annual Convention, Chattanooga, Tennessee.—Charles Warren Hunt, Secretary, 220 West 57th St., New York.
- June 21-22.**
National Conference of Poor Law Officials.—Boston, Mass.—Dr. Robert W. Hill, President State Board of Charities, 105 East Twenty-second street, New York City.
- June 22-24.**
Intermountain Good Roads Association.—Annual Convention, Pocatello, Ida.—Caleb Tanner, State Engineer.
- August 15-18.**
Firemen's Association of the State of New York.—Watertown, N. Y.—A. H. Otto, Secretary.
- September 12-15.**
International Association of Municipal Electricians.—Annual Convention, St. Paul, Minn.—Clarence R. George, Secretary, Houston, Tex.
- September 18-30.**
International Municipal Congress and Exposition.—Chicago, Ill.
- September 19-22.**
International Association of Fire Engineers.—Annual Convention, Racine, Wis.
- September 19-22.**
American Hospital Association.—New York City. J. N. E. Brown, M.D., Secretary, Toronto General Hospital, Can.
- September 24-30.**
International Congress on Tuberculosis.—Rome, Italy.—Professor Ascoli, Secretary-General, Via Lucina, Rome, Italy.
- September 26-29.**
American Society of Municipal Improvements.—Grand Rapids, Mich.—A. Prescott Folwell, Secretary, 239 West Thirty-ninth street, New York City.
- October 4-6.**
League of American Municipalities.—Annual Convention, Atlanta, Ga.—John MacVicar, Secretary, Des Moines, Ia.

PERSONALS

BEDFORD, L. A., has been elected Mayor of Eastland, Tex.

BRANCH, D. E., was re-elected Mayor of Franklinton, La.

CATLIN, F. M., has been appointed a member of the Board of Police Commissioners of St. Paul, Minn., succeeding Fred N. Dickson, resigned.

CHRISTY, LLOYD B., is the new Mayor of Phoenix, Ariz.

ECKLEY, SHERMAN, has been appointed commissioner of public works of Peoria, Ill. He succeeds George F. Simmons.

EDMUNDSON, C. L., Mayor of Bisbee, Ariz., has resigned.

FIELDS, W. E., has been elected Mayor of Lockhart, Tex.

FREELAND, JOSEPH H., is the new Mayor of Burlington, N. C.

GUNN, SELSKAR M., instructor of bacteriology and public health, Massachusetts Institute of Technology, has been secured by the Milwaukee Bureau of Economy and Efficiency to take charge of the investigation of present health conditions and to work out a final reorganization of the health department. Mr. Gunn is a graduate of the department of biology and public health, Massachusetts Institute of Technology.

HARDING, COLLIN H., was elected Mayor of Washington, N. C., as a result of a very quiet election, there being no contesting candidates.

HUMBER, GEO. H., is the new Mayor of Carthage, N. C.

JOHNSON, JAMES, has been elected Mayor of Raleigh, N. C.

JORDAN, W. S., is the new Mayor of Jacksonville, Fla.

LEDWICH, JAS., has been elected Mayor of Broken Bow, Neb.

KERCH, C. V., has been reappointed City Engineer of Janesville, Wis.

KEYSER, D. S., has been elected Mayor of Napa, Cal.

MCALLISTER, A., Democratic mayoralty candidate of San Luis Obispo, was elected.

MCCARTY, MAJ. JAMES, has been employed as consulting engineer by the Hudson Falls, N. Y., board to report on a new water system.

MATTHEWS, LEE R., is the new Mayor of Pomona, Cal.

MEGUIRE, E. N., was elected Mayor of Portland, Tenn.

MORGAN, W. L., was elected Mayor of Black Mountain, N. C., by a majority of one vote. The voters of that township found that he was a non-resident and the office of Mayor passed to Mr. Morgan's opponent, Mr. W. C. Hall. Morgan's exact status was determined when he went to the polls to vote, the registrar refusing him the privilege to vote on the ground that he was not a resident of Black Mountain township. Subsequent investigation revealed the fact that three months ago Mr. Morgan moved across the corporate limits while his old residence was being torn down to make place for a new one.

MURDOCK, ALLEN C., was elected Mayor of Parkersburg, W. Va.

POUJADE, J., has been elected Mayor of Carson, Nev.

RUARK, J. W., is the new Mayor of Sanford, N. C.

SANDERSON, FRED T., was elected Mayor of Klamath Falls, Ore.

TORNEY, WM. J., is the new Mayor of Vallejo, Cal.

TURBITTIN, R. C., has been elected Mayor of Reno, Nev.

WISE, JOHN W., is the new Mayor of Chester, S. C.

American Museum of Natural History.—A special exhibition of apparatus, models, charts and diagrams illustrating the work of the Metropolitan Sewerage Commission and signaling the inauguration of the Department of Public Health of the American Museum was opened at the Museum, 77th Street and Central Park West, New York City, May 15. Addresses were made by President Osborn, Mayor William J. Gaynor, Dr. George A. Soper, president of the Metropolitan Sewerage Commission; Professor C. E. A. Winslow, curator of the new Department of Public Health of the Museum, and Dr. Harvey W. Wiley, of the United States Department of Agriculture. The exhibition will be open for one month.

National Electric Light Association.—A catalogue exhibit will take the place of the usual exhibition at the convention in New York City, May 29-June 2. The exhibit will be held on the fifth floor of the Engineering Societies' building. Applications for space must reach the secretary not later than May 15.

National Board of Fire Underwriters.—At the forty-fifth annual meeting of the National Board May 11, in the New York Board rooms, No. 123 William Street, the instructing of school children in the importance of handling household combustibles, abolishing of dangerous matches and the punishment of careless cigarette smokers as measures which would greatly reduce the fire losses of the nation, were advocated. A. W. Damon, of Springfield, Mass., president of the organization who urged the instruction for school children, also recommended the enactment of State fire marshal laws by all of the States, modern building laws, legislation to impose stricter regulations regarding the storage of explosives and improved water supply.

Mr. Damon said, in part:

"Nebraska and Montana have followed Ohio in instructing school children as to the importance of observing greater care in the handling and use of those household commodities which are so often the cause of fires. Other States are considering the matter and could well afford to follow the examples of these Commonwealths."

"The Criminal Match" was treated in a resolution introduced by Louis S. Amonson, of Philadelphia, who urged the abolishing of dangerous matches from the household. In another resolution it was urged that laws be enacted to provide that persons who throw away lighted cigarettes and thereby start fires be held responsible.

M. O. Brown, of New York City, chairman of the Committee on Laws, declared that legislators should devote more time to preventing fire waste by the enactment of laws which would compel citizens to recognize their individual responsibility for fires. George W. Hoyt, chairman of the Committee on Fire Prevention, urged the adoption of a national building code.

These officers were elected: George W. Babb, New York, president; William N. Kremer, New York, vice-president; C. J. Holman, New York, treasurer; E. W. West, Glens Falls, N. Y., secretary; E. H. A. Correa, New York City; E. J. Richards, New York City, and Edward Milligan, Hartford, Conn., members of the Executive Committee. There were 135 insurance companies represented at the meeting.

INDUSTRIAL NEWS

Cast-Iron Pipe.—Chicago.—Conditions are decidedly better. Good orders have recently been closed with a number of cities. Prospects for a good pipe season brighter as the year advances. Quotations: 4-inch, \$25.50; 6 to 12-inch, \$24.50; 16-inch and up, \$24. Birmingham—The week has been a very satisfactory one. Prices are firm. Quotations: 4 to 6-inch, \$22.50; 8 to 12-inch, \$22; over 12-inch, average \$21. New York—The demand shows no improvement and transactions are small. Quotations: 6-inch, carloads, \$21 to \$22.

Lead.—Market is weak. Quotations: New York, 4.40c.; St. Louis, 4.25c.

Wire Brooms.—The Osborn Manufacturing Company, Cleveland, O., has purchased the business and patents of the American Wire Brush Company, 277 Greenwich street, New York. A new office and factory will be established at 202 Centre street, New York City. F. D. Jacobs will be in charge of the New York office.

Road Machinery.—To handle more efficiently its increasing business in the Middle West, the Iroquois Iron Works, of Buffalo, N. Y., have established a warehouse in Chicago, where a complete line of macadam and tandem rollers, asphalt tools, kettles, etc., is now carried for immediate shipment. The new shipping depot is in charge of T. H. Morris, the Chicago representative of the Iroquois Iron Works, with offices in the Tribune Building.

Water-Sterilizing Plant.—H. A. Carmer of the Seneca Falls Water Works Company, Seneca Falls, N. Y., has replied to a communication from the village officials asking if the company contemplated installing a purification system and asking for a revision of rates. Mr. Carmer replied that, although the water had been pronounced good on several occasions when tested, the company were considering the installation of some sterilizing process when such action was desired. Regarding the rates he said no reduction was possible unless the village sees fit to grant the company a contract.

Oil-Pressure Sprayer.—Street Commissioner McPhetres, Lynn, Mass., recently attended an experimental test of the Standard Oil Company's asphalt oil-pressure sprayer on Johnson Street, Lynn, given by David O'Brien, of Boston, agent for the company. The machine, after a few false starts, appeared to make good the claims made for it by its promoters. As regards costs, they claim that two applications a year will keep a street free from dust at an estimated cost of 2¾ cents per square yard.

Granite Paving Blocks.—Owing to the increased popularity of the granite paving block among city officials granite cutting sheds along the Maine coast have opened for regular production of the standard paving block during the Summer season. The boom in this branch of the State's granite industry was felt in the larger cities of the coast, and many sheds that had felt the business depression for a number of years were started at full capacity. The new paving block is cut with greater care and is smaller than the original. The new block is popular as piece work with the cutters.

Granite Blocks.—The American Granite Company is being organized at Augusta, Ga., with a capital stock of \$600,000, for the development of 100 acres of granite property near Augusta. Charles F. McKenzie will be president of the company, which will install a modern plant.

Universal Nozzle.—J. M. Camerson, Johnson City, Tenn., has invented a universal nozzle for use on fire hose. Arrangements are being made for its manufacture, following several successful demonstrations.

Calcium Chloride.—The Solvay Process Company, Detroit, Mich., is engaged in the construction of one of the largest additions to its mammoth plant of any undertaken in this city for several years. The building is an entire steel structure, three stories, and covering about seven acres.

Water-Works Specialties.—The H. W. Clark Company, Mattoon, Ill., manufacturer of meter boxes and other water-works specialties, has been incorporated with a capital stock of \$50,000. The incorporators are Horace W. Clark, Charles H. Tillotson and Dwight P. Child.

Auto Fire Engine Tested.—The new Robinson automobile fire engine of the Water Witch Fire Company, Wilmington, Del., was given a test last week at West Street and Park Drive, when it gave a good account of itself. Although there was a stiff wind blowing, the engine threw a stream through a nozzle, an inch and a quarter in diameter, a distance of 225 feet, with a water pressure of 150 pounds. This was continued, without variation, for 45 minutes, and could have been continued longer. The stream was siamesed through two lines of hose.

Gasoline Motor Truck.—A decision of the Fire Commission, Springfield, Mass., last week, came as the result of careful investigation by department officials of apparatus used in other cities. An arrangement has been made by the commission with the Knox automobile concern, by which the company offers to build a three-wheeled gasoline tractor for the water tower now stationed at the Pynchon Street house. At present this piece of apparatus is horse-drawn. This tractor, which is an experiment by the Knox people, who have never yet attempted to manufacture this particular class of apparatus, will be furnished to the city for its free use from the time of its completion until March 12, 1912. The commission reserves the right to return it to the company at any time prior to that date, if it so desires, but if it proves satisfactory the purchase will be made.

Reinforced Concrete Sewers.—The bulletin of the Universal Portland Cement Company for May contains illustrations of Meriwether reinforced concrete pipes in course of construction at Niagara Falls, N. Y. The pipes were made in molds furnished by the Lock-joint Pipe Company, New York. R. A. McClanathan was the City Engineer and W. A. Shepard & Co., Niagara Falls, the contractors. The bulletin also contains an illustration of the Dickinson Street reinforced-concrete bridge at Syracuse, N. Y.

General Asphalt Company.—Evidence of the continued success of the present management of the General Asphalt Company is contained in the eighth annual report of the company, for the fiscal year ending April 30. Gross earnings for 1910 were \$16,004,173, exceeding the gross of the preceding year by \$2,011,190. Net earnings were \$1,102,075, as compared to net of \$1,031,741 in 1909.

The progress made in the complete rehabilitation of the Asphalt Company's affairs is further evidenced by the fact that the 5 per cent. dividends on the company's \$13,140,000 of preferred stock paid during the year make a total cash disbursement for dividends since the company was organized of 20¼ per cent. This, with the 8½ per cent. cumulated dividends (represented by the 5 per cent. debentures issued March, 1911), makes a total distribution of 28¾ per cent. Dividends on the preferred stock became cumulative at the rate of 5 per cent. from June 15, 1905; so that with the payment of the regular 1¼ per cent. on June 1, 1911, 30 per cent., the full dividend for six years past, will have been paid in cash or by debentures.

The Barber Asphalt Paving Company constructed 2,349,917 square yards of new sheet asphalt pavements during the year, and 1,341,047 yards of private work and paid repairs, an increase, taking the two classes of work together, of 560,000 yards over 1909. These figures do not include contracts for 1,687,788 yards carried over to the present year.

Referring to the deduction from net earnings for maintenance guarantee account, the report points out the steady diminution of guarantee periods, which have been reduced from ten years or more to an average of 3.5 years on the work done by the Barber Asphalt Company in 1910. In 1910-11 guarantees expired on more than 7,510,000 yards, on which the average period of guaranteed maintenance was 7.5 years. With the large yardage going out of maintenance each year, accompanied by the adoption of much shorter guarantee periods or their entire elimination, it is pointed out that the company's obligations in this respect will be largely reduced or entirely done away with.

The first public announcement is made in the report of the discovery of immensely valuable oil deposits on the company's property adjoining the Trinidad asphalt lake. A small amount of oil had been obtained up to September of last year, when a well being bored, and then at a depth of 915 feet, began to produce oil at the rate of 3000 barrels a day. With this proof of the existence of an extensive supply of asphaltic oil for fluxing, fuel and road treatment, the company began the construction of storage tanks of 1,000,000 barrels capacity and chartered three tank steamers, the first of which will arrive in this country this month with oil cargoes. The report refers to the finding of the Trinidad oil as "an asset hitherto wholly undeveloped, which is already of proven value, and which possesses great possibilities for the future."

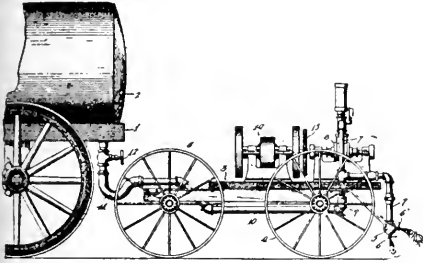
Aside from this oil discovery, the main development in the company's business as shown in the report, relates to the increasing use of asphalt in macadam road construction, the tonnage of Bermudez road asphalt being eight times greater in 1910 than the total for 1909. The outlook for the season of 1911 is considered as very encouraging.

(Continued on page 738.)

PATENT CLAIMS

991,043. PROCESS OF MAKING ROADWAYS. Joseph E. Ward, Longbeach, Cal. Serial No. 549,347.

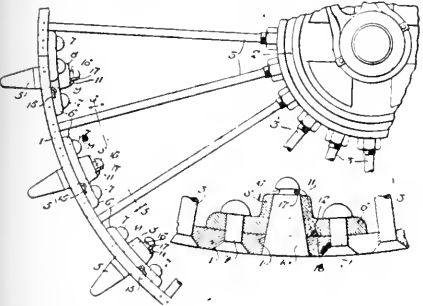
The process of making a roadway which consists in atomizing oil in contact with air in such a manner that the oil tends to remain suspended in the air for an appreciable time, bringing the atomized oil and air into contact with a porous road



surface, causing the oil to permeate the porous road surface while still in atomized condition, and causing the atomized oil to be deposited on the material of the road surface while said material is agitated and partly suspended.

990,846. ROAD ROLLER. Henry F. Crandall, Racine, Wis., assignor to J. I. Case Threshing Machine Company, Racine, Wis., a Corporation. Serial No. 601,619.

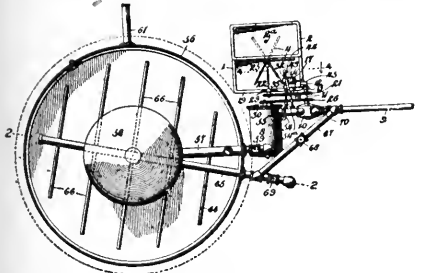
In road rollers, the combination of the roller rim having tapered seats at suitable



intervals extending therethrough, removable spike teeth having tapered shanks fitting said seats, and spring keepers detachably engaging the inner ends of said spike teeth.

991,990. APPARATUS FOR SOFTENING WATER. Axel R. Holmén, Columbus, Ohio. Serial No. 495,033.

An apparatus of the class described including a settling tank, a mixing chamber arranged exteriorly of the settling tank and connected therewith, means for supplying water under pressure to the mixing chamber, a motor connected with and oper-



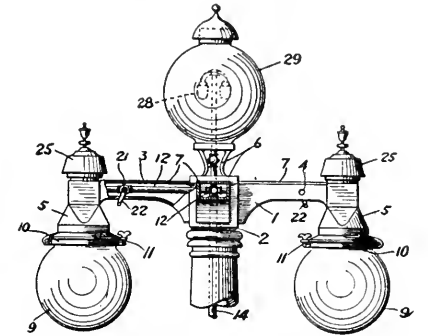
ated by the water supply, a solution tank also arranged exteriorly of the settling tank, a pump operated by the motor and connected with the mixing chamber and having an inlet pipe communicating with the solution tank, and a by-pass pipe extending from the water supply to the inlet pipe.

991,767. APPARATUS FOR PRODUCING OZONE. Charles G. Armstrong, Orange, N. J. Serial No. 496,310.

In a device of the class described, a condenser having in combination a plurality of relatively narrow positive and negative conductors, a plurality of solid dielectrics interposed one between each two adjacent conductors, said dielectrics and conductors being spaced apart to form a plurality of independent air passages, means for supplying an electric current to said conductors, and means for forcing air through the spaces between the dielectric plates from one side thereof to the other, whereby the air will cross said conductors transversely and is subjected to but one electrostatic action.

990,680. STREET LAMP. Henry E. Strelber, Canton, Ohio, assignor to The Sun Vapor Street Light Company, Canton, Ohio, a Corporation of West Virginia. Serial No. 602,893.

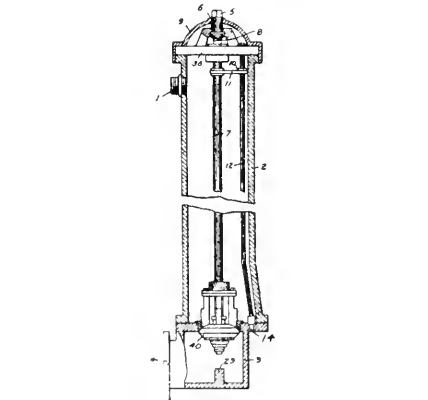
A lamp consisting of the combination of a hollow casting having attaching provisions and having trough-like arms radiating from said attaching provisions and terminating in a vertically arranged outer lamp shell, a globe for closing the lower part of the outer shell, a ventilator at the top of the outer shell, a gas pipe arranged in the arm and



depending through the outer shell and having a regulating valve and radiating air supply pipes or ducts, an inner shell arranged within the outer shell and joined to the top thereof with space between and through which said pipes or ducts extend, said spaces receiving air and supplying the same to the ducts or pipes and to the globe, incandescents or mantles arranged at the lower end of the inner shell, and detachable covers for the trough-like arms.

991,559. FIRE HYDRANT. William H. Symons, San Diego, Cal. Serial No. 586,979.

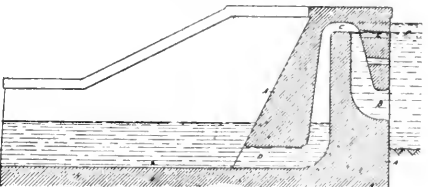
In a fire hydrant, a stand pipe, a funnel-shaped nozzle base extending outwardly from the stand pipe with its small end outwardly; said small end being internally screw-threaded, a nozzle bushing screw seated in the nozzle base and having an external screw-thread on its outer end to receive a hose coupling and having a valve seat upon its inner end, and there being an opening through the opposite side of the stand pipe in alignment with the opening through the bushing; the surface around



the inner end of the opening being finished to form a tight joint, and the surface around the outer end of the opening being finished to receive a lock nut, a valve frame mounted in said aligned opening and adapted to form a tight joint with said inner finished base and having an external screw-thread on its outer end and a lock nut on said external screw-thread, so that by removing the bushing and removing the lock nut the valve frame may be removed through the bushing opening.

991,907. SPILLWAY. George F. Stickney, Albany, N. Y. Serial No. 615,736.

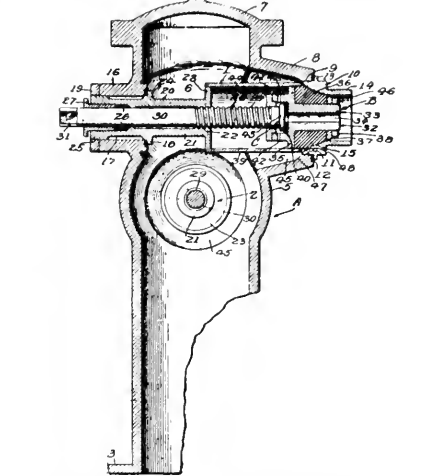
A spillway comprising a dam; a closed conduit siphon of an inverted U-shaped form when in position, the crown being



between the low and high water planes; said dam provided with an air passage extending from at the low water level to a point in the siphon near the crown.

991,690. GATE VALVE. Charles L. Bowker, Brunswick, Me. Serial No. 554,333.

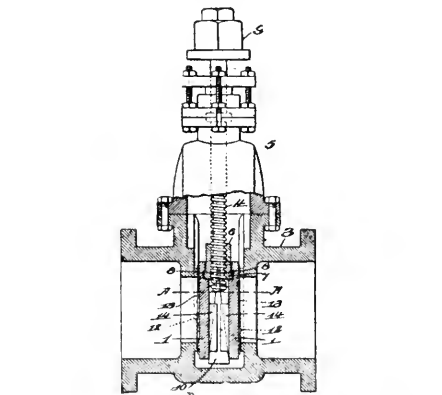
A gate valve, having, in combination, a valve casing, oppositely disposed valve seats in the casing, a valve chamber between said valve seats, valve disks in the valve chamber provided with inclined surfaces on their inner faces, wedge-shaped ribs arranged vertically in said chamber on opposite sides of the water-way and co-



operating with the inclined surfaces upon the valve disks to force the disks against their seats when the disks are lowered, and means located upon opposite sides of the valve chamber operating to force the valve disks away from their seats as the disks are raised, substantially as described.

990,989. FIRE HYDRANT. John Knickerbacker, Troy, N. Y., assignor to Eddy Valve Company, Waterford, N. Y., a Corporation of New York. Serial No. 501,999.

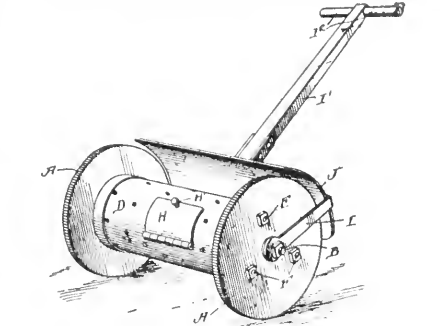
A hydrant comprising a stand pipe, a main valve to control admission thereto, a dash pot carried by said main valve, an



auxiliary valve connected with said dash pot and having a seating surface to further control admission to said stand pipe and a portion on said auxiliary valve arranged to substantially check admission before said seating surface becomes effective.

991,790. DEVICE FOR DISTRIBUTING ASHES AND SAND. Samuel M. Lampke, Detroit, Mich. Serial No. 563,221.

A device for distributing ashes and sand, comprising a pair of wheels having outwardly projecting journals, a perforated drum arranged between said wheels and



carried thereby, a handle frame pivotally mounted on said journals, a handle carried by said frame and a curved apron carried by said handle frame having a length greater than the distance between said wheels.

THE WEEK'S CONTRACT NEWS

Relating to Municipal and Public Work—Street Improvements—Paving, Road Making, Cleaning and Sprinkling—Sewerage, Water Supply and Public Lighting—Fire Equipment and Supplies—Bridges and Concrete Work—Sanitation, Garbage and Waste Disposal—Police, Parks and Miscellaneous—Proposals and Awards.

To be of value this matter must be printed in the number immediately following its receipt, which makes it impossible for us to verify it all. Our sources of information are believed to be reliable, but we cannot guarantee the correctness of all items. Parties in charge of proposed work are requested to send us information concerning it as early as possible; also corrections of any errors discovered.

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREET IMPROVEMENTS				
Ohio	Cincinnati	May 19, noon	Constr. Compton rd. in Hamilton Co.; mac. exten. of Strubler rd	Stanley Struble, Pres. Co. Comrs.
New Jersey	Camden	May 19, 8 p.m.	Constructing cement sidewalks and driveways	Joshua C. Haines, Chm. Police Comr.
Ohio	Akron	May 19, noon	Paving portions of various streets	John W. Gauthier, Dir. Pub. Serv.
Ohio	Columbus	May 19	Paving portion of Summit St.	H. S. Holton, Dir. Pub. Service.
New York	New York	May 19, noon	Furn. granite stone for bulkhead or river wall	Calvin Tomkins, Comr. Docks.
New Hampshire	Concord	May 19, 1 p.m.	Paving 3½ miles with native stone in the town of Hillsdale and paving 4,500 ft. in the town of Bethlehem	H. C. Hill, State Engr. City Clerk.
New York	Walden	May 19, 8 p.m.	Constructing concrete sidewalks on various streets	W. H. Morton, Secy. Park Board.
New York	Utica	May 19, 10 a.m.	Oiling two drives of Utica parkway	
Pennsylvania	Dormont	May 19, 8 p.m.	Grading, curbing and paving, including 4,700 cu. yds. grading, 3,900 lin. ft. curb and gutter, 4,500 sq. yds. paving	H. M. Stillely, Chm. Street Com.
Pennsylvania	Pittsburg	May 19, 10 a.m.	Furn. 100,000 gals. light asphalt road oil; 100,000 gals. heavy asphalt oil; 922,000 brick block for the Crooked Road Run; two all steel tank wagons of 600 gals capacity	R. J. Cunningham, County Compr.
Illinois	Mendota	May 20, 2 p.m.	Hauling about 5000 tons of material for constructing gravel rock and macadam roads from railroad and distributing along county roads in Mendota, township	Commissioners Highways.
Indiana	Evansville	May 20, 10 a.m.	Laying and repairing concrete and brick sidewalks	Simon A. Bartholome, Clk. B.P.Wks.
Arizona	Phoenix	May 20	Constr. territorial road from Tucson to Bisbee	Robt. W. Craig, Secy. Bd. Control.
Ontario, Can.	Kingston	May 20, noon	Constructing 6,100 sq. yds. pavement; 2,276 lin. ft. curb and gut	H. B. R. Craig, City Engineer.
New York	Chatham	May 20	Constructing a section of highway known as Rowe Hill	A. P. Tripp, Town Clerk.
Ohio	Cleveland	May 20, 11 a.m.	Grading, draining and improving portion of Settlement Road	John F. Goldenbogen, Clk. B. C. C.
Minnesota	Pelan	May 20, 2 p.m.	Turnpiking and graveling road No. 138	A. P. Erickson, County Auditor.
Ohio	New Philadelphia	May 22	Paving the New Cumberland Road with brick	City Clerk.
Ohio	Cincinnati	May 22, noon	Grade, cement park lot surrounding Public School	C. W. Handman, Business Managr.
Texas	Galveston	May 22, 11 a.m.	Remodeling the Seawall boulevard	John M. Murch, County Auditor.
Iowa	Council Bluffs	May 22, 5 p.m.	Paving curbing and guttering various streets	Chas. J. Duff, City Clerk.
Montana	Great Falls	May 22, 8 p.m.	Constructing concrete walks from June 1 to December 31, about 70,000 sq. ft. 5-foot walk, about 10,000 sq. ft. 15-foot walk	W. P. Wren, City Clerk.
New York	New York	May 22, 10:30 a.m.	Paving with asp. block on conc. found., setting curb and furn. 2,500 cu. yds. of paving sand	Cyrus C. Miller, Pres. Bronx Boro.
Iowa	Fort Dodge	May 22, 9 a.m.	Constr. cement conc. pavement and Portland cement curbing on various streets	W. L. Tang, City Clerk.
Wisconsin	Superior	May 22, 1 p.m.	Building standard cement sidw. 5 ft. wide on various streets	P. J. Ekstrand, Chm. Bd. Pub. Wks.
New York	New York	May 23, noon	Repairing and repaving portions of various roadways	Pres. Boro. Richmond.
New York	Auburn	May 23	Constructing subways in portion of Washington street and paving same with vitrified brick	J. S. Hanlon, City Clerk.
Ohio	Bowling Green	May 23, 1 p.m.	Grading, draining and macadamizing county road	F. W. Tean, County Auditor.
Wisconsin	Janesville	May 23, 2 p.m.	Improving portion of Jackson street	John C. Nichols, Chm. St. Ass. Com.
Tennessee	Memphis	May 23	Constr. 175,000 sq. yds. excavation; 70,000 sq. yds. gravel pavement; 48,000 sq. yds. macadam; 10,000 old stone; 25,000 brick; 70,000 sq. yds. asphalt, wood block or bitulithic	J. H. Weatherford, City Engr. Budroe, Sec'y Bd. Pub. Service.
Ohio	Dayton	May 24, noon	Paving 16 streets and 2 alleys	Chas. M. Tobin, Clk. Bd. Control.
Ohio	Marion	May 24, noon	Constr. 1,600 sq. yds. brick pavement; 8,000 sq. ft. sand stone flagging	J. Edw. Schell, Mayor.
Maryland	Frederick	May 24	Constr. 16,000 sq. yds. of pave. and 8,500 lin. ft. of curb	Harry F. Miller, Secy. Bd. C. & S.
New York	Schenectady	May 24, 2:30 p.m.	Repaving various streets and constructing culverts	R. O. Oberlin, County Clerk.
Ohio	Canton	May 24	Paving a mile of road with brick	Maj. H. L. Pettus, U.S.A., Wash.D.C.
Virginia	Culpepper	May 25, 11 a.m.	Repairs to roadway at National Cemetery	J. C. Ely, Dir. Pub. Service.
Ohio	Dayton	May 25	Paving portion of Eleventh st. and two alleys	
Dist. of Col.	Washington	May 25, 2 p.m.	Furn. asphalt paving blocks, repressed vitr. brick; vitr. invert sewer bricks; red sewer bricks; terra cotta sewer pipe; portland cem. and misc. castings for year ending June 30, 1912	Cuno M. Rudolph, Comr. City Clerk.
Ohio	Youngstown	May 26	Grading and paving various streets	John F. Goldenbogen, Clk. Bd. C. C. J.
Ohio	Cleveland	May 27, 11 a.m.	Grad, draining and improving Irish Road No. 2	D. W. Moffitt, County Auditor.
Indiana	Greencastle	May 27, 2 p.m.	Constr. 8,275 lin. ft. macadam road in Russel township	J. F. Goldenbogen, Clk. Co. Comrs.
Ohio	Cleveland	May 27, 11 a.m.	Grading and improving portion of Harvard Road	The George Company, Ran. Bldg. Memphis, Tenn.
Mississippi	Hazlehurst	June 1	Constructing 58 miles of gravel roads in Copiah County	
New Jersey	New Brunswick	June 1	Completing by macadamizing and otherwise improving Franklin Park and Kingston road	Asher Bisset, Clk. Bd. Co. Comrs
New Jersey	Laurel Springs	June 3	Construction concrete sidewalk in Washington Avenue	Sam'l L. Burgess, Township Clerk.
Ohio	Willoughby	June 5, noon	Grading, paving and curbing Euclid St.	C. C. Jenkins, Village Clerk.
New Jersey	Cape May	June 6	Constr. seashore road from Seaville to Beesley's Point	Bd. County Comrs.
Indiana	Wabash	June 6, 1 p.m.	Constr. a gravel road in Chester township	J. P. Nofitzges, County Auditor.
Indiana	Monticello	June 7, noon	Construct. a rock road on County line bet. White & Carrol Cos.	A. G. Fisher, County Auditor.
SEWERAGE				
Ohio	Akron	May 19, noon	Constr. main and lateral sewers in various streets	John W. Gauthier, Dir. Pub. Serv
New Jersey	Garfield	May 19	Installing sewers	Committee on Sewers.
Ohio	Mt. Gilead	May 19	Furn. 8 to 48-in. culvert pipe	Bd. County Comrs.
Massachusetts	Adams	May 20	Constructing sanitary sewers in various streets	Board Selectmen.
New York	Syracuse	May 22	Constr. the Colvin street trunk sewer and several lat. sewers	Geo. J. Metzplause, City Clerk.
Ohio	E. Youngstown	May 22, noon	Constructing sanitary sewer	J. P. Carney, Village Clerk.
Iowa	Council Bluffs	May 22, 5 p.m.	Constructing 600 lin. ft. 8-in. sewer; 900 lin. ft. 6-in. lateral sewer, 800 lin. ft. 10-in., 300 lin. ft. 50 in.	Chas. J. Duff, City Clerk.
Wisconsin	Fond du Lac	May 22, 3 p.m.	Constructing sanitary sewer in various streets	J. F. Hohensee, City Clerk.
Alabama	Birmingham	May 22, noon	Constructing a sewerage disposal plant	L. H. Salter, Sanitary Engineer.
Sask., Can.	Moose Jaw	May 22	Building storm sewer extensions requiring in all 9,000 lin. ft. storm sewer; 11,300 lin. ft. 10, 8 and 6-in. vit. tile pipe	J. M. Wilson, City Engineer.
Oklahoma	Muskogee	May 23	Constr. 21,200 ft. of 48-in. sewer pipe; 6,500 of 45-in. and 7,100 of 42-in. Alternate bids for two ring brick with vitrified invert and manufactured concrete pipe	City Clerk.
Ohio	Amherst	May 23	Constr. a small sewer system and sewage disposal plant	C. G. Aschenbach, City Clerk.
Maryland	Frederick	May 24	Constr. about 4,000 lin. ft. 6-in. to 42-in. sewers with inlets, m.h.	J. Edward Schell, Mayor.
Pennsylvania	Williamsport	May 24	Constructing storm water sewers in various streets	J. J. Galbraith, City Clerk.
New York	Binghamton	May 24	Constructing sanitary sewers in various streets, about \$15,000	Board of Contract and Supply
Ohio	Dayton	May 24, noon	Constructing sanitary and storm sewers in various streets	J. C. Ely, Dir. Pub. Service.
Ohio	Piqua	May 25	Constr. about 4,823 ft. of sanitary sewers with 84 house connec.	T. D. McClay, Dir. Pub. Service.
Ohio	Youngstown	May 26	Constructing sewers in various streets	City Clerk.
Kansas	Leavenworth	May 31, noon	Constructing main storm water drain in the college section	Capt. John S. Winn, Act. Q., U.S.A.
New York	S. Glens Falls	June 1	Constructing a sewer system and disposal plant	C. W. Skym, Village Clerk.

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
SEWERAGE (Continued)				
New York	Fort Hamilton	June 2, 11 a.m.	Constructing a sanitary sewer.	Constructing Quartermaster.
Ohio	Bellefontaine	June 2	Constr. reduction tank, primary contact beds, outlet drains, etc.	Dir. Public Service.
New Jersey	Englewood	June 3, 3 p.m.	Constructing a sewage disposal plant complete.	Oliver Drake Smith, Secy. Sew. Com.
Illinois	Ft. Sheridan	June 5, noon	Constr. sewage dis. plant complete, at Fort Sheridan.	Capt. M. E. Saville, Constr. Q.M.
New York	Ossining	June 6, 8 p.m.	Constr. the Kill Brook Trunk Sewer; bulkhead dock and screening chamber at outfall end; also other sewers.	J. M. Terwillinger, Village Clerk.
California	San Jose	July 3	Construct septic tank for County hospital.	City Clerk.
WATER SUPPLY				
Missouri	St. Louis	May 19, noon	Furn. cast-iron-coated water pipe, special castings, stop valves, post fire plugs and post fire plug top parts.	Board Public Improvements.
New York	New York	May 19, 2 p.m.	Furn. and laying water mains in various streets.	Henry S. Thompson, Comr. W. S.
Michigan	Marquette	May 20	Building 2 concrete dams on Dead river and other improvements to the hydroelectric plant. Cost about \$100,000.	Chas. Retaillic, Supt. L. & P. Com
Ohio	Silverton	May 22	Laying a 6-in. water main in portions of several streets.	A. A. Sprague, Village Clerk.
Minnesota	N. Mankato	May 22, 7:30 p.m.	Constructing a water works system. Alternate bids on electric pumping equipment and gasoline. Separate bids on reservoirs, pump house, pumping equipment, water mains and well.	L. Donohue, Village Clerk.
California	San Diego	May 22	Furn. 8,536 lengths of c. i. water pipe from 8 to 36-in.	P. E. Woods, Supt. Water Dept.
Illinois	Stanford	May 22	Constructing water works system.	W. C. Murphy, Village Clerk.
Pennsylvania	Etna	May 22, 5 p.m.	Furn. necessary boilers, smoke connections, boiler foundation, stack and stack foundation for Boro. Water Works.	J. C. Armstrong, Boro. Clerk.
Ohio	Cincinnati	May 22, noon	Constr. two turbine water wheels in the head house of filtration plant.	John J. Wenner, Clk. Bd. Pub. Serv.
Ohio	Youngstown	May 22, noon	Furn. 300 valves from 4 to 36-in. and 108,000 lbs. pig lead.	H. S. Holton, Dir. Pub. Service.
Minnesota	Good Thunder	May 22, 7:30 p.m.	Constr. a water tower and connection pipe.	A. F. Wendlandt, Village Recorder.
Nebraska	Battle Creek	May 22, 8 p.m.	Constr. a water plant, cost \$10,000.	Village Clerk.
Ohio	Barnesville	May 22, noon	Laying water pipe and appurtenances in various streets.	Edwin Wilson, Chm. Bd. Trustees.
Louisiana	Homer	May 22	Furnishing material for water works.	G. G. Gill, Town Clerk.
Ohio	Kenton	May 23	Furn. & install pump, engine, cap, 2,500,000 gal. per 24 hours.	W. P. Steffen, Dir. Pub. Service.
Ontario, Can.	Toronto	May 23, noon	Furn. 3,000 to 3,500 ft. of steel pipe 72-in. in dia. for w. w. intake	G. R. Geary, Mayor.
South Dakota	Vermillion	May 23, 4 p.m.	Constr. a system of water works for the State University.	Fred W. Ford, Secy. Regents Edu.
Wisconsin	La Crosse	May 23, 2 p.m.	Furn. 2,375 pieces c. i. pipe from 6 to 24-in.; 90,725 lbs cast-iron specials, 24 hydrants, valves etc.	Jas. T. Day, Chm. Bd. Pub. Wks.
New York	New York	May 23, 11 a.m.	Completing the Hudson siphon.	Board Water Supply.
Virginia	Ft. Meyer	May 25, 11 a.m.	Constr. about 2 miles of 10-in. water mains.	Capt. Warren W. Whiteside, C. Q.M.
New York	Cortland	May 25, 8 p.m.	Constr. a standpipe or water tank 50 ft. high and having storage capacity of 1,000,000 gals.	Board Water Commissioners.
Ontario, Can.	Harriston	May 25	Excavating and pipe laying for water works system.	City Clerk.
Missouri	Pleasant Hill	May 25	Constructing a water works including 1,500 ft. 8-in.; 10,000 ft. 6-in.; 7,500 ft. 4-in. pipe; lake covering 100 acres; 220 gal. per minute motor driven pumps and 50,000 gal. tank on 50-foot tower.	H. K. Willis, City Clerk.
California	Los Angeles	May 26	Furn. fabricated steel and rivets necessary to con. abt. 1,865 ft. of 9-ft. 3-in. and 8,313 ft. of 11-ft. riveted steel syphon.	Board of Public Works.
Ohio	Toledo	May 26, noon	Furn. rotary pump, 15,000,000 gals. daily; also bituminous coal gas producer and accessories, about 400 h.p. continuous capacity.	Fred Shane, Sec'y Bd. Pub. Service.
Ontario, Can.	Ottawa	May 29, 4 p.m.	Constr. a dam and spillway at Kipewa Village, Pon. Co., Quebec.	R. C. Desrochers, Secy. D.P.W., Ott.
Brit. Col., Can.	Vancouver	May 31, 4 p.m.	Furn. steel pipe, 1 pipe; also 18-in. flexible joint c. i. pipe.	Wm. McQueen, City Clerk.
Wyoming	Ft. Yellowstone	May 31, noon	Constructing pipe line from Panther Creek to Ft. Yellowstone water system.	Constructing Quartermaster.
North Carolina	Concord	May 31, 3 p.m.	Building auxiliary pumping station, furnishing turbine pumps and motors; about 2 miles of 12-in. c. i. pipe; 1,000,000 gal. reinforced concrete sedimentation reservoir; 1,000,000 gal. filter plant.	Chas B. Wagoner, Chm. Bd. W.&L.C
Missouri	St. Louis	June 2, noon	Furn. detailed drawing, constructing and erecting at Low Service Pumping station two steam, turbine-driven centrifugal pumping units, complete with condensing apparatus.	Board Public Improvements.
Ontario, Can.	Toronto	June 6	Furnishing vertically driven pumps.	C. H. Rust, City Engr.
Indiana	Richmond	June 12, 10 a.m.	Furnishing water to city for period of 25 years.	H. M. Hammond, Chm. Bd. Pub. W.
BRIDGES				
New York	Little Falls	May 19, 9:30 a.m.	Painting four Mohawk bridges.	Matthew A. Leahy, City Clerk.
Ohio	Dayton	May 19, noon	Constr. the substructure, re-erecting the superstructure and rip-rapping the south approach for bridge over Wolf Creek, at its confluence with Great Miami River.	J. C. Ely, Dir. Public Service.
Utah	Moab	May 20	Constructing a bridge over Grand river.	A. A. Neff, County Clerk.
Pennsylvania	Harrisburg	May 20, noon	Constr. new concrete bridge over Paxton Creek.	Board County Commissioners.
Iowa	Sioux City	May 20, 10 a.m.	Constr. a reinforced concrete abutment on the east end of the West 4th. St. Bridge over Perry Creek.	Paul J. Wells, City Clerk.
Ohio	Oberlin	May 22	Constr. superstructure and substruct. of a bridge, at Spring St.	Chas. Chandler, County Clerk.
Pennsylvania	Washington	May 22, 1:30 p.m.	Constructing four reinforced concrete bridges.	John H. Moffitt, Co. Comptroller.
Ohio	Lorain	May 22, 1 p.m.	Constr. substructure and superstructure of four bridges.	Chas. Chandler, Clk. Co. Comrs.
Ohio	Canton	May 22, 10 a.m.	Constr. the William Geckler Bridge No. 80914A, in Pipe twp.	Bd. County Comrs.
Wisconsin	Fond du Lac	May 22, 3 p.m.	Constr. steel & concr. bridge over west branch of de Neveu Creek	J. F. Hohensee, City Clerk.
New Jersey	Paterson	May 24, 2 p.m.	Building a steel and concrete bridge over Wessel Brook	John H. Kehoe, Chm. County Bd.
Mississippi	Jackson	May 27, noon	Bldg. 2 reinforced conc. arch bridges; 1 steel girder bridge.	John J. Pierce, City Engr.
Ohio	Warren	May 29, 1 p.m.	Constr. superstructure of a bridge in Farmington township; 42 ft. roadway, 12-ft. clear.	County Comrs.
Ohio	Norfolk	May 29, 10:30 a.m.	Constr. the sub-structure of the Garret Bridge over Marsh Run	County Commissioners.
Ohio	Cincinnati	May 29, noon	Driving piling for the construction of substructure and miscellaneous work in connection with Gilbert ave. Viaduct.	John J. Wenner, Clk. Bd. Pub. Serv
Ohio	Hamilton	May 31, 10 a.m.	Constructing a bridge on Sevenmile Pike.	J. E. Brate, County Auditor.
Pennsylvania	Pittsburg	June 1	Widening Smithfield Street Bridge, cost about \$150,000.	City Clerk.
New York	New York	June 1	Strengthening the end spans of the Williamsburg Bridge.	Kingsley L. Martin, Comr. of Br.
Pennsylvania	Pittsburg	July 1	Constructing one concrete arch, estimated cost \$85,000.	City Clerk.
LIGHTING AND POWER				
Michigan	Marquette	May 20	Building 2 conc. dams on Dead river, cost \$100,000.	Chas. Retaillic, Supt. L. & P. Comn.
New York	Utica	May 23	Furn. 150,000 duct ft. of tile and appar. for an exten. of the electric subways.	Board Contract and Supply.
California	Riverside	May 24, 10 a.m.	Selling a franchise, granting right to conduct and operate electric pole and wire system for light, heat and power along all public roads of Riverside County.	A. B. Pilch, County Clerk.
New York	Utica	May 24, 2 p.m.	Constructing and extending electric subways, consisting of about 150,000 duct ft. of the tile and appurtenances.	Stuart F. Day, Secy. Bd. Cont. & S
California	Riverside	May 24	Franchise to run poles and line for conveying electric power on all roads of county.	County Supervisors.
California	Los Angeles	May 29, 2 p.m.	Granting the right for period of 40 years to lay, construct and maintain system of gas pipes under and along roads of Los Angeles County.	H. J. Lelande, County Clerk.
New York	Amsterdam	June 6, 8 p.m.	Lighting streets and public places.	Thos. Hazlett, Clerk.
Alabama	Eufaula	June 7	Constructing an electric light plant complete.	W. L. Upton, Engr. Birmingham.
Georgia	Colquitt	June 10	Improving electric light system to cost \$7,500.	P. E. Willin, Mayor.
FIRE EQUIPMENT				
Virginia	Portsmouth	May 24, 7 p.m.	Furn. 2500 ft. of 2 1/2-in. double jacket, rubber lined, cotton hose with brass couplings.	L. P. Slater, City Clerk.
Oregon	Astoria	May 27, 8 p.m.	Furn. 1,200 ft. 2 1/2" fire hose for Fire Dept.; 200 ft. for Street Dept.	C. E. Foster, Chief Fire Dept.
Dist. of Col.	Washington	June 15, 2 p.m.	Furn. one second size, double action steam fire engine.	Cuno H. Rudolph, Commissioner.
Dist. of Col.	Washington	June 20, 2 p.m.	Furn. 15,000 ft. 2 1/2-in. cotton covered rub. lined fire hose.	Cuno H. Rudolph, Commissioner.
New Jersey	Princeton	July 5	Furn. auto pumping engine.	E. M. Updike, Chm. F. & W. Com.

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
MISCELLANEOUS				
New Jersey	Passaic	May 19, 8 p.m.	Install Police Signal, Fire Alarm and Mun. Tele. Exchange	M. B. Matthews, Chm. Com. Pub. S.
Ohio	Mount Gilead	May 19, 11 a.m.	Furn. iron culvert pipe from 8 to 48-in. diameter	Clinton Sipe, County Auditor.
New York	New York	May 19, noon	Completing an abandoned contract for disposing of all ashes, street sweepings and rubbish that may be delivered on board of deck scows or other vessels at the water front dumps of Dept. of Street Cleaning	W. H. Edwards, Comr. St. Cleaning, J. M. Wilson, City Engineer.
Sask., Can.	Moose Jaw	May 22, 8:30 p.m.	Constructing an incinerator plant	James W. Nelson, Secy. Bd. Pub. W.
California	Oakland	May 22, 10-11 a.m.	Constructing City Hall Building, separate bids on 27 items	John Schutt, Jr., Town Clerk.
New York	Grand Island	May 22, 2 p.m.	Constr. 500 ft. of conc. retain wall, 6-ft. high, 12-in. at top, 24-in. at base	Board Fire Comrs.
New York	New Rochelle	May 23, 8 p.m.	Erecting 2-story fire house	Will B. Jones, County Auditor.
Ohio	Youngstown	May 23, 11 a.m.	Renewing part of the floor of the Market St. Viaduct	G. R. Geary, Mayor.
Ontario, Can.	Toronto	May 23, noon	Building dock in Ashbridge Bay	Calvin W. Hendrick, Ch. Engr. S. C.
Maryland	Baltimore	May 24, 11 a.m.	Constr. office and laboratory building at Back River Disposal Works and constr. san. lateral sewers in Dist. 36 A	Chris. Schrader, Chm. Bd. Pub. Wks. City Clerk.
Indiana	Indianapolis	May 25	Removing garbage	Albert Sahn, County Auditor.
Wisconsin	Cecil	May 25	Constructing new town hall	N. P. Langford, Chairman.
Indiana	Indianapolis	May 27, 10 a.m.	Furn. 2,000 ft. of blue prints for County Surveyor's office; paints, brushes etc., for Marion County Jail; 30 tons of coal for guardian's home	Simon A. Bartholme, Clk. B. P. C.
Minnesota	St. Paul	May 29, 11 a.m.	Erecting Service and Maintenance building at City and County Hospital	Jas. T. Truax, Pr. Levy Crt., Kent Co.
Indiana	Evansville	June 1	Furnishing plans for building to be erected in Sunset Park	M. H. Prall, County Clerk.
Delaware	Dover	June 6, noon	Constructing wharf	
Nebraska	Imperial	June 6, noon	Constructing new court house and jail building	

STREET IMPROVEMENTS

Decatur, Ala.—Council has passed ordinance for paving Ferry st., Lee to Church st., with asphalt macadam.

Marion, Ala.—Perry County will vote June 10 on \$100,000 bonds for building good roads.

East San José, Cal.—Board of Town Trustees has rejected bids for graveling and improving various streets of town; lowest bidder, J. F. Adams, \$25,647.45.

Monrovia, Cal.—City will expend \$40,000 on street improvements.

Sacramento, Cal.—Commissioner of Streets Walter C. Howe has recommended to Board of Public Works that Washington st. between 2d and 4th sts. be repaved with asphalt pavement on concrete foundation.

Hartford, Conn.—Plans have been received by State Highway Commissioner for proposed road work, as follows: From A. S. Brainard, two sections of road in town of Colchester on Hartford-Norwich turnpike, aggregating 10,067 ft.; from S. H. McKenzie, 2,950 ft. on Maple st., Cheshire; from W. H. Knight, 1,900 ft. in town of Sherman, and 6,835 ft. in town of Roxbury; from G. E. Smith, 3,800 lin. ft. on West st., town of Seymour, and 3,825 ft. on the New Haven turnpike, in the town of Orange; from F. H. Oldershaw, 4,700 ft. on South Stanley st., in New Britain; from R. G. Pike, Jr., 6,600 ft. on Middlesex turnpike; town of Middletown; from J. S. Dickinson, 9,050 ft. in the town of Lyme; from A. S. Brainard, 17,300 lin. ft. in the town of East Windsor, 8,925 ft. in the town of Hebron, and 33,450 ft. in town of Marlborough.

New Britain, Conn.—City Engineer F. H. Oldershaw has prepared map for extension of subway in Arch st.

Milford, Del.—Town Council has decided to improve remainder of East Front st., South Milford, beginning at Franklin st. and extending to the town limits by putting down macadam; work of building streets will be under charge of Engineer Herbert Hatton, of Wilmington.

Wilmington, Del.—State Highway Commissioner Pierce has been instructed by the Levy Court to prepare specifications for good roads as follows: Mill Creek, from Hendrickson's farm by Telegraph road to St. James' Church, to Newark by Taylor's factory to Union; White Clay Creek, Newark and Elkton road to Maryland State line, Newark and Elkton road by Cooch's bridge road; New Castle, Hare's Corner to city limits of New Castle; Blackbird, Clayton to Cypress bridge; Red Lion, St. Georges to Kirkwood.

St. Petersburg, Fla.—Citizens will vote June 13 on \$5,000 bonds for street crossings.

Streator, Ill.—City proposes to lay about 20,000 sq. yds. of brick paving and 5,000 ft. of stone curb.—F. W. Herbert, City Engineer.

Huntington, Ind.—Huntington and Wabash County Commissioners have ordered construction of Ditzler road in Dallas Township at cost of \$7,268.

Indianapolis, Ind.—Board of Public Works has asked City Engineer Klausmann to prepare plans for resurfacing Capitol ave., from Washington st. to the Union railway tracks, and Park ave., from St. Clair to 17th st., with asphalt.

Mount Pleasant, Ia.—Hall & Adams, Engineers, Centerville, have been employed as

Engineers for about one mile of brick pavements with asphalt filler; work will soon be advertised.

Lake Providence, La.—State Highway Commission will expend \$15,000 in improving roads.—Gervais Lombard, Chief Engineer.

Lowell, Mass.—Loan order has been recommended by Street Committee for paving of the following streets: Belvide, Knapp ave., \$4,750; Summit st., \$1,325; Stackpole st., \$2,000, and Mansur st., from Wentworth ave. to Parkview ave., \$925; Centralville, Lilley ave. from West 6th st. to Lakeview ave., \$2,350; Dalton st., Lilley ave. to Ennell st., \$600; West 6th st. Ennell st. to Lakeview ave., \$2,350; Otis st., Moore st. to Angle, \$1,075; North st., \$975, and Bourne st., Andrew st. to Angle, \$375; Washington st., \$3,000; Pawtucketville, Moody st., Bridge to 6th ave., \$5,550, and Riverside st., from Moody st. to Bodwell ave., \$4,850.

Buchanan, Mich.—Town and Township are considering \$50,000 bond issue for good roads.

Duluth, Minn.—Cost of improving West 5th st., 23d to 25th st., has been estimated at \$3,222.

Stillwater, Minn.—Board of County Commissioners has set aside from general road and bridge fund sums to be expended in towns under direction of the Supervisors as follows: Stillwater township, \$400; Afton, Cottage Grove, May, Forest Lake, Denmark, Oneka, New Scandia and Woodbury, \$300 each; Lakeland, Grant, Baytown, \$250 each, and \$250 on Briggs road on line between Grant and Stillwater townships.

Virginia, Minn.—City Engineer E. F. Johnson has submitted to Council plans for paving of several avenues and streets.

Bay St. Louis, Miss.—Hancock County has issued \$25,000 bonds for road improvements.

Missoula, Mont.—City contemplates paving of business district and has sent a committee of five business men to make inspection of paving and street improvements in cities of Northwest.

Columbia, Mo.—Council has ordered plans for 6,000 sq. yds. brick pavement, also for pipe sewers to cost about \$4,000.—J. Russell Ellis, City Engineer.

Atlantic City, N. J.—Council has approved plans and specifications for paving New Jersey ave., Magelan ave. to Clam Creek, and for Massachusetts and other avenues.

Camden, N. J.—County Board of Freeholders will improve Camden and Westfield turnpike and resurface White Horse turnpike, West Collingswood to Berlin.

Elmer, N. J.—Salem Freeholders have been petitioned for State road from this town to Mullica Hill.

Montclair, N. J.—Bloomfield ave. will be paved with granite block at a cost of \$100,000.

North Wildwood, N. J.—Citizens have voted \$60,000 bonds for street improvements.

Pitman, N. J.—Council has voted to extend Holly ave. to the Washington Township line, at which point Gloucester County Freeholders will build bridge over Bethel Creek and township will extend street to the Glassboro and Woodbury road.

Trenton, N. J.—Board of Freeholders has decided to improve Trenton, Lawrenceville and Princeton road at cost of \$30,000.

Buffalo, N. Y.—Cost of repaving Lancaster-Alden road with brick has been estimated at \$59,500.

New York, N. Y.—Two macadam roadways in Riverside Drive are to be repaired by the Park Department with asphalt binding for their entire length.

New York, N. Y.—Board of Aldermen has approved resolutions providing for an appropriation of \$400,000 toward work of extending Riverside Drive north of 105th st. to connect with the Henry Hudson Memorial viaduct; also \$400,000 toward widening, regrading, repaving, recurling and otherwise improving 42d, 23d, 34th and other streets.

Syracuse, N. Y.—Council will at once ask for bids for paving Canal st., Pearl st. to Oswego Canal, at cost of \$3,200.

Hamlet, N. C.—Town has voted \$50,000 bonds for street improvements.

Salisbury, N. C.—Iredell County has voted \$400,000 bonds for general road building.

Cincinnati, O.—County Commissioners have ordered repair of Zig Zag road, Cooper ave. to Madison road, at cost of \$8,430.

Columbus, O.—All bids have been rejected for paving Summit st., Eleventh ave. to Mock road; new bids will be asked.

Girard, O.—Council has decided to pave Liberty st. from State st. to railroad tracks.

Middlefield, O.—Harlan Sperry, Village Engineer, has been instructed to prepare plans for paving portions of Elm, Main and North sts.

Eastvale, Pa.—State Highway Commissioner Hunter has notified Council to have the preliminary survey made of street that is affected by petition to the State for paving and grading and to forward same to Harrisburg.

McKeesport, Pa.—City is considering paving of Walnut st. at cost of \$20,000.—J. M. Smith, City Engineer.

Zelienople, Pa.—Town is planning additional street paving.

Pawtucket, R. I.—Special Commission has estimated cost of eliminating grade crossings within city at \$1,220,247.

Pawtucket, R. I.—Board of Aldermen has passed joint resolution appropriating \$1,000 for improvement of Elmdale ave. and \$850 for Japonica st.

Woonsocket, R. I.—Board of Aldermen has passed resolution appropriating \$1,500 for bitulithic pavement in Clinton and Cumberland sts.

Brady, Tex.—Voters of Voca, Mount Tabor and Lost Creek Districts have petitioned for election on \$10,000 bonds to improve roads.

Marlin, Tex.—Council is considering paving of Live Oak st.

Quitman, Tex.—Wood County has voted \$30,000 bonds for road improvements.

Seattle, Wash.—Board of Public Works has adopted plans for grading New Tenth ave.

Spokane, Wash.—Council has approved plans for grading, curbing and sidewalkalking Jefferson st., Wellesley to Garland ave., at an estimated cost of \$13,275; grading, curbing, parking and sidewalkalking 23d ave., Wall to Jefferson st., at cost of \$7,100.

Spokane, Wash.—Council has approved plans, and bids will be asked for grading, curbing, parking and sidewalkalking Lidgerwood st., Liberty to Rowa, at cost of \$27,500; also Thirty-eighth ave., Perry to Grand, \$9,200; plans were also approved for paving Washington st. at cost of \$29,000.

Ronceverte, W. Va.—Citizens will vote on \$10,000 bonds for paving Railroad ave. and several cross streets with brick.

Fond du Lac, Wis.—Council has passed resolutions for macadamizing West Scott

st., Main st. to city limits; Rosendale ave., river to city limits; Military st., Western ave. to city limits, and 4th st., Everett st. to city limits.

Medicine Hat, Alta., Can.—Citizens will vote on \$1,000 by-law for constructing plant sidewalks, \$33,500 for cement sidewalks, \$17,500 for curbs, gutters and boulevards and \$8,000 for street grading.—A. R. Perry, Secretary.

Chilwask, B. C., Can.—Ratepayers have passed \$76,000 by-law for street macadamizing, \$10,000 for drainage and \$10,000 for road machinery.

CONTRACTS AWARDED

Long Beach, Cal.—Paving as follows: Park Circle, to White & Gaskill, \$21,670, and Elliot st., to A. E. Burns, \$22,009.

Los Angeles, Cal.—To L. C. Garnsey, to pave Redondo-Wilmington road, \$45,633.

Bluffton, Ind.—Building two stone roads in Jefferson Township, to J. N. Neff, \$9,767, and to Chas. Nash, \$5,669.

Fowler, Ind.—To P. J. Kennedy, Templeton, by Board of County Commissioners, for construction of Anderson road in Oak Grove Township, \$6,900.

Ft. Wayne, Ind.—Paving, to Moelling Construction Co., city, \$38,724; to Barber Asphalt Paving Co., work to the amount of \$63,868.

Greencastle, Ind.—Paving with asphalt and constructing cement sidewalk four streets around public square, to Madison Construction Co., Anderson, \$21,720.

Indianapolis, Ind.—Building macadam pavement in Maple road, to American Construction Co.

Muncie, Ind.—Paving with brick Jackson st., to John Gubbins & Co., \$15,305.40; Howard st., to William Birch, \$7,158.08; Jefferson st., to William Birch, \$939.22; Liberty st., to William Birch, \$8,255.82.

Vincennes, Ind.—Improvement of Jefferson ave., to P. W. Lenahan, 1,155 cu. yds. excavation, 12c.; 11,628 cu. yds. embankment, 37c.; 3,615 cu. yds. gravel, 80c.; 30,552.6 sq. ft. concrete walk, 10c.; 6,188.6 lin. ft. stone curbing, 42c.; two lines 12-in. sewer, 25c. per lin. ft.

Franklin, Mass.—Furnishing \$3,000 road roller, to Buffalo-Pitts Co., Buffalo, N. Y.

Lawrence, Mass.—Building granolithic sidewalks and curb, to Contractor Wagenbach; coal tar sidewalks, to Wm. P. Rae; top dressing, to C. F. & R. M. Bailey.

Pittsfield, Mass.—Laying 4,000 sq. yds. pavement on Allen, School and Fenn sts., to Daniel J. Walsh, Pittsfield, \$2.58 per sq. yd.

Springfield, Mass.—Cement sidewalk and curb construction; specifications called for the complete laying of 825 sq. yds. of sidewalk and 5,820 lin. ft. of curbing of Portland cement concrete; to C. W. Streeter, 69 Spencer ave., for sidewalks, including excavating and refilling in cinders, 42c. per lin. ft.; to L. C. Baker, New Britain, Conn., for refilling in sand, 95c. per sq. yd.

Duluth, Minn.—Improving Juniata st. with tarson on concrete base, to E. A. Dahl, \$8,249.50.

Hibbing, Minn.—Furnishing 16,000 vit. brick, to C. A. Remington, \$22.50 per thousand.

Collins, Miss.—By Road Commission, to Boyd & Bradshaw, 18 miles of road in Beat Three, of Covington County, \$9,410.

Fulton, Mo.—To Jos. Pope, Jefferson City, for 9,000 sq. yds. brick paving, \$2.13; earth excavation 35c.; 6,000 lin. ft. curbing, 35c.; total, \$23,613; other bidders: Geo. W. Barkwell, \$22,477; Johnson & Hyatt, \$24,923; O. T. Dunlap, \$23,315; Engineer's estimate, \$25,719.30.

Kansas City, Mo.—By Park Commissioners, to E. H. Bradbury, to grade 40th st. between Kenwood ave. and Holmes st.

Metuchen, N. J.—Paving Main st., to Liddle & Pfeiffer, Perth Amboy, 68c. per sq. yd.

Newark, N. J.—Paving Concord and Ruyon sts., to Newark Paving Co., \$7,788 and \$7,634; South and Van Buren sts., to Philip & Peter Janmarone, Belleville, \$21,957 and \$3,816.

New Brunswick, N. J.—Resurfacing Livingston ave. with Bermuda asphalt, to Thos. F. Dunigan, Woodbridge, \$1.04 per sq. yd.

South Orange, N. J.—By Township Committee for oiling roads, to Walter S. French Co., of Moorestown.

Albany, N. Y.—To Dollard & Herran for relaying 5,000 ft. curb, 15c.; laying 400 lin. ft. new curb, 70c.; 8 new catch basins, \$50; one moving catch basin, \$50; 10,514 sq. yds. Jamestown brick, \$2.21, city's portion; total cost, \$24,715.94; 3,277 sq. yds., Albany & Southern Railroad's portion, \$2.32.

Brooklyn, N. Y.—Regulating and repaving with grade No. 1 granite on a concrete foundation Bay Ridge ave. from Shore road to 3d ave., to John J. Durkin, 1 Madison ave., New York City, as follows: 11,400 sq. yds. grade 1 granite pavement with ce-

ment joints, 1 year maintenance, \$2.73; 1,900 cu. yds. concrete for pavement foundation, \$1.40; 2,230 lin. ft. new curbs set in concrete, 90c.; 3,350 lin. ft. old curbs reset in concrete, 40c.; total, \$42,829; totals of other bids: M. J. O'Hara, 557 3d st., Brooklyn, \$43,083; Henry J. Mullen, 289 Fulton st., Jamaica, L. I., \$43,883; Richard L. Russell, 186 Remsen st., Brooklyn, \$46,337; MacFarlane Construction Co., 165 9th ave., Brooklyn, \$44,241; John J. Guinan, Gravesend ave. and Neck road, Brooklyn, \$41,442; John F. O'Brien, 740 4th ave., Brooklyn, \$44,788; M. F. Hickey, 6th st. and 2d ave., Brooklyn, \$43,563; Newman & Carey Co., 215 Montague st., Brooklyn, \$44,040; Norton & Gorman Construction Co., 301 Douglas st., Brooklyn, \$46,258; regulating and repaving with asphalt on a concrete foundation (a) of Essex and Linwood sts., (b) Greene ave., to Barber Asphalt Paving Co., (b) \$33,136; to Uvalde Contracting Co., (a) \$17,949; Borough Asphalt Co. bid on (a) \$17,988; regulating and repaving with wood block on concrete foundation Clinton ave. from Park ave. to Willoughby ave., to the U. S. Wood Preserving Co., 29 Broadway, New York City, as follows: 7,445 sq. yds. wood block pavement, 5 years' maintenance, \$2.38; 7,445 sq. yds. present asphalt pavement and foundation to be removed, 32c.; 30 sq. yds. old stone pavement to be relaid, 40c.; 1,140 cu. yds. concrete for pavement foundation, \$5.25; 1,605 lin. ft. new curbs set in concrete, \$1; 1,255 lin. ft. old curbs reset in concrete, 40c.; 12 noiseless covers and heads for sewer manholes, \$12; total, \$28,349; totals of other bidders: Barber Asphalt Paving Co., New York City, \$28.99; Republic Construction Co., 18 Broadway, New York City, \$28,552.

Buffalo, N. Y.—To Constantine Construction Co. for paving Milton st., 28 ft. wide, with round edge shale brick on concrete base, between Seneca st. and the Pennsylvania Railroad, and to German Rock Asphalt and Concrete Co., Ltd., for paving Sanford st., 26 ft. wide, with standard asphalt, between Dewey and Leroy aves.

Depew, N. Y.—Paving Broadway, 2.3 miles in length, with brick, to Edward T. Beck & Co., Warren, Pa., \$53,750.

Lancaster, N. Y.—To Niagara Contracting Co., Corning, for paving with brick principal streets, \$68,800.

New York, N. Y.—Paving with asphalt decks of certain piers of East and Harlem Rivers; Class 1, to Barber Asphalt Paving Co., 30 Church st., \$1.19 per sq. yd.; class 2, to Sicilian Asphalt Paving Co., 41 Park Row, \$1.19 per sq. yd.; class 3, 4, 5 and 6, to Uvalde Asphalt Paving Co., 1 Broadway, \$1.18, 90c., 90c. and 84c., respectively.

Rochester, N. Y.—Laying Medina block stone pavements on Clinton ave. South, Griffith to South Goodman st., to Hageman, Miller & Hageman, \$73,103; from South Goodman st. to city line, to H. N. Cowles, \$43,446.

Seneca Falls, N. Y.—To Patrick D. Conley, Ithaca, for paving State st. and East and West Bayard sts., by Village Board; \$17,000 for macadam paving in West Bayard st., \$27,800 for brick in East Bayard st., and about \$9,300 in State st. for brick.

Utica, N. Y.—Renaving with creosoted wood blocks the viaduct over Ballau Creek at Rutger st., to Harry W. Roberts & Co., \$5,825, the same to be completed by July 1.

Yonkers, N. Y.—Repairing asphalt streets for one year, to Hearn & Hart.

Fargo, N. D.—To Ira Eddy for laying cement sidewalks for season, \$1.25 per yd.; refilling, 80c. per yd.; to Robert Johnson for laying tile sidewalks, \$1.09 per yd.

Cincinnati, O.—Furnishing crushed stone and screening for the use of the street and sewer repair department, to the Tarco Construction Co., \$24,127.50 for crushed stone and \$5,859.50 for screenings.

Cincinnati, O.—Brick paving on eight alleys, to Evan Evans, \$5,965.50.

Chardon, O.—Grading and paving, to Cement Product Co., Erie, Pa., \$20,385; other bidders: Linniger & Bennet, \$28,337; C. J. Chinnock, \$21,877; Gould & Maybach, \$21,052; Advance Construction Co., \$20,816.

Marion, O.—Constructing Wildcat pipe, 6 1/2 miles long, in Big Island and Montgomery Townships, to J. M. Stone, Marion, \$25,900; other bidders: E. C. Brady, \$27,200; Uncapher & Shaw, \$27,186; P. Drake & Sons, \$29,910; Carrol & Hoyle, \$26,975.

Youngstown, O.—Repairing Market st., between viaduct and Warren ave., to Jas. McCarron, \$27,609; grading main entrance to Lincoln Park, to Kennedy Bros., \$1,900.

Portland, Ore.—Paving East Morrison st. with wood block, to Carbolineum Wood Preserving Co., \$18,655; Commercial st., to Consolidated Contract Co., J. N. Johnson, President, \$26,610.

Salem, Ore.—Paving with bitulithic Liberty st., to Warren Construction Co., Oregonian Bldg., \$1.85 per sq. yd.

Ashland, Pa.—Grading and paving with vit. brick Centre st., approximately 7,000 sq. yds., to Coryell Construction Co., of Williamsport.

Bradford, Pa.—Paving Webster st., 2,623 sq. yds., with brick, to M. Applegate & Son, \$2.06 per sq. yd.; 787 cu. yds. excavation, 55c.; cement sidewalks, to J. Sheehan.

Erie, Pa.—Building concrete top for Mill st. culvert, to O. S. Riblet, \$925 for work complete.

Scranton, Pa.—Furnishing stone crusher and bin, to Good Roads Machinery Co., \$1,159.

Pascoag, R. I.—Paving Main st. with granite blocks, to Fred L. Mathewson, Harrisville, \$2.25 sq. yd.

Austin, Tex.—Paving, as follows: To Dallas Bitulithic Co., for 37,778 sq. yds. bitulithic at \$2.278 per sq. yd., total \$86,058, and to Knox Johnson for 7,933 sq. yds. wood blocks, \$2.325 per sq. yd., or total of \$18,144.

Portsmouth, Va.—Street work in Sixth Ward: Grading Glasgow st., Scott's Creek to city limits, to E. P. Lindsay, \$2,431; curbing same thoroughfare, to F. J. McGuire, \$2,987; paving Glasgow st. with 4 1/2-in. concrete base, 2 1/2-in. macadam top with tarvia binder, to F. J. McGuire, \$6,760.20; total cost of paving will be \$12,178.20; grading County st., Chestnut to Rose st., to E. P. Lindsay, \$4,207; Pearl st., County to South st., to E. P. Lindsay, \$1,039; placing granite curb in County st., Chestnut st. to Rose st., F. J. McGuire, \$5,800; paving County st., Chestnut to Rose, 4-in. concrete base with 2 1/2-in. macadam top, with tarvia binder, to F. J. McGuire, \$22,104.60; the Air Line turnpike from Rose st. to the city limits, with macadam, to F. J. McGuire, \$2,679; bring the rails of the Traction Company on County st. up to grade, to F. J. McGuire, \$2,500.

Milwaukee, Wis.—Furnishing 16,500 cu. yds. of crushed stone, to Wisconsin Stone Co., \$1.23 for west side and 9,000 cu. yds. for south side, \$1.25.

Green River, Wyo.—By city, to Geo. Durnford, of Evanston, for construction of 18 blocks of cement sidewalk and 20 street crossings.

BIDS RECEIVED

Indianapolis, Ind.—Paving Locke st., Walnut st. to Indiana ave., American Construction Co., brick, \$2.33 per lin. ft. on each side and street and alley intersections, \$1.150; Marion County Construction Co., asphalt or bitu mineral, \$3.30 per lin. ft. for each side and street and alley intersections, \$1,120.

Saginaw, Mich.—Paving with asphalt, W. N. Sager, \$1.49 1/2; Quinlan Asphalt Co., Syracuse, N. Y., \$1.64; Cleveland Trinidad Co., \$1.58, and Carpenter & Anderson, Grand Rapids, \$1.50; brick, Z. & J. La Londe, Saginaw, and E. W. Reed, Detroit, \$1.42 each, and A. Gelinas & Sons, \$1.44; Saginaw material was named in all brick proposals: fifteen streets are to be paved.

Atlantic City, N. J.—Paving Vermont and other avenues, W. R. Keith, brick gutter, \$2.52; bituminous, \$2.66; bituminous old fill, \$2; gutter, \$2; rock, ton, \$2.50; curb, 70c.; United Paving Co., brick gutter, \$2.57; bituminous, \$2.62; bituminous old fill, \$1.95; gutter, \$2; rock, ton, \$2.56; curb, 68c.; Standard, New York, brick gutter, \$2.62; bituminous, \$2.68; bituminous old fill, \$2.02; gutter, \$2.05; rock, ton, \$2.45; curb, 74c.; paving Congress ave., Calloway pl. and Euclid ave., United Paving Co., gutter, \$2.57; bituminous, \$2.62; curb, 68c.; W. R. Keith, Rockford, Mass., gutter, \$2.52; bituminous, \$2.66; curb, 70c.; Standard, gutter, \$2.62; bituminous, \$2.68; curb, 74c.

Fulton, Mo.—Paving with macadam with binder, Jos. Pope, Jefferson City, lowest bidder, West 7th st., excavation, 30c.; curbing, 33c.; macadam, 63c. and parking, 5c.; East 5th st., 30c., 33c., 82c. and 3c.; totals, \$4,587.25 and \$8,287.87; Engineer's estimate, \$4,837.81 and \$9,481.85; other bidders: Johnson & Hyatt, \$4,710.20 and \$8,734.11; Geo. W. Barkwell, \$4,621.87 and \$9,009.23; O. T. Dunlap, \$5,963.88 and \$10,567.96.

Newark, N. J.—Resurfacing number of roads with stone, supplying of broken stone for others and the use of amesite for resurfacing; Springfield ave., Stuyvesant ave. to Rahway River, 10,000 ft., Millburn Trap Rock Co., 18c. per sq. yd.; Northfield road, on easterly slope of First Mountain, 2,000 ft., Daniel J. O'Rourke, 35c.; Mt. Pleasant ave., Prospect ave. to Rahway River, 2,500 ft., Donato Fusco, 37c.; Little Falls road, Montclair, 2,000 ft., Robert Doriety, 31 1/2c.; Mt. Hebron road, Montclair, 2,000 ft., Robert Doriety, 38 1/2c.; Grove st., Montclair, 8,000 ft., Osborn & Marcellus, 32c.; Sanford ave., Irvington, 6,000 ft., R. H. Kernan and Ludwig Bolt, tied, 35c.; Stuyvesant ave., Irvington, 10,000 ft., R. H. Kernan, 38c.; Grove st., East Orange, 2,500 ft., Eagle Rock ave., different sections, 5,500 ft., P. A. Matthews, 30c.; Ridge road, south end, 3,000 ft., P. A. Matthews, 30c.; Pompton turnpike, Bloomfield ave. N., 3,000 ft., F. H. Marley, 24c.; South Orange ave., Centre st. W., 2,000 ft., R. H. Kernan, 29 1/2c.

Geneva, O.—Paving Main St. (A) E. A. Freshwater & Sons, awarded contract, for Century block, \$46,437; (B) Ohio Engineering Co.; (C) The Buckeye Engineering Co.; (D) The Enterprise Paving & Construction Co.; (E) H. N. O'Berlander; (F) Wilson & Harper; (G) Geo. M. Harris; (H) Downs & Campbell; (J) J. J. & K. W. Burns; (K) Gould & Mayback; (L) Baldwin Bros.; (M) Wm. E. McHugh; (N) Hewitt Construction Co.

Table with 13 columns (A-N) and multiple rows of construction items and their corresponding costs. Items include grading, foundation, block paving, curbs, sewers, manholes, and sheet piling.

Paving Broadway, to same, for century block, \$34,823; bids for material were practically same as above.—Cummings & Downer, Painesville, Engineers.

Philadelphia, Pa.—Asphalt repairs to traction streets, Filbert Paving and Construction Co. bid 63c. per sq. yd. and the Barber Asphalt Co. 54c.; granite block along rails and between rails, Filbert Co. 15c., and the Barber, 20c. per yd.

Vancouver, B. C., Can.—Grading 12th ave., Granville to Hemlock, A. R. Gibson, \$6,975; M. P. Cotton, \$8,287.50; H. V. Tucker, \$6,630; R. J. Preston, \$8,287.50; Cleland & McLeod, \$8,840; LaPlace Bros., \$6,398; tenders for grading, grade 13th ave., Spruce to Birch, Cleland & McLeod, \$5,149.90; A. R. Gibson, \$5,500; D. Matheson, \$5,149.90; LaPlace Bros., \$5,989.20; 11th ave., Spruce to Alder, Cleland & McLeod, \$4,100; A. R. Gibson, \$3,950; LaPlace Bros., \$4,359; 12th ave., Spruce to Alder, Cleland & McLeod, \$4,131; D. Matheson, \$4,712; A. R. Gibson, \$4,050; LaPlace Bros., \$4,608; 12th ave., Main to Sophia, Cleland & McLeod, \$2,600; LaPlace Bros., \$2,841; bitulithic paving on 12th ave., two sections, Columbia Bitulithic Co., from Bridge to Columbia, \$14,300; from Columbia to Main, \$20,891.34.

SEWERAGE

Oxford, Ala.—Election on \$12,000 bonds for sewerage improvements has been postponed until May 29.

Pollard, Ala.—City has decided to construct sewer system.

Orland, Cal.—Citizens have voted \$25,000 bonds for sewer system.

St. Petersburg, Fla.—Citizens will vote June 13 on \$5,000 bonds for sewers.

Collegepark, Ga.—City has engaged Doak & McKechnie, of Greenville, S. C., as Engineers in charge of installation of sewerage and water works.

Unadilla, Ga.—City is considering installation of sewers; Engineer C. F. Wagner, representing J. B. McCrary Co., Atlanta, will run town line of streets and prepare map.

Brazil, Ind.—Plans have been prepared for sewer work including 20,000 ft. of concrete sewer and 3,000 ft. of sewer pipe.—Frank Kattman, City Engineer.

Fairfield, Ia.—Hall & Adams, Centerville, have been selected as engineers to prepare plans for installation of complete sanitary sewer.

Reed City, Mich.—Council has passed resolution directing the President to engage engineer to prepare plans for sewer system and rehabilitation of water works.

Proctor, Minn.—Bond issue for construction of sewers is being considered.

Billings, Mont.—Council is considering resolution for forming of sewer district in North Elevation subdivision; system will include 9,000 lin. ft., 8- and 10-in. pipe, 26

manholes, seven flush tanks and 6,556 cu. yds. of excavation; total cost, \$12,497.

Ocean City, N. J.—Citizens have defeated \$75,000 bond issue for storm water drainage.

Seaside Park, N. J.—Borough Council is considering \$35,000 expenditure on sewer, water and light plant.

Roswell, N. M.—Council has authorized building of \$3,400 ft. of sewer to extend system into Lea subdivision.

Carey, O.—Riggs & Sherman, of Toledo, have been selected to prepare plans and specifications for sewer and sewage disposal plant.

Girard, O.—Council has adopted set of storm sewer plans as prepared by City Engineer Wm. Wilson; cost \$8,000.

Hilliard, O.—Citizens voted \$8,000 bonds for sewer system.

Bristol, Pa.—Changes will be made in proposed sewage disposal plant on suggestions by Dr. Dixon; sterilization plant will be installed instead of sand filters as originally proposed, while Imhoff digesters will be installed instead of septic tanks, and sprinkling filters instead of concrete beds; site of plant will be changed to higher ground, and to a point 500 ft. nearer Pennsylvania Railroad tracks.

Sharon, Pa.—Trimble & Miller, of Pittsburgh, are preparing plans for sewage disposal plant.

Zellienople, Pa.—Town is planning additional sewerage.

Pawtucket, R. I.—Joint resolution has been passed by Board of Aldermen appropriating \$1,350 for sewer in Rhode Island ave.

Woonsocket, R. I.—Board of Aldermen has passed ordinance for construction of sewers in Harrison ave. and Glen road.

Bastrop, Tex.—Sewerage system will be at once installed in Main st.; later will be extended over all parts of city.

Itasca, Tex.—Citizens have voted to install sewerage system.

Slaton, Tex.—City is considering installation of sewerage system.—J. S. Edwards, Mayor.

Ronceverte, W. Va.—Citizens will vote on \$5,000 bonds for extension of sewer and water systems.

Milwaukee, Wis.—Special Sewerage Commission, J. W. Alford, Chairman, has recommended entire rearrangement of city's sewerage system by erecting miles of main intercepting sewers along river front at cost of \$2,213,000; purification plants on shore of Kinnickinnic River, \$933,000, and on lake shore, \$2,668,000; flushing tunnel for Menominee River, \$1,162,000; sewage pumping plant, \$669,000; low level interceptors, \$4,110,000, and installation of complete filtration plant, \$1,500,000.

Green River, Wyo.—Surveys and estimates have been made for 2,500 ft. of 8-in. sewer with 8 manholes, which will be an extension to present city sewer system. Turpin & Eldridge, Civil Engineers, of Itawilla, are Engineers for this work.

Camrose, Alta., Can.—Ratepayers have voted \$83,000 for construction of sewerage and water works systems.

CONTRACTS AWARDED

Bement, Ill.—To Arthur Birt, Decatur, by the Board of Local Improvements, for the furnishing of material and construction of system of storm sewers and also an out-flow drain.

Galva, Ill.—Building sewer, to R. C. Richter, of Manitowoc, Wis., \$15,702.

Gibson City, Ill.—To Frank Sullivan, Bloomington, by Town Board, for sewer work, \$2,500.

Peoria, Ill.—To Ottawa Construction Co., Ottawa, for construction of the Swinnerton st. sewer.

Kokomo, Ind.—Building intercepting sewer, to Michaels-Minnick Co., Marion, \$47,041.45; only other bidder, Reliable Construction Co., Indianapolis, \$47,700.

Kokomo, Ind.—Construction of sewers, to Michael & Murnick, Marion, \$47,041.11; other bidder, Reliable Construction Co., Indianapolis, \$47,700.

Cloquet, Minn.—Extending sewer and water system, to Pastoret-Lawrence Co., Duluth, \$23,398.43.

Duluth, Minn.—Laying storm sewer in 6th ave. West, to P. McDonnell, \$12,761.10.

Deming, N. M.—Constructing a sanitary sewer system, to G. Jaeger, of Rich Hill, Mo., \$34,940; contract calls for 38,600 ft. sewer, 80 standard manholes, 5 flush tanks, one double compartment septic tank, etc.—W. B. Bullock, Kansas City, Mo., Engineer.

Utica, N. Y.—Construction of a sewer in Warren ave., Holland ave. to Genesee st., to Jeremiah Augar, \$2,065.50.

Farago, N. D.—To Gilbert W. Haggert for building sewers on 9th st., \$1.24 per lin. ft.; \$50 for manholes and \$50 for catch basins; on 10th st., to same, \$1 per ft., \$50 for manholes and \$50 for catch basins.

Hubbard, O.—Construction of a sewer system and disposal plant, to Harry Baxter, Lorain, \$23,269.65.

Doylestown, Pa.—Reconstructing sewage disposal beds, to Julian M. Solomon, Jr., 30 N. 7th st., Philadelphia.—Wm. Bishop, Superintendent.

Erie, Pa.—Building 9-in. sewer in East 14th st., to F. J. Eichenlaub, \$4.50 per ft. for pipe and \$150 for manholes.

Kenosha, Wis.—To White Construction Co. for building main sewer of concrete, \$97,200.

BIDS RECEIVED

Washington, D. C.—Bids were received as follows on May 1 by District Commissioners for construction of sewers in Cleveland Park: George Hyman, excavation, \$2,40; sewer brick masonry, \$14; 10-in. sewer, 55c.; Warren F. Brenizer Co., excavation, \$1,40; sewer brick masonry, \$14; 10-in. sewer, 70c.

Butler, Pa.—Sewer on Miller st., W. J. Eury, 6-in. sewer, 38c.; 8-in. sewer, 43c.; N. J. Boyer, 8-in., 40c.; 6-in., 35c.; 4-in., 33c.; flush tanks, \$65; "Y" branches, 30c.; F. E. McQuiston, 6-in., 44c.; 8-in., 47c.; manholes, \$25; flush tanks, \$60; laterals, 35c.; "Y" branches, 35c.; Tony Morelli, 4-in., 34c.; 8-in., 44c.; flush tanks, \$65.25; "Y" branches, 65c.; manholes, \$35.50; section of sewer on 4th st., J. E. Huselton, 8-in., 55c., 4-in., 45c., "Y" branches, 35c. extra; W. J. Eury, 45c.; "Y" branches, 44c.; laterals, 35c.; N. J. Boyer, 8-in., 60c.; 6-in., 35c.; "Y" branches, 35c.; H. A. McNamee, 8-in., 75c.; 4-in., 60c.; "Y" branches, 50c.; Tony Morelli, 8-in., 48c.; 4-in., 35c.; "Y" branches, 75c.

WATER SUPPLY

Booneville, Ala.—Booneville Oil and Gas Co. is considering construction of water works and gas plant; has applied for franchise.

Pollard, Ala.—City will construct water works and sewer system, including pipe 6 ins. in diameter to depth of 800 to 1,000 ft., where it is expected to secure flow of water which will rise to height of 60 ft. from ground; water will flow into tank of about 35,000 gals. capacity.

Doris, Cal.—City has sold \$12,500 water bonds to G. G. Blymer & Co., San Francisco.

Orland, Cal.—Citizens have voted \$25,000 bonds for water works system.

Milton, Del.—Council has commissioned George E. A. Fairley, Baltimore, to make plans for water system of artesian wells and standpipe.

Washington, D. C.—American Consul in an European country reports that Mayor of a city in his district has applied for information regarding pumps run by electricity; the Mayor desires to install in the city wells pumps of this character, and wishes to be put in touch with manufacturers. Address No. 6686, Bureau of Manufacturers.

St. Petersburg, Fla.—Citizens will vote June 13 on \$5,000 bonds for extension of water works.

Collegepark, Ga.—City has engaged Doak & McKechnie, Greenville, S. C., as Engineers in charge of installation of water works and sewerage.

Tallapoosa, Ga.—Citizens will vote on \$25,000 water works bonds to purchase water works system now in operation, and improving same by installing filtering system and adding other improvements.

Idaho, Ida.—Council is considering installation of water works.

Hammond, Ind.—W. F. Brunt, 25 Marion st., will purchase power-driven diaphragm pump.

Richmond, Ind.—Board of Works has advertised for bids for supplying water to citizens of Richmond from five to twenty-five years.

South Bend, Ind.—Complete rehabilitation of the city water works system at expense of approximately \$335,500 has been recommended by Clinton S. Burns, of Burns & McDonnell, Hydraulic Engineers, Kansas City, Mo.; work includes pumping station in the northwest section of city, the cost of which will be \$25,000; auxiliary station in Leeper Park, costing \$7,200; water tower in the south end, \$18,700; new lines and extensions, \$110,000; 5,000,000-gal. reservoir, \$43,500; new wells, \$20,000, and 8,000,000-gal. capacity engine, \$30,000.

Blockton, Ia.—Citizens will vote on installation of \$15,000 water system.

Fairfield, Ia.—Hall & Adams, Centerville, have been selected as engineers to prepare plans for improvements to water works plant, including filtration plant.

Shelbyville, Ky.—Charles E. Collins, Consulting Engineer, Drexel Bldg., Philadelphia, is preparing plans for concrete dam for Shelbyville Water and Light Co.

Kentwood, La.—Town is being surveyed for location of water works and electric light system.

North Haven, Me.—City proposes to construct water works.—J. O. Brown, Town Clerk.

Lynn, Mass.—Council has authorized \$75,000 bond issue to cover cost of installing pump at Montrose, pump at the easterly end of Glen Lewis Pond, laying of pipe line from the proposed Glen Lewis pumping station to Breed's Pond, and preparation of plans for raising of Breed's Pond Dam to a height of 51 ft.

Worthington, Mass.—Water Commissioners of Worthington Fire District have engaged E. E. Davis, Northampton, civil engineer, to make necessary surveys and estimates for water supply.

Oswosso, Mich.—Superintendent of Public Works has recommended improvements to water works.

Eveleth, Minn.—Installation of new and enlarged water main is being considered.

Ossipee, N. H.—Dudley & Sawyer, Manchester, are preparing plans for water works for the Ossipee Water Co. to supply village of Moultonville, Mountainview and Center Ossipee with water by gravity from Dam Hole Pond.—Col. L. A. Merow, President.

Seaside Park, N. J.—Borough Council is considering \$35,000 expenditure on water, sewer and light plant.

Bloomingsdale, N. Y.—Village has sold \$15,000 water bonds and will at once install system.

Fredonia, N. Y.—Board of Trustees has decided to engage Frederick K. Wing, of Buffalo, to look over situation in regard to proposed improvements at the water works and pass on feasibility of plans that already have been drawn; plans call for expenditure of \$16,000.

Granville, N. Y.—Charles E. Collins, Consulting Engineer, Drexel Bldg., Philadelphia, Pa., is preparing plans for improvements to water works, including concrete reservoir, filtration plant, a pumping station of about 2,000 gals. per minute capacity and about two miles of 12-in. c.i. mains.

Lyons, N. Y.—Citizens have defeated \$4,000 appropriation for pure water supply.

Newport, N. Y.—Morrell Vrooman, of Gloversville, is preparing plans for proposed water distribution system.

New York, N. Y.—Board of Estimate has approved plan of Commissioner Thompson for completion of easterly basin of Jerome Park reservoir, and construction of sand filtration plant for purification of the water from Croton watershed; \$8,690,000 corporate stock will be issued to carry out the proposed improvements.

Morgantown, N. C.—Citizens have voted \$35,000 bond issue for water works.

Zanesville, O.—Johnson & Fuller, 150 Nassau st., New York, N. Y., have been selected as engineers to design system of water works.

Hermiston, Ore.—John T. Whistler has been engaged by Council to make a survey of city and report on the most feasible plan for water system.

Franklin, Pa.—City will expend about \$23,000 for improvements to include pump, boiler, etc.—Phil. Heid, Superintendent Water Works.

Junlata, Pa.—H. C. Linton, Altoona, is preparing plans for water works; cost \$25,000.—W. H. Baird, Borough Clerk.

Montrose, Pa.—Council is considering resolution that committee be appointed to in-

Easton, Md.—Building sewer and sewage disposal plant, bids received Apr. 15: (A) Heins & Hayman, successful bidders, \$37,011.78; (B) United Paving Co., Atlantic City, \$39,117.06; (C) Coryell Construction Co., Williamsport, Pa., \$40,239.15; (D) B. F. Sweeten & Son, Camden, N. J., \$40,262.76; (E) D. M. Andrew & Co., \$40,733.04; (F) Hard & Worm, New York, \$41,285.77; (G) J. B. O'Rourke (K) Kingdon Construction Co., Baltimore, \$46,353.05; (L) Wm. C. Evans, Ambler, Pa., \$51,867.17; Clyde Potts, 30 Church St., New York City, Engineer.

Item.	Quan.	A.	B.	C.	D.	E.	F.	G.	H.	J.	K.	L.
8" pipe 0-6 cut	1,787	.39	.43	.45	.45	.52	.44	.53	.45	.53	.45	.56
8" " 6-8	9,715	.48	.46	.58	.52	.64	.48	.55	.53	.59	.54	.74
8" " 8-10	9,620	.59	.60	.70	.68	.75	.54	.70	.69	.80	.75	.95
8" " 10-12	1,075	.75	.76	.82	.88	.87	.70	.84	.95	.99	.95	1.29
8" " 12-14	..	1.18	1.06	.95	1.13	1.10	.85	1.30	1.45	1.21	1.04	1.70
10" " 0-6	..	1.90	1.73	1.20	1.96	1.60	1.46	2.75	3.00	1.70	1.15	2.85
10" " 6-8	820	.54	.51	.54	.53	.68	.56	.59	.65	.70	.59	.66
10" " 8-10	1,790	.69	.68	.80	.76	1.00	.65	.65	.77	.79	.74	.82
10" " 10-12	1,425	.81	.85	.91	.96	1.16	.80	.97	.80	1.05	.85	1.14
10" " 12-14	365	1.22	1.15	1.05	1.25	1.37	.95	1.47	1.50	1.30	1.00	1.37
10" " 14-18	..	2.00	1.83	1.35	2.00	1.80	2.05	3.00	3.00	2.19	1.13	1.71
12" " 0-6	2,215	.58	.65	.60	.65	.69	.59	.69	.75	2.19	1.24	2.90
12" " 6-8	525	.70	.71	.75	.72	.96	.65	.69	.75	.74	.69	.78
12" " 8-10	40	.84	.81	.90	.88	1.09	.65	.79	.83	.92	.81	.97
12" " 10-12	635	1.05	.97	1.03	1.08	1.23	.90	1.10	.97	1.19	.95	1.25
12" " 12-14	430	1.35	1.33	1.17	1.37	1.41	1.01	1.15	1.25	1.44	1.12	1.49
12" " 14-18	110	2.10	1.95	1.49	2.37	1.90	2.20	3.50	3.00	2.44	1.50	2.95
12" " 18 up	..	2.30	2.79	2.00	3.00	2.50	4.10	5.00	5.00	3.07	1.86	3.50
15" " 0-6	720	.68	.76	.74	1.35	.87	.78	.85	1.00	.97	.85	1.02
15" " 6-8	200	.88	.89	.93	1.50	1.04	.80	1.00	1.15	1.15	.96	1.21
15" " 8-10	..	1.12	1.56	1.10	1.75	1.40	.82	1.15	1.25	1.48	1.14	1.55
15" " 10-12	..	1.48	1.67	1.24	2.00	1.75	1.13	1.50	1.50	1.78	1.31	1.85
15" " 12-14	..	1.97	2.03	1.40	2.25	2.10	1.24	1.75	1.85	2.11	1.59	2.40
Manholes 10' and under	118	38.00	49.83	52.00	35.00	35.00	61.50	42.00	39.00	40.00	55.00	58.00
Extra depth M. H. per ft.	20	3.80	4.98	3.40	4.00	4.00	4.00	5.00	4.50	4.00	3.80	4.50
Flap valves for F. T.	32	12.00	13.35	17.50	7.50	12.00	11.50	12.00	15.00	15.00	15.00	7.00
Water con. to F. T.	32	8.50	6.43	10.00	15.00	15.00	21.50	10.00	10.00	10.00	7.20	10.00
Deep house con.	200	.30	.23	.12	.50	.60	6.50	10.00	10.00	7.00	6.75	12.00
Lumber foundations, bd. ft.	10,000	39.00	34.50	40.00	35.00	35.00	45.00	35.00	35.00	40.00	45.00	45.00
Lumber sheeting, bd. ft.	10,000	25.00	40.25	25.00	35.00	15.00	50.00	30.00	30.00	25.00	32.00	35.00
Cast iron pipe	3 T.	40.00	40.25	35.00	50.00	35.00	37.50	45.00	50.00	50.00	37.50	33.00
Extra concrete, yds.	10	7.00	7.36	8.00	10.00	9.00	11.50	8.00	8.00	9.00	8.00	7.00
Fill, yds.	200	.40	.69	.50	.75	.25	.85	.60	.50	1.00	.25	.60
N. settling and sterilizing tank minus engine and pump	..	4,600.00	4,538.53	3,750.00	3,725.00	3,200.00	4,950.00	4,950.00	5,700.00	5,400.00	5,900.00	4,800.00
S. settling and sterilizing tank minus engine and pump	..	4,200.00	4,232.62	3,500.00	3,625.00	3,200.00	4,435.00	4,800.00	5,000.00	4,500.00	5,540.00	4,500.00
North sludge bed	..	700.00	756.15	900.00	1,600.00	1,266.00	1,370.00	1,000.00	1,350.00	800.00	1,400.00	1,385.00
South sludge bed	..	700.00	756.15	900.00	1,800.00	1,266.00	1,370.00	1,000.00	1,350.00	800.00	1,400.00	1,385.00
Engine and pump for N. tank	..	750.00	939.75	700.00	770.00	650.00	450.00	800.00	700.00	700.00	500.00	850.00
Engine and pump for S. tank	..	750.00	939.75	700.00	770.00	650.00	450.00	800.00	700.00	700.00	500.00	850.00
House connections	..	.38	.40	.35	.65	.60	.96	.45	.35	1.50	.35	.37

OGDEN CITY, UTAH.—CONCRETING CITY RESERVOIR NO. 1; CONTRACT AWARDED TO MORAN CONTRACTING CO.

Description.	Estimated Quantities	MORAN CONTRACTING CO.	MCKAY & REED.	J. P. O'NEILL CONS. CO.	GILLIS CONS. CO.	LYNCH CAN-NON ENGR. CO.	WHEEL-WRIGHT CONS. CO.	WILLIAM DOYLE.
		Price.	Price.	Price.	Price.	Price.	Price.	Price.
Excavation	12,618 cu. yds.	\$0.20	\$0.30	\$0.40	\$0.46	\$0.36	\$0.50	\$0.55
Concrete in outlet gate chamber	53 cu. yds.	6.80	9.00	9.00	9.00	12.00	9.00	9.00
In reservoir	1,502 cu. yds.	6.80	6.90	7.00	7.00	7.54	7.00	6.95
Outlet gate house	Complete	150.00	125.00	36.00	7.00	110.00	75.00	225.00
Hauling and laying Matthewson Joint Pipe								
12-inch diam	110 lin. ft.	.40	.15	.44	.10	.25	.24	.46
20-inch diam	100 lin. ft.	.60	.30	.54	.10	.30	.40	.70
24-inch diam	120 lin. ft.	.90	.40	.65	.10	.35	.48	.84
Hauling and laying vitrified cement pipe								
6-inch	350 lin. ft.	.20	.06	.08	.10	.12	.1	.17
8-inch	25 lin. ft.	.30	.10	.12	.10	.18	.16	.40
10-inch	25 lin. ft.	.35	.15	.18	.10	.23	.20	.48
12-inch	100 lin. ft.	.40	.20	.34	.10	.29	.24	.50
Constructing and erecting fence	750 lin. ft.	1.33	1.20	1.08	1.00	1.18	1.50	1.43
Removing old material	Complete	.....	.....	8.00	.....	50.00	50.00	150.00
Hauling and setting								
Setting 36x36-inch C.L. gratings	1 only	7.00	2.00	5.50	10.00	5.00	2.00	5.00
Setting 12x18-inch gratings	6 only	1.25	.50	1.00	10.00	2.00	2.00	3.00
Totals		\$14,597.85	\$15,797.95	\$17,276.60	\$17,698.28	\$17,746.31	\$18,763.00	\$19,679.20

investigate ways and means of installing water plant to be operated by borough.

West Chester, Pa.—Council has decided to install larger water mains.

Arlington, Tenn.—City is considering installation of water plant; cost \$6,000.

Terrell, Tex.—Commission has ordered purchase of 22,200 ft. of new 8-in. water main to be installed on North Rockwall ave.

Camrose, Alta., Can.—Ratepayers have voted \$83,000 for construction of water works and sewerage systems.

London, Ont., Can.—Tenders will soon be asked for three or four deep wells with 8-in. casing, about 12,700 ft. of 4-in., 6-in. and 8-in. c.-i. water pipe, about 35 hydrants and 8 tons of special castings, also 1 steel elevated tank, 125 ft. high, capacity 40,000 or 50,000 gals; pumping equipment not decided upon until wells are driven; two half million gal. pumps or greater, also deep well pumps or air lift will be installed.—F. W. Farncomb, Chief Engineer.

Prince Rupert, B. C., Can.—Plans have been prepared for Council by Col. W. H. M. Davis for a permanent water supply for city; estimated cost of \$330,000 for supply main, \$480,000 for whole work.

South Vancouver, B. C., Can.—City will soon receive bids for 42 miles of 4-in. and 8 miles of 6-in. steel pipe; furnishing 45,000 ft. of ½-in. and 20,000 ft. of ¾-in. g.-i. pipe; 4,400 brass cocks, 300 fire hydrants and special castings and pig lead.

Tavistock, Ont., Can.—F. W. Farncombe, London, has prepared plans for water works; cost about \$22,000.

CONTRACTS AWARDED

Corning, Cal.—Construction of water system, to Braun, Williams & Russell Co., \$40,500.

Alamosa, Col.—Constructing water works, to Marshall Bros., Las Animas, \$74,000.

Dolores, Col.—To Engineer Geo. H. Sethman, Denver, for constructing water works, about \$40,000.

Washington, D. C.—Furnishing 90 tons of c.-i. water pipe and specials, to Standard Cast Iron Pipe and Foundry Co., Bristol, Pa., \$51.50 per gross ton, and 2,411 tons c.-i. water pipe, to U. S. Cast Iron Pipe and Foundry Co., 71 Broadway, New York, at \$22.84 per gross ton; furnishing corporation and curb cocks, 4,000 ¾-in. corporation cocks, to the Glauber Brass Mfg. Co., Cleveland, O., at 56.5c. each; 200 1½-in. corporation cocks, to A. P. Smith Mfg. Co., of East Orange, N. J., \$1.96 each; 250 ¾-in. lead flanged corporation cocks and 4,250 ¾-in. lead flanged curb cocks, for lead and pipe only, to Hays Mfg. Co., of Erie, Pa., 58.5c. and 63c., respectively.

Chicago, Ill.—Furnishing and installing sluice gates in the Southwest Land tunnel, to Coffin Valve Co., Neponset, Boston, Mass., \$7,000.

Orangeville, Ill.—Building water tank, to U. S. Wind and Pump Co., Batavia.

Whiting, Ind.—Construction of 14-in. water mains in 121st st., Indian blvd. and Clark st., to W. H. Brunt, \$9,664; other bidders: Neyd & Greenwald, \$10,055; T. H. Iglehart, \$10,525.

Arkansas City, Kan.—To Layne & Fowler Co., Houston, Tex., to furnishing city with water, \$13,500, city to furnish pipe, erect settling basin and convey water to pumping station at cost of \$14,000; work to begin at once.

Hoisington, Kan.—To Bash & Gray, Joplin, Mo., for constructing water system.—Rollins & Westover, Beals Bldg., Kansas City, Mo., Engineers.

White Castle, La.—Laying 2,000 ft. of water mains on lower Bowle st., to David Lopez; material will be furnished by Woodward, Wight & Co., Ltd., New Orleans.

Fort McKinley, Me.—Installation of chemical water softening plant, to the L. M. Booth Co., 116 Liberty st., New York, for plant complete, except item 4, at \$6,320; to F. H. Marshall, item 4.

Longmeadow, Mass.—By Water Commissioners for construction of concrete reservoir and foundation of pump house at the water works, to Vaughn & Kibbe, Springfield.

Cloquet, Minn.—Extending water and sewer system, to Pastoret-Lawrence Co., Duluth, \$23,398.43.

Kansas City, Mo.—Furnishing about 1,622 tons of c.-i. pipe and 3 5 tons of special castings, to U. S. C. I. Pipe and Foundry Co., city; pipe, all sizes, \$26.70 per net ton; castings, \$65 per ton.

Morehead, N. C.—To the Harris Hardware Co., Washington, N. C., to construct water works; cost about \$20,000.

Fargo, N. D.—To James Kennedy for the construction of filtration plant, \$98,968, for furnishing pumping engine \$11,860, and the boilers and stokers, \$8,062.

Cincinnati, O.—By Service Director Sundmaker for laying water mains in Lick Run road and other Westwood streets, to J. J. Brown, \$6,429.50.

Oklahoma City, Okla.—Building sedimentation basin at water works, to Hunter & Hunter, city, \$12,987.60.

Erie, Pa.—Laying 400 pieces of 6-in. pipe to be used in extension of water mains by Water Commissioners, to the United States Cast Iron Pipe Co., Chicago, \$21.75 per ton delivered in Erie; other bids were as follows: American Casting and Foundry Co., Detroit, \$24.85; Standard Cast Iron Pipe and Foundry Co., Bristol, Pa., \$22.50; Massillon Iron and Steel Co., \$24.15.

Zelienople, Pa.—To Martin Swain, city, for the construction of reservoirs and an 8-in. rising main, \$8,500.—Douglass & McKnight, 1709 Union Bank Bldg., Pittsburg, Engineers.

Galveston, Tex.—Adding 40 ft. to Alto Loma standpipe, to J. J. Kane, \$1,052.

Park City, Utah.—Building water system, to A. A. Clark, Salt Lake City, \$47,245.15.

Gleichen, Alta., Can.—Water works and sewers: Contract A, drilling deep well, to Alberta Well Drilling Co., Calgary; B, supply of lap-welded steel pipe, to General Supplies, Ltd., Calgary, for Stewarts & Lloyds; C, gate valves, to Canadian Fairbanks Co., for Alley & McLellan's valves; D, hydrants, to Calgary Ironworks Co., Calgary; E, elevated steel tank, to Des Moines Bridge and Iron Co., Des Moines, Ia.; F, sewer pipe, to Red Wing Sewer Pipe Co., Red Wing, Minn.; G, manhole covers, etc., to London Foundry Co., London, Ont.; work will be done by John Galt Engineering Co., of Winnipeg and Calgary.

Harrison, Ont., Can.—Supplies for water works: Cast iron pipes and special casting, to Gartshore Tomson Pipe and Foundry Co., Ltd., Hamilton, \$31.20 per ton for c.-i. pipe and \$2.75 per 100 lbs. for special casting, to James Robertson Co., Ltd., for lead \$3.06 per 100 lbs. and \$14.50 per 100 lbs. for gasket; building water tower, to Hunter Bridge and Boiler Co., Kincardine, \$2,505; to Ker Engine Co., Walkerville,

\$30 each for hydrants, and \$2.50 for 10-in. valves, \$15 for 8-in. valves, \$9 for 6-in. and \$5.60 for 4-in. valves.

Welland, Ont., Can.—Furnishing pump and water wheel for the new water works pumping station, to Canadian Boving Co., Toronto; contract calls for a 3,300,000 horizontal triplex single acting pump developing 250-hp. on a 7-ft. head, \$11,900; traveling crane, \$400; pump and wheel are slow speed machines; other bidders: John McDougal Co., Montreal, pump and turbine, \$14,069; John T. Farmer, Montreal, pump and turbine, \$15,250; Goulds Pump Co., Montreal, pump and turbine, \$15,250; Smart Turner Machine Co., Hamilton, pump and turbine, \$18,500; Wm. Hamilton Mfg. Co., Peterboro, pump and turbine, \$14,600; Escher Wvys & Co., Toronto, pump and turbine, \$14,365; the Canada Foundry Co. and John Inglis Co. tendered for pump only.

BIDS RECEIVED

Fort McKinley, Me.—Construction and installation of a chemical water softening plant of 15,000 gals. capacity: L. M. Booth Co., 116 Liberty st., New York, complete, \$6,870; Item (1) \$4,800, (2) \$550, (3) \$970, (4) \$550; the Kennicott Co., Chicago Heights, Ill., Item (1) \$5,500; American Water Softener Co., 1011 Chestnut st., Philadelphia, Pa., complete, \$7,300; Item (1) \$4,950; Northern Water Softener Co., Madison, Wis., Item (1) \$4,400, (2) \$750, (3) \$1,300; William Graver Tank Works, Rookery Bldg., Chicago, Item (1) \$3,150 and \$3,980, (2) \$1,260, (3) \$2,065; Reisert Automatic Water Purifying Co., 30 Church St., New York, Item (1) \$3,475, (2) \$285, (3) \$485, (4) and (3) 1,064; Gem City Boiler Co., Dayton, O., Item (1) \$5,570, (2) \$1,770, (3) \$3,645, (4) \$850; Pittsburg Filter Mfg. Co., Pittsburg, Pa., Item (1) \$6,475, (2) \$675 and \$375, (3) \$2,225; Frank H. Marshall, South Portland, Me., Item (4) \$439; Felber Engineering Works, Inc., New York, complete, \$6,750, not complying with specifications, Item (4) not included in price.

Rahway, N. J.—Installing 5,000,000-gal. pump at water works: Wilson-Snyder Co., Pittsburg, Pa., \$21,000; Allis-Chalmers Co., New York, \$13,950; Heisler Co., St. Mary's O., \$16,195; Cockburn Co., Jersey City, \$19,220; Alternate bids, \$16,300, and \$21,500; Platt Iron Works Co., Dayton, O., \$17,900; Epping-Carpenter Co., Pittsburg, Pa., \$14,600, and three alternate bids, \$13,200, \$13,100 and \$12,700; Snow Steam Pump Co., Buffalo, \$14,335.

Buffalo, N. Y.—Building two tunnels from east side of old pumping station and carried under the New York Central tracks, with extensions to west curb of Front ave.; they are to be of brick and are for discharge mains and new pumps Nos. 3 and 4; Eastern Concrete Steel Co., \$22,462; William Franklin, \$25,860; B. I. Crooker Co., \$26,981; George W. Moore, \$27,900; Joseph F. Stabell Co., \$29,500; Dark & Co., \$29,600; the Commissioner certified the Eastern as the low bidder.

Fargo, N. D.—Construction of filtration plant: F. T. Powers & Co., Fargo, \$109,300; James Kennedy, Fargo, \$98,970; Pittsburg Filter Co., \$115,700; Fargo Plumbing and Heating Co., \$130,507; S. Birch & Sons Co., Fargo, \$118,000; furnishing the pumping engines, the Fargo Plumbing and Heating Co. had four different bids, for different types of engines as follows: No. 2, \$22,325; No. 3, \$22,447; No. 4, \$21,393; No. 5, \$23,922; Platt Iron Co., of Kansas City, Mo., one bid for

\$12,650, and same company offered another for vertical expansion engines for \$23,000, the former bid being on horizontal type of engines; the Eppington-Carpington Co., horizontal engine for \$12,700; James Kennedy, Canton-Hughes with four bearings, \$12,300 and \$11,860, latter having two bearings; the Murray Iron Works Co., of Minneapolis, horizontal engine for \$14,448; Allis-Chalmers Co., Milwaukee, offered vertical engine for \$28,000 and one of horizontal type for \$12,625; specifications call for pumping engines with a capacity of 4,000,000 gals. every 24 hours; boilers and stokers, the Robinson, Cary & Sands Co., of St. Paul, three Edgemore horizontal boilers with stokers, \$10,460; Detroit Auto Stoker Co., three boilers and stokers, \$8,450; James Kennedy, for the same, \$8,062; R. B. Whitaker, for the same, \$9,965; Minneapolis Steel and Machine Co., for the same, \$7,547; the \$130,507 bid of Fargo Plumbing and Heating Co. was for complete filtration plant and equipment; specifications call for boilers tested to 150 for continuous use.

Niles, O.—Construction of the Water Filtration plant and clear well; Ensminger Bros., of Columbus, lowest bidders: Purification plant, (a) material, \$20,000, (b) labor, \$12,900; clear well, (c) material, \$4,000 (d) labor, \$2,920; total, \$30,820; other bidders: W. H. Ralston, Mt. Vernon, purification plant (a) \$20,000, (b) \$19,000, (c) \$3,300, (d) \$3,000; total \$45,300; Roberts Filter Mfg. Co., Philadelphia, Pa., (a) \$20,000, (b) \$22,100, (c) \$4,000, (d) \$3,000; total, \$49,100; Pittsburg Filter Mfg. Co., Pittsburg, (a) \$17,200, (b) \$25,000, (c) \$3,600, (d) \$3,000; total, \$48,800; Niles Lumber Co., Niles, (a) \$28,000, (b) \$12,000, (c) \$4,500, (d) \$3,500; total, \$42,950; American Water Softener Co., Philadelphia, (a) \$28,224, (b) \$18,815, (c) \$4,048; (d) \$2,700; total, \$53,787; Louis Adavasio, Youngstown, (a) \$26,000, (b) \$20,000, (c) \$4,000, (d) \$3,000; total, \$44,501.

Springfield, O.—Laying a force main from the old to new pumping station, Patrick Caffery, lowest bidder, 79c. per ft.; U. S. Cast Iron Pipe and Foundry Co., lowest bidder for supplying 873 tons of 20-in. pipe, \$22.45 per ton.

Somerset, Pa.—Construction of a reservoir of concrete construction from plans of L. E. Chapin, Frick Bldg., Pittsburg, to W. G. Ferner, Somerset, \$4,191; other bidders on concrete construction were: H. C. Brooke, Uniontown, \$5,874; U. S. Construction Co., Columbus, O., \$4,431; Somerset Construction Co., Somerset, \$6,000, and J. C. McSpadden, Rockwood, \$6,077.

LIGHTING AND POWER

Eufaula, Ala.—Council will advertise for bids for erection of municipal light plant for the city on June 7.—W. L. Upton, Birmingham, Consulting Engineer.

Gadsden, Ala.—Franchise has been granted E. T. Hollingsworth, Chas. P. Smith, T. S. Kyle, E. R. LeFevre and John D. Dunlap to operate gas and electric company, using the alleys and streets of city for the pipe line and wires.

Tuscaloosa, Ala.—Tuscaloosa National Gas Co. has asked for franchise to pipe gas into city.—L. H. Maxwell, President.

Palatka, Fla.—F. P. Clark, Jacksonville, has petitioned Council for 30-year franchise to light streets with electricity; plant will cost \$40,000 to \$50,000.

Nampa, Ida.—L. L. Nurn has been granted franchise to install light, heat and power system; generating plant will be built on Nalad River.

Anderson, Ind.—C. W. Hooven, who controls natural gas franchise in this city, has announced that city will next winter be supplied with artificial gas and that work on gas producers will begin at once.

Fairfield, Ia.—Hall & Adams, Centerville, have been selected as engineers to prepare plans for improvements of electric light plant.

New Market, Ia.—Lee Electric Light Co. Clarinda, has been granted franchise to supply city with light.

State Center, Ia.—Municipal electric light plant has been destroyed by fire.

Burton, Kan.—Installation of gasoline engine and dynamo to supply electric light is being considered.

Nortonville, Ky.—Nortonville Traction Co. will erect electric plant for lighting.—Frank E. Mohr, President.

Kentwood, La.—Town is being surveyed for location of electric light and water works system.

Buchanan, Mich.—Citizens have voted in favor of giving Niles Gas Light Co. franchise to extend mains through village.

Brown Valley, Minn.—Installation of electric light system is being considered.

Delano, Minn.—Preliminary plans will be prepared by Oscar Claussen Engineering Co., St. Paul, for remodeling or building electric light plant.

Duluth, Minn.—Council has passed resolution calling for complete set of specifica-

tions, plans and surveys, with detailed statements of cost for the construction and equipment by city of a plant for furnishing electric light, heat and power.

Carthage, Mo.—Empire District Electric Co., M. R. Bump, General Manager, will make improvements.

Bloomfield, N. J.—Installation of municipal lighting plant is being considered.—Jas. E. Brooks, Chairman Lighting Committee.

Seaside Park, N. J.—Borough Council is considering \$35,000 expenditure on light, sewer and water plant.

Marion, N. Y.—Public Service Commission, Second District, has authorized the Marion Power Co. to construct and operate electric lighting plant.

Wilmington, N. C.—Tidewater Power Co. is considering installation of one 400-hp. boiler and other machinery at gas plant.

Bowbells, N. D.—National Briquetting Co., Kenmore, has asked Council for franchise to supply light and power.

Velva, N. D.—City has granted franchise to John Moore to build and operate electric light plant for period of 20 years.

Columbus, O.—Council has passed ordinance providing \$20,000 bond issue for proposed cluster light system.

Greenspring, O.—Village Council has granted franchise to D. M. Scott to build electric light and power plant.

Oklahoma City, Okla.—Oklahoma Gas and Electric Co. will extend electric light system to Britton at cost of about \$20,000.

Madras, Ore.—Council has passed an ordinance authorizing A. E. Hammond to construct and operate electric light and power plant.

Coatesville, Pa.—Town is considering erecting plant for electric street lighting.

Custer, S. D.—Custer Electric Light, Heat and Power Co. has been granted franchise to operate electric plant for a period of 50 years.—Edward L. Grantham, President.

Livingston, Tenn.—W. W. Hendricks, Cookeville, is considering installation of electric light plant.

McAllen, Tex.—Town has granted franchise to A. L. Stang, El Campo, for electric light plant.

Port Lavaca, Tex.—W. E. Shell & Co. are considering construction of electric light plant.

Waxahachie, Tex.—Council has granted franchise to Raymond G. St. John and Henry M. Wallace, of Detroit, Mich., to establish, maintain and operate gas plant.

Danville, Va.—Election on June 27 on \$150,000 bonds to improve and extend electric light system is being considered.

Monroe, Wash.—H. H. White, representing Everett Gas Co., has asked Council for franchise to extend the present system from Snohomish to this city.

Berlin, Ont., Can.—Ratepayers will vote May 31 on \$20,000 electric light by-law and \$7,900 by-laws for street railway.

South Qu'Appelle, Sask., Can.—Electric Light Co. is considering erecting a more substantial power house, and also installing gasoline power.—L. G. Bell, Secretary-Treasurer Board of Trade.

CONTRACTS AWARDED

Old Orchard, Me.—Furnishing city with 86 60-c.p. tungsten lights, \$25 per light per year.

Kansas City, Mo.—By Kansas City Electric Light Co. to Electric Storage Battery Co., Philadelphia, Pa., for installation of storage battery plant at substation, 6th and Wall sts., \$100,000.

Rockingham, N. C.—Continuing and completing construction of hydroelectric plant and 100 miles of transmission line, to F. W. Abbott & Co., 90 West st., New York, by Yadkin River Power Co.—Charles E. Johnson, Raleigh, President.

Stoughton, Wis.—Installation of electric light plant on the Yahara River, to the Power Engineering Co., Minneapolis, Minn., about \$75,000.

FIRE EQUIPMENT

Los Angeles, Cal.—Council has voted to adopt the report of Supply Committee, recommending purchase of aerial ladder truck, 65 ft. long and motor-driven, for \$10,834.

East Hartford, Conn.—Fire District is considering erection of \$1,000 addition to house of Volunteer Hose Co.

Coffeyville, Kan.—Board of Insurance Underwriters has recommended purchase of one steamer, one combination hose wagon, installation of modern fire alarm system, erection of additional fire station.

Haverhill, Mass.—Alderman Bean, head of the Fire Department, has been designated as Investigating Committee to look into merits of automobile engine, and also matter of police signal system.

Lawrence, Mass.—Chief D. E. Corey has recommended \$4,000 appropriation for fire alarm boxes.

Salem, Mass.—Finance Committee will recommend erection of \$6,500 fire house and a flying squadron to cost \$5,500.

Salem, Mass.—Chief Engineer Arnold has recommended need of auto apparatus.

Worcester, Mass.—Firemen are urging purchase of more fire apparatus.

Adrian, Mich.—Need of additional hose, hose wagon and other equipment is being urged. Address Mayor Joslin.

Watervliet, Mich.—Council has decided to purchase chemical engine.

Nelson, Neb.—Volunteer fire department has been formed.—M. L. Crossley, Chief.

Omaha, Neb.—Fire Chief Salter has recommended purchase of auto fire engine.

Bloomfield, N. J.—Need of chemical engine is being urged.

Jersey City, N. J.—Fire Chief Dunn has recommended purchase of hook and ladder truck, erection of fire house on Washington st. and early consideration of auto apparatus.

Albany, N. Y.—Board of Contract and Supply will at once ask for bids for construction of an alarm system for the First, Second, Third and Fifth Police Precincts; estimated cost, \$27,000.—Isidore Wachsmann, Secretary.

Old Forge, N. Y.—Citizens have voted \$2,500 to erect engine house and municipal building.

Granite Pass, Ore.—Citizens will vote on bonds for purchase of auto fire engine.

Trappe, Pa.—Purchase of fire engine is being considered by fire company.

Montreal, Que., Can.—Fire Chief Tremblay is urging erection of harbor fire station and purchase of fireboat.

CONTRACTS AWARDED

Lynn, Mass.—By Purchasing Agent Carleton for 500 ft. of double jacket cotton-knit, rubber-lined hose, 65c. per ft. to New Jersey Car Spring and Rubber Co., of Jersey City.

BRIDGES

Jackson, Cal.—County Surveyor Gustave Schroeder has prepared plans for erection of bridge across Jackson Creek.

Nevada City, Cal.—Supervisors have voted to build steel bridge across Wolf Creek at Lime Kiln, on Auburn road; it will have a floor of reinforced concrete.

Milford, Conn.—Selectmen are considering replacing of bridges at east end of Cherry st. and over Tory Brook at Broad st. with concrete structures.

Sanford, Fla.—County Commissioners have asked for bids for erection of \$15,000 bridge over St. Johns River.

St. Augustine, Fla.—Council is considering erection of solid concrete bridge over San Sebastian River to New Augustine.

Chicago, Ill.—Plans have been prepared for 4 bascule type bridges to be constructed over river at 5th, Washington, 92d and Indiana sts. at cost of \$1,195,000.

Bloomington, Ind.—Monroe County Commissioners have ordered plans on which bids will soon be asked for the construction of overhead bridge at the Monroe crossing of Vernal pike.

Indianapolis, Ind.—County Commissioners have advertised for bids for construction of bridge over Fall Creek, in Capitol ave.; appropriation of \$85,000 has been made.

Indianapolis, Ind.—Plans and specifications for reinforced concrete arch bridge across Pleasant Run at State ave. have been adopted by Board of Public Works.

Martinsville, Ind.—Niagara County Commissioners have approved plans for construction of a concrete bridge 450 ft. in length, with 20-ft. roadway, across White River at Waverly; \$40,000 available. S. A. Blunk, Engineer.

Mishawaka, Ind.—Wm. S. Moore, City Engineer of South Bend, has prepared plans for \$65,000 concrete street bridge of four spans to be erected over St. Joseph River at Loxan st. if petition is granted by County Commissioners.

Shell Rock, Ia.—Board of Supervisors has decided to construct a bridge in Dayton Township at a cost of about \$5,000.

Kansas City, Kan.—Specifications have been prepared for the viaduct to be constructed over Reynolds ave. at 6th st.

Georgetown, Ky.—Scott County Commissioners will soon ask for bids for constructing seven highway bridges; Prof. Walter E. Rowe, College of Civil Engineering, State University of Kentucky, Lexington, has been employed as Designing and Inspecting Engineer.

Sanford, Me.—Bridge will be erected over Mousam River at River st.—H. E. Perkins, Moderator.

Fulton, N. Y.—Plans for proposed \$170,000 steel reinforced concrete bridge over the Oswego River at Broadway have been received by Board of Public Works; plans call for a bridge running from East 1st to West 1st st., 1,205 ft. in length, with a probable driveway of 34 ft.

Lowville, N. Y.—Town is considering election on \$9,000 bonds to construct concrete culvert across Mill Creek.

Washington, Pa.—Grand Jury has approved construction of following bridges: Over Pigeon Creek in the Borough of Monongahela City with a span of 110 ft., at estimated cost of \$18,000; bridge of 60-ft. span over the waters of Pigeon Creek in Borough of Bentleyville, \$5,333; over Brush Run in Peters Township at Thompsonville, with 41-ft. span; over Brush Run in Independence and Hopewell Townships near David Barr farm, with a 40-ft. span, \$4,015; over Peters Creek in the Borough of Finleyville, with 50-ft. span, \$4,445.10; Sparta bridge in Morris Township over Short Creek, with 18-ft. span, \$387.71.

Richmond, Va.—Board of Supervisors of Henrico and Hanover Counties are considering erection of bridge over Chickahominy River at Creighton road.

Spottsylvania, Va.—Spottsylvania County is considering construction of reinforced concrete and steel structural bridge across Po River at Snell.

CONTRACTS AWARDED

Bloomfield, Ind.—Constructing three bridges, to the Vincennes Bridge Co., Vincennes, Ind.

Bloomfield, N. J.—Building concrete and steel bridge over Third River and Morris Canal, at Baldwin st., to Linde & Griffith, Newark, \$12,995.

Chester, Pa.—Repairing four county bridges, to C. L. Franklin, Darby, about \$1,200.

Ebensburg, Pa.—By County Commissioners for the erection of bridges across Brubaker Creek, in Elder Township, to Polo Azzara, \$1,975, and at Portage, crossing Trout Creek, to Ashley J. Lord, \$2,300.

Richmond, Va.—Building Mayo bridge, to I. J. Smith & Co., \$224,734; Belgian block paving of roadbed, \$8,000; approaches according to the "yellow line" or modified grade, \$21,000; supervision and inspection, \$4,200; testing material, \$3,000.

BIDS RECEIVED

Passaic, N. J.—Constructing the drawbridge which is to span Passaic River at Rutherford ave. to the Bergen County side, Walter J. Harris, lowest bidder, \$60,375; other bidders: Stillman-Delehanty-Ferris Co., \$62,280; Pennsylvania Steel Co., \$73,140; F. W. Schwiers, Jr., \$67,749; Long & Miller, \$84,255; Snare & Triest Co., \$72,480; Northeastern Construction Co., \$77,983; Oswego Bridge Co., \$71,490; F. R. Long & Co., \$67,720; Oscar Daniels, \$87,000.

Philadelphia, Pa.—Widening Chestnut st. bridge over the Schuylkill River: M. & J. B. McHugh, \$74,084; Oswego Bridge Co., \$76,096; American Paving and Construction Co., \$77,519; Strabel Steel Construction Co., \$88,805; Richard Walsh, \$97,868; all bidders agreed to complete the work in 10 months; building double track steel plate girder bridge, with grading and paving of streets, on the line of Springfield ave. under Philadelphia and Baltimore Central Railroad, DeNorre Delise, eight months, \$32,874; William P. Mahoney, four months, \$33,216; P. F. Reilly, five months, \$33,314; McNichol Paving and Construction Co., five months, \$37,891; American Paving Co., 10 months, \$39,765; there were 13 bidders altogether, of which W. S. P. Shields was high at \$40,477; Shields was low bidder on rip-rapping, and other tender work on Passyunk ave. bridge piers, \$5,608.88; other bidders were American Paving and Construction Co., \$7,260, and Armstrong & Latta Co., \$7,537.

Fairmount, W. Va.—Building 4th st. bridge, Nelson-Merydith Co., Pittsburg, Pa., plan A \$12,187, plan B \$12,798, plan C \$15,198, plan D \$11,548, Plan E1 \$6,822, plan E2 \$6,375, plan E3 \$6,471, plan E4, \$6,122, plan F, \$11,241; American Bridge Co., New York, \$5,710; Robert H. Morfitt, Jr., Harrisburg, Pa., reinforced concrete, \$12,096; McClintic-Marshall Construction Co., Pittsburg, Pa., \$10,513; Faris Bridge Co., Pittsburg, Pa., \$6,985; difference in the prices is caused from fact that some companies gave bids for complete bridges, others for bridges without the floors completed, some for steel and some for reinforced concrete structures.

MISCELLANEOUS

Berkeley, Cal.—Citizens have defeated proposed \$1,000,000 bond issue for improvements.

Palo Alto, Cal.—Bids will be received May 22 for purchase of bonds to be used for the construction of a garbage crematory and auxiliary pumping plant.—J. T. Buxbee, Jr., City Engineer.

Redwood City, Cal.—Trustees have accepted plans for erection of \$12,000 town hall; exterior plans will be prepared by E. P. Antonovich, 333 Kearny st., San

Francisco, and interior plans by T. M. Edwards, San Mateo.

Washington, D. C.—District will handle street cleaning without contractors after July 1; Street Cleaning Department will have about \$220,000 to spend next year.—J. W. Paxton, Superintendent.

St. Petersburg, Fla.—Citizens will vote June 13 on \$15,000 bonds for improving Lake Park and \$5,000 for purchase and improvement of water front lots.

Moscow, Ida.—Stritesky & Rooney, Empire State Bldg., Spokane, Wash., have prepared plans for erection of \$150,000 jail and court house for Latam County.

Richmond, Ind.—Drawings have been prepared by Architect F. S. Kaufman for addition to county jail.

Council Grove, Kan.—Modern jail will be erected.

Brooksville, Ky.—Hernando County will erect \$40,000 court house.

New Orleans, La.—Board of Liquidation of City Debt has sold \$7,000,000 bonds for public improvements.

Mason, Mich.—Plans by Architects White & Butterworth, Lansing, have been accepted and bids will soon be asked for erection of addition to county poor house.

Duluth, Minn.—Council has authorized the Board of Public Works and the City Engineer to purchase auto for their combined use at cost of \$1,800.

Hibbings, Minn.—Bids will be at once asked for furnishing sanitary dump wagon.

St. Paul, Minn.—City Engineer Claussen will soon ask Council to purchase pressure street flushing machines.

McAlester, Mo.—Pittsburg County Commissioners are considering \$150,000 bond issue for erection of jail and court house.

Garwood, N. J.—Bids have been rejected for erection of \$12,000 borough hall; plans will be revised and new bids asked.

Trenton, N. J.—Bids will be received May 23, 2 p. m., for \$50,000 harbor improvement bonds.—H. E. Evans, City Treasurer.

Woodbine, N. J.—Borough has voted \$6,000 bonds for improvements.

Buffalo, N. Y.—Mayor Fuhrmann has signed bill authorizing city to issue \$100,000 bonds for playground purposes.

Buffalo, N. Y.—Board of Park Commissioners will expend \$100,000 in buildings and improvements at the Zoo.

New York, N. Y.—Plans have been filed by Department of Parks, T. E. Videto, Architect, for erection of \$10,000 comfort station on Worth st.

New York, N. Y.—Board of Estimate has appropriated \$10,000 to Street Cleaning Department, Wm. Edwards, Commissioner, for purchase of hose and hose carts for use in new street flushing work.

Old Forge, N. Y.—Citizens have voted \$2,500 to erect municipal building and engine house.

Youngstown, O.—Fully \$10,000 will be expended by Park Commission in beautifying local parks this spring.

Guthrie, Okla.—Citizens have voted \$100,000 bonds for improvements at Mineral Wells Park.

Beaver, Pa.—Citizens will vote June 17 on bonds for erection of borough hall.

Westerly, R. I.—Town will issue \$100,000 bonds for erection of town hall.

Humboldt, Tenn.—Citizens will vote on \$15,000 bonds to erect city hall.

Nashville, Tenn.—C. K. Colley, city, has prepared plans for erection of proposed public market.

Colville, Wash.—Jones & Levesque, Mobawk Bldg., Spokane, have prepared plans for erection of \$35,000 city market.

CONTRACTS AWARDED

Louisville, Ky.—By Board of Public Safety, to Oldsmobile Co., Lansing, Mich., for delivery of a motor patrol chassis to Central Police Station, to be used with motor patrol already in service; cost \$1,900; body of car will be built in Louisville; total cost about \$3,000.

Falmouth, Mass.—Erecting addition to town hall, to Chas. E. Robbins, \$3,774.

Eveleth, Minn.—Hauling city garbage for one year, to J. Smolik, summer months, \$283.35; winter months, \$215 per month.

Hibbing, Minn.—Furnishing garbage cans, to Thourin Hardware Co., city, 1,000 20-gal. cans, \$2.25 each and 150 30-gal. cans, \$2.75 each.

Great Falls, Mont.—Furnishing 2,000 ft. of hose for use on boulevards, to Strain Bros. 750 ft., to Murphy-Maclay 750 ft. and Northern Hardware Co. 500 ft.

Orange, N. J.—Scavenger contract, three years, to John N. Lohman & Co., \$16,266.66 per year.

New York, N. Y.—Repairs to the steamer Massasoit, to Waters-Colves Co., West New Brighton, S. I., \$14,938; other bidders: John W. Sullivan Co., \$15,200; James Shewan & Son, \$15,272; James Tregarthen & Son, \$15,500; John F. Walsh, Jr. & Co., \$15,970.

Svracuse, N. Y.—Completing municipal bath house; carpenter and mason work to Miller, Raleigh & Co., \$3,200.

Whitesboro, N. Y.—Sprinkling and sweeping paved streets for two years, to Utica Sweeping and Contracting Co., Utica.

Youngstown, O.—Building comfort stations in Lincoln and South Side Parks, to Thompson & Frame, \$672, and Arthur Chesney, \$790.

BIDS RECEIVED

Los Angeles, Cal.—Furnishing county with auto for highway repair work: R. C. Hamlin, Franklin motor truck, \$2,550; Whiting & Mead, Johnson, \$2,150; Pioneer Commercial Auto Co., Randolph, \$2,100, or a Rapid at \$2,950; Lord Motor Car Co., Garford, \$2,500; C. C. Henion, Standard, \$3,000; Hawley, King & Co., Grabowsky, \$2,450, or a Clark at \$1,750; M. S. Bulkeley & Co., Autocar, \$2,525.

Waycross, Ga.—Building county jail: Pauly Jail Co., brick, \$34,194.50; concrete, \$35,467.43; South Eastern Jail Co., brick, \$34,985; concrete, \$37,069; Park Mor Ran Co., concrete, \$34,984; brick, \$32,995.50.

Boston, Mass.—Construction of wood or steel ferryboat for East Boston service; steel construction, Maryland Steel Co., \$155,000, and W. & A. Fletcher Co. bidding \$129,950; wood construction, Bertelsen & Peterson Engineering Co., \$117,000, the boat to be finished in 11 months; Atlantic Works, \$121,450, boat to be finished in 7 months; William McKie's bid was \$120,750, boat to be finished in 7 months, and W. & A. Fletcher Co., \$127,450, to be finished in 8 months.

Boston, Mass.—Disposal of garbage and refuse for city districts of West Roxbury and East Boston excluded: Daniel P. Sullivan, formerly Superintendent of Sanitary Department, disposing of garbage, \$27,400 less than price the city is now paying New England Sanitary Disposal Co.; offer for garbage is \$24,995, and for refuse 44.9-10c. per ton; by this proposition city furnishes stations and does all work of carting; Jeremiah P. O'Riorden, Charlestown, will dispose of the garbage and waste and furnish all the scows necessary for the harbor work for \$197,000 first year; for each succeeding year of the nine remaining years he seeks an increase of 2 1-10 per cent over cost of the year preceding; Boston Disposal Co., \$234,940 a year with 2 1-10 per cent increase each year, as in case of O'Riorden; the Vulcan Incinerating Co., of New York, would build plant in Brighton with capacity of 18,000 tons daily, the cost of plant to be \$72,500, the same at the expense of city, and for disposing of garbage would charge 66 2-3c. a ton of 2,000 lbs.; another bid of the company was that of disposing of garbage and waste in Districts 1, 6, 7, 8, 9 and 10, about 316,000 tons annually, at rate of 66 2-3c. per ton; company would erect a station at Cow Pasture or on Deer Island at cost to city of \$276,000; Frank P. Neelon & Co. offered to dispose of garbage and waste at annual cost of \$189,000, city to erect and maintain collection stations; Joseph Marrone, of New York, offered to dispose of the garbage for 52c. a ton, or to do the work on ten-year contract for \$200,000 first year and increase of 2 per cent a year for remaining years; four propositions were contained in the bid of the Boston Development and Sanitary Co., submitted by William F. Donovan, President; first proposition provides for three water-front and two inland stations; the price for disposal would be \$184,000 the first year and 3 per cent increase each year; second proposition provides for three water-front and three inland stations; cost would be \$210,000 per year, plus 3 per cent yearly over the figure of the preceding year; third proposition provides for three water-front and two inland stations; in addition the company would furnish dump for ashes in swamp lands of New Haven road on the South Bay; price for disposal the first year would be \$200,000 plus the yearly increase of 3 per cent; fourth proposition provides for three water-front and three inland stations; dump for ashes is also included; price is \$220,000 a year, plus the yearly addition of 3 per cent.

New York, N. Y.—By Park Board, constructing Bushwick playground, bounded by Putnam ave. and Woodbine st. extension, between Knickerbocker ave. and Irving ave., Kelly & Kelley, 45 East 42d st., lowest bidder, \$23,234.

New York, N. Y.—Installing fire protection system and compressed air line on Manhattan Bridge over East River, between Manhattan and Brooklyn, as follows: Vulcan Rail and Construction Co., \$20,742; McHarg-Barton Co., \$22,200; M. J. O'Brien \$29,495; Oscar Daniels Co., \$24,900; A. Kaufman, \$28,000.

Spokane, Wash.—Furnishing three asphalt dump wagons for Street Department: J. I. Case Threshing Machine Co., \$200 each; Folson Implement Co., three for \$642; McGowan Bros. Hardware Co., three makes at \$180, \$193 and \$200 each; E. P. Jamieson & Co., \$209 each; T. J. Coffman Co., \$190 each.

TOO LATE FOR CLASSIFICATION

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREET IMPROVEMENTS				
Minnesota	Duluth	May 19, 10 a.m.	Grad., pav., re-pay. and otherwise improving var. streets	Olof G. Olson, Pres. Bd. Pub. Wks.
Virginia	Amherst	May 29, 11 a.m.	Constr. about 4½ miles of macadam road, alternate bids with County owning 5,000 cu. yds. stone and a 10-ton roller and sprinkler and contractor furn. roller and sprinkler	P. St. J. Wilson, St. Hwy. Comr. Edgar A. Stages, Audr. Clay County Oscar J. Denny, Boro. Secy. A. B. Easterling, County Auditor.
Indiana	Indianapolis	June 6, 11:30 a.m.	Constr. stone and gravel roads in Harrison & Sugar Ridge twp.	
Pennsylvania	Sharon	June 6, 5 p.m.	Paving about 1,900 sq. yds. on Oakland ave.	
Indiana	Kokomo	June 6	Constr. about 9 mi. of gravel road in Jackson & Liberty twps.	
Indiana	Rushville	June 6	Constr. 6,659 ft. of macadam road in Jackson twp.; and 7,523 ft. of macadam road in Posey and Jackson twps.	Jesse M. Stone, County Auditor.
Indiana	Vincennes	June 6	Constr. 2 gravel roads in Busseron twp. in all 11,600 ft. long; and a gravel road in Vincennes twp. 2,295 ft. long	County Commissioners.
Pennsylvania	M'Donald	May 20	Paving various streets.	O'Dell Allison, Boro. Clerk.
SEWERAGE				
New Jersey	Summit	May 20, 2 to 2:30 p.m.	Constr. 1,500 lin. ft. vit. pipe sanitary and storm sewer, for the Summit Estates Company	John S. Stiger, Chief Engr.
West Virginia	Hamilton	June 10, 1 p.m.	Constructing sewers in various streets, size 12 to 18-in.	A. B. Maupin, City Engr.
WATER SUPPLY				
Minnesota	Lake City	May 25, 8 p.m.	Laying water pipes, hydrants, gates, etc.	H. F. Jones, Pres. Bd. W. & Lt. Com.
Connecticut	Waterbury	May 30, 8 p.m.	Stripping of surface soil from the basin of Morris Reservoir in the towns of Morris and Litchfield	R. A. Cairns, City Engr.
Ontario Can.	Ridgetown	June 1	Laying water pipe, castings, hydrants, valves, etc. and constructing a steel elevated tank	D. Cochrane, Town Clerk. Lee Nichols, City Auditor.
North Dakota	Mandan	June 2	Improving water works	
Alabama	Ft. Morgan	June 2	Furn. a motor driven deep well pump, elec. trans. line, 4-in. cast iron water main, etc.	Lieut. E. F. Barlow, Con. Q. M.
LIGHTING AND POWER				
Ohio	Cincinnati	May 26, noon	Lay. gas mains and interior pipe fitting required at Branch Hos.	Edw'd P. Durr, Secy. Dept. P. S.
BRIDGES				
Ohio	Niles	May 29, 1 p.m.	Constructing the superstructure of a bridge Farmington twp.	Fred T. Stone, County Auditor.
Pennsylvania	Pittsburg	May 31, noon	Constr. 2 elliptical arch reinforced concrete stone faced bridges and 1 reinforced concrete semi-circular arch bridge	R. J. Cunningham, County Com. Fred G. Schwartz, County Clerk. Albert Sahn, County Auditor.
Kansas	Garland	June 6, noon	Constr. either a steel or conc. bridge across Drywood Creek	
Indiana	Indianapolis	June 12, 10 a.m.	Constr. a bridge over Fall Creek, on Capitol ave.	
MISCELLANEOUS				
Minnesota	Duluth	May 19, 10 a.m.	Furn. one 5-passenger automobile 40 to 60 H. P.; also one 3 or 4 passenger runabout	Olof G. Olson, Pres. Bd. Pub. Wks. Wilkes Barre Park Com.
Pennsylvania	Wilkes Barre	May 22, noon	Furn. one 35-in. horse lawn plow with shafts and seat	
Kentucky	Middlesboro	May 24, noon	Constr. a city building, courthouse, jail and fire department	Mayor.
Ohio	Cincinnati	May 25, noon	Furn. one automobile run about with rumble seat	John J. Wenner, Clk. Dept. P. S.

STREET IMPROVEMENTS

Sacramento, Cal.—County Supervisors are considering petition for road in eastern part of the Haggin Grant.

Summerville, Ga.—Bids will be received June 1, noon, for \$45,000 bonds for street improvements.

Morocco, Ind.—Jackson Township has voted to build extensive system of stone roads.

Fairfield, Ia.—Hall and Adams, Center-ville, have been selected as engineers to prepare plans for about 3 miles of street pavements.

Nevada City, Cal.—Supervisors have decided to ask bids for building piece of road along Cherry Creek at cost of \$2,000.

Lexington, Ky.—Bids will be readvertised for construction of Clay, Ashland, Columbia and other avenues with macadam; West 3d st. will be resurfaced with sheet asphalt from Jefferson to Henry.

Springport, Mich.—Village Council has \$800 available for graveling and improving road leading to Duck Lake.

Bemidji, Minn.—Citizens will vote May 31 on \$20,000 bonds for paving streets.

Fremont, Neb.—Cost of paving portion of H st. has been estimated at \$12,500.

Atlantic City, N. J.—State Road Commissioner Stevens has given approval to widening of roadway out of May's Landing to Cape May, at dangerous points, and also for its rebuilding.

Clinton, N. J.—Public road from Lebanon to this town is to be macadamized this year.

Trenton, N. J.—Ordinances will be prepared for paving North Stockton st. with asphalt and North Willow st. with vitr. brick.

Binghamton, N. Y.—Citizens will vote June 9 on \$10,000 bonds for laying proposed brick pavement on Main st.

Franklin, Pa.—Council has decided to re-pave Liberty st.

Mauch Chunk, Pa.—Carbon County Commissioners will build road from Fairview, via White Haven, to Freeland and Hazleton, to cost \$195,000.

Paterson Heights, Pa.—Council is considering macadamizing of Darlington road.

Washington, Pa.—Washington County Grand Jury has approved nine sections of road to be improved with brick.

Beaumont, Tex.—County Commissioners are considering \$5,000 expenditure on proposed county road to Mansfield Ferry.

Fort Worth, Tex.—City Commission has adopted resolution for paving Daggett st. from Summit ave. to South Main st.

McKinney, Tex.—Celina Precinct will vote on \$125,000 bonds for good roads purposes.

Troup, Tex.—Citizens of that portion of Cherokee County lying east of Mud Creek and composing one of the commissioner's precincts of county are agitating question of bond issue for the construction and repair of public roads of precinct.

Waco, Tex.—County Commissioners will consider calling election June 20 on \$600,000 bonds to build good roads in McLennan County.

Danville, Va.—Citizens will vote June 27 on \$150,000 bonds to pave North Warren st. and improve electric light.

Farmville, Va.—South Main st. will be improved at cost of \$5,000.

Richmond, Va.—State Commissioner of Highways P. St. Julian Wilson has announced apportionment of State good roads fund; Warwick County will receive \$1,124.81; Elizabeth City, \$3,093.23; York, \$788.85; Isle of Wight, \$2,000; Nansemond, \$4,132, and James City, \$538.

Tacoma, Wash.—City Commission has adopted resolution providing for improvement of Portland ave. by grading and planking and South Twenty-fifth st., East C and East D sts. by paving with sandstone and brick.

Ashland, Wis.—County Board has passed resolution which will place at disposal of County Highway Commissioner \$13,700 for building a county road from Ashland to Price County.

CONTRACTS AWARDED

Oakland, Cal.—Paving 7th st., by Southern Pacific Co., to Oakland Paving Co.

Redondo Beach, Cal.—By City Trustees, to Fiachilds-Gilmore-Wilton Co., Los Angeles, for paving Pacific ave. from the southerly city limits to its junction with Benita ave.; paving will be of asphalt concrete.

Detroit, Mich.—Paving with cedar block portions of Waterloo st., Cantor and Iroquois ave., to J. S. Affeld, 761 Campbell ave., \$31,340.

Danville, Pa.—Paving East Front and Bloom sts., to Corve'l Construction Co.; curbing, to T. L. Evans Sons.

Springdale, Pa.—Grading 30,000 cubic yards. Thoney Pietro, Morgantown, W. Va., \$10,500; work also includes building of

sewer and water mains at a total cost of \$100,000.

Washington, Pa.—Construction of three Washington County roads that are to be improved with brick; to the Donora Construction Co., Charleroi-Bentleyville road, \$31,808.20, not including furnishing of the brick; road is to be three miles in length; to John F. Howley & Co., Pittsburg, to build the Prosperity-Dunns Station road and McDonald-Venice road, \$23,671.50 and \$11,612.06, without the brick; former road is two miles in length, extending from Prosperity towards Dunns Station; latter road is one mile in length, extending from the McDonald borough line; furnishing brick, to the United Fire Brick Co., Uniontown, two miles of Charleroi-Bentleyville road, \$15.50 per 1,000, or 65c. per sq. yd.; remaining one mile will be furnished by J. M. Porter, a highway block, \$17.25 per 1,000 or 58.65c. per sq. yd.; also highway block for the McDonald-Venice road, \$16 per 1,000 or 54.4c. per sq. yd.; Waynesburg Brick Co. is the lowest bidder on Prosperity-Dunns Station road, but the contract has not yet been let.

Houston, Tex.—To Horton & Horton, city, to pave Washington ave., \$11,159.

Racine, Wis.—Paving Erie st., to White Construction Co., Milwaukee, \$1.89 per yd. for asphalt and 55c. per ft. for curb and gutter.

BIDS RECEIVED

Jacksonville, Fla.—Laying total of 167,767 square yards of vitrified brick pavement on various streets of the city and involving approximate expenditure of \$325,000; Engineering & Paving Co., Jacksonville, was lowest in its bids on 71,855 square yards, prices ranging from \$1.55 to \$1.75, while Georgia Engineering Co., Augusta, Ga., came within figures on 59,110 square yards, prices \$1.60 to \$1.74; the Graves-Matthews Paving Co., Birmingham, Ala., on 22,827 square yards, prices \$1.65 to \$1.73, and Alabama Paving Co., Birmingham, on 12,973 square yards, prices, \$1.61 to \$1.67; 5c. is allowed for maintenance.

Duluth, Minn.—Furnishing a gyratory rock crusher, which will be installed at the Point of Rocks, near Thirteenth ave. West and Superior st.; The Austin-Western Co. bid \$1,047, \$1,342 and \$1,650, and G. E. Ingersol, \$1,630, \$1,825 and \$2,037, according to kind.

Altoona, Pa.—Resurfacing paved streets; Duster Paving Company, of Tarentum—

Removing old paving, per sq. yd., 20c.; asphalt block, as specified, per sq. yd., \$1.65; 3-in. asphalt block, per sq. yd., \$1.86 and \$1.88; repairs during guaranteed period, 50, 33, 25 and 25 per cent.; The Standard Bitulithic Company, of New York—Removing old paving, 20c. per sq. yd.; for bitulithic block, per sq. yd., \$1.35; repairs during guaranteed period, 50, 33, 25 and 25 per cent.; The Barber Asphalt Company, of New York—Removing old paving, 10c. per sq. yd.; for paving, per sq. yd., \$1.27; for repairs during guaranteed period, 45, 30, 20 and 20 per cent.; in presenting its bid the Barber people said it was understood that it was for all work, aggregating 50,000 sq. yds.; The Monroe Paving Company, of New York—Bituminous concrete, per sq. yd., with binder, \$1.06; without binder, 85c.; for repairs during guaranteed period, 40, 30, 25 and 25 per cent.; The W. J. McElhany Company, of Pittsburgh—Removing old paving, 23c. per sq. yd.; for asphalt block, according to specifications, \$1.65 per sq. yd.; for 3-in. asphalt blocks, \$1.86; for repairs during guaranteed period, 50, 33, 25 and 25 per cent.

SEWERAGE

Summerville, Ga.—Bids will be received June 1, noon, for \$30,000 bonds for sewer and water extension.

Toccoa, Ga.—Time for letting contracts for proposed sewerage system has been extended to June 20.—D. E. Hogsted, Chairman, Sewerage Committee.

Libby, Mont.—Council is considering election on \$15,000 bonds to install sewer system.

Palmyra, N. J.—Installation of sewer system is being considered.

Ashland, Wis.—Board of Public Works will at once ask bids for construction of sewers.—City Comptroller Dillon, Chairman.

CONTRACTS AWARDED

Dallas, Tex.—Building storm sewer on South Harwood st., Jackson and First sts., to Dallas Lime & Gravel Co., \$13,089.59.

Springdale, Pa.—Building sewers to Thoney Pietro, Morgantown, W. Va.: 470 lineal feet, 20-inch pipe sewer, \$1.49; 1,170 lineal feet 18-inch, \$1.195; 970 lineal feet 15-inch, \$1.11; 9,640 lineal feet 12-inch, 80c.; 10,530 lineal feet 10-inch, 77c.; 13,850 lineal feet 8-inch, 73c.; 83 manholes, \$39.50; 28 lampholes, \$10; 5 flush tanks, \$75, and 60 cubic yards concrete embankment, \$10.

WATER SUPPLY

Summerville, Ga.—Bids will be received June 1, noon, for \$30,000 bonds for water and sewer extension.

Marquette, Mich.—Citizens have voted \$75,000 bonds to extend water works intake pipe additional 3,000 feet into Lake Superior.

Trenton, N. J.—George A. Johnson has been selected by Water Board to prepare at once plans for chloride purifier for this city; the idea of the board is to have the plant placed at the pumping station.

Trenton, N. J.—Judge Rellstab has decided that United States government might proceed at once to condemn the lands desired by it in Essex, Hudson and Bergen counties for the purpose of laying pipes to carry New Jersey potable water to fortifications at the Narrows, in New York Harbor, especially those in Richmond Borough. Government has contract with Hudson Water Co., which is in hands of a receiver.

Salt Lake City, Utah.—County Commissioners have decided to install pump near county reservoir.

Tacoma, Wash.—City Commission has adopted ordinance providing for construction of water mains in Dist. No. 573.

CONTRACTS AWARDED

Springdale, Pa.—Building reservoir and water mains to Thoney Pietro, Morgantown, W. Va.: 1,900 cubic yards reservoir excavation, \$2.75; 850 square yards reservoir lining, \$3; 50 lineal feet 8-inch cast-iron cleansing pipe, \$3; 300 lineal feet 8-

inch T. C. overflow drain, \$1.00; 400 lineal feet reservoir fence, \$1.00; 7,710 lineal feet 10-inch water line, \$1.02; 5,780 lineal feet 8-inch, 83c.; 14,730 lineal feet 6-inch, 64c.; 7,140 lineal feet 4-inch, 49c.; 40 fire hydrants, \$30.

Salt Lake City, Utah.—Installation of centrifugal pump to Fairbanks-Morse Co., \$645.

LIGHTING AND POWER

Gravette, Ark.—Harry V. Forest, of Kansas City, has made a proposition to Council for the purchase of lighting plant.

Tucumcari, N. M.—Tucumcari Electric Light Co. is planning improvements to cost \$10,000.

Haddonfield, N. J.—Installation of municipal electric light plant is being considered; cost about \$40,000.

Danville, Va.—Citizens will vote June 27 on \$150,000 bonds to improve electric light plant and pave North Warren st.

CONTRACTS AWARDED

Wheeling, W. Va.—Work in connection with changing present gas works to burning gas plant, removing upper retort and erecting new building, to Bushon & Leham, \$10,109; furnishing water-gas apparatus, consisting of 8-ft. 6-in. sets, cast-iron floor, condenser, elevator and oil tank, to Union Gas Improvement Co., Philadelphia, \$25,393; furnishing pumps to M. T. Davidson & Co., New York, \$185 for iron pumps and \$200 for brass; two of each kind will be used.

FIRE EQUIPMENT

Catlettsburg, Ky.—City will erect fire house and city building at Main St. and Broadway.

Virginia, Minn.—Fire Commissioner has rejected all bids for remodeling Fire Hall No. 1 and will do work by day labor.

CONTRACT AWARDED

Virginia, Minn.—Furnishing auto fire truck to Waterous Engine Works, St. Paul, \$5,500.

BRIDGES

Lawrence, Mass.—City Engineer Marble will prepare plans for proposed White Pups bridge.

Fort Worth, Tex.—Plans, specifications and bids for a 90-foot bridge of reinforced concrete that is to span Marine creek at Twenty-third st. will soon be advertised for by County Commissioners of Tarrant County.

Spokane, Wash.—Bids will be received June 15, noon, for \$415,000 bridge bond issue.—Jas. McGougan, City Auditor.

MISCELLANEOUS

Greenville, Ala.—Erection of jail is being considered.

Catlettsburg, Ky.—City will erect city building and fire house at Main st. and Broadway.

Duluth, Minn.—Health Department is asking for auto trucks for garbage collection.

Syracuse, N. Y.—Resolution asking Board of Contract and Supply to advertise for bids to excavate with steam shovels more than 125,000 cubic yards of earth at Lincoln and Onondaga parks has been passed by the Syracuse Park Commission; commission also decided to buy apparatus for Lincoln School playgrounds, including swings, ladders, horizontal bars, toboggan slides and giant strides.

CONTRACTS AWARDED

Boston, Mass.—To William McKie, East Boston, for double-screw ferryboat for city, \$120,750.

Duluth, Minn.—Rebuilding old Quebec pier at foot of Becker Ave. to Interstate Dredge & Dock Company, \$5,896.98.

INDUSTRIAL NEWS

(Continued from page 726)

Jamestown Block.—William A. Howell, engineer of the street department of the Board of Works, Newark, N. J., visited Jamestown, N. Y., the latter part of last week to make an inspection at first hand of a type of brick pavement known as Jamestown block, which has been mentioned recently in connection with prospective paving contracts. He found that the block had been in extensive use in Jamestown and that it had given excellent satisfaction there. At the plant where it is manufactured he was informed that the demand for it had been so great that largely increased facilities were being provided. Certain features of the process used in making the blocks were interesting and out of the ordinary, Mr. Howell says. There was a brick-cutting machine which was "almost human," he expressed it.

"One special advantage which is claimed for the Jamestown block," Mr. Howell is reported as saying, "is its evenness of quality. This claim appeared to be substantiated by the results of the long service it has given in the Jamestown streets. It has not worn down in patches, as in streets where the quality of the pavement does not run even. Of course it has not had the volume of traffic it would in our busier streets."

Testing Wells.—Tests of the artesian wells, sunk at Mishawauka for the city's water supply were made last week under the direction of Consulting Engineer Dabney H. Maury and Water Works Superintendent C. F. Crabill. There are five wells, varying from 200 to 300 feet deep, and the water rises to within 6 feet of the surface. Harris Air Pumps have been installed. Engineer Maury, after the first test, stated that the wells were doing better than 2,000,000 gallons in 24 hours. Mr. Maury also stated that in nearly every test he had ever attended the first day was marked by breakdowns of some character, but on this occasion none occurred.

Consulting Engineer.—P. R. Moses, consulting engineer, 366 Fifth Avenue, New York City, who specializes in the handling of industrial equipments, announces that the following engineers have been added to his staff: John Fallon, Industrial Engineer, recently Mechanical Engineer of the Tennessee Copper Company, and Stanley G. Flagg & Company; Arthur V. Farr, M. E. Textile Engineer, formerly Szepesi & Farr, 90 West Street; Alfonse Kaufman, E. E., formerly Manager and Chief Engineer Alaska Chemical Company, and associated with Charles B. Jacobs Industrial Laboratories; J. N. Walton, recently Power Engineer and Storage Battery Expert, Brooklyn Edison Company.



Hand-Wiped
Joint

or lead flange, in from one
to eight branch.

Gooseneck Headquarters

ALL SIZES—ANY STYLE—FOR ANY MACHINE
GET OUR PRICES BEFORE PLACING ORDERS

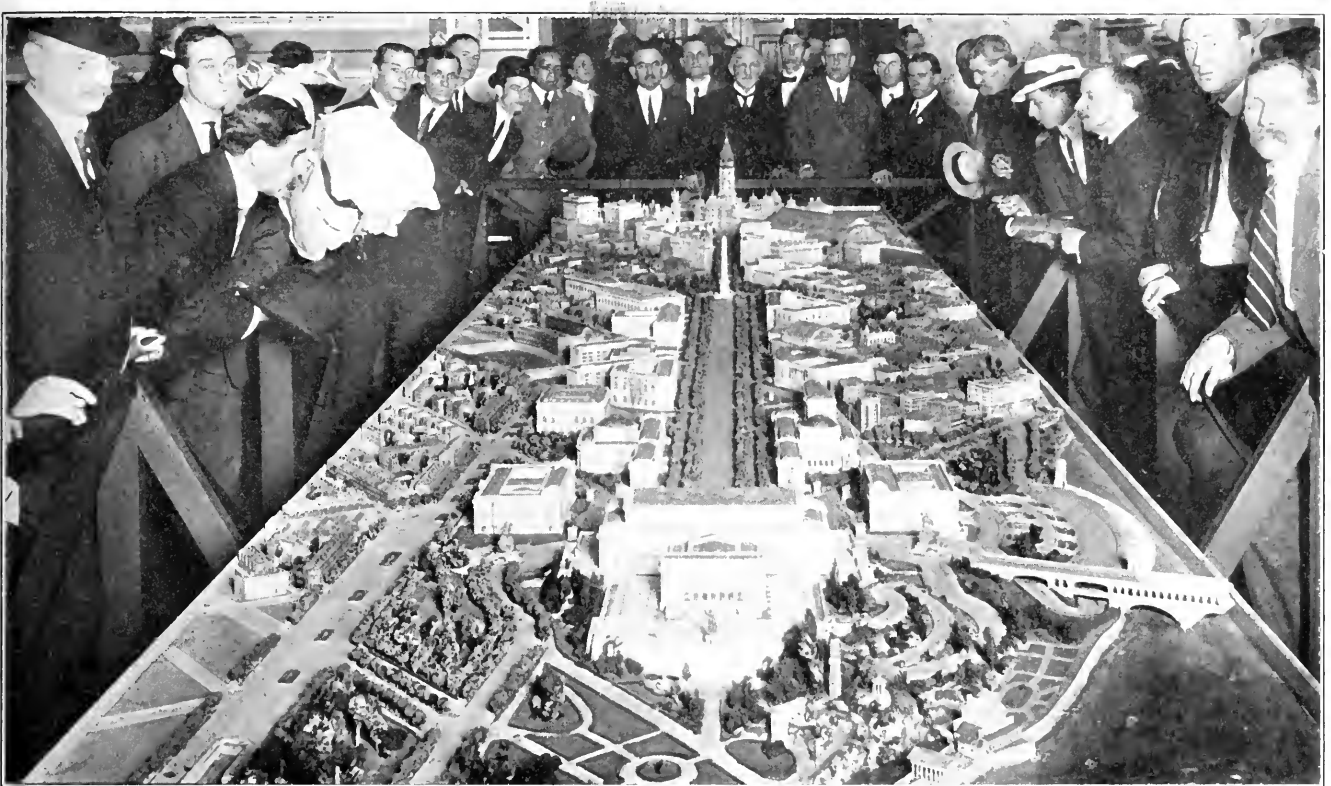
Glauber Brass Mfg. Co. Cleveland

Municipal Journal

VOLUME XXX

NEW YORK, MAY 24, 1911.

No. 21



MODEL OF PROPOSED PHILADELPHIA PARKWAY, CITY PLANNING EXHIBIT

Scale 1-32 of an inch to the foot

CITY PLANNING EXHIBIT AND CONFERENCE

Held in Philadelphia Last Week—Largest Municipal Planning Exhibit Ever Held in This Country—
Effectiveness of Models Demonstrated—Street Dimensions—Surface and Subsurface Construction

IN connection with the third annual conference on City Planning in Philadelphia last week there was on view in the City Hall an exhibit which had been arranged by the officials of that city, assisted to a certain extent by suggestions from the members of the executive committee of the conference, which is to remain open to the public until June 15, and which is undoubtedly the best exhibit of the kind which has yet been collected together in this country and the first given by a municipality. In mere magnitude it excels other exhibits which have been held by private organizations, the length of the line of charts and maps arranged along the walls of the corridors totaling one-half to three-fourths of a mile, in addition to which there were

models and other forms of display and of conveying information. These exhibits were contributed by from 35 to 40 American cities and a number of European ones, in addition to which a number of exhibits were made by individuals showing suggested or developed improvements for a number of other cities, bringing the total number of cities represented up to about 75.

Mere abundance of material, however, is by no means a commendable feature of such exhibit, and, in fact, has been found in other exhibits of a similar nature to be a decided drawback since the very multiplicity of charts, figures, "suggestions," "studies," "proposed plans" and the like have so overwhelmed

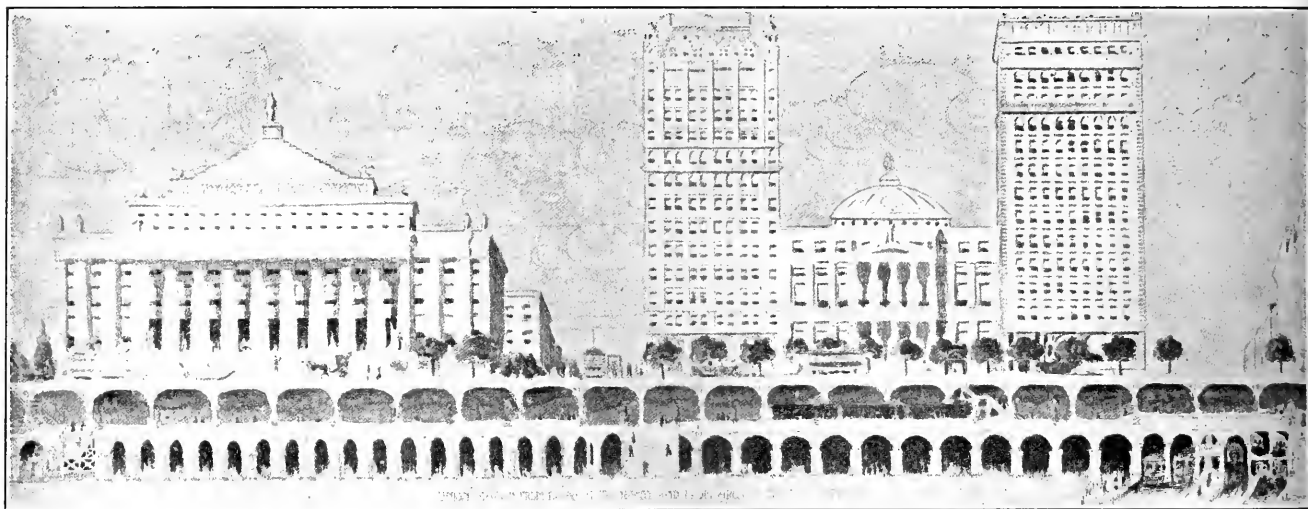
the visitor as to permit him to carry away no definite idea, unless that of the great disproportion between the amount of work devoted to such studies and plans and the number which have been actually carried out. In this exhibit, while there was room for criticism of this kind, an effort had evidently been made and with some success to have the exhibit more practical in its nature, to substitute photographs of realized conditions for wash drawings of architectural dreams, and to introduce models and other forms of representation of topography and city construction for the work of draftsmen, which is not so readily understood by the average citizen. One thing which impressed the writer in connection with this use of models was the fact that even those who are thoroughly familiar with the interpretation of drawings found that they could much better appreciate actual conditions when they were presented to them in the form of a model made accurately to scale.

Undoubtedly the most elaborate feature of the exhibit was the model prepared by the city of Philadelphia showing the proposed parkway leading from the City Hall northwest to Fairmont Park. This model is about 5 feet wide and 35 feet long, and shows, constructed accurately to scale, all the buildings in the blocks touched by the parkway, either those now existing, which

checker-board system, showing the excessive grades produced.

The two models last referred to differed from most of the others in that they represented actual rather than proposed conditions. Another interesting model representing plans which were well on toward completion was sent by the city of Des Moines, Ia. This was a model of the municipal buildings on opposite banks of the Des Moines River. The plan illustrated by the model includes five buildings and four bridges, of which four buildings are nearly or quite completed and two bridges.

Most of the exhibits, as already stated, consisted of maps, plans and photographs. These were displayed, as is the ordinary plan, on vertical surfaces. As the walls of the corridors in which the exhibit was held, however, were of stone, it was necessary to arrange for some method of attaching the exhibits. For this purpose screens were prepared, consisting of a framework of two end posts connected by two or more cross-pieces, on which was stretched burlap. The screens thus formed were approximately 8 feet high and 8 feet long. For the larger drawings these proportions served very well. For the smaller ones and for photographs of ordinary size, however, the height was too great. Six feet should be the limit of height for any exhibit of this nature, which it is necessary to inspect closely.



PROPOSED UNION STATION FOR SUBWAYS, PHILADELPHIA

will not be affected by the construction of the parkway, or the new ones which it is proposed to erect. This was located in the Mayor's reception room, and was inspected and in many cases closely examined by thousands of visitors, and by none more attentively than the citizens and taxpayers of Philadelphia. In addition to this the city had also prepared models of the proposed union station for the underground railroads, three lines of which are planned to meet near the northwest corner of the City Hall. There were also models of two local civic centers, these showing branch library buildings, fire and police stations, playgrounds, public bath houses, comfort stations, subway entrances, etc., arranged around a central park.

A larger model than that of the Philadelphia parkway, although in some ways not so elaborate, was one of the city of Toledo and the immediately surrounding country, which was about 20 feet square and showed the streets of the city and the roads leading therefrom, rivers, parkways and other features. This had been sent in several sections, which were re-joined in the exhibition room, and the whole blocked up at an angle of about 30 deg. with the horizontal to facilitate inspection from one side only.

A somewhat different style of model was that shown by Olmsted Brothers representing two methods of developing a hill in a residential district. One of these, Aspinwall Hill, Brookline, Mass., showed the streets arranged with reference to the contour lines so as to produce easy grades; on the other, Wallaston Hill, Quincy, Mass., the streets were laid out on the

In addition to these general classes of exhibits there were a few of different kinds, these included a model of the Heenan refuse destructor, bricks made in England of refuse clinker, a model of a poured concrete house with full-sized samples of a make of forms adapted for such construction, and an underground garbage receiver for private residences.

One interested in only a general way in city planning was impressed if not oppressed by a constantly repeated similarity in the drawings shown, although the expert would, of course, recognize the minor differences in treatment. Possibly the most important similarity was the word "proposed." City after city displayed plans of "proposed improvements," "proposed civic centers," "proposed parkways," etc. Of American cities Boston, Des Moines and Milwaukee seemed to be almost the only exceptions to this. As just stated, Des Moines' proposed civic center is well along toward completion, at least so far as the buildings are concerned. In Boston, while the ideas and ideals of the city planning experts and enthusiasts are not by any means completely realized, there is a more considerable degree of fulfillment of them than in the case of any other city.

It is very suggestive, however, that mingled with these proposed plans for centers of concentrated civic beauty were a number of plans and photographs showing both existing and proposed conditions as to ordinary streets for both business and residence purposes, arrangements for housing and subdivision and treatment of properties which show that the city improvement movement is obtaining momentum along more practical

nes. This, in our opinion, is very fortunate, not only because this class of improvements is fully as important as, if not more than, the opening up of parks and civic centers, but because we believe that the entire movement for city improvement was likely to collapse from the absence of a serious interest in it by the ordinary taxpayer and because of the enormous sums involved in these ambitious projects which necessarily postponed their carrying out into the future.

When a citizen and taxpayer, however, sees that city planners are not entirely in the clouds, but are taking an interest in matters which affect their every-day life, they may not only be glad to adopt their plans for the improvement of their homes and business and every-day comforts, but may be willing to seriously consider even the most ambitious aims for the development of cities along the artistic side.

Among these what may be called utilitarian features of city planning, as illustrated at this exhibit, may be mentioned the proposals for introducing diagonal avenues in Philadelphia. This city has long been the standard example of the rectangular system of street planning and it is significant that its deficiencies have been felt by the citizens to be sufficiently serious to lead to the contemplation of cutting out of built-up blocks ten or fifteen diagonal streets scattered over the entire area of the city. Another suggested plan for the Thirty-fifth Ward of Philadelphia shows a riot of curved roads with hardly an inch of straight line, which appears to us to be altogether too great a reaction from the rectangular.

A number of features were illustrated in the exhibit by several cities which have not ordinarily been connected with city planning, and the presence of which are a further indication of the tendency to consider this from all its practical sides. These include plans of bridges, of water works structures, including not only water towers and pumping stations, but also filters, underground mains and the like. Some cities showed photographs of the improvements effected by removal of street obstructions, by street paving and cleaning up and paving of alleys. Railroad station treatment in New York, Baltimore, Frankfurt (Germany) and other cities was shown by numerous photographs, indicating the desire of these corporations to do all in their power to remove those former conditions which made it generally true that the worst impression obtainable of any city was that given by and in the view from its railroad station.

Photographs of modern houses in Munich, Germany, show that that city has found it practicable to adhere to the old and picturesque traditions of architecture and at the same time not to neglect modern ideas of sanitation or even of convenience. It is to be hoped that American cities will similarly retain their local peculiarities of architecture as far as these are artistically commendable and consistent with modern sanitation, and that the familiar styles of colonial New England and Philadelphia, the high-pillared mansions of Virginia and the Spanish architecture of our Southwest, will be retained with a similar pride and appreciation of their value in making attractive cities and contributing "local color" in this country, where history is so new and traditions so few.

There are numberless details of city planning represented in this exhibit, such as plans of proposed and constructed subways, wire conduits, sewers and other underground structures, street railways, lighting standards, etc., features which we hope to see occupying a prominent part in future exhibits.

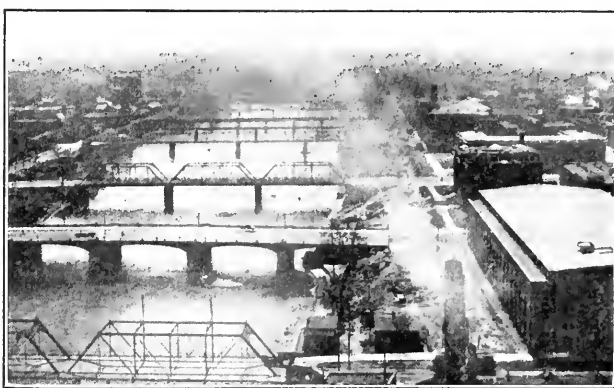
Not the least promising feature of this Philadelphia exhibit is the interest being taken in it by the citizens of that city. The exhibit is open to all from 10 a. m. to 10 p. m., and at no time between these hours during the past week was the exhibit without some visitors, and during the evening hundreds if not thousands inspected it. Moreover, these appeared to be in most cases not merely brought there by idle curiosity, but to have come with an aim to seek and obtain some definite information or general ideas on the subject of city planning.

Possibly no better idea could be given of the widespread attention which is being given to this matter of city planning than to give a list of the cities which sent exhibits to Philadelphia

for this occasion. These include Corey, Ala.; San Francisco, Cal.; Montreal and Toronto, Can.; Denver, Col.; Hartford and New Haven, Conn.; Washington, D. C.; Savannah, Ga.; Chicago, Ill.; Des Moines, Ia.; Baltimore, Md.; Boston, Mass.; Detroit, Mich.; Minneapolis and St. Paul, Minn.; Kansas City and St. Louis, Mo.; Montclair and Jersey City, N. J.; Buffalo, New York and Rochester, N. Y.; Cleveland, Columbus and Toledo, O.; Portland, Ore.; Harrisburg, Philadelphia, Pittsburgh and Wilkes-Barre, Pa.; Newport, R. I.; Columbia, S. C.; Seattle, Wash.; Madison and Milwaukee, Wis.

CONFERENCE ON CITY PLANNING

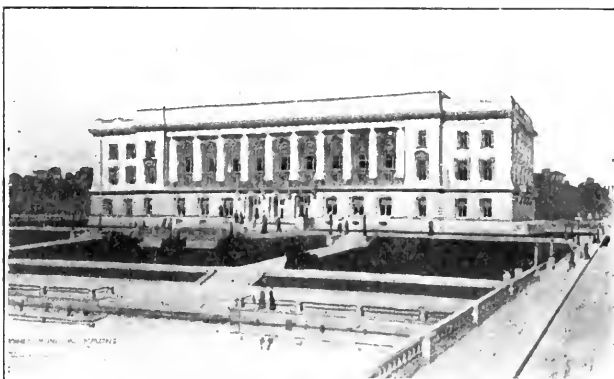
The Philadelphia conference on city planning was the most successful of the three which have been held in this country. The program was carried out practically as previously arranged, most of the sessions beginning promptly on time. The arrangements made by the city of Philadelphia were excellent and thoroughly appreciated. One indication of the good management which characterized the arrangements throughout was the fact that the extensive exhibit was completed in all details in time for the conference, although it is intended to keep it



DES MOINES RIVER FRONT, LOOKING SOUTH. Auditorium, library and post office on the right bank



LOCUST STREET BRIDGE, CITY LIBRARY AND GOVERNMENT POST OFFICE. The buildings are on the west bank of the river



MUNICIPAL BUILDING OF DES MOINES. At east end of Locust Street bridge. Nearly completed

open for several weeks and the preparation of it involved the obtaining of material from scores of cities throughout the country.

The first session of the conference was devoted to the general topic of real estate policies, one of the principal speakers being Thomas Adams, city planning expert of the Local Government Board of England. The second session was devoted to public buildings and their location; and the third to the relation of public buildings to the street and to the site. Among those discussing the last topic was Mr. Raymond Unwin, of London, England, a well-known writer on town planning. The fourth session discussed the subjects of taxes, assessments and condemnation. At the fifth the harbor improvements of New York and of Philadelphia were described, compared and discussed.

The sixth session was of especial interest to city engineers and was essentially practical in its nature, dealing with street dimensions, surfaces and sub-surfaces. This was in charge of Nelson P. Lewis, chief engineer Board of Estimate and Apportionment of New York City. The papers presented were four, one by Chas. Mulford Robinson, entitled "Narrowing of Minor Residence Streets as Affecting Tenants and Owners"; one by John Nolan, entitled "Standardized Street Widths"; the third entitled "The Street Surface," by Geo. W. Tillson, consulting engineer for the Borough of Brooklyn, N. Y., and the fourth, by Geo. S. Webster, chief engineer of the Department of Surveys of Philadelphia, entitled "The Sub-surface." An abstract of the first mentioned is given elsewhere in this issue.

In discussing street widths Mr. Robinson expressed opinions adverse to the establishing and enforcement of standard street dimensions, while Mr. Nolan advocated such standards. We do not believe, however, that the opinions of the two differed greatly, but rather the papers were written from slightly different points of view. Perhaps the most serious objection to establishing street widths, and especially to adopting the narrow streets recommended by Mr. Robinson, is the possibility that the future character of the street may refuse to develop along the lines planned for it, and that a street made narrow and designed as a minor residence street may become more or less of a thoroughfare. To meet this objection Benjamin Haldeman, assistant engineer in charge of city planning, Philadelphia, recommended the "elastic street," in which provision is made for the width required by a thoroughfare, although only present needs are met by finished roadways and sidewalk paving, the remainder of the width between property lines being given over to parking, tree spaces, shrubbery and the like.

In discussing the street surface Mr. Tillson called attention to the influence upon choice of surface material which should be exercised by the traffic of the street, its width and other features of city planning. There was not total agreement with his expressed opinion that macadam roadways have no place on city streets. He apparently would confine city pavements to those only which are placed upon a concrete foundation, while others thought that macadam may well be used on lightly traveled residence streets.

In discussing the sub-surface, Mr. Webster called attention to the great importance of municipal control over the conduits, pipes and other structures which are hidden from the view and from the knowledge of most citizens, but the proper construction and control of which play a large part in the maintenance of the pavement above, and which are becoming so numerous in the streets of large cities that it is with difficulty that place can be found for new ones. He also emphasized the necessity for the keeping by city officials of an accurate plan of all subsurface structures. We described some months ago Brooklyn's method of keeping such records and hope in a few weeks to describe those employed in Philadelphia.

The topic for the seventh session of the convention was the legal aspect of city planning—the existing laws and those which it seemed practicable to secure which would permit and encourage the adopting and carrying out of city plans. The principal paper on this was by A. W. Crawford, assistant city solicitor

of Philadelphia, discussed by Prof. Freund, of the University of Chicago Law School. The session was presided over by Hon. Walter L. Fisher, the Secretary of the Interior. Concerning excess condemnation—that is, the acquiring by a city of more land than is required for a contemplated improvement—Mr. Crawford said: "It is practically essential that the power of excess condemnation shall sooner or later be upheld, if American cities are to be rebuilt as European cities are being rebuilt. We would refer to constitutional changes proposed in Massachusetts and New York expressly authorizing such acts of excess condemnation. Whether this is an advisable method is at least questionable. While the constitutional change may be effective in the States concerned, they will not avoid a difficulty possibly presented by the Constitution of the United States.

"The Constitution of the State providing for excess condemnation will have to be upheld as not unconstitutional under the Constitution of the United States. For my own part I am inclined to think it more likely that a decision by a State Court upholding excess condemnation within reasonable limits would in turn be upheld by the Supreme Court of the United States. Up to the present time there has been no case before the Supreme Court of the nation in which a decision of a State Court holding that a condemnation is for a public use has been reversed. If, instead of a decision of a court of competent jurisdiction, a constitutional declaration passed by the people at the polls is presented to the Supreme Court of the United States I fear an entirely different attitude will be found upon the part of that distinguished tribunal."

The power to restrict high buildings to fixed zones had already been upheld in Boston and probably would be elsewhere. The power to generally prescribe the nature of development which must take place in each zone of a city, however, he did not think was to be recommended, as he did not believe that any authorities were competent to justly decide for future generations where must be located the business, the manufacturing and the residence districts; especially in view of the rapid growth of each of these in most of our cities.

In discussing excess condemnation Professor Freund believed that this should apply only to "remnants"; that is, unutilized sections of the city blocks or of estates or properties only portions of which are required for municipal developments such as streets, parkways, etc., these unrequired remnants being then sold or leased under restriction. He did not believe that properties should be acquired by the city simply because they were adjacent to improvements, in order that the city might reap the profits of appreciating value, partly because of the distrust of taxpayers that this right would be exercised wisely and honestly by the officials. A wiser plan for attaining the same end would be to assess the cost, or a large part of the same, against the property whose value would so appreciate because of the benefits rendered by the improvements.

Reference was made at this session to a law recently adopted in Germany, which law was described at the eighth and closing session by the German Ambassador, Count von Bernstorff. In the expansion of Frankfort it was found desirable to acquire considerable private property for streets, parks, etc., and in doing this a large number of small holdings of land were taken, comprising practically all of the district affected, the streets and other improvements plotted out, and the land now required for this purpose was then redistributed to the original owners, each in proportion to the size of his original holding. This was at first with the consent of the owners, but a law has now been passed giving the city the right to force a redistribution in this way. During the past ten years Frankfort had spent more than fifty million dollars in the purchase of land.

At this session Senator F. G. Newlands, of Nevada, advocated the establishing of a department of city planning by the general government; a proposition which had received the approval of the conference by formal vote in the afternoon session.

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MAY 24, 1911

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The City Planning Conference

Probably no one who was present at the Philadelphia Conference on City Planning last week would disagree with the statement that this was the most successful of the three conferences so far held. Much credit is due to the committee which, in lieu of a more formal organization, has been keeping up the interest in these meetings and arranging for the annual conventions. The City of Philadelphia, and especially Mayor Reyburn, also are entitled to a large share of the credit.

City planning is or should be the foundation for practically all of the development of the city on its material side, and we therefore offer no apologies for the considerable amount of space given this week to a discussion of this subject. Unfortunately, sufficient attention has not been given to this fundamental feature in most cities, with the result which ordinarily follows from carelessly built foundations, that trouble ensues later on.

There is, of course, acceptable excuse for this, if not excellent reason, in that most cities have grown almost imperceptibly from villages, and that for the latter a formal plan seems almost conceitedly elaborate. But experience has taught the desirability of preparing city plans as soon as the tendencies of growth can be anticipated with a fair degree of accuracy.

City officials, however, who have to do with city streets or any of the structures which are located either above or below their surfaces, realize how much simpler would be their present duties and how much more satisfactory the possible results if these streets had been planned in the first place with carefully thought out ideas as to just what their functions would be and how these best could be provided for.

In no city, however, is it too late to seriously study the problems presented and plan comprehensively for the extensions of its street system, at the same time giving even more serious consideration to the more difficult problem of adapting existing conditions to present and future requirements at the least cost and with the least interference with private rights in the streets and properties affected.

We hope that city planning will in the future receive much more attention from city engineers and other municipal officials having charge of street paving and the designing and construction of sewers, water distribution systems, wire conduits and similar structures, as well as by park departments and others engaged in cultivating the artistic features of the city.

Cost Keeping for Contractors

A recent issue of the *Journal of the American Society of Engineering Contractors* contains an article entitled "Cost Keeping and Its Value in Relation to Estimating on New Work," which is significant in its substance as well as in its title in that it indicates that the contractor of to-day is looking upon his business as not merely that of a good "boss," getting a maximum amount of work out of each laborer at the minimum wage, but that he is advancing it to be a profession, the laws of which should be studied and mastered if success is to be attained.

Even more significant of this than the paper itself was the discussion, in which several contractors stated their belief in this idea of contracting. One contractor whose work is largely reinforced concrete stated: "I keep a clerk on all of my work, and he has nothing to do but one thing, keep the time and keep track of the materials and their disposition. He checks up materials, and that relieves the foreman of that duty. . . . It is a small job that does not pay for the clerk to keep time and check materials. I think that is as necessary as any other part of the work. If there is a bag of cement that goes over to a certain footing it is charged to that footing, and so on for other sections of the work. And all it costs to know that is the salary of the man who is taking notes of them."

Another speaker summed up the advantages to contractors of cost keeping as follows: "The old-fashioned contractor who did not keep cost records never knew whether he had made or lost money on his job until it was completed; and if he had made money he did not know on what items he had made it. He had made money on the whole job, and that is all he knew. And he used those same figures on the next job, if it was similar to the previous one; whereas, if he had kept a cost system he would have been able to bid more intelligently on work by reducing the price on some of the items where he had made more than was necessary, and increasing the price for those items on which he had figured too low before."

The author of the article, Berton M. Laughhead, described in brief what is included in such cost keeping, as follows: "In order to successfully make estimates that will enable a contractor to make safe bids, it is absolutely necessary that he keep daily records, in detail, of every branch of his work, so that on completion, he will be able from such records to compile a final cost sheet that will show him the total cost and the cost per yard of his work."

ASPHALT PAVEMENT CONSTRUCTION

By S. R. MURRAY, Asphalt Superintendent, Denver, Colo.

A GREAT deal has been written and said on the subject of asphalt paving, but as most of it has been written by parties who were interested in exploiting some particular kind or brand of asphalt a few words on the subject by one who has only the best interests of the entire asphalt paving industry at heart may be of interest.

The laying of asphalt pavements was kept as a secret by the paving companies for a great many years in order to eliminate competition, but at the present time full information can be secured from any of the many asphalt experts in the country.

A first class asphalt or bituminous pavement can be constructed from any first class asphalt. The Trinidad asphalt, both lake and land, was the most widely used asphalt until the last decade. It is one of the best known natural asphalts, and comes from Pitch Lake, on the island of Trinidad, on the eastern coast of South America. The two kinds of Trinidad asphalt, lake and land, are similar in character, with the exception that the land asphalt has overflowed from the lake at some early time and has been exposed to the action of the sun and elements, which have rendered it harder and more brittle than that remaining in the lake. The asphalt in the center of the lake is soft, while that around the edges is comparatively hard, especially in the early morning, at which time it can be dug out with picks and loaded on vessels in bulk (usually as ballast). A great quantity is shipped to the United States, where it is refined. In its natural state it only contains about 35 per cent of pure bitumen, which is the only ingredient in asphalt cement which is of any value in a pavement.

After refining the purity is increased to about 57 per cent. The asphalt thus obtained is shipped in barrels to the point where it is to be used, where by the addition of a proper flux, usually a heavy oil residuum, it is converted into asphalt cement of the consistency desired. Its purity has been increased by the addition of this flux to probably 66 or 67 per cent pure bitumen.

The Cuban asphalt also is a natural asphalt, as are the Bermudez, Venezuelan and Gilsonite. The Cuban asphalt has a great many of the qualities of Trinidad asphalt, and has about the same degree of purity. One peculiarity about this asphalt, however, is that it does not readily assimilate with a flux of a paraffine nature, but readily mixes with oils of asphaltic base. The Bermudez is the purest of the Pitch Lake asphalts, and comes from the province of Bermudez, in Venezuela. After refining and fluxing it runs in the neighborhood of 95 per cent pure bitumen, and many good pavements have been laid with this material. Gilsonite, from Utah, is the purest of all natural asphalts, being almost entirely pure bitumen. The bitumen is in a very hard form, resembling anthracite coal, and therefore this asphalt requires a great deal more flux to render it of a suitable consistency for paving purposes than any of the other asphalts. Great care should be taken in the flux used with Gilsonite if intended for paving purposes, as on account of the hardness of Gilsonite it sometimes requires as much as 100 per cent of flux, depending on the kind used, to make it of the proper consistency, whereas with Trinidad about 25 per cent of flux would be sufficient, and in the case of Bermudez 15 to 18 per cent is usually sufficient to make asphalt cement.

Manufactured asphalt or residual pitches are obtained from the California and Texas oils, and the oil found in Kentucky is also rich in asphaltic bitumen. The Kansas oil is a semi-asphaltic oil, the base being partly asphalt and partly paraffine.

The Indiana, Ohio and Pennsylvania oils are nearly all paraffine base and therefore the residue is paraffine, instead of asphalt, as in the California, Texas and Kentucky asphalts. In the manufacture of oil asphalts the stills must be kept at a temperature not any higher than is absolutely necessary to drive off the volatile oils, and the distillation can be stopped at any point to secure the consistency desired.

On our work in the city of Denver we have combined the

Texas asphalt, which is not readily affected by changes of temperature, with the California asphalt, which possesses very high ductility, thereby securing a first class asphalt cement which has great adhesive qualities and is not liable to become brittle in cold weather.

A mistake which has been made in a great many cities is in not getting the proper gradation of the mineral aggregate entering into the asphalt mixture. Grading of the sand is of the utmost importance if stability is to be secured in the pavement, for with the voids filled a softer asphalt cement can be used in the pavement and still not shove up in waves.

In the past there have been as many as 15 to 25 per cent of voids in asphalt paving mixtures, and in this case if a soft asphalt cement was used in order not to crack at low temperature the pavement would shift around under traffic during the warm weather. In some instances as many as three different kinds of sand have been mixed together to secure the results desired, while in other localities, for instance, in Sandusky, O., sand can be secured where one grade is all that is necessary to form what is known as a well balanced mixture. The sand need not necessarily be of the sharpest grade, but on the other hand, sand found in the sand dunes along the Great Lakes, which has been blown around by the wind for ages until the grains become rounded and nearly all of the same size, would not make a good paving mixture.

The sand gradings are varied somewhat by the conditions of traffic on which the paving mixture is to be used. A good sand grading for ordinary traffic would be about as follows: all of the said to be passed through a screen 8 meshes to the lineal inch:

8	per cent to be retained on a	20	mesh screen
18	" " " " " " "	40	" "
17	" " " " " " "	60	" "
19	" " " " " " "	80	" "
18	" " " " " " "	100	" "
20	" " " " " " "	pass through the	100 " "

This would form a well balanced mixture with the addition of a proper amount of filler, usually from 5 per cent to 13 per cent, according to the degree of fineness of the sand and the kind of asphalt cement used. Trinidad asphalt contains a good deal of fine volcanic dust and does not require as much filler as Bermudez or manufactured asphalts, which run very high in bitumen. In good practice 10 per cent to 11½ per cent of bitumen is all that is needed in an asphalt mixture, the larger quantity being used on streets that carry very heavy traffic, and a good deal of fine material and filler being added in order to carry the extra amount of bitumen.

Bituminous macadam pavements have been laid in a great many cities, usually with good results where traffic is not too great. In the pavements of this character laid on Speer Boulevard by this city asphalt cement was used as a cementing material in one block and coal tar bitumen as a cementing material in about two blocks, Portland cement being used as filler in each instance on account of the inability to secure limestone dust. Care was taken that the mineral aggregate should contain as few voids as possible, and the pavement after being laid was squeegeed with Texas asphalt on account of its not being so susceptible to changes of temperature. Lincoln street of this city was also laid with asphalt macadam by contractor two years ago, and all of these various pavements are giving good results.

The main difference between these pavements and the shell asphalt pavements is that the material usually used is crushed hard limestone, granite or basalt ranging in size from one inch down to an impalpable powder, graded in order to reduce the percentage of voids, whereas in asphalt pavements the material is all smaller than 8 mesh. These pavements have only been used for ten years, and therefore cannot be justly compared with asphalt pavements, which have been in use for more than twenty-five years, but on account of their lower cost they have been very popular pavements where tried.

Municipal asphalt plants have been established by a great many cities in the United States, among them being Brooklyn, Detroit, Columbus, Dayton, New Orleans, Indianapolis, Bluffton, Denver, Spokane, San Francisco, Kansas City and Cincinnati, and in every instance they have proved good investments for the city and have paid for their installation in about two seasons, besides enabling all pavement repairs to be made at a lower cost, at the time desired, and of the very best materials.

Winnipeg and Hamilton, Ont., not only do their repairs, but do all the new work from their own plants, saving thousands of dollars to the property owners annually, and I believe it is only a question of time until the American cities follow the example of their Canadian sisters.

A municipal plant is even a good thing for the paving contractor, as it enables the city to keep its pavements in first class condition at all times, and in my opinion the very best advertisement for asphalt and sheet pavements of any kind are "good" sheet pavements.

NARROWING MINOR RESIDENCE STREETS

Its Effect on Tenants and Property Owners—Too Wide Streets Require Crowded Buildings—Building Restriction

Abstract of paper by Chas. Mulford Robinson before Street Planning Convention.

THE phrase "minor residence streets," as used in the title of this paper, is intended to exclude all main highways, all avenues and boulevards, and all streets which carry a through travel that so much as even equals the traffic originating and terminating within the street itself; consequently all streets that carry car lines or that are routes convenient for general teaming, driving and motoring. Minor residence streets include those which are relatively uninviting to traffic, either because of the special development of other thoroughfares, or because of some physical handicap of their own, such as indirection, heavy grades or a break in continuity. They receive the little eddies from the traffic streams which flow through main thoroughfares, and will therefore be generally in close connection with major streets and traffic highways. In an ideal city plan, in which arterial streets radiate from a common business center, the minor streets are located between the radii. They will not be limited to any one residential section of the city. They do not exclusively belong to any one class of citizens. Necessarily, therefore, they vary in character. The back-lined alley off a third-class business street, and a private "Place" off a fashionable avenue will alike be considered here as a "minor residence street." They are more numerous and on them dwell more citizens than any other single class of streets.

Their economic influence, for good or ill, is not their only influence. Between two minor residence streets, or between two well-defined divisions of one of them, there may be the diameter of the whole social structure. If, then, even the width of these streets be standardized, so that they all tend to uniformity, and the lives of the residents are not, and cannot be, reduced to a fixed social mean, there must inevitably result a series of misfits, of which the outcome can be only prodigality, social inconvenience and a general maladjustment to real conditions. There are other ways in which standardization means extravagance and maladjustment; but I shall speak of only the one matter of width.

Wide streets increase the rents of houses. Alderman M. W. Thompson, chairman of the National Housing Reform Council of England, in his valuable compilation, "Housing Up to Date," states that under modern conditions of subdivision the cost of roads, sewers, etc., reaches in some cases as high as \$45 per room, or \$225 per cottage, and that it averages \$45 per cottage. This calculation is based on statistics covering thousands of cottage dwellings, and since the word "cottage" means this connection houses built in continuous rows—that is, dwellings that occupy with their grounds a minimum street frontage—it reveals the effect on rents for even the cheapest

homes. As to the more costly villa type of dwellings, the same authority notes that the English by-law requiring a paved or macadamized road surface of about 40 feet, has made the cost of thoroughfares, in newly developed estates on the outskirts of towns, from \$1000 to \$2500 per acre—"or more than the land itself."

John S. Nettleford, in his "Slum Reform and Town Planning," calculates that the interest on the expenditure for street work "comes to one shilling or more per week on a house rented for six shillings, if the number of houses is restricted to fifteen per acre." One must hear that statement twice to get its full significance, and must realize that the suggested restriction is not a low one. At Bournville the houses are restricted to eleven to the acre, and at Hampstead Garden Suburb to only eight. Yet at fifteen to the acre, one sixth or more is added to the weekly rent by the English by-law requirement of forty-foot streets.

Raymond Unwin puts the unreasonableness of the requirement in this striking way: "A mansion such as Chatsworth or Blenheim will be adequately served by a simple carriage drive from 13 to 20 feet wide. The population of such a building will be larger than that of a row or group of cottages, and the amount of wheel traffic to and from it many times as great; yet for the cottage road asphalt or concrete paved footpaths, granite curbs and channels, and granite macadamized surface, the whole from 40 to 50 feet wide, and costing, with the sewers, etc., from £5 to £8 (\$25 to \$40) a lineal yard, are required by the local authority under our existing by-laws."

The burden of all this cost, to which is to be further added the value of the land thus withdrawn from productive use, is borne by the occupants of the district, whether they be tenants or owners. The cost is therefore an important factor in the living expenses of all citizens, and if our present method of standardization is unduly extravagant it should not be permitted to persist simply through inertia and because it saves trouble in surveying and thinking.

The new town planning act in England recognizes the condition by permitting English local authorities, in order "to secure proper sanitary conditions, amenity and convenience," to relax or modify former requirements, breaking away from the tradition that all streets should be of like width and like strength. Furthermore, the act itself recognizes three distinct grades of roads—main arterial, secondary and residential.

Dr. Hegemann, of Berlin, has traced the relation of cause and effect between the wide streets which the Germans built a few years ago and the tenements with which those streets are lined in the more remote portions of the German capital; while Thomas Adams, of the town planning department of the Local Government, of England, said that after investigating conditions in Germany and Sweden, he had come to the conclusion that the system of high tenement block dwellings was as much the result of wide roads, as wide roads had become the result of the tenement system. The one, he said, was complementary to the other. It was necessary that the owner extract from each yard of his frontage enough rent to pay its share of the costly street.

That in England and America broad streets, in areas where the poor are congregated, are not—save in New York—as commonly lined with tall tenement barracks as in Germany, does not mean that the same economic law is not in operation, or that it operates less unfortunately. A social repugnance to the big tenement, except as a last necessity, has led to the construction of small houses (often more crowded per room, and less sanitary, than is the tenement block) and then, to squeeze from the land the higher rent necessitated by the cost of frontage on an expensive street, has induced the construction of another house, sometimes a small tenement, on the rear of the lot. These houses hidden by the structures in front are uncontrolled by ordinary police inspection and unaffected by public observation and criticism. They become such breeding places of disease and vice that at last, in city after city, it becomes necessary to forbid their erection.

Of great significance also is the fact that there could be

cheaper minor streets for residence purposes, less capital would be required in the development of estates, less land tied up for want of the capital, and more land thrown open for building.

If the narrowing of minor residence streets tends to reduce rents, it does not follow that it tends to reduce property values. The latter are for the most part—as regards property of this character—the capitalization of net income, expected if not realized. A reduction in rents, which results from reduction in carrying charges, may leave net income unaffected.

But this does not mean that a method of street designing adjusted to street needs would not have any influence upon property values. Real estate would feel its influence in various ways.

In the first place it would tend to create stability in values. This effect would be seen alike on the main thoroughfares and on the minor streets. The concentration of through travel upon certain streets would raise the value of the frontage on those streets for commercial purposes; while the assurance that intermediate streets would not be encroached upon for business purposes would not only settle definitely the business character of the chosen main highways, but would have a beneficial effect upon property on the intermediate streets. The reason for this is the certainty which would then be gained that they would be free from the danger of invasion by elements inconsistent and out of harmony with their present use. The more certain, it has been well said, a man can feel that the character of any given street is fixed, the more he is willing to pay for the privilege of having a lot on that street, if it is the kind of a street he wants. He justifies this willingness from an economic standpoint by the argument that the property for the use for which he desires it will not decline in value.

Another effect of a more rational method of street planning would be, as already suggested, the opening of additional tracts for building purposes. This means that fewer persons owning property on the outskirts of cities need be "land poor." There would follow a greater equalization of values between adjoining properties.

Over against the possible depressing effect upon values, which would be anticipated from a greater supply of available building lots, is to be put the increase in demand, which may be expected to follow an enhancement in the attractiveness of small streets. It must be clear that streets which follow more nearly the topography, which makes use of every natural advantage, which are narrow, grass bordered, quiet ways rather than broad and dusty highways that are hot in summer and cold in winter, would call men from the city streets with an even greater appeal than suburban tracts now call.

Though a good deal has been said about the cost of *making* needlessly wide streets, a factor of scarcely less weight is the cost of *maintaining* such thoroughfares once they are built. The saving would represent not only the economy of having to provide for the depreciation of a smaller area of street, but it would be the result of a much less rapid rate of deterioration, because there would be nothing but local travel to wear out the street; so that a cheaper grade of pavement, costing less in the first place, would last as long as an expensive one; for these minor residential streets, inviting no through travel, would be as private entrance ways to the few houses gathered upon them.

It may be said that those who own property on the main traffic highways would be pretty hard hit by construction and maintenance charges, if all through travel were concentrated upon their streets. This is true, but there are three answers to the objection: In the first place, their property would at once gain speculative value. It would have the commercial possibilities which are to be denied to the intermediate streets, and which pay such high returns. In the second place, it would be but fair, wherever it is demanded that wide streets be put through a residential estate for the convenience of communication between districts lying on either side of it, to require that the general body of tax payers should pay the cost of street works in excess of what might

reasonably be held to make for the convenience of the frontage and for the increase of its speculative value. Third, it is probable that, taking the city or even the neighborhood as a whole, the deterioration of pavement would be much less than under the present system. There would be a smaller street area to take care of, and some pavements, such as asphalt, deteriorate less rapidly if they carry a fairly heavy and constant stream of travel. At any rate, by concentrating the bulk of the traffic on a relatively small number of selected streets, these could be especially prepared for it, and given a width and style of pavement calculated to handle the business with the least delay and the smallest cost for operation and maintenance. Then each purely local street could be developed in the way that would best suit the needs, the means and the taste of the people it is designed to serve.

A final consideration with reference to real estate values is, that only such a system of street designing as here proposed can make just and reasonable—and that is to say, can make possible—a radical restriction of the number of houses which may be constructed to the acre. If the city is going to say to the owner of a certain tract that he can construct not more than fifteen houses to the acre, it must also say to him that he will not have to pay, for the development and maintenance of the streets in his tract, any such sum that thirty houses to the acre would be necessary to give him an adequate return on the investment. The one act is really complementary to the other. When a city restricts the number of dwellings per acre in any given area, it places an approximate limit on the amount of traffic for which provision need be made by the local streets of that area. The necessity no longer exists to require that there be adherence to rigid specifications designed to take care of a traffic which may increase with unchecked rapidity. It becomes possible at last to adjust the streets' development to the property's development. But when no limit is set to the latter, as in unrestricted areas, the standard for the street work must be set by the promoter's dreams. It will be correspondingly high, and correspondingly forgetful of the common good.

BEAUTIFYING MUNICIPAL PROPERTY

THE illustration accompanying this article shows a most practical application of principles of city beautifying. Too many city yards are blots upon the landscape and depreciate the value of adjacent property, but we here find the stable and entrance to the yard presenting a most attractive appearance. It is unfortunate that the majority of cities do not set a better example to their citizens by paying some attention to the neatness and attractiveness of their own properties. Springfield, Mass., the owner of the city yard here illustrated, as well as of another, is certainly to be commended for the example which it sets. Incidentally, the city also owns three gravel banks and a trap-rock quarry, a trestle and bins for receiving and storing trap rock, together with buildings for housing the steam roller, wagons and other appliances owned by the street and sewer department.



CORNER OF CITY YARD, SPRINGFIELD, MASS.

NEWS OF THE MUNICIPALITIES

Current Subjects of General Interest, Under Consideration by City Councils and Department Heads—Streets, Water Works, Lighting and Sanitary Matters—Fire and Police Items—Government and Finance

ROADS AND PAVEMENTS

Business Men Make Roads

Council Grove, Kan.—The Good Roads Committee, comprised of the business men of this city, turned out in a solid mass 200 strong, with pick, shovel and teams and cut down and graded a large hill south of town which has long been a hindrance to travel to one of the best farming sections of Council Grove's territory. The test was a very successful one and they hope by spending several such days of the summer in this manner this city will have some of the best roads in the State.

Will Charge Oil to the Property

Superior, Wis.—The Board of Public Works is now working on the matter of assessing the cost of oil to be used on the streets against the property fronting on the streets treated in this manner. In accordance with the sprinkling law which Mayor Crumpton succeeded in having the Legislature pass the cost of the oil as well as the labor expense, etc., can be charged to the property benefited. Secretary Beglinger has conferred with Mayor Crumpton in regard to making the assessments and a system is now being worked out by the clerical force in the Board of Public Works. Winter, Twelfth, Bay and Third streets will be the first to be treated with oil. The new sprinkling law covers the street car sprinkling as well as the oil feature, compelling the company to bear its share of expense.

Important Street Improvements Nearing Completion

Charleston, S. C.—Both the boulevard work and the sewerage extension, one representing the reclamation of over 40 acres of land from the Ashley River, at a cost of about \$250,000, and the other standing for an investment of \$400,000 in street sewers and connections, will be completed practically in a few days. After the boulevard filling is done then the City Engineer will proceed to lay out streets on it, and lots will be divided off and sold. Considerable work remains to be done in the sewer contract restoring paving, and making house connections, but the big part of each undertaking is nearing completion.

City Relieved of Paving Burden

Los Angeles, Cal.—By a slight omission in the amended State law passed by the last Legislature to cover the proceedings for the paving of streets, the city is relieved of the responsibility of repaving certain streets where traffic is heaviest. The new law was signed by the Governor a week ago and it has just been discovered that the slight change will have a far-reaching effect in Los Angeles. Many years ago the City Council passed a series of ordinances formally "accepting" the pavement on the following streets:

- Main from Alameda to Thirty-seventh.
- Spring from Temple to Ninth.
- First from Main to Sixth.
- Broadway from First to Sixth.
- Sixth from Broadway to Figueroa.
- Seventh from Main to San Pedro.

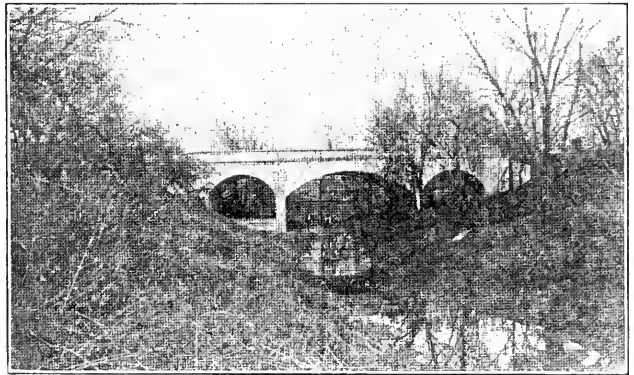
Under the old State law the city was authorized to include in these ordinances a declaration that inasmuch as these streets bore an extraordinary amount of general traffic the city would undertake to renew the pavements from time to time as it became necessary, paying the cost out of the general tax funds. The original cost had been borne by the property owners. Except for these favored streets, the rule was that the expense of repaving a street should be borne by the property owners on either side. Under the new law this favored exception is ignored and in future should any of these streets have to be repaved the property owners will be assessed for the improvement.

Misunderstanding Will Prevent Oiling of Streets

Bridgeport, Conn.—Because of the failure of the Board of Apportionment to specifically appropriate funds for street oiling, instead of providing a lump sum for sprinkling the streets with both oil and water, City Attorney Cullinan has given an opinion to Public Works Director Kenny that the Burns Company is within its rights in going ahead and sprinkling all of the streets with water. There will, consequently, be no street oiling done this year by the Public Works Department.

Concrete Viaduct for Boulevard Crossing Park

Oklahoma, Okla.—A new concrete viaduct has been erected on the Grand Boulevard encircling Oklahoma City. It is one of a number to be constructed along specially-prepared plans for this work; they are reinforced to with-



CONCRETE BRIDGE IN OKLAHOMA PARK

stand a great weight. With the completion of these viaducts more than four-fifths of the new boulevard will be opened to travel. The method of concrete construction employed has enabled the park board to effect a saving of 20 per cent in this work over estimates of the same class of work in the city in the past. The structure illustrated is 30 ft. wide, the central span 40 ft. long and the other two spans 20 ft. long. A park driveway will pass underneath this viaduct.

City Has Fine Boulevard System

Des Moines, Ia.—"Des Moines can profit from Kansas City, which has the finest boulevard system in America," declared Mayor Hanna on his return from Kansas City, where he delivered two addresses on the commission form of government. One address was delivered at the fifty-fifth annual banquet of the Real Estate Board of Kansas City. It was attended by 500 people. "The boulevard system in Kansas City," said Mayor Hanna, "is not costing the city a cent. The property owners are paying for it. They appear before the City Council and ask permission to convert the streets into boulevards. There is always a scramble for permits. After they receive permission they go ahead with the work and pay for it. They receive the benefits by having the value of their property doubled."

Dust-Laying Commences in Earnest

Taunton, Mass.—The municipal dust-laying machinery, after exasperating delays, has started. On the trolley lines this is to be, as in the past three years, by the tramway sprinkler. On the other streets, residential and business, where the houses are closely situated, it is by an application of oil. Some of the latter may not get their treatment for a day or two, but the Highway Department has made its start. The expenses for oiling and watering are so arranged that the cost will be assessed on the owners of abutting property and not from general taxation.

SEWERAGE AND SANITATION

Drinking Cup Outlawed

Chicago, Ill.—Chicago physicians are united in praising the action of the Council in outlawing the common drinking cup. Under the terms of the ordinance, public drinking cups must disappear by August 8. All cups and glasses found in schools, office buildings, department stores, physicians' reception rooms and all public places will be seized.

Health Board Plans Improved Sanitary Conditions

South Bend, Ind.—At a recent meeting of the City Board of Health several matters were taken up. The Board has issued instructions to the sanitary officers of the Police Department to see that all yards are cleaned and out-buildings placed in first-class condition. Those who failed to heed the warning issued some weeks ago will have the work done by the city at their expense.

Water Cups to Go

Plainfield, N. J.—The use of the common drinking cup in public places in Plainfield will be a thing of the past after July 4, according to the provisions of the new law enacted by the Legislature, and persons violating the act will be liable to a fine of \$25 for each offense. There are a number of places in this city where the law will be effective, such as railroad stations, stores, shops, factories, etc. After July 4 paper cups in slot machines, or some other approved method will have to be adopted, not only here, but all over the State.

Explosion of Sewer Gas Does Serious Damage

Akron, O.—It is estimated that it will cost the city \$50,000 to repair the damage done on Howard street by the explosion of sewer gas on that street one day last week. The explosion was in the main trunk sewer, one of the largest sewers in the city, through which practically all of the sewage of the city passes down into the Little Cuyahoga River. This sewer is fully five feet in diameter and was built many years ago of brick. The sewer is so large that it is possible for a man to walk through it. Upon examination it has been found that the sewer has been wrecked in many places, and it was thought that it will be necessary to tear up all of the sewer from the river bridge, at the foot of North Hill, on up to the railroad bridges, and possibly up to a point near Market street. The explosion was more terrific than first reported. Not only is this main trunk sewer wrecked but it is feared that great damage has been done to a large part of the sewage system in that section of the city. The damage done to the bridge over the Little Cuyahoga River will require an expenditure of a large sum of money.

River Residents Must Build Sewers

Toledo, O.—Plans for diverting the sewage of upriver residences and institutions from the Maumee River between Delaware Creek and the Children's Home, for the protection of the water supply at the filtration plant, were thrown into the air by the defeat of the Geleerd bill in the House of Representatives last week. This bill was intended to give the County Commissioners authority to build public sewers by districts outside of the city limits, the cost to be borne by the property benefited. The only way such a sewer can now be built is by assessing the cost on the entire county. West Toledo residents, for whose benefit the bill originally was drawn, similarly will have their plans knocked out. The village is incorporated and the citizens wanted it erected into a sewer district, so that the County Commissioners could build the sewers and assess the cost on the property benefited. "I simply will have to insist that the upriver residents proceed at once with the elimination of the sewage from the river," said Service Director Cowell. "The original order was that this must be done by March 1. It is up to the residents affected to find some way around the difficulty. I waited for the passage of this bill because I thought it was the best way to solve the problem. I am sorry for them, but I am looking after the purity of the city water, and the interests of 180,000 persons must supersede those of 200." W. H. Gould, engineer, employed by the upriver residents, said that he has no idea how they can comply with the order, although his employers are willing to do so.

WATER SUPPLY

Filtered Water by November 1

Evansville, Ind.—Clear water by November 1. That's what the Water Works Board is promising the people of Evansville. A report to the water works trustees assures that Evansville would have clear water in six months. The monthly payment to the Norwood Engineering Company was made, amounting to \$8,762. With the extras to date the plant will represent a value of \$246,292.68. The sum of \$138,633.74 has been paid on the plant and \$147,395.74 remains to be paid. The money is to be paid in monthly instalments until 65 per cent of the total has been paid. Fifteen per cent is to be paid after a test of the plant. Ten per cent, amounting to \$24,600, will be paid a year from the completion of the plant. The remaining 10 per cent is to be paid two years after the completion of the plant.

Will Protect Water Supply

Cortland, N. Y.—The Board of Water Commissioners is taking steps to fully protect the source of Cortland's water supply. The Commissioners have secured options on Dr. Santee's farm of 45 acres and on 20 acres of the Yager & Halstead farm. They will now go before the State Board of Water Commissioners to obtain the privilege of purchasing this land, which will give the city control of practically the entire immediate watershed. The city recently purchased the water works from a private corporation and is improving the system in many ways. All the water used by the municipality comes from a series of springs west of the city, and almost within the city limits.

Citizens Repair Big Dam

McAlester, Okla.—Last year the city of Krebs, with 3,000 population, adjoining McAlester on the east, put in a system of water works at a cost of \$80,000. This included an immense dam. No rain fell following its construction and the winds injured the inner side, so it was feared the rains when they did begin would wash it. Councilman Tony Rich and Councilman-elect T. P. Carano, both former miners, thought while the mines were idle, the miners would help repair the dam. Mayor Seamons proclaimed a holiday and appealed to every citizen to donate a day's work in helping to riprap the dam. On the day set last week over 200 men appeared there and worked all day. The citizens who did not work contributed the money to buy a fine dinner, and at night the work was completed. The old adage of "many hands make light work" was verified, for these 200 men, with 15 teams and wagons, had laid a riprap wall 700 feet long and from 20 to 25 feet thick, averaging 28 feet high. The stone was found in abundance on the watershed and measurements showed that over 600 perch of stone was handled that day. Thus the people of an enterprising little city solved the problem for which they had no money in the treasury to pay to have the work done.

Make City Departments Pay for Their Water

Atlanta, Ga.—The suggestion was made at the Water Board meeting recently that the various city departments now using free water be made to pay for it. This may sound like a joke, but the Water Board didn't consider it so. They've actually got the notion in their heads, and are very serious about it. Complaint because some of the departments are wasting water brought up the suggestion to make them pay. Hereafter a record will be kept on all the departments and they will be ordered to be more careful. Some years ago when water was being wasted the department had meters installed and now they will be made to serve the same purpose again.

Paterson Pays for Water Survey

Paterson, N. J.—The Board of Finance adopted a resolution directing the drawing of a warrant for the payment of the sum of \$1,000 to the State Treasurer for the use of the Water Supply Commission, this being Paterson's share of the cost of the making of the necessary preliminary surveys and borings by the State Board for the purpose of preparing plans for the developing of the Wanaque watershed for the use of this city and other municipalities which have joined in a request for a municipal supply from this source.

LIGHTING AND POWER

Growth of Business Forces City Light Plant to Expand

Pasadena, Cal.—General Manager Koiner has called the attention of the Council to a condition of affairs existing at the municipal light plant, which must have been apparent to any one familiar with the rapid growth of the city's business. This condition is the unpreparedness of the city plant to cope with an excess load. During the winter the plant played almost to capacity business, having left practically no reserve for extra heavy loads, and new and growing business. The steam boilers already installed at the plant are capable of generating much more steam than is needed, but the plant has neither the engine capacity nor the generating unit necessary to use this steam, and now Manager Koiner asks the Council to arrange for this permanent improvement, which cannot be installed in less than six months, and will be needed as soon as installed.

Commission Will Redistribute Arc Lights

Birmingham, Ala.—That the electric arc lighting of Birmingham was not in good apportionment was the declaration of Arc Light Inspector Higgins to Commissioner Weatherly recently, and upon his statement the policy of redistributing the arc lights of Birmingham will be taken up by the Commissioners at once. Inspector Higgins will be accompanied on a round by President Exum and Commissioner Weatherly very soon. They will look into all the lighting conditions and their inspection will perhaps result in a serious curtailment of the present number of lights used. President Exum and Commissioner Lane agreed a few days ago that the lighting system was in serious need of betterment. It is held by the Commissioners that the arc lights have in the past been placed indiscriminately over the city and in places where favored personages reside and not in accordance with any system of lighting. Their proposed reformation of this illumination question will not result in any decrease of efficiency on the system, but it will result in a saving of money to the city and the betterment of the lighting of the streets of Birmingham.

Will Have Municipal Electric Light Plant

Chase City, Va.—The Town Council has just awarded a contract for the erection of a \$20,000 electric light plant. Contracts have also been made to macadamize Main street and Fifth street to the depot. These improvements have been made possible by a town bond issue. A peculiar thing about this bond issue is that the highest and best bidder for the bonds when issued was a local concern, to wit, the First National Bank, of which N. H. Williams is president.

Put in New Electric System

Chicago, Ill.—County officials have installed an emergency battery to be used as a relay electric service system in the county building and the City Hall after the sanitary district begins supplying current. Material for operating the battery, one of the largest in existence, was taken into the county building basement. At present the power is supplied by the Commonwealth Edison Company. The cost of installing the battery aggregates \$200,000. By the new system the saving to the city is estimated at \$140,000.

Would Build Subways

Los Angeles, Cal.—The construction of a system of subways in Los Angeles and the operation through them of lines of monorails, is contemplated by the American Monorail Company, a Baltimore corporation, capitalized at \$10,000,000. The tentative plan includes also the building and operation of monorail surface lines between Los Angeles and Pasadena and between this city and beach points, with possibly other suburban lines.

Steps Looking to Municipal Ownership of Lighting Plant

Birmingham, Ala.—Active steps will be taken within a few days by the Board of Commissioners to begin preparation for the North Birmingham light plant for supplying Birmingham city buildings with electric current. Commissioner James Weatherly in an interview agreed literally with the resolution of Commissioner A. O. Lane that the plant should be made efficient and the enormous light bill paid each year by Birmingham to the Birmingham Railway, Light & Power Company cut down to the smallest possible figure.

FIRE AND POLICE

Would Make Firemen Responsible for Safeguards Against Fire

Chicago, Ill.—Mayor Carter H. Harrison wants the Council Building Committee to vest full authority in the Fire Department to enforce protection of human life against fire. The Mayor, talking of the new ordinance to be drafted, ordered by the Building Committee, left no doubt that it is his wish that the Fire Department shall hold the responsibility for the enforcement of safeguards against fire. The Mayor in his message to the Council on this subject, which was accompanied by resolutions adopted by the Woman's Trade Union League, let it be known that the bureau proposed was to be more than a mere inspection body.

New Fire House Dedicated by Mayor

Oakland, Cal.—Mayor Frank K. Mott, Fire Marshal N. A. Ball and others were the prominent speakers in exercises dedicating the new fire house at Fifty-sixth and Dover streets. The house was recently completed, and has been equipped with modern apparatus. It will protect a hitherto inadequately protected area. A combination chemical and hose automobile has been installed in the Dover street house. The apparatus was purchased at a cost of \$5,000, and in a test made recently was found to be highly satisfactory. Two more of these combination wagons have been ordered and will arrive within a few days. Additional hose will permit of better work with the high-pressure salt water system.

Better Fire Facilities

Chatham, Va.—The double-tank chemical fire engine for the town has been received, and is of the latest and most improved type. It is of the same type as the larger engines of the large cities. The fire fighting facilities of the place are greatly improved.

Police Pension System Started

Woonsocket, R. I.—The Police Commission last week voted to establish a police pension fund, doing so under the authority of the act creating the board. Last year the Board of Aldermen, by legislative authority, was given the right to establish the pension system, but did not do so.

New System for Police to Report

Huntington, W. Va.—The new Gamewell police telegraph system went into effect last week, the officers from every district reporting to headquarters by the new system. From now on the work of the police sergeants and of the officers as well, will be greatly lessened.

Fire Engine Tested

Elizabeth, N. J.—The Webb motor fire engine, recently sold to the city of Newark for Fire Company No. 21, was given a test here late last week, which was witnessed by several town officials and citizens. Two lines of hose were laid up Mountain avenue from the engine, which stood at Central avenue and Broad street. The streams were thrown over 100 feet in the air.

Fire Auto Being Built for City

Superior, Wis.—What Fire Chief Johnson believes will be one of the most efficient pieces of apparatus belonging to the local department is being constructed at the shop attached to the Eighteenth street fire hall. It is to be an automobile hose and chemical truck. The chassis for the new piece of apparatus was purchased by the city early this spring and ever since that time the firemen have been busy getting it into shape for the body which is to go on it. Several changes were necessary to adapt the chassis to the use to which it will be put. These have now been completed and the body is being built for it. The auto truck will carry 1,000 feet of hose and also a 50-gallon chemical tank with the hose which goes with it. There will also be several ladders and other fire-fighting apparatus on the machine. The machine is a 60-horsepower and is expected to make about 30 miles an hour after being rebuilt and with the full equipment aboard.

GOVERNMENT AND FINANCE

City Gets Three Per Cent on Its Deposits

Lexington, Ky.—Mayor John Skein has completed an arrangement with the Phoenix-Third National Bank of this city whereby the city of Lexington is paid 3 per cent on its deposits in the form of sinking funds, and has thereby established a precedent in the annals of the financial history of the city.

Selling Bonds at Auction

Chicago, Ill.—A new method of putting municipal bonds on the market has been inaugurated in Chicago. The city of Council Bluffs, Ia., has sent an issue of bonds to be used for various municipal purposes and will sell them at auction to the highest bidder at one of the principal hotels here next week. The City Clerk of Council Bluffs will preside at the sale and will furnish to intending purchasers an opinion by a recognized firm of Chicago attorneys approving the bond issue.

Elections Are Proving Costly

Tacoma, Wash.—The holding of numerous elections in Tacoma is costing more than had been anticipated by many, according to the report of City Comptroller J. F. Meads for April. The report shows that the two mayoralty elections held on April 4 and 18, respectively, with the change of administration cost the taxpayers over \$7,000. The exact cost of the two elections was \$7,412.34. The recall elections against the commissioners this month resulted in fully as large an expenditure. This means \$15,000 for the four recall elections.

Citizen Asks Injunction to Prevent Bonding of District

Oakland, Cal.—An injunction suit has been started by F. W. S. Brookes against Mayor Mott and the City Council to prevent a bond issue for sewer work totaling \$102,000. Brookes, representing property owners in Oakland Sewer District No. 1, brought action as a test to determine the validity of the act under which the city was authorized to proceed. The First District is almost the same as the Upper Fruitvale Sanitary District, the bonds for which work were knocked out in the higher courts. The total issue at stake and upon which the outcome of this case will have direct bearing, is more than \$400,000. Brookes, through his attorneys, contends that the bonds of a portion of the territory of a municipality must be voted for by the entire city. This is in direct opposition to the act, which says the bonds shall be voted by residents of the district where the work is to be done. Bonding houses have refused to consider the issue until the legal obstacles shall have been overcome.

Bond Issue May Be Invalid

Oklahoma City, Okla.—It is very probable that the \$3,000,000 bond issue authorized in an act of the last Legislature, behind which the State pledged the school lands as collateral, will come to naught, and that the construction of all new buildings authorized by the Legislature will be delayed indefinitely, or until another session of that body. The point is made that the school lands were given to the State by the Government for the benefit of the school children of the State and could not be used except in the interests of educational institutions. At any rate, this opinion seems to have been the law with bond buyers, and they have refrained from bidding because of future possible complications. It is contended that the act of the Legislature in causing the bond issue to be made upon the public building fund was in violation of the constitution, and that before such proceedings could be legally binding the constitutional provision would have to be repealed, and this could only be done one way, by a vote of the people. Consequently there seems no way other than to wait for the next Legislature to provide an election on the proposition of repealing the constitutional provision which now supercedes all acts of the Legislature. Some of the new buildings provided for under the new issue are the law building at Norman, costing \$125,000; construction work on the penitentiary at McAlester and reformatory at Granite, new building at Edmond and building No. 3 for the insane at Vinita.

Town Has Three Mayors in Thirty Minutes

Harlingen, Tex.—Probably the first incident of the kind in the history of the State, if not in the entire country, occurred when Harlingen last week had three duly qualified Mayors in 30 minutes. The meeting of the City Commission was opened by the retiring Mayor, I. B. McFarland, who then proceeded to qualify John D. Hill, who was elected on April 4. Mr. Hill, who has been away since the election and has acquired some business interests in Houston that will take all his time, accordingly resigned, and then the commission proceeded to elect Judge A. W. Cunningham as his successor, who qualified at once, making three Mayors in half an hour.

Bond Money Available

Fort Worth, Tex.—With the arrival at Kansas City of the balance of the million dollars in bonds of the city that the Commercial Trust Company of that city has bought, there will be available to the order of the city \$310,000. The trust company has already paid to the city \$690,000 on the first delivery of the bonds and this second delivery will complete the million. The bonds were registered in Austin and will be forwarded at once to Kansas City. There is a second million dollars in bonds on which the same company holds an option and that block of bonds was also registered.

City Budget Goes to City Council

St. Louis, Mo.—A total appropriation of \$10,819,638.57 is carried by the annual appropriation bill, which has been sent to the City Council by Comptroller Taussig, together with the bill fixing the tax rate for St. Louis at \$2.22 per \$100 of assessment the same rate as last year. The total appropriation is \$681,802.54 larger than last year.

The heaviest expenditures are for the Police Department, \$2,098,575.47, which is \$2,420.85 less than last year; the Fire Department, \$1,094,980, which is \$4,391.51 more than last year, and the Street Department, \$1,343,244.54, which is \$31,406.78 more than last year.

Allotments for extensive work are made in the bill, amounting to \$657,308.69, as against \$235,599.28 the year before. Some of the work provided for is the completion of the Municipal Courts building and the beginning of work on the new jail building, \$325,000; the city's share of sewers and streets, \$102,325; addition to the workhouse, \$23,800; improvements in parks, \$82,105; the annual payment on Fairgrounds Park, \$50,000; new fire engine houses, \$45,985, and other new work, \$28,093.69.

Co-operation Aim of City Bureaus

Spokane, Wash.—Carrying out their idea of obtaining a closer co-operation of all city departments on all matters, the city commissioners have established an innovation in the way of a general report system, which requires inspectors of one department to report not only what they find in need of repair coming under the supervision of their own chief, but matters concerning all other departments. Under this system, which is the idea of Commissioner Fassett, inspectors in all departments—water, sidewalk, sewer, street, crematory, health, fire, building, etc.—are provided with the same kind of report blank on which they are required to report every discrepancy noticed on their inspection trips through the city, the report being forwarded to the commissioner under whose supervision the matter comes.

For instance a water inspector who found an unsanitary yard or a bad sidewalk would have to report it. This sort of co-operation has never been in effect among city departments before, but it is expected to be of material assistance.

Agree on Harrisburg Charter

Harrisburg, Pa.—The Senate Judiciary Special Committee of the Legislature had a special meeting and voted to report out the Pittsburg-Scranton plan with amendments. The changes made are the elimination of the initiative and referendum, the incorporation of that part of the Hunter bill relating to councilmanic procedure and the official authority vested in that body. Nine councilmen who are to receive a salary of \$6,500 a year each are provided. They are to be appointed by the Governor and serve until the first Monday in January, 1912. Their successors are to be chosen at the general election in November, five for four years and four for two years.

STREET CLEANING AND REFUSE DISPOSAL**Street Sweeper Will Not Be Used Any More**

Macon, Ga.—The Board of Health has adopted the recommendation of the Mayor, and decided to abolish the street sweeper. Hereafter only the "white wings" will be used. The board decided to put eight more men on the street sweeping force, equipping them with the white coats, pushcarts and brooms. It is believed that by this method the streets can be kept cleaner.

Regular Baths to Be Provided for City Dump

Huntington, Ind.—Pleased with the excellent results obtained by using the city fire engine to flood the dumping grounds west of the city, Street Commissioner Ed Smith will probably adopt this plan about twice a month to do away with the complaints of residents in that section and he expects little further trouble from that source during the time necessary in preparing plans for an incinerating plant. Since the great collection of refuse was soaked with water pumped from the river nearby disagreeable odors have been hardly noticeable. Unless some such plan is followed a repetition of the complaints to health officers will probably be the result and the Street Commissioner has determined to follow up the trip of the firemen with others at regular intervals of about two weeks. Favorable results from the soaking process arise from the fact that ashes constitute a large part of the pile of refuse to be found on the river bank near the slaughter houses. Before the rule regarding separation of garbage and ashes went into effect all varieties were dumped together. Since the two kinds have been collected separately some ashes have been deposited there when no opportunity to use it as filling material was offered. When the water pumped from the river came into contact with the ashes the chemical action following was such that features of the dump which caused complaint were remedied.

To Regulate Dumping of Refuse in City

Racine, Wis.—The general cleaning day created considerable friction regarding the dumping of refuse and called the attention of the city officials to the fact that there is not sufficient regulation and control of dumping grounds. The Mayor states that he will take this matter up with the Board of Public Works and the Board of Health in a few days and see if some more systematic and orderly way cannot be devised to regulate this in the future. It is his idea that there should be three or four official dumping grounds where all refuse, not of insanitary nature, could be deposited for filling purposes under strict inspection and regulation.

Chloride on the Streets

Duluth, Minn.—Many streets have received the first treatment of calcium chloride of the season, and many persons have been curious about the appearance of the streets. Although visible when first spread, it is soon absorbed by the surface of the street and becomes a part of it. The chloride preparation was tried in Duluth last year as an experiment, and it worked so well that it was introduced this year on a much larger scale. In addition to many streets, the boulevard and the park driveways are being treated with it.

Starts Campaign for Clean Streets

Albany, N. Y.—The directors of the Chamber of Commerce at a regular meeting of its directors decided to inaugurate a campaign for clean streets in the city. It will be in charge of the Committee on Public Improvements, of which Peter D. Kiernan is chairman. The committee will cause circulars to be placed in every home in the city asking citizens to co-operate with the city authorities to keep the streets free from paper and other refuse that is frequently thrown into the streets. The circular will make an appeal to the civic pride of every one to observe the regulations regarding the using of the streets as a dumping place. Last spring a similar campaign was undertaken with gratifying results and the city co-operated by placing receptacles for refuse.

RAPID TRANSIT**Studying City's Street Car Conditions**

Providence, R. I.—"Any consideration of the city traction problem falls far short of the mark if we consider only the boundaries of the city itself," declared J. R. Bibbins, of Chicago, in an address recently before the members of Brown University Engineering Society in Rhode Island Hall. "We must look beyond the city limits," said the speaker, "and study the situation there regarding street car conditions; for the trend of population and, therefore, the trend of rapid transit, is away from the center of every city." Mr. Bibbins is assistant to Bion J. Arnold, who is studying the street car conditions in this city, with a view to reporting matters as he sees them here and presenting recommendations for a remedy of the congestion that has been the cause of so much complaint.

Council Orders Extension of Car Line

Vincennes, Ind.—At the special call meeting of the City Council in the Council Chamber one day last week to take action on the extension of the street railway to South Vincennes, a resolution was adopted calling upon the Vincennes Traction Company to make the desired extension of their line on Main street from Seventh to Fifteenth street, and on Fifteenth street from Main to Willow street within the next six months or forfeit their franchise rights to the use of the portions of Main and Fifteenth streets designated. In addition to the adoption of the resolution, the City Attorney was instructed to draw up a notice informing the traction company of the action taken and what it is desired of them to do. Some time ago a petition signed by several hundred citizens was filed with the Council, asking that they take some action toward having the street car line extended out Main street.

City Is Soon to Have a Motor Car Line

Santa Maria, Tex.—Santa Maria is soon to have a motor car line in operation, giving the farmers and residents of this section a direct connection with the St. Louis, Brownsville & Mexico Railway at San Benito, if the plans of R. H. Kern, the St. Louis capitalist, who is extensively interested in land here, do not fail. Mr. Kern has been doing some extensive farming in this section for the past two years and early realized that for successful operations, the six-mile haul to Bixby, the nearest point on the St. L., B. & M., would have to be eliminated. With this end in view Mr. Kern has been busy for the past three months on a motor car line proposition, with the result that he now has subscribed by interested parties in this section bonuses to the amount of \$60,000. Mr. Kern says work will commence on the new line probably by May 15, any way not later than June 1, and will then be pushed to completion with vigor.

Mayor Advocates Merger of Elevated Lines

Chicago, Ill.—There has been a revival of the report that arrangements have been completed for the merger of the elevated lines, and Mayor Harrison went on record as in favor of the proposed merger, declaring it is the economical plan of operating the elevated lines. He also indorsed the idea of a consolidation of the surface and elevated lines, asserting it is something to be desired in the ultimate working out of Chicago's transportation facilities. The roads concerned in the merger planned are the South Side, Metropolitan, Northwestern and Chicago and Oak Park elevated roads. These lines operate over 177 miles of track, carry 500,000 passengers daily and represent over \$160,000,000 of capital obligations. Efforts have been made to consolidate the elevated railroads for some time, and in former attempts it has been planned to involve the surface railroads in the merger. It is expected that a merger of the elevated railroads, if successful, will be followed by the opening of negotiations with the surface roads again and that an effort will be made to put through the greater scheme as originally conceived.

City Gives Fifty-Year Franchise

Gary, Ind.—Business men of Gary, especially of the Commercial Club, are in arms because the City Council after a long and stormy session ratified a 50-year franchise to the Calumet United Railways Company. Further feeling was created when it was learned that Mayor Knotts, instead of exercising his veto, signed the franchise ordinance.

MISCELLANEOUS

Gives Park to Crawfordsville

Crawfordsville, Ind.—Harry J. Milligan, an Indianapolis attorney, has presented a tract of land, consisting of 30 acres, to the city of Crawfordsville, Ind., for park purposes. The land is situated in the east end of Crawfordsville and will be known as Milligan Park in memory of Mr. Milligan's father, Joseph Milligan, for years one of Crawfordsville's leading citizens. Crawfordsville at present has no park. Harry J. Milligan was born and reared in Crawfordsville and is president of the board of trustees of Wabash College.

City Would Settle Labor's Disputes

Spokane, Wash.—Mayor Hindley announced last week that he has definitely decided on the creation of a commission on industrial disputes. The Mayor has been in conference with the other commissioners and leaders of labor and employers on the project. He is yet undecided whether to make the commission a permanent one or to create temporary boards for separate industrial disputes, but leans to the former plan. Commissioner Coates and one or two others favor only the temporary board. If a permanent board is created the Mayor will name the city school superintendent, the president of the Central Labor Council, a minister of the gospel or priest, and probably a member of the Manufacturers' Association as four of the five members.

City to Aid Poor

Spokane, Wash.—Control of benefactions in Spokane by a municipal charities commission is the plan announced by Mayor W. J. Hindley last week on his return from a tour of the Coast cities. The Mayor's plan, admittedly an innovation in the line of relief work in cities, contemplated discontinuation of the present arrangement with the Associated Charities and absorption of its duties by a bureau operated directly by the city itself through a commission of citizens appointed by the Mayor. The Mayor states that the governing board of the Associated Charities has practically agreed to the plan. "I have become more than ever convinced after my trip to the Coast and investigation of the plan of handling charities there that revolution in the way these things are handled by cities is necessary," said the Mayor. "I believe the plan of a municipal commission and bureau is the right one."

Children Will Use Tooth Brushes Daily in School

Cleveland, O.—Five minutes of the time usually given to study will be devoted to scrubbing the teeth by the 60,000 school children of Cleveland next term. This was decided by the school officials last week following dental experiments made with a group of pupils at the Marion school. In the presence of Dr. Wille, of the Marine Hospital Service, and Dr. J. S. Marshall, of Columbus Barracks, representing the Federal Government, and a number of physicians, dentists and school officials, the 27 children of the group showed that their powers of perception, keenness of observation and general quickness of mind were better developed than those of their schoolmates. The great improvement shown in their studies after they had been submitted to a dental treatment has resulted in the tooth scrubbing order.

Street Directors to Care for City Trees

Wilmington, Del.—Directors of the Street and Sewer Department, at a recent meeting, adopted an ordinance giving the department entire jurisdiction over all trees, shrubs, plants or grass along the sidewalks or in the streets of the city. The directors also entered into an agreement with A. E. Bonsey & Co., florists and tree experts of Wilkes-Barre, Pa., to act as advisers of the department in all matters pertaining to the planting, care and conservation of trees along the city streets. The department will not appoint, for a while at least, a city forester, under authority of the law passed by the recent Legislature, but will use its own workmen under the direction of an expert from Bonsey & Co. to protect, care for and propagate trees on the streets. Bonsey & Co. offered to supply an expert to give advice, when especially called, at \$8 a day and railroad transportation.

Denver Building All of Its Playground Equipment

Most cities which have playgrounds buy their equipment ready made, but Denver not only designs but builds all its play equipment. This work is done at the playground shops located near Curtis Park. R. W. Thornton is in charge and designs the models. He has under him four



SLIDE OF DENVER MUNICIPAL MANUFACTURE

good mechanics and blacksmiths. All of the new material going in at the playgrounds is made of steel. The welding, forging, riveting, etc., is performed at the shops. The city is saving the taxpayers a considerable sum monthly by doing the work that was formerly done by private contract outside the city. The products of the shops are substantial and modern and the workmanship speaks for itself. The old wooden swings, slides, merry-go-rounds, seesaws and other apparatus in the playgrounds is rapidly being replaced by the steel material, and by the end of the Summer all of the dozen recreation places will be provided with the new kind of equipment.

Cornerstone of City Hall Laid with Exercises

Grand Forks, N. D.—Five former Mayors of the city of Grand Forks participated in the ceremonies of laying of the cornerstone of the new City Hall, a structure that will cost approximately \$85,000. A civic holiday was declared and business was suspended while the ceremonies were in progress.

City Playhouse to Cost \$52,000

Philadelphia, Pa.—The handsome brick recreation building in course of construction in Starr Garden Park, Lombard street, between Sixth and Seventh, the first of its kind to be built by the Playgrounds Committee, will be opened the latter part of May, when its splendid equipment will be placed at the disposal of children.

City Autos to Be Lettered

Brockton, Mass.—The Common Council has passed an order authorizing all city automobiles to be lettered "City of Brockton" on or before June 1, after which no automobiles may be used without such letters. A similar order was passed last year to prevent joy riding by department heads, but the autos were not lettered. The order this year provides that the letters be not less than three inches high.

Citizens Protest Against City Accepting Big Bridge

St. Augustine, Fla.—Protesting against the city accepting the burden from the county of the bridge over the San Sebastian to New Augustine, a petition has been circulated and largely signed asking the St. Johns County delegation in the Legislature to secure the passage of a measure placing the city boundary definitely at the eastern side of the San Sebastian.

Civic Improvements Due to Women's Efforts

Victoria, Tex.—The women of Victoria, who are largely responsible for the civic advancement of the town, have launched two new movements that, if successful, will greatly improve the looks of the city. One is to have the standpipe removed from the center of the public square and have a Confederate monument erected in its place. The other is to have a new county jail built on a site less prominent than the present one and convert the building now used as such into a public library. The quarters of Victoria's present library, the Bronte, have become too small. Andrew Carnegie has offered to erect a magnificent library building here if given satisfactory assurances the citizens will maintain the institution.

\$10,000 for Park Music

Milwaukee, Wis.—The sum of \$10,000 was set aside for free park concerts during the summer at a recent meeting of the Park Board. About 121 concerts will be given in the larger parks. Music will cost \$8,000, while \$2,000 has been set aside for illumination, decorations and special concerts, if found necessary. No date has been set aside for the beginning of the concerts, but the first probably will be about the middle of June.

Municipal Shop Proposed

San Francisco, Cal.—A conference with the Supervisors on the proposition of establishing a municipal shop to do the work required on the city's vehicles has been requested by a joint committee of the Carriage and Wagon Workers' Union and the Pattermakers' Association. The committee asks that provision for the shop be made in the budget, asserting that the work of the various municipal departments can be done more economically and satisfactorily in it than under the present contract system.

Place Workmen in the Parks

Birmingham, Ala.—Commissioner Weatherly has announced that he would instruct Street Commissioner Frank Gafford to place a force of workmen in the parks and clean them up thoroughly. Since the commissioners with one sweep discharged all the park keepers of the city their condition has caused considerable censure. Frequenters of the parks say that the weeds are flourishing and that trash has accumulated very rapidly. The creation of a park commission will be taken up as outlined heretofore, to be composed of some of the best-known men in the community.

Test Employees for Retirement

Boston, Mass.—The first actual steps in the wholesale removal of veterans in the employ of the city were taken when Drs. Arthur H. Davidson and Edward T. Brearton, of the Public Works Department, started to examine 266 veteran employees to see if they were incapacitated for work and eligible for retirement under the recent legislative act. Doctors will be engaged for other municipal departments during the next few days and before the end of the month the Mayor will have in his possession a complete list of every department official or employee eligible for retirement on half-pay. The Commissioner of Public Works' list of employees who will be examined includes men receiving from \$2.25 a day to \$2,100 a year. On that list are five foremen, 27 inspectors, 19 drawtenders and assistants, as well as scores of laborers, stablemen, clerks, ferryboat captains, sub-foremen, painters, blacksmiths, masons, steam engineers, machinists and teamsters.

Ohio Cities to Run Pawnshops

Columbus, O.—The Bertsch municipal pawn department bill, said to be the first of its kind, has just become a law in Ohio. The new law takes its name from Joseph F. Bertsch, its author. Some foreign countries have such departments, but they have been established by the cities without asking the State for authority or power therefor. The new law is intended to be of benefit to the worthy poor, and its working in Ohio will be watched with interest by the authorities of other States with a view to adopting some such measure in their localities.

Plan Municipal Amusement Commission

Los Angeles, Cal.—Managers of the large theaters of Los Angeles will be invited to appear before the committee of citizens who are working on a plan to have established a municipal amusement commission to supervise all commercialized amusements in the city of Los Angeles. The managers will be given an opportunity to discuss before the body the advisability of establishing such a commission for amusement censorship. The recommendation of Guy Eddie, City Prosecutor, that a censor be appointed to divide the responsibility of preventing the production of objectionable shows, has been endorsed by the committee. The committee, consisting of well-known reform and civic workers, discussed the proposal for a municipal amusement commission and decided to hear the views of theatrical managers at its next meeting. Several moving picture show men were present and addressed the committee.

City Improvements Increases Real Estate Values

Sparta, Ga.—The city of Sparta is spending \$40,000 on putting in a system of water works and sewerage and street improvements. It is expected now that water will be turned on in July. Real estate values in the city as well as in the county are going up very fast as a result of the public improvements now going on.

Gives Fountains to City

Connersville, Ind.—Roy Williams, a former resident of Connersville, now a wealthy contractor of Cairo, Ill., has given Connersville four drinking fountains. A local concern is to erect the fountains at his expense. One will be placed near the court house, one near Fifth street, one near Sixth street and one near the First M. E. Church. These fountains will have drinking places for horses and men and will cost about \$1,000.

School Children Set Out Catalpa Trees

Providence, R. I.—Arbor Day was made more significant in this city this year by the distribution of 30,000 young catalpa trees to the school children for planting. The trees were given by John Shepard, Jr., of Boston and Providence. Two trees were planted and dedicated to the late Julia Warde Howe.

Would Distribute Maps of City Without Cost

Norfolk, Va.—The Industrial Commission have taken steps to obtain 500 official complete maps of Norfolk city for free distribution to commercial interests which may request them. It seems that the city councils some time ago appropriated \$1,000 to get out a complete map of Norfolk city showing the ten wards. These maps were placed in the city engineer's office, where they may be had for \$1 per map. The Industrial Commission has requests every day for an official map of the city. Consequently a committee was appointed to wait upon the Board of Control and see if authority cannot be gotten to obtain copies of the maps for free distribution.

City Beautiful League Planned for Asheville

Asheville, N. C.—A movement is on foot here to organize in Asheville a "city beautiful league" similar to the league formed in Knoxville. Alderman R. L. Fitzpatrick, of the City Council, who has for years favored such a move, is interested in the matter and is pushing it. Mr. Fitzpatrick, while on the board several years ago, started "cleaning-up day" in Asheville, which has proved a vast benefit to the town. Mr. Fitzpatrick says if owners of vacant properties in Asheville will convert the vacant lots into vegetable gardens, flower beds, etc., and remove the trash and tin cans, etc., from their back yards, Asheville would take a long step forward. It is believed that something will come of the movement.

Paris Wants Pictures of Chickamauga Park

Chattanooga, Tenn.—Mr. E. E. Betts, of the Chickamauga Park Commission, feels pretty good over the fact that Paris, France, has officially taken notice of the fine road and park work that has been done in Chickamauga Park, and the possibility that Paris may obtain practical ideas from a humble, though very efficient, Chattanooga road builder. The letter which reached the Park Commission was addressed to the Honorable Director of Chickamauga National Military Park and reads as follows:

We should be greatly obliged if you would lend us the report on your cemeteries and some photographs, which we may use for the exhibition of our French Garden-City and Town-Planning Association. I have read the most interesting report which appeared in your work in "Park & Cemetery." I should add that we would be very pleased to have you visit—when you have the opportunity—to come to Paris.

With anticipated thanks.

Yours faithfully,
GEORGES BENOIT-LEVY.

Of course Mr. Betts will supply the desired information to the Paris association and will also send a strong invitation to the Parisians to make a visit to Chattanooga and see for themselves just what God and the government, assisted by man, money and brains, can do in the way of making scenery and building great parks. As to accepting the invitation to visit Paris—that is a question which Mr. Betts will take under advisement.

LEGAL NEWS

A Summary and Notes of Recent Decisions—Rulings of Interest to Municipalities

Obligations of City of Manila, P. I.

Verisimo Vasquez Vilas (Plaintiff in Error and Appellant) vs. City of Manila.—The present city of Manila, re-incorporated by the Philippine Commission with substantially the same municipal powers, area and inhabitants as the Spanish municipality of the same name, is liable upon municipal obligations incurred prior to the cession of the Philippine Islands by the treaty of Paris of December 10, 1898, to the United States. A claim under a contract to supply coal to a municipality for use in operating its water works system, apparently entered into upon the general credit of the city, does not constitute a charge upon the property and funds held in trust by the city to be devoted to the establishment and maintenance of such system.—31 S. C. R., 416.

Change in Grade of Street—Liability for Damages

Morris et al. vs. City of Indianapolis et al.—Since Act March 6, 1905, governing cities and containing no provision making cities liable for damages from change in the grade of streets, repeals Acts 1867, authorizing the recovery of such damages, an abutting owner in the city of Indianapolis may not urge that Acts 1891, repealing the latter act, so far as it applied to the city of Indianapolis, denied to him the rights guaranteed by the fourteenth amendment of the Federal Constitution, based on the fact that the Acts of 1867 established one rule for some cities, while the act of 1891 established another rule for the city of Indianapolis. The Supreme Court will as a general rule adhere to its own decisions wherein the rules of the common law are expounded, and it need not accept and follow the common law as expounded by the Supreme Court of sister States.—Supreme Court of Indiana, 94 N. E. R., 705.

Regulating Installation of Electrical Appliances

Ex Parte Cramer.—An ordinance of a city regulating the installation of electrical appliances inside and outside all buildings subject to the supervision of the city electrician, and requiring permits for such installation, and the payment of fees for the inspection of the work, is valid as a proper exercise of the police power of the city to adopt measures to protect life and property. License and inspection fees levied under the police power of a city are not an "occupation tax" within the Constitution, article 8, section 1, providing that persons engaged in mechanical and agricultural pursuits shall not be required to pay an occupation tax.—Court of Criminal Appeals of Texas, 136 S. W. R., 61.

Permit to Erect Telephone Poles

East Tennessee Telephone Company vs. Board of Councilmen of City of Frankfort et al.—Where an ordinance gives a telephone company permission to place its poles on the street and to carry the wires across a city bridge, being a mere permission, the city does not part permanently with the control of the subject, and may revoke such permission.—Court of Appeals of Kentucky, 136 S. W. R., 138.

Police Judge—Removal

State ex rel. Working, Police Judge, vs. Mayor and City Council of City of Helena.—Revised Codes, authorizing the City Council to remove any officer on written charges after notice by a two-thirds vote of all the members-elect, is in consonance with the Constitution, subjecting officers not liable to impeachment to removal in the manner provided by law, and the statute is a proper exercise of the legislative authority granted, and a police judge of a city may be removed in a proper case by the City Council.—Supreme Court of Montana, 114 P. R., 777.

Widening Streets—Removing Trees

Jeffress vs. Town of Greenville.—Where a town charter gives it express authority to widen streets and remove obstructions therefrom, its act in removing trees on widening streets will not be interfered with in the absence of oppression.—Supreme Court of North Carolina, 70 S. E. R., 919.

Proceedings to Establish Water Works—Validity

Edwards et al. vs. City of Cheyenne et al.—In absence of a contrary constitutional or statutory provision, the questions whether proposed city water works for which land is sought to be condemned are required by the city's lawful needs, and when and how the works are to be constructed, are solely for the determination of the city, and the validity of the condemnation proceedings cannot be attacked on the ground that the purpose for which the water, made available by the proposed works, was used, was unlawful.—Supreme Court of Wyoming, 114 P. R., 677.

Water Main—Right of Way

Tone et ux. vs. Tillamook City.—A deed to a city of a right of way for a pipe line for its water system, which recites that the grantors shall have the free use of a specified quantity of water from the pipe lines on compliance with enumerated requirements, does not require the city to perpetually convey water through the pipes, but it may at any time relieve itself from the obligation by taking some other route than that across the land conveyed.—Supreme Court of Oregon, 114 P. R., 938.

Ownership of Dirt in Street

John P. Sharkey Company vs. City of Portland et al.—The abutter on a street in Portland owns the soil to the center of the street, and he still owns it when it is excavated, unless needed for the improvement of the same street, and he has the right to take it away, provided he does so promptly; and, if there is a place as convenient for the contractor to dump surplus dirt as to place it elsewhere, it is the right of the owner to have it dumped at such place, if he so indicates at the commencement of the work; but, as such dirt is usually valueless to the abutting owner, he is deemed to have abandoned his claim thereto, unless seasonably made, and the owner cannot require the contractor, at the latter's own expense, to place the dirt at a distant or inconvenient place, in which event he must remove the dirt promptly himself.—Supreme Court of Oregon, 114 P. R., 933.

Violation of Void Ordinance

Glendinning vs. City and County of Denver.—Accused could not be convicted for violating an ordinance requiring a license to sell oleomargarine made in imitation of butter; it being repugnant to Revised Statutes 1908, making one guilty of misdemeanor who sells an article in imitation of yellow butter.—Supreme Court of Colorado, 114 P. R., 652.

Franchise of Water Company—Construction

Madera Water Works vs. City of Madera et al.—The franchise of a water company to occupy and use the streets of a city must necessarily rest in a grant from the State, and the measure of its rights is to be determined from a construction of such grant purely as a matter of contract. The public grant of a franchise, whether by a Constitution, statute or municipal ordinance, is to be strictly construed in favor of the public, and nothing passes by implication. Constitution California, which provides that, in any city not itself operating works for supplying water or light to its inhabitants, any person or corporation organized under the laws of the State shall have the privilege of using the streets for the purpose of constructing and operating such works, subject to municipal regulation, does not grant an exclusive franchise to a corporation constructing water works thereunder, nor can such exclusive right be implied, and its rights are not violated by the construction and operation of competing works by the city.—United States Circuit Court, 185 F. R., 281.

City as Tenant at Will—Void Lease

Commercial Wharf Corporation vs. City of Boston.—There can be no implied contract marking a city a tenant at will of a location for a boat landing; there being no statute authorizing it to expend its income to procure or maintain such a location, and there not only being no evidence that its occupation conferred on it some pecuniary gain, benefit or advantage, but no evidence that the premises were required for any general or special municipal use, or were provided for or occupied by any of the various departments of the city.—Supreme Judicial Court of Massachusetts, 94 N. E. R., 805.

Special Assessment—Reversement

City of Chicago vs. Willoughby et al.—The failure of a city to file the remanding order of the Supreme Court reversing a judgment sustaining objections to a special assessment for benefits for widening a street and remanding the case operates as an abandonment of the proceeding against the property, but not as an abandonment of the right to levy any assessment against it to pay awards made in the condemnation proceedings, and the city may cause a new assessment under Cities and Villages Act, 1872, as amended by Hurd's Revised Statutes, 1893, authorizing a new assessment where an assessment has been set aside by any court, etc.—Supreme Court of Illinois, 94 N. E. R., 513.

Assessments—Sufficiency of Ordinance

Borden vs. City of Brockton.—The mayor and aldermen of a city, having the powers of selectmen of towns under Statutes 1881, could order the construction of a sidewalk under the power given by Revised Laws, to order special repairs, but where the order for a sidewalk fails to state that in the judgment of the mayor and aldermen public convenience requires the building of the sidewalk as is necessary in acting under either of the three systems of sidewalk assessments authorized by Revised Laws, it is not apparent whether the order was made under the act as to specific repairs or under the assessment act, and the order cannot be made the foundation of an assessment.—Supreme Judicial Court of Massachusetts, 94 N. E. R., 558.

Building Ordinance—Reasonableness

Lane-Moore Lumber Co. vs. City of Storm Lake.—A provision of an ordinance regulating the construction of buildings within the fire limits which requires the builder to obtain a permit from the mayor is not unreasonable. An ordinance requiring builders constructing buildings within the fire limits to obtain a permit from the mayor is not invalid as delegating the legislative power of the council.—Supreme Court of Iowa, 130 N. W. R., 924.

Defective Highways—Injuries.

Madisgan vs. Town of Schaghticoke.—The location and character of a highway and the extent of travel thereon are to be considered in determining whether it was in a reasonable state of repair at the time of an injury thereon.—New York Supreme Court, 128 N. Y. S., 800.

Highways—Cost of Construction

Town of Queensbury vs. City of Glens Falls.—Charter of City of Glens Falls, providing that the city shall be liable for its proportional share of the indebtedness of the town of Queensbury, and that, when the charter shall take effect, the money belonging to the town shall be proportionally divided except the highway fund, did not impose the whole burden of constructing a State road on the town outside the city limits, or permit the town to retain any moneys on hand except those raised by tax for the annual repair of highways, and hence the city is liable for its proportional share of the cost of constructing State roads.—New York Supreme Court, 128 N. Y. S., 833.

Street Accidents—Notice—Statutes

Gribben vs. City of Franklin.—Under Burns' Annotated Statutes 1908, providing that no action for injuries from defects in any street, alley, highway or bridge shall be maintained against any city or town unless written notice of the time, place, cause and nature of such injury shall be given to the clerk or mayor, or the board of trustees of such city or town, failure to give the statutory notice precludes the right to maintain such action, and actual notice to a member of the common council does not dispense with the statutory notice.—Supreme Court of Indiana, 94 N. E. R., 757.

Rights and Remedies of Taxpayers

Iglehart vs. City of Dawson Springs.—Where the publication of an ordinance necessary to the validity of bonds was not made as required by law before a taxpayer's action was begun but it was duly published shortly afterward and before the bonds were issued, there is a sufficient publication.—Court of Appeals of Kentucky, 136 S. W. R., 211.

Civil Service—Appointments

People ex rel. Sullivan vs. Mayor, etc., of City of New York.—Under Laws 1909, providing that every clerk or assistant employed in the office of the Richmond county clerk, January 1, 1909, and continuing in office until the act took effect, and who prior to January 1, 1910, passed a noncompetitive civil service examination, should be retained and assigned to perform the same services in the clerk's office, an incumbent in the clerk's office on January 1, 1909, who failed to pass a noncompetitive civil service examination before January 1, 1910, but who was re-examined and finally passed in February, is not qualified for appointment under the terms of the act.—New York Supreme Court, 128 N. Y. S., 776.

Employment of Special Counsel

Vicksburg Water Works Co. et al. vs. Mayor and Aldermen of City of Vicksburg.—A city may employ associate counsel to assist its city attorney in any case where its authorities deem it necessary.—Supreme Court of Mississippi, 54 S. R., 852.

Street Accident—Proximate Cause

City of Louisville vs. Hart's Adm'r.—Decedent, through defects in a street rendering it unsafe for travel, was thrown from his wagon upon a street car track immediately in front of a car running at a dangerous and negligent rate of speed, and was thereby killed. Held, that the negligence of both the city and the street railway company can be deemed the proximate cause of the death.—Court of Appeals of Kentucky, 136 S. W. R., 212.

Sufficiency of Sewer—Liability

City of Louisville vs. Leezer.—A city undertaking to establish a system of sewers must provide for the increase that may naturally be expected in population, and that sewers when first constructed are adequate to meet the demands of conditions then existing does not relieve it from responsibility, if, by growth of population, they become inadequate. Where a sewer becomes increasingly inadequate by the increasing demands on its capacity, due to the growth of the city, each recurrence of injury attributable to the changed condition is a separate cause of action, and limitations do not begin to run until the accrual of such a case of action.—Court of Appeals of Kentucky, 136 S. W. R., 223.

Different Systems of Sewer Construction

Holt Lumber Co. vs. City of Oconto et al.—Under Stat. 1898 relative to city sewers, providing three different modes of constructing and maintaining sewers (1) by the city at large; (2) by sewer districts; and (3) by abutting property owners, a city which has adopted such subchapter as part of its charter does not, by passing an ordinance adopting the sewer district plan, exhaust its power in that respect; but in view of other sections such adoption of such system in no way abrogates the city's right to avail itself of any of the other methods, or of any provision of the subchapter.

Constitution, providing that the rule of taxation shall be uniform, is not contravened by permitting a city, after adopting a system by which sewers shall be constructed at the expense of sewer districts, to adopt a system by which main sewers shall be constructed at the expense of the city at large, though one who had to contribute to the expense of constructing a main sewer under the first system is obliged to also contribute to the expense of constructing another main sewer outside his sewer district under the second system.—Supreme Court of Wisconsin, 130 N. W. R., 709.

Regulation of Gas Rates

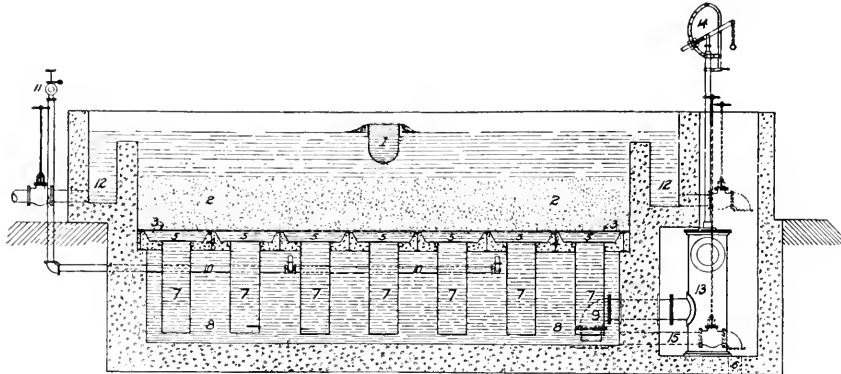
State ex rel. Jackson, Atty.-Gen., vs. Redding, Mayor, et al.—When a grant is made by a city of the second or third class of a franchise to supply gas to the city and its inhabitants for a term of years, which prescribes the plan on which gas is to be distributed and the rates which consumers will pay therefor, it is competent for the mayor and council of such city thereafter to make reasonable changes in the rates from time to time, and section 749 of the Gen. Stat. 1909 does not require that an ordinance making such changes shall be submitted to the electors for their approval or rejection.—Supreme Court of Kansas, 114 P. R., 1094.

MUNICIPAL APPLIANCES

Reisert Patent Filter

The Reisert water filter, placed on the market by the Reisert Automatic Water Purifying Co., 30 Church street, New York City, employs compressed air and clean water for washing the filter. The filter bed, it is stated, is washed out in about a minute, using about 25 gallons of water per square foot of filter surface. Another advantage claimed for the filter is that it delivers clean water immediately after

forced upward through the filter bed with uniform pressure over the entire area. To create this uniform pressure the area of the perforations in the filter bottom must be less than the area of the pipes, 7. In this manner every portion of the filter bed is reached by the wash water. The particular advantage of the Reisert filter is this, that the wash water is clean water and hence cannot add new impurities to the filter material. The wash water overflows with



REISERT GRAVITY FILTER

washing. It is stated that there are 3000 Reisert filter installations in operation throughout the world, varying in size from small filters of 50 or 100 gallons per hour to filters of many units delivering 200,000 gallons per hour.

The new improved Reisert patent gravity filters are made rectangular or circular in shape to meet individual conditions. They are constructed either of concrete, as shown in the illustration, or of steel, or of a combination of these two. The illustration shows a sketch of a rectangular filter made of concrete. The raw water enters the filter proper from the trough, 1, and overflows on to the filter bed, 2. This filter bed is supported by a perforated plate, 3, provided if necessary with a wire screen. The perforated plate rests on a reinforced concrete floor, 4, which is the tight bottom of the filter, and is so divided that a series of parallel pans or troughs, 5, are formed under the filter bottom, 3. In these parallel troughs rows of pipes, 7, of suitable diameter and suitably spaced, are set, which extend to within a short distance of the bottom of the clean water compartment, 8.

The raw water percolates through the filter bed, then passes through the perforations of the filter bottom into the troughs and finally through the pipes into the clean water compartment and to the outlet, 9.

When the impurities in the raw water begin to clog up the filter, so that it no longer delivers the proper amount of water, as indicated by a regulating device, 14, they should be washed from the filter bed. To accomplish this, the clean water outlet is closed and the air cock, 11, is opened. The compressed air entering the clean water compartment at the top through an air manifold, 10, forms an air piston under the reinforced concrete floor, 4, and this air piston forces the filtered water out of the clean water compartment and up through the system of pipes, 7. The filtered water, by means of the troughs, 5, above the pipes, spreads out uniformly under the filter bed, and is

the impurities into the gutter, 12, and from there runs off to the sewer, 6. When the water overflowing into the gutter, 12, runs clear, the air pressure valve is closed, the air relief valve, 17, and the clean water outlet valve opened; the filter material then settles by gravity to its original position in clean water. The raw water then follows, forcing the clean water through the filter material. In doing this the suspended matter in the raw water will deposit a film in the top layer of the filter bed as an important aid to clear filtration. If the washing is done prop-

acter of the filter bed can only be determined when the quality of the raw water is known. If these are known the flexibility of the Reisert apparatus is such that it can be charged and operated under varying conditions.

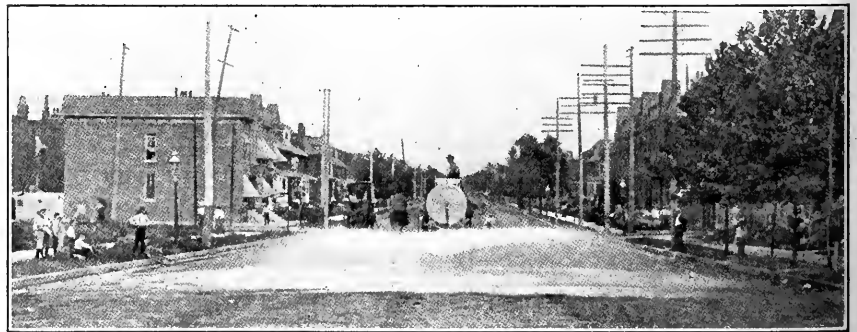
In the Reisert filter system a piston of clean water is forced through the perforated bottom at a uniform pressure and speed and then through the entire filter bed, removing the accumulation of impurities by one simple and effective operation with a minimum quantity of water.

These filter units are made of varying size to meet individual requirements. For large installations units are placed side by side in such a manner that each one can be operated and washed separately. This permits continuous filtration, as only one unit at a time is out of commission when washing, while the rest of the installation continues to filter.

The same company makes a pressure filter, circular in section for rapid filtration. They also manufacture water softeners on the Reisert-Dervaux patented system.

Sanitary Automatic Street Flushing Machine

The street flushing machine made by the Sanitary Street Flushing Machine Company, Carleton Building, St. Louis, Mo., has been described in the MUNICIPAL JOURNAL AND ENGINEER, and its construction and operation is well known. The use of the machine with a sprinkling attachment, as shown in the illustration, is perhaps not so generally known. The advantage of air pressure as applied to the machine is that the whole width of the street may be sprinkled at one time. A gravity wagon has to make two or three trips over a street in order to wet it down from curb to curb. Unless the operator is very careful a considerable proportion of the water will run off without accomplishing any useful purpose.



SANITARY STREET FLUSHING MACHINE USED AS SPRINKLER

erly the filter will deliver clean water at all times.

The time consumed in washing is of course proportional to the amount and character of the impurities in the water, but for ordinary water supplies it should be less than one minute. This one operation is the only one required to clean the filter material thoroughly.

The quantity of compressed air and the quantity of clean water necessary for washing the filter bed will be directly proportional to the quantity and quality of the impurities in the raw water removed by the filter bed, and to the character and depth of the latter. Naturally the amount of the compressed air, the capacity of the clean water chamber, and the depth and char-

The sanitary flushing machine may be used at night for street flushing and in the daytime for sprinkling, thus reducing the capital charge against the operations of the street department. At a meeting of the American Society of Civil Engineers, where road preservation and dust prevention was the special topic of discussion, the question of scientific watering was taken up by a prominent engineer. He advocated both as a means of preserving macadam roads and preventing dust the use of a street sprinkler which would cover the whole width of the road lightly at a single operation. The sanitary automatic street flushing machine used as here illustrated seems to conform to the requirements.

Hoisting, Elevating and Dumping Bodies for Motor Trucks

PATRICK LALLY & SONS, 21-25 West First street, Boston, Mass., who have had 35 years' experience in the manufacture of elevating and dumping bodies for handling materials in bulk have adapted their old apparatus, as well as devised new, for use in connection with motor commercial vehicles. One of their devices, called the Atlantic side dump, not illustrated here, consists of a body which works on a turntable, and can be dumped on either side, held at any angle or released and allowed to drop to the sidewalk to give the

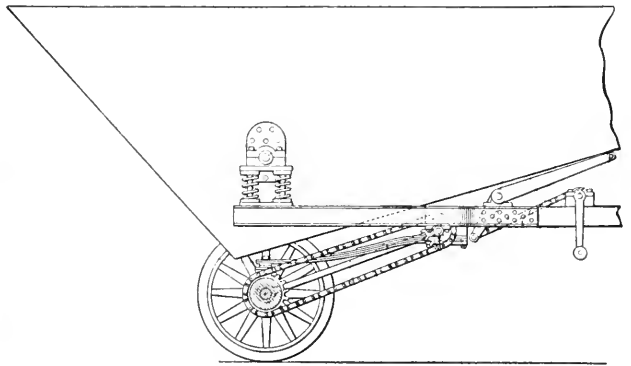
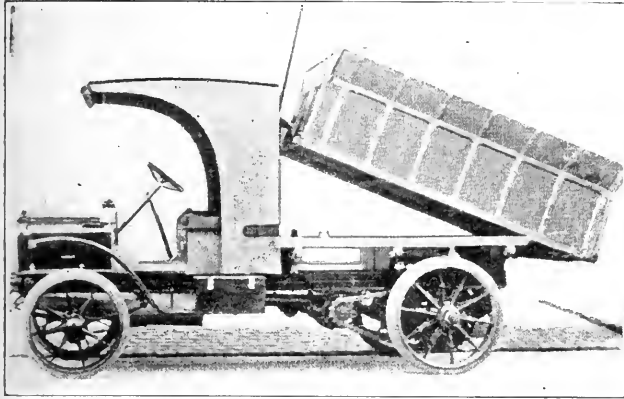
shelved on the frame, and so constructed and balanced as to dump over the rear axle. The fittings and body hanger are all of steel castings.

Wire-tied Cement Sacks

THE use of wire in tying cement sacks has rapidly come into favor throughout the cement industry. The general opinion of the trade is that the wire tie is greatly superior. The two types of wire tie that have come generally into use are known as the Bates and Curry ties. The illustration shows a sack tied with the Curry tie, and on the front of this sack will be seen a

lamps. At 1 o'clock in the morning we send along a second impulse, which puts out all the lights in Longmeadow, but leaves those in West Springfield burning. At daybreak a third impulse is sent along, which extinguishes the lamps in West Springfield and leaves them ready for the evening impulse, which puts them on again."

According to reports of the technical press automatic gas lighting on the impulse system has met with considerable success and has resulted in a considerable saving in gas. It should be borne in mind also that gas is generally sold abroad at lower prices than those prevailing in this country. It is often



END DUMPING AUTO TRUCK WITH PERFECTION VERTICAL FRAME HOIST

GARBAGE WAGON WITH WATER TIGHT STEEL BODY—DUMPS OVER REAR AXLE

load a free discharge. This wagon is a convenience in dumping in a street where an end-dumping body would cause the street to be obstructed. The reproduction shows an end-dumping vehicle fitted with the Perfection vertical frame hoist, one of the older inventions of the company. This is claimed to be more substantial than chain hoists. In dumping the driver elevates the front of the wagon body by turning a crank, which, by means of a bevel gear and pinion, revolves a vertical rod having a substantial screw thread. This runs in a corresponding threaded bracket on the front of the body, which is pivoted. The change in the angle of the rod is not sufficient to throw the gears out of mesh.

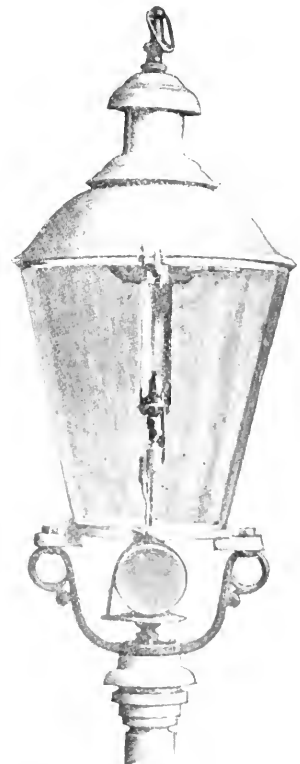
Curry tie before it is put into place. This tie is fastened by bringing the wire around the neck of the sack. Then the loops on the ends are caught on a tool that is made after the style of an automatic screwdriver, having a spiral shaft and a head fitted with hooks to engage the loops. One pull on the handle of this tool causes the head to revolve a sufficient number of times to twist the wire tightly around the neck of the sack. The two small loops act to form a handle for use in untwisting the wire. In order to unloosen the tie it is only necessary to take hold of the loops and untwist the wire. Two or three turns are sufficient to untwist it, so that it will come off the sack. This may be done almost while a man would be reaching for his knife if he were working on string-tied sacks.

stated that pressure lighting systems are impracticable in this country because the pressures of gas are less uniform. Our gas works employ pumps to increase the normal pressure over certain sections of the distribution system. This is commonly known as the booster system. It is claimed that the impulses created in the ordinary operation of the boosters would be sufficient to operate the delicate mechanisms in the automatic lights and turn the lights on or off at times not down on the schedule.

The second illustration shows a portion of the outlines of a garbage wagon. This is a steel body, made liquid tight, with fantail back, and is mounted on a chassis of special design, with springs

Kilchman Automatic Street Lighter

THE Springfield Gas Light Company Springfield, Mass., is handling the Kilchman automatic street lighter, which is manufactured in Switzerland. The device operates by a pressure impulse on a float in mercury. One hundred and fifty-one of these lights have been installed in Springfield, and according to General Superintendent H. Burgi, of the company, they work to perfection. He describes the method of operation as follows:



STREET LAMP FITTED WITH KILCHMAN AUTOMATIC STREET LIGHTER



SACK PROPERLY TIED WITH CURRIE TIE

"Here they are working under very adverse circumstances; that is, we have the lighting of the town of Longmeadow, where the lamps are put on in the evening, extinguished at 12 o'clock; and then we have some lighting in the town of West Springfield, where the lamps are lighted in the evening and stay lighted all night. Longmeadow is about nine miles and West Springfield about five miles from the works where the impulse is put on.

"During the evening lighting time we send an impulse in the shape of a raise in pressure about 1 inch above the ordinary pressure, which goes along all the mains and puts on all the

NEWS OF THE SOCIETIES

Third National Conference on City Planning.—The conference was held in Philadelphia, May 15-17, and the program heretofore announced was carried out. On Monday, the first day of the conference, the visiting delegates, about 250 in number, after visiting the historical places of interest in and about the city, attended two sessions, one in the Mayor's reception room and the second in the Clover Room of the Bellevue-Stratford in the evening.

The delegates were greeted by Mayor Reyburn, who extended the welcome of the city to the visitors. He told of the great development of Philadelphia and declared that the planners of this city would be greatly assisted by the advice of experts from many of the principal cities of the world. The Mayor also said that if the plans were properly worked out the city could be beautified without increasing taxation.

F. L. Olmsted, chairman of the executive committee, replying, said that the population of large cities would steadily increase and the question is how will the masses be provided for.

The general topic of the first conference was Municipal Real Estate Policies. The principal address was on German Municipal Real Estate Policies, and the speaker was Frederic C. Howe.

Out of the mass of the first day's discussion there loomed one topic probably of paramount importance in this nation in connection with city building. This concerned the right of a community to place the community interests above those of the owner of private property.

Experts told how, in Germany and England, thoroughgoing, efficient and well ordered systems are in vogue, whereby the health, convenience and happiness of the whole community are of higher importance than the liberty of the individual to use his property as he pleases.

It was asserted by some speakers—one of whom is a mayor in Pennsylvania—that such a paternalistic policy as obtains in Germany would not be acceptable in this country. In reply to this almost all the speakers declared with emphasis that in all instances where the best interests of the whole city are at stake the liberties of the individual should be made subservient to those of the community.

Over and over again it was declared—and applause invariably followed the declaration—that Americans must get away from the notion that any individual right should clash with a community right to the detriment of the latter. England's experts, especially, laid emphasis on this point, and from Socialistic Milwaukee came the mayor elected on a Socialistic ticket with the prophecy that the time is fast drawing near when we will "build our houses on the hilltops and our smokestacks in the valleys, no matter what the right of the individual may be."

At the evening session at the Bellevue Stratford Ernest Flagg spoke on Public Buildings, and F. M. Day on the Location of Public Buildings in Parks and Other Public Open Spaces. Mr. Day held that no buildings or monuments or statues should be placed in small parks, because, in his opinion, they deprive the landscape of its rural aspect. With this view Thomas Mawson, one of England's foremost experts, disagreed, and he pointed out European examples to back up his opinions.

Mr. Day dwelt in his paper upon the urgent necessity of guarding public parks and squares from the erection of buildings and other structures which are not imperatively demanded for use.

President Olmsted and William W. Emmart, Baltimore, also addressed the evening meeting.

At the third session, Tuesday morning, Lawrence Veiller spoke on Buildings in Relation to Street and Site.

Mr. Veiller declared that, contrary to the general belief, city planning will not solve the housing problem, which, he said, is in America largely a sanitary problem, one of good municipal housekeeping, the prompt removal of garbage, rubbish and other waste materials from the homes of the poor, the cleanliness of streets and alleys, the provision of adequate water supply in convenient locations, of proper sanitary conveniences in the place of antiquated expedients.

In three important points, however, city planning, the speaker said, touches the housing problem—the regulation of the height of buildings, the depths of lots and alleys. To the deep lot he traced most of the housing evils so far as they relate to land overcrowding. He analyzed conditions in various American cities to show that there has been no system in the laying out of blocks and lots in order to adapt the land to the uses for which it was intended in the various districts of the cities. The speaker advocated for large cities and industrial towns lots not exceeding in depth twenty-five or thirty feet. In his scheme, which he admitted is radical and startling, he would have no back or front yards for the reason that they become gatherers of contaminating rubbish, and he would have the houses built in continuous rows.

The English experts disagreed with Mr. Veiller that workmen's houses in cities should not have open spaces about them.

At the fourth session, the question of how to pay for city planning was taken up. Lawson Purdy, New York, spoke on Taxes, Assessments and Condemnation. Speaking of land condemnations, he said it would be an ideal condition if certain judges devoted themselves exclusively to land cases. He advocated the policy of having the municipality purchase land in excess of that needed for improvements and sell it afterwards. In this way the whole cost of an improvement could often be paid. In the course of the discussion following the paper Professor Frank J. Goodnow, Columbia University, maintained that American city governments leave development almost entirely in the hands of private individuals who develop for their own profit. He also pointed out that transportation facilities now privately controlled tend to develop cities for private interests rather than the public good. He said all city planning should be thought out with a view to the social, not financial or theoretically just, effects of the planning. Taxation, he held, should be regarded not as a means for getting money, but as a social instrument.

At the fifth session the question of harbor front improvements and docks was taken up, and the speakers were Calvin Tompkins, Dock Commissioner, New York, and Joseph Hasskarl, Director of Department of Wharves, Docks and Ferries. Each speaker referred specially to the conditions in his own city. Conditions in Baltimore were also briefly described by Oscar F. Lackey, Harbor Engineer.

The sixth conference dealt with streets and was more technical than the other meetings. Nelson P. Lewis, Chief Engineer, Board of Estimate and Apportionment, New York, was chairman of the meeting. The papers were by C. M. Robinson, on Narrowing of Private Residence Streets as Affecting Tenant and Owners, and by John Nolen on Standardized Street Widths.

The seventh conference dealt with administration and legal methods. The principal address was by A. W. Crawford, on Principles of a Uniform City Planning Code.

The social features of the convention were as follows:

Automobile ride to points of interest about the city.

Luncheon given by Mayor John E. Reyburn for men.

Luncheon for women at New Century Club, 124 South Twelfth street.

Reception by the Colonial Dames of America at the Randolph Mansion, East Fairmount Park.

Banquet by the City Club of Philadelphia at the Bellevue-Stratford Hotel.

At that banquet the conference was spoken of as one of the most important events in the history of things which really count in the everyday lives of citizens. Illuminated by the first municipal exhibition of city planning ever held in the country, an exhibition described by the experts as remarkable, the conference was declared to be epoch-making in the world-wide fight which is just beginning to be waged in the interests of a city which shall be useful, healthy, happy and beautiful for all of the people, and not only for a small class of the people.

The exhibition in the city hall will remain open until June 15. The exhibits occupy both sides of the corridors, half a mile in length.

League of American Municipalities.—The fifteenth annual convention of the League of American Municipalities will be held in Atlanta, Ga., October 4, 5 and 6, 1911. Important topics will be discussed, among them being: "Municipal Insurance," "Taxing Personal Properties," "Commission Government," "Garbage Collection and Disposal," "Public Service Franchises."

National Fire Protection Association.—One of the principal subjects for discussion at the coming meeting of the National Fire Protection Association will be private fire departments and fire drills. The association already has a pamphlet on the subject, which was recommended to the National Board of Fire Underwriters in 1902 and published and circulated by that body. This pamphlet, however, deals almost entirely with private fire brigades. The matter of fire drills of school children and employees in mercantile and manufacturing establishments has never been thoroughly worked out. The discussion will be opened by R. H. Newbern.

Ohio Society of Mechanical, Electrical and Steam Engineers.—The Society will hold its twenty-third meeting May 18-19, in the Ellis Club Auditorium, Youngstown, O. The following papers will be presented: "Flue Gas Analysis," Joseph W. Hays, Chicago, Ill.; "The Engineering Features of the Columbus Garbage Reduction Plant," Irwin F. Osborn, Columbus, Ohio; "Industrial Motor Control," D. Martignone, Cleveland, Ohio; "Hydro-Electric Development in the Central West," Paul M. Lincoln, Pittsburg, Pa.; "Centrifugal Blowers," Dr. Lowenstein, Schenectady, N. Y.

American Water Works Association.—The programme for the thirty-first annual convention at Rochester, N. Y., June 6-10, has been announced as follows:

Monday, June 5, 1911—Secretary's office, Powers Hotel, parlor floor, adjoining Assembly Hall. Open at 8 A. M. for registration of members and guests and transaction of other business. Registration by card, and members are requested to be particular to register on the proper color card. Active members, red; associated members, blue; guests and ladies, white. Committee room, parlor opposite Secretary's office. Committees will meet at call of Chairmen. Eight o'clock P. M., Reception in banquet room, Powers Hotel, under the auspices of the Ladies' Committee. Light refreshments, dancing.

Tuesday, June 6, 1911—Forenoon session, nine o'clock. Reception by Hon. Hiram H. Edgerton, Mayor of Rochester. Regular order of business. Calling of Roll. Reading of Minutes. Election of Officers. President's address. Reports: Executive Committee, Secretary-Treasurer, Finance Committee, Publication Committee. Afternoon Session—Half-past one o'clock. Reports of Special and Standing Committees—Committee on Electrolysis, Fire Protection, Water Works Standards, Depreciation, Uniform Annual Reports and Accounts, Reorganization, Special Committee on National Bureau or Department of Health. Reading of papers: "Fire Line Meters, a Comparison of Efficiency," George Houston; "Pumping Station Management," Thomas McMillan. The men of the association are invited to be the guests of the Bartholomay Brewing Company at their brewery from five to seven on the evening of Tuesday, May 6, 1911. Evening Session—Eight o'clock: "Some Fundamental Considerations in the Determination of a Reasonable Return for Public Hydrant Service," Leonard Metcalf, Emil Kuichling, W. C. Hawley; illustrated lecture on "The Panama Canal," Dabney H. Maury.

For the Ladies—Card party in room "C," Powers Hotel, at eight o'clock in the evening. Light refreshments will be served.

Wednesday, June 7, 1911—Forenoon session (nine o'clock)—Question box: Reading of written replies to questions and general discussion of questions presented, and propounding of new questions. Eleven o'clock—Election of officers for 1911-12. Selection of place for holding 1912 convention. Afternoon session (half-past one o'clock)—Experience meeting. Presentation of short "experience papers" and general discussion of water works subjects. The following named two papers will be read and discussed: "An Emergency Intake," Dr. William P. Mason; "Wood Stave Pipe, Some Questions Answered," T. Chalkley Hatton. (This paper answers some questions in the question box.) Evening Session—The Association will be the guests of the Water Works Manufacturers' Association at a fish dinner at Manitow Beach. Special cars will leave Church street, one block from the Powers Hotel, promptly at 4.30. Dinner will be served promptly at 6 o'clock.

Thursday, June 8, 1911—Forenoon Session (nine o'clock)—"Water Rates," George G. Earl; "High Pressure Fire Service Compared with Portable Fire Engines," Charles A. Hague; "Compressed Air in Water Works Construction," Alexander Milne; "The Investigation of Underground Water Waste in Washington, D. C.," W. A. McFarland.

For the Ladies (ten o'clock)—The Entertainment Committee has provided an automobile trip, starting from the ladies' entrance to the Powers Hotel promptly at ten o'clock in the morning. Afternoon Session (half-past one o'clock)—"Steel vs. Iron Pipe," Allen Hazen; "Hot Water Problems," George C. Whipple; "Interpretation of Chemical and Bacteriological Terms Used in Water Analysis," Daniel D. Jackson; "Methods of Keeping Records of Improvements to Established Water Works Plants," Charles Carroll Brown.

Evening Session (eight o'clock)—Band concert in the Park Arena or Convention Hall.

Friday, June 9, 1911—Forenoon Session (nine o'clock)—"Water Softening by Means of Zeolith," Boris N. Simin; "Stripping Reservoir Sites," H. G. Coventry; "Sydney (Australia) Water Supply; Its History and Management," Charles Walter Smith; "Ultra-Violet Ray Sterilization," A. E. Valden. Reading of papers not announced and a general discussion of water works subjects. Unfinished business. Installation of officers for 1911-12. Afternoon Session (quarter-past two o'clock)—By invitation of the Water Works Manufacturers' Association, Special Water Works Matinee at the Lyceum Theatre. Probable play, "The Great Divide." Evening Session—Will be announced later.

National Association of Comptrollers and Accounting Officers.—At the last session of the association it was voted to hold the next annual convention in Birmingham, Ala., but owing to reasons which appear to be ample and sufficient it has been decided to meet this year in Washington, D. C., the dates selected being June 8, 9 and 10. The meeting place will be the Arlington Hotel, and the first session will open promptly at 10 o'clock on Thursday morning, June 8. Secretary Rex advises members to be in Washington the morning before in order to make acquaintances before the sessions begin. The programme is one of the best that the association has had, and in addition to this, President Tweedale states that other speakers than those mentioned will doubtless address the convention.

The matter of uniform budgets for cities is one of exceedingly great importance, and it has been decided to set apart a portion of one of the sessions to a discussion of this matter, and members of State boards and those having this matter in charge have been invited to be present and address the convention.

The entertainment feature has not as yet been fully developed, but it is anticipated that a banquet will be given at the Arlington on the evening of the second day of the convention.

The President of the United States has signified his willingness and pleasure to receive the members of this association at the White House on the afternoon of Friday, June 9, at 2:30 o'clock.

The programme follows:

The Philadelphia Balance Sheet, John M. Walton, Comptroller, Philadelphia, Pa.

Financial Statements of Municipalities, with Special Reference to the Balance Sheet contained in the last Annual Report of the Comptroller of Philadelphia, Dr. Frederick A. Cleveland, Chairman of the President's Economy and Efficiency Commission.

Financial Statements of Municipalities—Balance Sheets, Edward Stetson Griffing, Comptroller, New Rochelle, N. Y.

The Capital Account of a City, Howard C. Beck, C. P. A., President of The Detroit Audit Company.

The Necessity of the Budget from the Legislative Viewpoint, Hon. Swagar Sherley, of Kentucky.

The Essentials of a Good Budget, Dr. Le Grand Powers, Chief Statistician, Census Bureau, Washington, D. C.

Standardization, Edmund D. Fisher, Deputy Comptroller, New York City, N. Y.

The Back Tax Problem, William G. Justice, Comptroller, Buffalo, N. Y.

What Detroit Does with Back Taxes, David E. Heineman, Detroit.

The Duties of a Comptroller Under a Commission Form of Government, W. H. Farnham, Comptroller, St. Paul, Minn.

Financial Statements of Municipalities—Balance Sheets, Duncan MacInnes, Chief Accountant, New York City.

In addition to the foregoing list of speakers who have accepted, the Hon. Henry E. Turner, Auditor of the State of Massachusetts, has been requested to address the association on the subject of "Financial Statements of Municipalities," and the Hon. Henry George, Jr., Representative from the State of New York, has promised, in case his official duties do not interfere, to make an address on the subject of "Taxation." A number of other subjects are under contemplation, and therefore this programme is simply tentative.

South Carolina Water Works Association.—The following notice has been sent to prospective members: "The South Carolina Water Works Association will be organized on June 28 at Columbia. The undersigned have selected this date in order that delegates to the convention may avail themselves of the opportunity of securing reduced railroad rates, as the South Carolina Firemen's Association will meet during the same week. The following fees have been agreed upon subject to the approval of the convention: Fees for active and associate members, \$2; annual dues, active members, \$2; annual dues, associate members, \$1. Those eligible to active membership are City Council members of Committees on Water Works and officials of Water Works Departments. Those eligible to associate membership are Mayors and City Councilmen. We request you to co-operate with us in every way possible to make our organization successful and useful. Please call upon those in your city who are eligible to active or associate membership and secure their pledge to join. Printed programmes will be sent out one week in advance of the meeting. A good attendance at our first meeting will place the organization on a solid foundation and be a guarantee for usefulness and service to our respective communities. The city officials should be vitally interested in this movement, and the Water Works Department officials are urged to enlist them in the work of perfecting our organization. For further information write W. F. Stieglitz, Columbia, S. C. Signed: W. F. Stieglitz, Columbia; R. A. Easterling, Union, J. G. Barnwell, Yorkville, H. M. Banks, St. Matthews; C. M. McClure, Anderson; A. J. Sproles, Greenwood.

American Institute of Electrical Engineers.—Unusual interest is taken in the forthcoming annual convention of the American Institute of Electrical Engineers, for it will be held in Chicago on June 26 to 30, inclusive, and it has been many years since the convention met in that city, although the electrical attractions of Chicago and vicinity are exceptional in interest and variety. Among these points of interest may be mentioned the Ryerson Physical Laboratory of the University of Chicago, where the atomic theory of electricity has been demonstrated by most interesting experiments; the electric furnaces in the steel mills at South Chicago; the enormous electric plant at the Gary, Ind., steel works, driven by gas engines; the great central stations of Chicago, famous for their size and modern design; the hydroelectric development of the Chicago Drainage Canal; "Underground Chicago," with its network of electrically operated freight tunnels; the latest large automatic telephone system; several of the largest manually operated telephone exchanges in the world; street railway and other substations of unusual interest; possibly the largest street railway shops in the world, with electric drive throughout, and many other notable electrical applications.

The convention will meet in the new Hotel Sherman, the most recently completed of Chicago's group of modern hotels. The sessions will be held in the handsome Louis XVI room, which will seat 700 people and can be connected with adjoining apartments to seat 1,500 if desired. Every room in this hotel is provided with bath, and the rates are very reasonable. The restaurants in the hotel, including the

well-known College Inn, have a wide reputation.

A committee of fourteen local members of the Institute has been appointed to make the arrangements for the convention. Mr. Louis A. Ferguson, 120 West Adams street, Chicago, is the chairman of this committee. The program will include visits to points of interest and various social events, and it is confidently expected that the 1911 convention of the Institute will be the most successful in its history.

The following are among the papers to be presented: "Economic Design of Direct Current Magnets," by R. Wikander; "Catenary Span Calculations," by W. L. R. Robertson; "Currents in Inductors of Induction Motors," by H. Weichsel; "Multiplex Telephony and Telegraphy by Means of Electric Waves Guided by Wires," by Major G. O. Squier; "Electrolysis in Reinforced Concrete," by C. E. Magnusson; "Induction Motor Design," by T. Hoock; "The High Efficiency Suspension Insulators," by A. O. Austin; "The Electric Strength of Air," by J. B. Whitehead.

International Association of Fire Engineers.—The annual meeting will be held in Milwaukee, Wis., September 19 and 22, in a large and commodious hall. The Auditorium has been secured for the meetings and the exhibits all under one roof. Application for space should be made to Chief Thomas A. Clancy, Milwaukee, Wis. The Plankinton House has been selected as headquarters.

The following subjects have been selected for discussion:

1. A College for the Purpose of Educating and Perfecting Firemen in Their Various Duties—Edward F. Croker, ex-Chief, New York.

2. Fire Prevention by Education Rather Than Legislation—H. C. Henley, Superintendent Fire Prevention Bureau, St. Louis, Mo., and A. V. Bennett, Chief Fire Department, Birmingham, Ala.

3. Motor Fire Apparatus—Electricaly Propelled—W. H. Daggett, Chief, Springfield, Mass.

4. Motor Fire Apparatus—Gas Engine Propelled—Thomas Ballantyne, Chief, Savannah, Ga., and Arthur Aungst, Chief, Alliance, Ohio.

5. The Calibre of Fire Streams and a New Method of Determining Their Value—Charles H. Fox, Ahrens-Fox Fire Engine Company, Cincinnati, Ohio.

6. Compulsory Sprinkling of Basements—W. H. Loller, Chief, Youngstown, Ohio.

7. The Duties of State Vice-Presidents to the International Association of Fire Chiefs—J. Q. Hawk, Chief, Moline, Ill.

8. Rubber Tires—Solid vs. Pneumatic—Charles E. Swingley, Chief, St. Louis, Mo.

9. The Best Method of Selecting Hose for Fire Department Purposes—Harry L. Cremer, 87 Washington street, Chicago.

10. The Equipment and Efficiency of the Volunteer Fire Services—J. F. Runyan, Chief, Morristown, N. J.

11. Standards of Drill and Discipline for Fire Departments—T. F. Owens, Chief, Denver, Col.

The International Municipal Congress and Exposition has invited the members of the association to visit the exposition, and will charter a steamer to transport them from Milwaukee to Chicago.

Calendar of Meetings

May 23-26.

National Good Roads Association.—Fourth National Good Roads Congress, Birmingham, Ala.—J. A. Rountree, Secretary, Birmingham, Ala.

May 25-26.

League of Second and Third Class Cities of New York.—Poughkeepsie, N. Y.

May 29-June 2.

National Electric Light Association.—New York City.—T. C. Martin, Secretary, 31 West 39th St.

June 5-14.

National Probation Officers' Association.—Boston, Mass.—Roger N. Baldwin, Secretary, 903 Security Building, St. Louis, Mo.

June 6-8.

Engineers' Society of Pennsylvania.—Annual Meeting at State College, Pa.—E. R. Dasher, Secy., P. O. Box 704, Harrisburg, Pa.

June 6-10.

American Water Works Association.—Thirty-first Annual Convention, Powers Hotel, Rochester, N. Y.—John M. Diven, Secretary, 14 George street, Charleston, S. C.

June 7-14.

National Conference of Charities and Correction.—Boston, Mass.—Alexander Johnson, Secretary, Ft. Wayne, Ind.

June 7.

National Association for the Study and Prevention of Tuberculosis.—Denver, Col.—Dr. Livingston Farrand, Executive Secretary, 105 East Twenty-second street, New York City.

June 8-10.

National Association of Comptrollers and Accounting Officers.—Annual Convention, Arlington Hotel, Washington, D. C.—George M. Rex, Secretary, 525 Industrial Trust Building, Providence, R. I.

June 11-16.

International Association of Chiefs of Police.—Eighteenth Annual Convention, Rochester, N. Y.—Major Richard Sylvester, Superintendent of Police, Washington, D. C., President.

June 13-18.

New York State Association of Chiefs of Police.—Annual Convention, Rochester, N. Y.

June 13-16.

American Society of Civil Engineers.—Annual Convention, Chattanooga, Tennessee.—Charles Warren Hunt, Secretary, 220 West 57th St., New York.

June 21-22.

National Conference of Poor Law Officials.—Boston, Mass.—Dr. Robert W. Hill, President State Board of Charities, 105 East Twenty-second street, New York City.

June 22-24.

Intermountain Good Roads Association.—Annual Convention, Pocatello, Ida.—Caleb Tanner, State Engineer.

August 15-18.

Firemen's Association of the State of New York.—Watertown, N. Y.—A. H. Otto, Secretary.

September 12-15.

International Association of Municipal Electricians.—Annual Convention, St. Paul, Minn.—Clarence R. George, Secretary, Houston, Tex.

September 18-30.

International Municipal Congress and Exposition.—Chicago, Ill.—Curb W. Treab, Secretary, Great Northern Building, Chicago, Ill.

September 19-22.

International Association of Fire Engineers.—Annual Convention, The Auditorium, Milwaukee, Wis.—James McFall, Secretary, Roanoke, Va.

September 19-22.

American Hospital Association.—New York City. J. N. E. Brown, M.D., Secretary, Toronto General Hospital, Can.

September 24-30.

International Congress on Tuberculosis.—Rome, Italy.—Professor Ascoli, Secretary-General, Via Lucina, Rome, Italy.

September 26-29.

American Society of Municipal Improvements.—Grand Rapids, Mich.—A. Prescott Folwell, Secretary, 239 West Thirty-ninth street, New York City.

October 4-6.

League of American Municipalities.—Annual Convention, Atlanta, Ga.—John MacVicar, Secretary, Des Moines, Ia.

November 13-17.

National Municipal League.—Annual Meeting, Richmond, Va.—Clinton Rogers Woodruff, Secretary, North American Building, Philadelphia, Pa.

PERSONALS

ADAMS, ALTON D., of Worcester, Mass., has been engaged by the city of Racine, Wis., as an expert engineer to assist the city attorney in the prosecution of the water works case.

ARNOLD, CHARLES C., is again mayor of East Peoria, Ill., as he was successful in his suit to contest the seat of John T. Keil, who was declared elected at the election held in April. At the time of the election, the election judges decided that Keil was elected by a majority of three votes, 134 to 131, but 11 ballots were thrown out as being defective, and the contest was over these, Mr. Arnold contending they had been cast for him and should have been counted.

BROWN, P. L., has been elected Mayor of Silverton, Oregon.

CALLAGHAN, BRYAN, was re-elected Mayor of San Antonio, Texas.

CHILDS, WM. T., has been appointed deputy city comptroller of Baltimore, succeeding Julius W. Freeman, who had held the position for fifteen years.

CROZIER, A. J., has been elected Mayor of Salina, Utah, to fill the vacancy caused by the death of H. F. Jorgensen.

EDYVEAN, EDMUND H., has been appointed road engineer of Iron County, Mich.

FISHER, LEWIS, was re-elected Mayor of Galveston, Texas.

GINDORF, F. C., was elected Mayor of Sidney, Iowa, and then qualified as deputy county sheriff. The Attorney General has decided he cannot hold both offices. He rules that a mayor, being ex-officio a justice of the peace, is a judicial officer and that a deputy sheriff is an executive office and that one person cannot hold both offices at one and the same time.

RALPH, GEORGE E., Minnesota's state drainage engineer, is taking a ten-day trip over the eastern part of the State investigating the progress of field and construction work.

ROOT, WM. T., Sr., city councilman of Pasadena, Cal., for six years and recently elected to serve two years more, has been elected president of the council.

STEINERT, ALEXANDER, has been named by Mayor Fitzgerald as a member of the Boston municipal art commission.

THOMPSON, S. A., field secretary of the National Rivers and Harbors Congress, is making a tour of the Southern States in an effort to arouse interest in deep waterways.

TIPTON, A. H., has been elected mayor of Elizabethton, Tenn.

WILLIAMS, PROF. GARDNER S., of the University of Michigan, presented a paper at a meeting of the hydraulic, sanitary and municipal section of the Western Society of Engineers, Chicago, on May 17, on the subject of "The Measurement of Water, Means Available and Their Relative Accuracy."

WEBER, WALTER H., is the new mayor of Havre de Grace, Md.

WESTON, ROBERT SPURR, of Boston, lectured on the general subject of sewage disposal before a meeting of the eastern section of the American Chemical Society at Union College, Schenectady, last week. Mr. Weston is a sanitary expert and formerly consulting engineer of the Massachusetts State Board of Health.

WHIPPLE, GEORGE CHANDLER, of New York, has been appointed Professor of Sanitary Engineering at Harvard University and will begin his work there next fall. Mr. Whipple is one of the most eminent engineers in the country. He was graduated in 1889 from the Massachusetts Institute of Technology.

INDUSTRIAL NEWS

Cast-Iron Pipe.—Although recent lettings have been small the condition of the market is considered as satisfactory. Quotations: 4-inch, \$25.50; 6 to 12-inch, \$24.50; 16-inch and up, \$24. San Francisco: The tonnage booked is satisfactory and several large inquiries are in the market. Birmingham: Some fair contracts have been closed; there is little expectation of any material reduction in the output for several months. Quotations: 4 to 6-inch, \$22.50; 8 to 12-inch, \$22; over 12-inch, average, \$21. New York: The inquiry for pipe has increased notably. Quotations: 6-inch, carloads, \$21 to \$22.

Lead.—The market continues weak and independents are making the price. Quotations: New York, 4.50c; St. Louis, 4.25c.

Steam Fire Engine Test.—The Ahrens steam fire engine recently purchased by the city of Janesville, Wis., was satisfactorily tested last week. With a steam pressure of 240 pounds and an 1 3/8-inch nozzle a stream was thrown about 200 feet high, which is higher than any building in Janesville.

Chemical Engine Test.—In connection with an excursion of Cincinnati business men, who stopped at Charleston, W. Va., last week, the Kanawha Chemical Fire Engine Manufacturing Company gave a demonstration of the ability of their apparatus to put out a fire. A shack about 16 feet square, open on one side and with large openings at the top for draught, was built on a lot. The structure was filled with dry wood, covered with excelsior and just before the demonstration was begun 10 gallons of coal oil and five gallons of gasoline were thrown on the contents, making the subject of the test as highly inflammable as possible. An alarm was then turned in and a match applied. Within a few seconds the entire pile of material was a roaring furnace and spectators were forced to retreat. The entire Fire Department responded and made the run from Central Station in two minutes. When they arrived on the scene the fire was burning fiercely. Mr. Harlan, representative of the chemical company, directed a stream of the chemical from the chemical wagon used by the Fire Department on the blaze, but the flames ad secured such headway, and as the building was so constructed that nothing in the fire fighting line could stop such a big blaze, the demonstration, to the casual observer, seemed to fall short of its aim. The efficiency of the chemical itself, however, was clearly demonstrated, as the blazing portion of the structure reached by the force of the stream was extinguished instantaneously.

Water Company.—Officials of the Girard Water Company, Girard, O., met with members of Village Council for the purpose of discussing the schedule of rates in the water franchise over which there had been some complaint. After a thorough discussion and investigation of the subject Council decided that the water company was entirely within its rights in making the charges which had been complained of. Upon investigation members of Council discovered that the water rates for Girard are no higher and in many cases less than over 40 towns in this section of the country.

New Cause of Sewer Clogging.—According to reports submitted to Mayor Simon sewers in streets in Portland, Ore., where Hassam pavement has been laid are becoming clogged partly from cement grout which runs into the sewers during the construction of the pavement and partly from washings of cement from the pavement after it has been laid. When the Hassam pavement is laid the rock which forms the base of the pavement is rolled and flushed with cement to thoroughly grout it. As it is being grouted the pavement is rolled again, causing a foam to form in which there is a large amount of cement. This is washed from the pavement into the catch-basins, where much of it is caught, but a portion of it finds its way into the sewers, where it is deposited on the sides and bottoms of the sewers, where it hardens into a substance resembling lime rock. It is also said that the wear upon the pavement loosens particles of the cement, which is washed into the sewers when the streets are flushed by the street cleaners, and these minute particles also form and harden into the lime-like substance. Sewers in which this deposit is said to be found more largely are located in the Holladay Addition and on East Twentieth street. The Multnomah sewer is said to be seriously affected. During the last two years many miles of Hassam pavement have been laid in the city, and about 20 additional miles are projected.

Sewer Pipe.—Representatives of the Akron Sewer Pipe interests were in conference last week with representatives of manufacturers from other sections of the country for the purpose of discussing matters of interest to the sewer pipe trade.

Paving Plant Burned.—Fire gave the firemen a fight of several hours May 12 at the Standard Bitulithic Company's plant at the foot of Essex street, Harrison, N. J. The blaze destroyed the frame building occupied by the concern. The blaze was caused by the boiling over of a pot of asphalt. When the fire started there were between 30 and 40 employees at work, a day and night force being employed at the plant. With the firemen the employees worked hard to try and put the fire out, but the best they could do was to save the adjacent buildings.

Corrugated Culverts.—The California Corrugated Culvert Company, Berkeley, Cal., expects to make a large addition to its factory this summer.

Cement.—The Canada Cement Company has purchased a site of 100 acres near Winnipeg, on which it intends to place a cement-grinding plant to cost \$400,000.

Municipal Auto Truck.—The Eclipse Truck Company, Franklin, Pa., has placed on the market an auto truck specially designed for the use of city departments. Last week Mayor Francis M. Graff, Superintendent of the Water and Light Department Harry W. Ellsworth and City Clerk Fred Kiebert, of Meadville, inspected the truck and looked over the plant of the company. The city of Meadville is considering the purchase of a truck for the Water Department. The Meadville officials were favorably impressed with the Eclipse truck, and it is likely that an order will be placed for one.

Record Run.—The new 80-horse-power automobile combination chemical engine and hose wagon purchased from the Seagrave Company, of Columbus, O., was given its official test by Fire Chief A. H. Myers, accompanied by Commissioners Hayden, Coates, Fairley and Fassett, Spokane, Wash. It was accepted by Commissioner Hayden and Chief Myers ordered it placed in service at No. 4 fire station. The route selected by Chief Myers for the test was most difficult. The start was made from Police Headquarters. At Fourth avenue and Monroe street it was stopped. At a signal from Chief Myers the engine was started and the Monroe street hill, south from Fourth avenue to Ninth, was made in 1 minute and 14 seconds. The Monroe street hill has a 17 per cent grade. From there a run was made out South Lincoln to Twenty-fifth avenue, returning to Ninth avenue, east to Grand avenue, then south on Grand avenue to Thirty-second avenue, back to Sprague and then to the City Hall; in all a total distance of 10 1/2 miles. Going east on Sprague avenue the machine was given its test for speed, when it maintained 40 miles an hour. This new piece of fire fighting apparatus is one of the latest models manufactured and carries 2,000 feet of fire hose with a partition in the center of the hose body, thus permitting two leads to be laid off on arrival at the fire. It also carries a 40-gallon chemical engine with 250 feet of chemical hose. The motor is an air-cooled six-cylinder, with auxiliary exhausts.

Incinerators.—The McCall Incinerator Company of North America, Memphis, Tenn., has issued several circulars describing and illustrating different types of incinerators for the disposal of excreta and other wastes of construction and permanent or semi-permanent camps.

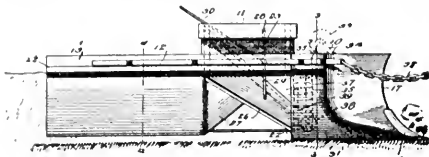
Fire Crusher.—The Gardner Crusher Company, 556 West Thirty-fourth street, New York, has issued a pamphlet describing and illustrating its crushers. Seventy-three materials are enumerated which the crusher is suitable for handling; these vary in character and hardness all the way from sugar to corundum. One of the illustrations shows the breaking and grinding process which takes place in the machine and the position which the material being handled assumes.

Pipe Coating.—The American Asphaltum and Rubber Company, 600-614 Harvester Building, Chicago, Ill., is sending out a card regarding its mineral rubber pipe coating. The card has an illustration of a 36-inch steel pipe coated with mineral rubber, at Montreal, Canada; also a 3,000,000-gallon reservoir water-proofed with Pioneer reservoir water-proofing at Muskogee, Okla.

Scales for Water Works.—The Standard Scale and Supply Company, of Pittsburg, has secured a large contract for scales to be installed at the various pumping plants of the Department of Water Supply, Gas and Electricity, Borough of Brooklyn, N. Y. These scales aggregate thirty-five in number, and include several hundred-ton 42-foot railroad track scales, both pit and suspension pattern, and a large number of wagon scales of 10-ton capacity, heavy railroad pattern. All these scales are to be built in steel and concrete construction. The contract will be completed during the summer. This is one of the largest installations of high capacity scales ever made.

PATENT CLAIMS

992,649. CONCRETE-SPREADER FOR DITCHES, SIDEWALKS, AND OTHER SURFACES. George W. Gale, Greeley, Colo. Serial No. 598,234.
A mortar or concrete spreading apparatus comprising a frame, a hopper for the reception of the plastic material, inclined



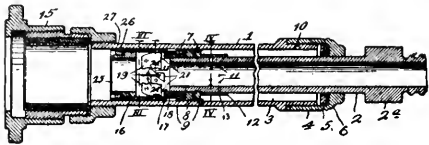
plates spaced apart in the rear of said hopper, and an agitator in said hopper movable against the inclined bottom thereof.

990,417. FORM FOR MOLDED CONDUITS. Henry W. Bassett, Seattle, Wash. Serial No. 550,247.

An inner form for molded conduits comprising longitudinal segments adapted to outline the invert, other longitudinal segments adapted to outline the remainder of the conduit, a restraining band adapted to surround and locate said segments and having its inner edge recessed to hold the invert segments enough farther from the center than the segments adjoining to permit the edges of the latter moving peripherally within the invert segments, and means for peripherally expanding those segments above the invert.

992,314. HOSE-NOZZLE. Francis Wheatley, Kansas City, Mo. Serial No. 542,556.

A hose-nozzle consisting of an outer tubular section and a tubular piston section, which latter is slidably mounted in



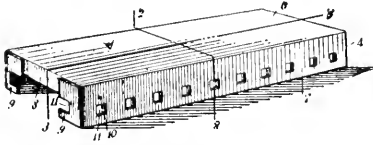
the former and of sufficiently less diameter to form a chamber having communication with the interior of said piston.

992,313. PROCESS OF MANUFACTURING WATERY SOLUTIONS OF OILS, FATS, TAR, ASPHALT, &c. Leonard Schade van Westrum, Berlin, Germany, assignor to Westrumite Company of America, Chicago, Ill., a Corporation of Maine. Serial No. 288,855. Renewed July 13, 1907. Serial No. 383,626.

The process of manufacturing watery solutions of substances which are not naturally soluble or emulsifiable in water which consists in mixing said substances while heated with a saponifiable oil, adding water and a volatile alkali and agitating the mixture.

992,573. ARMORED PAVING. Peter P. McMenamin, Jersey City, N. J. Serial No. 532,368.

A block, composed of a single sheet of metal bent to form top, sides and ends, said sides having flanges bent to overlap



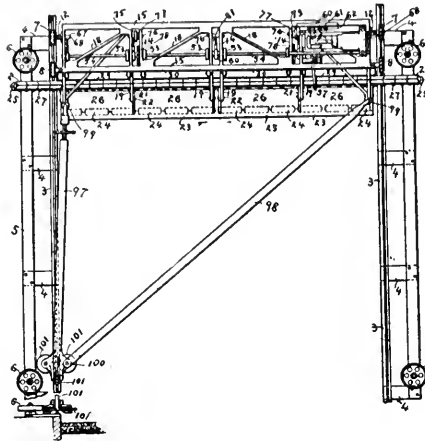
said ends, and said sides and flanges also having tongues struck inwardly from the body thereof to form concrete engaging members and also to form communicating apertures between the interior and the exterior of the block.

992,279. PRESSURE-OPERATED GAS LIGHTING AND EXTINGUISHING APPARATUS. Ernest Sparks, London, Eng. Serial No. 575,497.

A pressure operated gas lighting and extinguishing apparatus comprising a piston mounted in a cylinder, a gas cock passing laterally through the wall of the cylinder and interposed in a straightway gas pipe, a spindle mounted in said gas cock and adapted to project over the said piston, a ratchet wheel at one end of said spindle and a cam wheel at the other end of the spindle, said ratchet wheel adapted to be engaged and rotated by said piston, said cam wheel having half the number of teeth of the ratchet wheel and adapted to raise from its seat a coned plug in the gas cock casing and in the line of the straightway gas pipe.

992,538. APPARATUS FOR AND PROCESS OF LAYING PAVING MATERIAL. William Bayley, Springfield, Ohio. Serial No. 488,107.

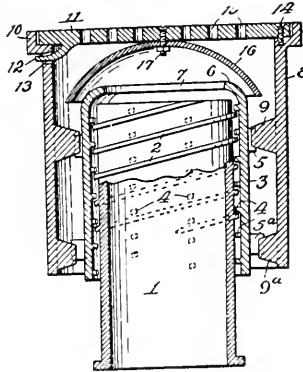
In a paving apparatus, a bridge-like main frame supportable at the sides of the paving-bed and movable relatively to and



over the paving-bed, means carried by said frame to receive and hold the paving blocks and positive means to cause the blocks to move thence into paving position.

992,377. SEWER VENT-BOX. Thomas P. Moore, Reading, Pa., assignor to Abraham Lincoln Frame, Reading, Pa. Serial No. 611,746.

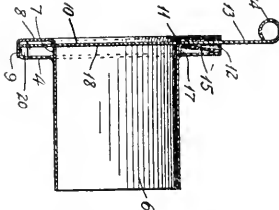
In a vent box for sewers, the combination with a sewer pipe connection threaded externally, an inner casing formed with an inwardly flanged upper end, internal buttons arranged to engage the convolutions of the thread on the pipe connection and four pairs of diametrically opposite lugs on its outer surface, of an outer casing



formed with registering lugs adapted to enter the spaces between the pairs of lugs on the inner casing, a perforated cover plate for the outer casing, said plate having a locking tongue adapted to engage the casing and means for securing the cover plate to the casing, and a dome secured to cover the upper open end of the inner casing.

992,293. FLUME-GATE. Elmer O. Thomason, Covina, Cal., assignor to Kellar-Thomason Manufacturing Company, Covina, Cal., a Corporation of California. Serial No. 584,490.

A gate having a seat, a slide coming upon said seat and a member having a



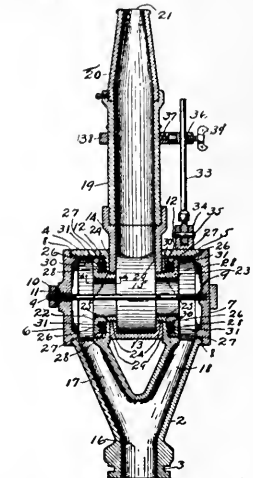
projecting lip pressing said slide and holding the same upon said seat, said lip following the outline of said seat.

991,434. WOOD-PRESERVING COMPOSITION. Carleton Ellis, Montclair, N. J., assignor to Copper Oil Products Company, a Corporation of New York. Serial No. 582,989.

A wood preserving composition, comprising copper gyaualate and oleate in solution in heavy asphaltic oil.

992,193. NOZZLE. Milton H. Hart, Akron, O. Serial No. 593,133.

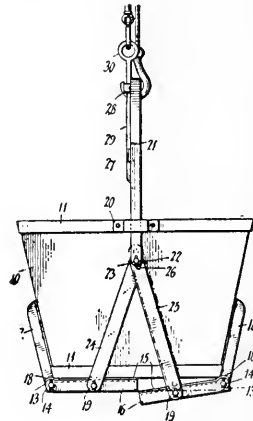
The combination with a bifurcated supply-pipe, and an adjustable nozzle-piece disposed concentrically between flanged portions of the branches of said pipe, of a pair of cylindrical bushings threaded into said nozzle-piece, each bushing having an external flange arranged to form an annular



groove facing the flange of said supply-pipe, corrugated seats formed in the flanged portions of the supply-pipe, corrugated seats formed in the grooves of said bushings, and a compressible packing disposed between said corrugated seats for preventing the leaking of the device.

992,724. CONCRETE-BUCKET. Willard D. Lockwood, Schenectady, N. Y. Serial No. 466,882. Renewed Apr. 18, 1910. Serial No. 556,259.

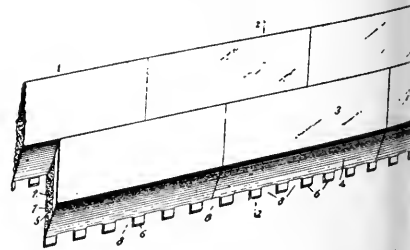
In a hoisting bucket, a body comprising side and end walls, doors hinged to said body and provided with hinge edges formed



to constantly contact with the edges of the wall to which they are attached, and links connected to said doors and arranged to close one of said doors before the other is closed.

992,574. INTERLOCKING ARMORED PAVING. Peter P. McMenamin, Jersey City, N. J. Filed Aug. 3, 1910. Serial No. 575,256.

A paving block comprising a cementitious filling and an armored covering, said armored covering comprising a single sheet of metal stamped up to form a top, sides and ends, said sides having incisions in the lower edges thereof, forming tabs, each alternate tab being bent inwardly to



form retaining members adapted to maintain said filling within said covering, and the remainder of said tabs being bent outwardly to form interlocking members which dovetail with the corresponding members on the juxtaposed blocks so as to prevent longitudinal and vertical movement of said block relative to adjacent blocks.

THE WEEK'S CONTRACT NEWS

Relating to Municipal and Public Work—Street Improvements—Paving, Road Making, Cleaning and Sprinkling—Sewerage, Water Supply and Public Lighting—Fire Equipment and Supplies—Bridges and Concrete Work—Sanitation, Garbage and Waste Disposal—Police, Parks and Miscellaneous—Proposals and Awards.

To be of value this matter must be printed in the number immediately following its receipt, which makes it impossible for us to verify it all. Our sources of information are believed to be reliable, but we cannot guarantee the correctness of all items. Parties in charge of proposed work are requested to send us information concerning it as early as possible; also corrections of any errors discovered.

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREET IMPROVEMENTS				
Ohio	Youngstown	May 26	Grading and paving various streets	City Clerk.
New York	Buffalo	May 26, 11 a.m.	Paving, masonry and other work necessary for constructing the subways and approaches in Elmwood ave. under tracks of N. Y. Central	Geo. N. Norton, Deputy Engr. Com. J. J. & W. W. Cox, Engrs.
Michigan	Coldwater	May 26	Constr. 6 miles of road in Branch County	
Pennsylvania	Bellevue	May 26, 6 p.m.	Improving portion of Brighton and Lincoln ave., consisting of 700 cu. yds. grading, 4,400 ft. curbing, 13,650 sq. yds. paving	John McBride, Boro. Engr.
Utah	Salt Lake	May 26	Constructing cement walks in sidewalk extension No. 129	H. G. McMillan, Clk. Bd. Pub. Wks.
Ohio	Cleveland	May 27, 11 a.m.	Grad. drain and improve Irish Road No. 2 and Harvard Road	John F. Goldenbogen, Clk. Bd. C. C. J.
Indiana	Greencastle	May 27, 2 p.m.	Constr. 8,275 lin. ft. macadam road in Russel township	D. V. Moffitt, County Auditor.
Pennsylvania	Eric	May 29, 8 p.m.	Paving various streets	City Clerk.
Ohio	Toledo	May 29, 10 a.m.	Furn. macadam and other materials for repair of all imp. roads	Chas. J. Sanzenbacher, Co. Aud.
Virginia	Amherst	May 29, 11 a.m.	Constr. about 4½ miles of macadam road, alternate bids with County owning 5,000 cu. yds. stone and a 10-ton roller and sprinkler and contractor furn. roller and sprinkler	P. St. J. Wilson, St. Hwy. Comr. P. B. Bowler, Street Comr.
New Jersey	Morristown	May 29	Paving various streets	
Minnesota	Minneapolis	May 29	Repairing and resurfacing Road No. 41 and graveling parts of Roads 47 and 74 in town of Plymouth and No. 8 in town of Hassam	A. P. Erickson, County Engr.
Sask., Can.	Moose Jaw	May 29, 8:30 p.m.	Laying about 41,093 sq. yds. pavement; 206,061 sq. ft. concrete sidewalks; 46,366 lin. ft. curb and gutter; 1,056 sq. yds. wood block crossing	J. M. Wilson, City Engr.
Illinois	Mt. Carmel	May 30, 2 p.m.	Constr. 15,725 sq. yds. vit. brick pavement, concrete foundation, cement filler, concrete curb and gut. Est. about \$42,000.	T. B. Wright, Jr., Mayor.
Pennsylvania	Scottdale	May 31, 8 p.m.	Grading, curbing and paving various streets, about 6,734 sq. yds., with vitrified brick or block; also paving with vitrified hillside brick or block 1,824 sq. yds.	R. F. Ellis, Burgess.
New York	Brooklyn	May 31	Repaving with iron slag about 2,915 sq. yds.; and with asphalt 21,245 sq. yds. Furn. 200,000 gals. asphalt road oil and 3,000 bbls. Portland cement	Alfred E. Steers, Boro. Pres. W. J. Williams, Boro. Secy.
Pennsylvania	Wilkes Barre	May 31	Constr. 6,060 sq. yds. paving; and 3,500 lin. ft. curbing	
Pennsylvania	Kingston	May 31, noon	Constr. 10,000 sq. yds. brick paving on concrete foundation; 3,000 sq. yds. Warrenite or similar paving	W. J. Williams, Boro. Secy.
Ohio	Columbus	June 1, noon	Grading and mac. .88 mile of road in Hocking County; est. cost \$5,073.80.	Jas. C. Wonders, State Hwy. Comr. The George Company, Ran. Bldg. Memphis, Tenn.
Mississippi	Hazlehurst	June 1	Constructing 58 miles of gravel roads in Copiah County	
New Jersey	New Brunswick	June 1	Completing by macadamizing and otherwise improving Franklin Park and Kingston road	Asher Bisset, Clk. Bd. Co. Comrs Ora E. Lauber, Village Clerk.
Ohio	Archbold	June 2	Imp. Defiance st., by grad., drain., curbing and paving	H. C. Hill, State Engr.
New Hampshire	Concord	June 2, 1 p.m.	Furn. trap rock, estimated about \$4,500	F. Driecks, Clk. Bd. Co. Comrs.
Ohio	Cincinnati	June 2	Improving Crookshank Road in Green township	Sam'l L. Burgess, Township Clerk City Clerk.
New Jersey	Laurel Springs	June 3	Construction concrete sidewalk in Washington Avenue	C. C. Jenkins, Village Clerk.
Pennsylvania	Franklin	June 5, 7 p.m.	Paving various streets	
Ohio	Willoughby	June 5, noon	Grading, paving and curbing Euclid St.	
New York	Newburgh	June 5, 5 p.m.	Paving portion of Grand street with sheet asphalt, bitulithic, wood block or Hassam pavement, consisting of 25,630 sq. yds. pavement and 11,500 lin. ft. curb, inlet basins, catch basins, manholes, etc.	Max E. Bastian, Jr., Supt. Sts. W. Lea Smith, County Auditor. J. N. Leatherman, County Aud. Chas. D. Feidt, Boro. Secy. Mayor.
Indiana	Portland	June 5, 3 p.m.	Constr. and improv. public hwy's. in Bear Creek township	J. E. Wallace, County Auditor. W. T. Roberts, County Auditor.
Indiana	Rensselaer	June 5, 3 p.m.	Constructing 5 stone roads in Keener township	Edgar A. Staggs, County Auditor. A. V. Hamis, County Auditor.
Pennsylvania	Steelton	June 5, 7:30 p.m.	Sub-grading, paving and curbing portion of Second street	Chas. A. Johnson, County Auditor, Bd. County Comrs.
Kansas	Marion	June 5	Paving, curbing and otherwise improving Third Street	J. P. Noitzges, County Auditor.
Indiana	Logansport	June 6, 10 a.m.	Constr. a gravel road in Jefferson twp. and macadam roads in Jackson, Harrison and Tipton townships	Edgar A. Staggs, Audr. Clay County. Oscar J. Denny, Boro. Secy. A. B. Easterling, County Auditor.
Indiana	Princeton	June 6, 10 a.m.	Improving several public highways	Jesse M. Stone, County Auditor.
Indiana	Brazil	June 6, 11:30 a.m.	Constr. a stone and gravel road in Harrison twp. and a gravel road in Sugar Ridge township	County Commissioners. A. G. Fisher, County Auditor. Horace Vlakely, County Auditor.
Indiana	Paoli	June 6, 2 p.m.	Constr. 3 gravel roads in Orange County	Geo. W. Vaxter, County Auditor.
Indiana	Crown Point	June 6, noon	Constructing various gravel roads in Lake County	
New Jersey	Cape May	June 6	Constr. seashore road from Seaville to Beesley's Point	
Indiana	Wabash	June 6, 1 p.m.	Constr. a gravel road in Chester township	
Indiana	Indianapolis	June 6, 11:30 a.m.	Constr. stone and gravel roads in Harrison & Sugar Ridge twp.	
Pennsylvania	Sharon	June 6, 5 p.m.	Paving about 1,900 sq. yds. on Oakland ave.	
Indiana	Kokomo	June 6	Constr. about 9 mi. of gravel road in Jackson & Liberty twps.	
Indiana	Rushville	June 6	Constr. 6,659 ft. of macadam road in Jackson twp.; and 7,523 ft. of macadam road in Posey and Jackson twps.	
Indiana	Vincennes	June 6	Constr. 2 gravel roads in Busseron twp. in all 11,600 ft. long; and a gravel road in Vincennes twp. 2,295 ft. long	
Indiana	Monticello	June 7, noon	Construct. a rock road on County line bet. White & Carrol Cos.	
Indiana	Bloomington	June 7, 10 a.m.	Improving a highway in Bloomington township	
Indiana	Lafayette	June 8, 10 a.m.	Constructing and improving various gravel roads in Tippecanoe County	
Indiana	Mt. Vernon	June 8, 2 p.m.	Constr. a 2 mile gravel road in Marris township; 1 mile road and 3,520 ft. gravel road in Lynn township; 3,335 ft. of gravel road in Center township; and 12 miles of work in Smith twp.	Paul Maier, County Auditor.
Pennsylvania	Ridgeway	June 12	Constr. 2,500 cu. yds. excavation; 7,000 sq. yds. paving and 5,600 lin. ft. curb	P. W. Ward, Voro. Engr.
SEWERAGE				
Ohio	Youngstown	May 26	Constructing sewers in various streets	City Clerk.
Pennsylvania	Harrisburg	May 26, 2 p.m.	Constr. a terra cotta pipe sewer in portion of Front Street	D. E. Tracy, Secy. Bd. Pub. Wks. W. W. Caldwell, Comr.
Pennsylvania	Harrisburg	May 27, noon	Constr. a sewer in portion of Peffer street	
Ohio	Lorain	May 29, noon	Constr. lateral sanitary sewers and storm water sewers in various streets	L. B. Johnson, Clk. Pub. Serv. Dept. R. E. Hart, City Engr.
Iowa	Clinton	May 29	Constr. brick and pipe sewers in various streets	
Michigan	Bessemer	May 29	Laying 1,850 ft. 12-in. 3,607 ft. 15-in., 293 ft. 18-in., 400 ft. 20-in. vitrified pipe sewers; 1,835 ft. 2 x 2½ ft. reinforced concrete sewer, manholes, catch basins, etc.	W. L. Guyer, City Clerk. H. S. Holton, Dir. Pub. Service.
Ohio	Columbus	May 29	Installing sanitary sewers in various streets	
Maryland	Baltimore	May 31, 11 a.m.	Constr. junction sewer consisting of about 2,400 cu. yds. excavation, 450 cu. yds. concrete masonry; 40,000 lbs. reinforcing steel; 25,000 ft. B M. sheeting; 800 sq. yds. waterproofing, in connection	Chas. England, Chm. Sewer. Com

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
SEWERAGE (Continued)				
Kansas	Leavenworth	May 31, noon	Constructing main storm water drain in the college section	Capt. John S. Winn, Act. Q., U.S.A.
Pennsylvania	Norristown	May 31, 8 p.m.	Install an 8-in. vit. pipe san. sewer in portion of Markley St.	Chas. C. Rambo, Chm. Sewer Com.
Minnesota	Albert Lea	June 1, 5 p.m.	Constr. 9,513 ft. 8-in. pipe sewer; 1,408 ft. 10-in.; 208 ft. 8-in. and 15-in. double; 28 ft. 15-in.; 40 ft. 10-in. C. B. connection pipe and appurtenances	Wm. Barneck, City Engr.
New York	Buffalo	June 1, 11 a.m.	Constructing sewers in various streets consisting of 12-in. tile, 10-in. tile, and 48, 27 and 24-in. brick and 20, 15 and 18-in. tile sewers	Francis G. Ward, Comr. C. W. Skym, Village Clerk. Constructing Quartermaster.
New York	S. Glens Falls	June 1	Constructing a sewer system and disposal plant	Dir. Public Service.
New York	Fort Hamilton	June 2, 11 a.m.	Constructing a sanitary sewer	Oliver Drake Smith, Secy. Sew. Com.
Ohio	Bellefontaine	June 2	Constr. reduction tank, primary contact beds, outlet drains, etc	Capt. M. E. Saville, Constr. Q.M.
New Jersey	Englewood	June 3, 3 p.m.	Constructing a sewage disposal plant complete	C. C. Jenkins, Village Clerk.
Illinois	Pt. Sheridan	June 5, noon	Constr. sewage dis. plant complete, at Fort Sheridan	C. E. Goodlad, City Auditor.
Ohio	Willoughby	June 5	Install a san. sewer with manh., house and lot con. in Euclid st.	J. M. Terwillinger, Village Clerk.
South Dakota	Plankington	June 5	Disposing of sewage now emptied into small nearly dry creek	Boro. Council.
New York	Ossining	June 6, 8 p.m.	Constr. the Kill Brook Trunk Sewer; bulkhead dock and screening chamber at outfall end; also other sewers	E. H. Christ, Pres. Bd. Pub Wks.
Pennsylvania	Bristol	June 7, noon	Constr. complete system of sewerage and disposal plant	A. B. Maupin, City Engr.
Michigan	Grand Rapids	June 8	Constr. a public sewer to be known as the East Side Trunk Sewer	Boro. Clerk.
West Virginia	Huntington	June 10, 1 p.m.	Constructing sewers in various streets, size 12 to 18-in.	Chas. A. Trimmer, City Engr.
Pennsylvania	Westchester	June 14	Constr. of outfall sewers and disposal plants	City Clerk.
South Dakota	Madison	June 20	Installing a sewer. Estimated cost \$65,000	
California	San Jose	July 3	Construct septic tank for County hospital	
WATER SUPPLY				
California	Los Angeles	May 26	Furn. fabricated steel and rivets necessary to con. abt. 1,865 ft. of 9-ft. 3-in. and 8,313 ft. of 11-ft. riveted steel syphon	Board of Public Works
Ohio	Toledo	May 26, noon	Furn. rotary pump, 15,000,000 gals. daily; also bituminous coal gas producer and accessories, about 400 h.p. continuous capacity	Fred Shane, Sec'y Bd. Pub. Service.
New Jersey	Crosswicks	May 26, 7:30 p.m.	Constructing complete water works system, including piping, pumping station, standpipe or tower, etc.	Geo. B. Thorn, Secy. Crossw. Wt. Co.
Minnesota	Zumbrotta	May 26, 8 p.m.	Constr. 5 blocks of 6-in. water m-ns, with 5 fire hydrants	Albert Severson, Village Recorder.
Ontario, Can.	Ottawa	May 29, 4 p.m.	Constr. a dam and spillway at Kipewa Village, Pon. Co., Quebec	R. C. Desrochers, Secy. D.P.W., Ott.
Minnesota	Madelia	May 29	Constr. a steel water tank and tower	A. Massey, Village Recorder.
South Dakota	Wolsey	May 29, 8 p.m.	Constructing a 4 1/2-in. artesian well	A. M. Chenoweth, Mayor.
Connecticut	Waterbury	May 30, 8 p.m.	Stripping of surface soil from the basin of Morris Reservoir in the towns of Morris and Litchfield	R. A. Cairns, City Engr.
Brit. Col., Can.	Vancouver	May 31, 4 p.m.	Furn. steel pipe, 1 pipe; also 18-in. flexible joint c. i. pipe	Wm. McQueen, City Clerk.
Wyoming	Pt. Yellowstone	May 31, noon	Constructing pipe line from Panther Creek to Ft. Yellowstone water system	Constructing Quartermaster.
North Carolina	Concord	May 31, 3 p.m.	Building auxiliary pumping station, furnishing turbine pumps and motors; about 2 miles of 12-in. c. i. pipe; 1,000,000 gal. reinforced concrete sedimentation reservoir; 1,000,000 gal. filter plant	Chas B. Wagoner, Chm. Bd. W.&L.C
Florida	Titusville	June 1	Drilling an 8-in. artesian well 113 ft. deep	B R. Wilson, Mayor.
Ontario, Can.	Ridgetown	June 1	Laying water pipe, castings, hydrants, valves, etc. and constructing a steel elevated tank	D. Cochrane, Town Clerk.
W. Virginia	Romney	June 1, 8 p.m.	Installing a pipe line consisting of about 3,559 ft. 4-in. wrought iron and steel screw pipe or 4-in. wood stave pipe; 10,250 ft. 3-in.; 3,550 ft. 4-in. c. i. pipe with necessary appurtenances; and constructing a 100,000 gal. concrete reservoir; repairing old dam; building stone or concrete pump well	John C. Linthicum, Chm. W. Com.
Virginia	Lexington	June 1, noon	Furn. 41,800 ft. wood pipe and 16,800 ft. c. i. pipe, 8-in., valves, special castings; also for constr. small concrete intake and pipe laying	City Clerk. Lee Nichols, City Auditor.
North Dakota	Mandan	June 2	Improving water works	Lieut. E. F. Barlow, Con. Q. M.
Alabama	Pt. Morgan	June 2	Furn. a motor driven deep well pump, elec. trans. line, 4-in. cast iron water main, etc.	
Missouri	St. Louis	June 2, noon	Furn. detailed drawing, constructing and erecting at Low Service Pumping station two steam, turbine-driven centrifugal pumping units, complete with condensing apparatus	Board Public Improvements. H. J. Lelande, County Clerk.
California	Los Angeles	June 5	Constr. a one-story brick power house at County Farm	City Clerk.
Iowa	Leon	June 5	Constructing water works system	Village Clerk.
Minnesota	Slayton	June 5	Constr. water mains in var. sts., about 3,650 ft.	C. H. Rust, City Engr.
Ontario, Can.	Toronto	June 6	Furnishing vertically driven pumps	Boro. Surveyor.
Pennsylvania	Bristol	June 7	Constr. complete system of w. w. and filtr. plant of 2,000,000 gals. capacity	James F. Ewers, Town Clerk. John P. Kern, Secy. Bd. Fire & W. C.
Wyoming	Basin	June 7	Constructing water works and electric light plant	H. M. Hammond, Chm. Bd. Pub. W
Michigan	Marquette	June 9, 8 p.m.	Extending existing water works intake	
Indiana	Richmond	June 12, 10 a.m.	Furnishing water to city for period of 25 years	
BRIDGES				
Illinois	Springfield	May 26	Constr. two bridges, one of reinforced concrete, the other reinforced conc. abutments with repairs for old steel superstruc.	Floyd Finchum, Town Clerk. C. J. Ives, County Auditor.
Ohio	Wauson	May 26, 10 a.m.	Constr. bridge No. 175, 36 ft. long, 14 ft. roadway	
Ontario, Can.	Arkwright	May 27, noon	Constr. two concrete abutments and one 100-ft. span Baltimore Truss over the Sauble River about 2 miles from Tara	John H. Wiles. John J. Pierce, City Engr.
Mississippi	Jackson	May 27, noon	Bldg. 2 reinforced conc. arch bridges; 1 steel girder bridge	County Comrs County Commissioners.
Ohio	Warren	May 29, 1 p.m.	Constr. superstructure of a bridge in Farmington township; 42 ft. roadway, 12-ft. clear	John J. Wenner, Clk. Bd. Pub. Serv. Fred T. Stone, County Auditor.
Ohio	Norfolk	May 29, 10:30 a.m.	Constr. the sub-structure of the Garret Bridge over Marsh Run	
Ohio	Cincinnati	May 29, noon	Driving piling for the construction of substructure and miscellaneous work in connection with Gilbert ave. Viaduct	G. R. Gary, Mayor. J. H. McConnell, County Auditor.
Ohio	Niles	May 29, 1 p.m.	Constructing the superstructure of a bridge Farmington twp.	R. J. Cunningham, County Com. P.
Ontario, Can.	Toronto	May 30, noon	Constr. a steel and concrete bridge at Turner's Baths, Harlan's Point, Toronto Island	J. E. Brate, County Auditor. R. I. Proctor, County Highway Engr.
Ohio	Canton	May 31, 10 a.m.	Constr. the Levi Shirk Bridge No. 71,932 A	
Pennsylvania	Pittsburg	May 31, noon	Constr. 2 elliptical arch reinforced concrete stone faced bridges and 1 reinforced concrete semi-circular arch bridge	Board County Commissioners. City Clerk.
Ohio	Hamilton	May 31, 10 a.m.	Constructing a bridge on Sevenmile Pike	Kingsley L. Martin, Comr. of Br.
Missouri	Independence	May 31	Constr. 2 reinforced concrete arch bridges	Ed. Metz, City Clerk. John F. Goldenbogen, Clk. Co. Comrs
Pennsylvania	Lock Haven	June 1	Constr. a bridge over west branch of Susquehanna river at McElhattan	Jos. H. Nash, Clk. Bd. Supervisors. J. A. Hall, County Clerk. J. S. Whitaker, County Auditor. H. A. Thompson, Chm. Joint Bd. S. T. Sistrunk, Clk. Bd. Co. Comrs. Fred G. Schwartz, County Clerk. C. A. Hunt, County Clerk.
Pennsylvania	Pittsburg	June 1	Widening Smithfield Street Bridge, cost about \$150,000	Edward H. Werner, Clk. Bd. Co. Co. Board County Commissioners.
New York	New York	June 1	Strengthening the end spans of the Williamsburg Bridge	Albert Sahn, County Auditor.
Kansas	Hutchinson	June 2	Constr. reinforced concrete slab and girder bridge 50 ft. long and 90 ft. wide	J. A. Hall, County Clerk.
Ohio	Cleveland	June 3, 11 a.m.	Repairing and general bridge work	
California	Richwood City	June 5, 10 a.m.	Constr. a concrete arch bridge over Woodruff Creek	
Kansas	Leavenworth	June 5, noon	Repairing bridge No. 8 over Nine Mile Creek, Delaware twp.	
Indiana	Martinsville	June 5	Constr. a concrete bridge to cost \$38,000	
Florida	Live Oak	June 6	Erecting steel bridge over Suwanee River	
Florida	Ocala	June 6, noon	Raising the Stokes Ferry Bridge over Withlacoochee riv. 4 ft.	
Kansas	Garland	June 6, noon	Constr. either a steel or conc. bridge across Drywood Creek	
California	Santa Barbara	June 6, 10 a.m.	Constr. a bridge across Loma Abaja Creek	
Pennsylvania	Somerset	June 7, noon	Constr. superstructures, substructures and abutments and furn. all steel required for six bridges	
Florida	Duval	June 7, 10 a.m.	Constr. a reinforced concrete bridge over Miller Creek	
Indiana	Indianapolis	June 12, 10 a.m.	Constr. a bridge over Fall Creek, on Capitol ave.	
Kansas	Leavenworth	June 14, noon	Repairing concrete culvert on Wyandotte and Leavenworth County line, also repairing Harms Bridge in Kickapoo twp.	
Pennsylvania	Pittsburg	July 1	Constructing one concrete arch, estimated cost \$85,000	

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
LIGHTING AND POWER				
Ohio	Cincinnati	May 26, noon	Lay gas mains and interior pipe fitting required at Branch Hos.	Edw'd P. Durr, Secy. Dept. P. S.
California	Los Angeles	May 29, 2 p.m.	Granting the right for period of 40 years to lay, construct and maintain system of gas pipes under and along roads of Los Angeles County.	H. J. Lelande County Clerk.
New York	Amsterdam	June 6, 8 p.m.	Lighting streets and public places.	Thos. Hazlett, Clerk.
Alabama	Eufaula	June 7	Constructing an electric light plant complete.	W. L. Upton, Engr. Birmingham.
Georgia	Colquitt	June 10	Improving electric light system to cost \$7,500.	P. E. Willin, Mayor.
FIRE EQUIPMENT				
New York	New York	May 26, 10:30 a.m.	Furn. 3,500 ft. of 3½ in. rubber fire hose for fire boats, Boros. Manhattan and Richmond and 1,500 ft. 3½-in. fire hose for fire boats, Boro. of Brooklyn.	R. Waldo, Fire Comr.
Oregon	Astoria	May 27, 8 p.m.	Furn. 1,200 ft. 2½" fire hose for Fire Dept.; 200 ft. for Street Dept.	C. E. Foster, Chief Fire Dept.
Dist. of Col.	Washington	June 15, 2 p.m.	Furn. one second size, double action steam fire engine.	Cuno H. Rudolph, Commissioner.
Dist. of Col.	Washington	June 20, 2 p.m.	Furn. 15,000 ft. 2½-in. cotton covered rub. lined fire hose.	Cuno H. Rudolph, Commissioner.
New Jersey	Princeton	July 5	Furn. auto pumping engine.	E. M. Updike, Chm. F. & W. Com.
MISCELLANEOUS				
Indiana	Indianapolis	May 27, 10 a.m.	Furn. 2,000 ft. of blue prints for County Surveyor's office; paints, brushes etc., for Marion County Jail; 30 tons of coal for guardian's home.	Albert Sahn, County Auditor.
Minnesota	St. Paul	May 29, 11 a.m.	Erecting Service and Maintenance building at City and County Hospital.	N. P. Langford, Chairman.
Maryland	Baltimore	May 31, 11 a.m.	Furn. an automobile to Park Bd. Comrs.	Wm. S. Manning, Gen'l Supt.
Indiana	Evansville	June 1	Furnishing plans for building to be erected in Sunset Park.	Simon A. Bartholme, Clk. B. P. C.
Pennsylvania	N. Braddock	June 3	Furn. garbage disposal furnace of 10 tons, 15 tons and 20 tons capacity in 24 hours. Constructing building to enclose same.	Boro. Secretary.
Delaware	Dover	June 6, noon	Constructing wharf.	Jas. T. Truax, Pr. Levy Crt., Kent Co.
Nebraska	Imperial	June 6, noon	Constructing new court house and jail building.	M. H. Prall, County Clerk.
Florida	Ocala	June 6, noon	Furn. a prison van for not less than 20 prisoners; also an 8 to 10-ton road roller.	S. T. Sistrunk Clk. Bd. Co. Comrs.
Nebraska	Pierce	June 15, 9 a.m.	Constructing a Carnegie Library.	Fall River Co., Arch. Hot Spgs. S. D.
Indiana	Muncie	July 5	Constructing a new barn at County Infirmary, 40x50 ft.	County Auditor.

STREET IMPROVEMENTS

New Decatur, Ala.—City is considering paving of 6th and 8th aves. from Gordon Drive to Moulton st. at estimated cost of \$14,000.—Henry Hartung, City Clerk.

Fresno, Cal.—Board of Supervisors has directed Scott McKay, County Surveyor, to make survey for wagon road to be constructed to Grant National Park; cost about \$25,000.

Inglewood, Cal.—Council has decided to pave Los Angeles st.; estimated cost, \$50,000.

Ontario, Cal.—Paving of Euclid ave. and A st. is being urged.

Santa Barbara, Cal.—Plans have been prepared for paving with asphalt Haley and Monticito sts. at cost of \$150,000.

Whittier, Cal.—Plans are being prepared for paving Philadelphia st. with asphalt; distance 8 blocks; cost \$33,000.

Arcadia, Fla.—Citizens have voted \$10,000 bonds for street improvements.

Bainbridge, Ga.—Decatur County is considering \$100,000 bond issue for road improvements.

Covington, Ga.—Newton County will vote on bonds for road construction.

Sparta, Ga.—Hancock County has voted \$35,000 bonds for road construction.

East St. Louis, Ill.—Board of Local Improvements has decided to improve Twenty-seventh ave. at cost of \$15,000; Eighteenth st., \$14,200, and Gray Boulevard, \$17,300. W. J. Crocker, City Engineer.

Indianapolis, Ind.—County Commissioners have approved petition for opening road on township lines between Franklin and Perry townships; length 2 miles.

Corning, Ia.—Council has decided to pave Davis ave. and Eighth and Adams sts.; work includes 14,133 yds. of brick, 290 yds. of concrete, 3,000 ft. of curb and gutter, and 2,419 ft. of gutter.—Theo. S. Delav, Creston, Engineer; W. C. Shrubbs, City Clerk.

Maquoketa, Ia.—City will expend about \$50,000 for paving.—J. F. McCulloch, Engineer.

Lawrence, Kan.—Council has ordered widening of Henry st.—F. D. Brooks, City Clerk.

Drakesboro, Ky.—Council is considering various street improvements.

Brockton, Mass.—Council has passed \$50,000 loan order of widening of court, Main and North Main sts.

Lowell, Mass.—Committee on Appropriations is considering \$75,000 loan for paving of downtown streets.

Detroit, Mich.—Department of Public Works has been directed to receive bids for paving and resurfacing streets as follows: With brick, Revard, Mt. Elliott, Antone sts. and two alleys; estimated cost \$48,058.

Lansing, Mich.—Council has voted unannouncedly to purchase construction plant for making of the concrete pavement adopted by Council recently and also decided that all paving work hereafter be done by city.

Ovett, Miss.—City is considering paving of Main st.

Libby, Mont.—Citizens will soon vote on \$20,000 bonds; \$5,000 will be used to build cross walks to connect cement sidewalks and other improvements and \$15,000 for sewer system.

Bayonne, N. J.—Council has granted number of petitions for improvement of streets between Broadway and Ave. C. and the latter thoroughfare and Boulevard.

Hoboken, N. J.—Council has decided to ask for bids for repaving Washington st.

Millville, N. J.—Council is considering petition for paving principal streets.

Roselle Park, N. J.—Borough Engineer J. Wallace Higgins has prepared plans for proposed paving of streets; paving with 6-inch macadam and grading streets, cost will be approximately \$29,800; paving with 4-in. macadam and grading will cost approximately \$21,000; curbing will cost approximately \$24,800.

Trenton, N. J.—Board of Freeholders has approved recommendations of Road Committees that twenty-six county roads be oiled, at an estimated cost of \$6,863.13.

Trenton, N. J.—Council has decided to pave Conrad st., from Anderson st. to Division st., with libertine; and Ward alley, from East Front st. to northerly end of alley, with monolith concrete six inches thick.

Lestershire, N. Y.—Citizens will vote June 17 on bonds about \$45,000 for proposed street paving.

Niagara Falls, N. Y.—City Engineer Parkhurst has recommended resurfacing Niagara st. from 3d to 7th st.

Tarrytown, N. Y.—Bricking of Old Post road from Hastings to Scarborough has been estimated at \$500,000.

Whitesboro, N. Y.—Bids will soon be asked by Village Board for pavements to be laid in Mohawk, Clinton, Westmoreland and Railroad sts.

Raleigh, N. C.—Wake County Road Improvement Council, Dr. R. H. Lewis, President, has passed resolution calling on Wake County Commissioners to call election throughout county Aug. 31 on question of issuing \$300,000 bonds for road improvement.

Statesville, N. C.—Iredell County has voted \$400,000 bonds for road construction, including class A roads, macadam, with asphalt as other binder; class B, well-graded sand-clay roads; class C, well-graded and bad places sanded and dragged with split log rag.—N. B. Mills, Chairman County Commissioners; C. M. Miller, County Engineer.

Addyston, O.—Cost of filling and macadamizing the Lower River road in Addyston has been estimated at \$10,254.

Cincinnati, O.—Cost of resurfacing Blue Rock pike, Colerain pike to Miami River, has been estimated at \$14,960.

Oregon City, Ore.—Council will sell bonds for improvement of Twelfth st.

Portland, Ore.—City is considering paving of main business streets at cost of \$69,000.—J. W. Morris, City Engineer.

Altoona, Pa.—Council has rejected all bids for resurfacing paved streets and new

bids will be asked by Board of Public Works.

Butler, Pa.—Council is considering ordinances for paving 2d and 3d aves.

Erie, Pa.—Council has passed ordinances for grading, draining and curbing five streets.

Galeton, Pa.—Ordinance approving plans and establishing grade lines as made in the survey of the Boro Engineer, F. F. Brady, has been passed by Council.

Lansdowne, Pa.—Citizens have defeated proposition for \$80,000 loan for highway improvements.

Marcus Hook, Pa.—Council has passed ordinance for permanent improvement of Market st.

Sumter, S. C.—Citizens will vote June 1 on \$25,000 bonds for paving Main st.

Brownsville, Tenn.—Cameron County Rd. District No. 1 will vote June 24 on \$250,000 bonds for road improvements.

Paris, Tenn.—Council has appropriated \$4,000 for graveling Head, Jackson, Thompson, Irvine, East Washington and Blakemore sts.

Croveton, Tex.—Trinity County will vote June 24 on \$10,000 bonds for building and maintaining graded and graveled roads.

Honey Grove, Tex.—Citizens have voted \$5,000 bonds to build concrete street crossings.

Houston, Tex.—City is ready to pave Harrisburg road from Melby st. to city limits.

Liberty, Tex.—Liberty Precinct has voted \$250,000 bonds for construction of 70 miles of highway.

Anacortes, Wash.—Council has ordered grading and curbing of 5th and other streets.

Everett, Wash.—Board of Public Works is considering grading and laying of cement sidewalks on Twenty-fifth and Twenty-first sts.

Seattle, Wash.—Bids have been rejected by Board of Public Works for constructing sidewalk and approach to city hall; Rounds & Hurson, lowest bidders, \$6,224.

Spokane, Wash.—City Commissioners have rejected all bids for paving McClellan st.

Morgantown, W. Va.—Council has decided to hold election on \$60,000 bonds for paving.

Fort William, Ont., Can.—Council is considering paving of five streets.

Richmond, B. C., Can.—City is considering purchase of road machinery and general road improvements.

Stettler, Alta., Can.—Citizens have voted to grade streets and build sidewalks and crossings.

CONTRACTS AWARDED

Los Angeles, Cal.—By Board of Supervisors for improving Sections 2, 3 and 4 of Harbor Blvd., to Bent & Pennebaker.

Jacksonville, Fla.—By Board of Public Works for laying total of 167,767 sq. yds. of vit. brick pavement on various streets and parts of streets of the city, involving ap-

proximate expenditure of \$325,000; To the Engineering and Paving Co., Jacksonville, 71,835 sq. yds.; to Georgia Engineering Co., Augusta, Ga., 59,110 sq. yds.; to the Graves-Matthews Paving Co., Birmingham, Ala., 22,827 sq. yds., and to the Alabama Paving Co., Birmingham, 13,973 sq. yds.

Atlanta, Ga.—Laying wood block pavement, about 8,250 sq. ft., on North Blvd., to Thornton & Maxson, \$2.65 per sq. yd.

Mt. Carmel, Ill. Graveling 9½ miles of road, to Hoffman & Townsend, \$21,883.

Vincennes, Ind.—Improvement of Nicholas st., 11th st. to 15th st., to Jas. O'Donnell; 219 cu. yds. excavation, 15c.; 1,240.7 cu. yds. embankment, 35c.; 1,301.5 cu. yds. gravel, 80c.; 17,663.5 sq. ft. concrete walk, 60c.; 3,597.9 lin. ft. curbing, 42c.; alley crossings, 12c.

Clinton, Ia.—Macadamizing Ravine road, P. V. Clarke, \$3,852, and Thos. Carey & Son, \$2,704.

Lexington, Ky.—Furnishing 7,000 tons of crushed rock and 1,000 tons screenings, to Home Construction Co., \$1.15 per ton; constructing sidewalks on East Main st., to Louis des Sognets & Co.

Baltimore, Md.—By State Roads Commission, Union Trust Bldg., Charles and Fayette st., for road and bridge construction; To Hassam Paving Co., Worcester, Mass., \$149,951.14, three sections of Annapolis Blvd.; to P. F. Connolly Co., Boston, Mass., six miles of T. B. road in Prince George County, conditionally; to Rickey-Swann Co., Trenton, N. J., three miles of Bryantown road in Charles County, conditionally; to Coblenz & Clipp, Frederick, \$12,554.67 for road from Monrovia to Kempton in Frederick County; to I. G. Robinson, Hollidaysburg, Pa., \$23,092.22, road from New Market to New London; to Baker & Smith, East New Market, Md., road from Shiloh to Brookview in Dorchester County, conditionally; to B. F. Sweeten & Son, 2303 Pennsylvania ave., \$18,275, road from bridge to Patapsco River in Anne Arundel County; Luten Bridge Co., York, Pa., \$3,529, Rock Creek bridge on Rockville road.

Lynn, Mass.—Laying 5,500 sq. yds. of granite block, regular Hassam size, for Street Department, to Hildreth Granite Co., Chelmsford, \$1.49 per sq. yd.; other bidders: John Svenson Granite Co., Concord, N. H., \$1.55 per sq. yd.; Lovejoy Granite Co., Milford, N. H., \$1.53 per sq. yd.; C. A. Bailey, Suncook, N. H., \$1.57 per sq. yd.; J. Leopold & Co., \$55 per 1,000.

Manistee, Mich.—To Barrett Manufacturing Co., for furnishing city with tarvia, and to Lake Shore Stone Co., for furnishing stone to city for coming year.

St. Paul, Minn.—By Board of Public Works for street grading as follows: Charles st., Pascal ave. to Hamlin ave., to Dale & Baumgardner, \$2,728; Charles st., Eustis st. to west city limits, to Keough Bros., \$3,300; Burgess st., Chatsworth st. to Lexington ave., to Keough Bros., \$1,600; alley in block 4, Brightwood Park, to W. H. Malone, \$538.

Greenville, Miss.—Laying 150,000 sq. ft. granolithic paving, to P. C. Powers & Sons, Memphis, Tenn.

Kansas City, Mo.—Furnishing 2,000 tons of asphalt for municipal asphalt plant, to Texas Co., city, \$20.40 per ton.

Hackensack, N. J.—Improving two parks, to F. V. Ferber Construction Co., \$1,648.30; bid was as follows: 2-ft. walk, 17½c.; 4-ft., 17½c.; resetting curb, 12c.; new curb, 20c.; time, 40 days.

Perth Amboy, N. J.—Paving Smith st. with asphalt block, to Hastings Paving Co.; Excavation, \$1.15 per cu. yd.; concrete, \$6 per cu. yd.; old curb reset, 50c. per lin. ft.; new curb set, 80c. per lin. ft.; asphalt block, \$1.85 per sq. yd.

Lackawanna, N. Y.—To Hurley & Lyne, Fredonia, to pave Ridge road with vit. brick, \$95,000.

Nyack, N. Y.—Building tarvia filled macadam road from New st. to the Upper Nyack corporation line, to John M. Rooney, 80c. per sq. yd.; other bidders: James Duell, Tarrytown, \$1.21 per sq. yd.; Freeman G. Merritt, White Plains, \$1.29½ per sq. yd.; C. Campanini, Northvale, \$1 per sq. yd.

Rochester, N. Y.—Street improvements: Medina block stone pavement of South ave. south from Linden st., to Clarence Aikenhead Co., \$24,706; Walton st. brick pavement, to Thomas Holahan, \$2,090.50; Bowman st. asphalt pavement, to Whitmore, Rauber and Vicinus, \$9,836; Asbury st. brick pavement, to Thomas Holahan, \$8,018; Lark st. cement walks, to John J. Regan, \$681.75; Weicher st. sewer, to Henry Schoenfeldt, \$463; Court st. Medina block stone pavement, to Thomas Holahan, \$4,029; Seward st. asphalt pavement, to Whitmore, Rauber & Vicinus, \$24,930.50; Lansing st. sewer, to Nicola Desiderio, \$283.50.

Schenectady, N. Y.—Paving Howard st. with sheet asphalt, to Union Paving Co., 48c. per cu. yd. for excavating, \$2.20 per sq. yd. for asphalt, 85c. per lin. ft. for curbing, \$6.50 each for water taps, 55c. per lin. ft. for water connections and 50c. per lin.

ft. for sewer connections; about 3,400 sq. yds. in the job; to A. C. Ford, city; for laying sidewalks on Anthony st., 50c. per lin. ft.

Yonkers, N. Y.—Regulating Grant st., to Kelly & Hanniffin, \$4,888; other bidders: Thomas Grady, \$5,600; Frank Cianfagione, \$5,700; O'Rourke Contracting Co., \$6,742.25; W. J. Watson Co., \$8,000; Nicholas Mangini, \$6,641.36; McDonald & Murray, \$5,954; Joseph Cuzzo, \$5,958, and R. A. De Strange, \$8,500; regulating Crescent pl., to Thomas Grady, \$6,000; other bidders: Joseph Cuzzo, \$6,533.55; O'Rourke Co., \$7,035.33; Kelly & Hanniffin, \$6,140; Anthony Fisher, \$6,354.35; Frank Cianfagione, \$6,755; Joseph Canepi, \$7,379.19; R. A. De Strange, \$7,200; Nicholas Mangini, \$6,600, and Watson Construction Co., \$6,600; Portland pl., to Thomas Grady, \$9,905; Kelly & Hanniffin bid \$11,144; Charles pl., to same, \$1,575; Kelly & Hanniffin bid \$1,670 and Anthony Fischer, \$1,616.25; to McDonald & Murray for paving Herriott st., \$1,192.50.

Canton, O.—Street improvements: Grading, curbing and constructing sidewalks on Henry ave., to John Skeels, 735 S. Market st., \$10,546; paving S. Rex st., to Wise, Smith & Krabill, \$6,438, and paving N. Walnut st., to Turnbull & Son, \$17,134.

Cincinnati, O.—Improvement of Loveland and Madeira roads, to Wm. Keller, \$20,805.

Middletown, O.—To Bigler Bros. for paving with brick Tytus ave., \$27,500.

Albany, Ore.—To the Warren Construction Co. for additional paving to be laid on Washington, Elsworth and 3d sts.

Portland, Ore.—Street work: Hermosa Blvd. and Beulah Vista and Alpine terraces on Kings Heights, grading and concrete curbs and walks, to Porter Bros., \$114,558; Commercial st., from Skidmore to Killingsworth, Hassam pavement, to Consolidated Contract Co., \$26,610; East Morrison st., from East Water to Union, wood blocks to Carbolium Wood Preserving Co., \$18,665; Emerson st., from Patton st. to St. Johns road, grading and concrete curbs and walks, to Baker Bros. & Hayden, \$7,777; East 10th st., from Alberta to Going, grading and concrete curbs and walks, to Baker Bros. & Hayden, \$2,078; East 29th st., from Francis ave. to Kenilworth, grading and concrete curbs and walks, to Baker Bros. & Hayden, \$1,846; Roselawn ave., from East 19th to Concord Heights, grading and concrete curbs and walks, to Baker Bros. & Hayden, \$2,140; East 33d st., from Francis ave. to Kenilworth, grading and concrete curbs and walks, to Baker Bros. & Hayden, \$6,651; East 30th st., from Francis ave. to Kenilworth, grading and concrete curbs and walks, to Joplin & Meeks, \$2,152; 19th st., from Washington to Couch, Hassam pavement, to Oregon Hassam Paving Co., \$1,463; Wasco st., from Holladay's Addition to East 24th st., bitulithic pavement, to Pacific Bridge Co., \$9,345; Barker st., from Lovejoy to Melinda, bitulithic pavement, to Warren Construction Co., \$6,958; Center st., from Williams to East 39th, grading and concrete curbs and walks, to Keenan Bros., \$2,281; East Everett st. district, bitulithic pavement, to Warren Construction Co., \$41,733; Greenwood ave., from Francis to Kenilworth, grading and concrete curbs and walks, to Baker Bros. & Hayden, \$2,450; East 27th st., from Francis ave. to Kenilworth, grading and concrete curbs and walks, to Baker Bros. & Hayden, \$2,197; Kenilworth ave., grading and concrete curbs and walks, to Baker Bros. & Hayden, \$1,877; Oakdale st., grading and concrete curbs and walks, to Coast Construction Co., \$1,287; East 25th st. district, Hassam pavement, to Oregon Hassam Paving Co., \$13,747.

Chester, Pa.—Paving 17 streets, to Filbert Paving Co., with fibertine; \$1.67 for 6-in. concrete base and \$1.49 for 4-in. base.

Kennett Square, Pa.—By Council, to Daniel O'Connell, for telfording two streets, \$5,487.50.

McKeesport, Pa.—Paving 5th and 6th aves., to Bowman Bros. Co., McKeesport, \$11,805.

York, Pa.—Reconsidering bids which it had rejected as too high. Highway Committee of Council has granted to Standard Bitulithic Co. contract for repairing York's asphalted streets, \$1.50 per sq. yd. for mere resurfacing, and \$2.15 for repairs where holes have been permitted to get so deep that concrete must be replaced.

Olympia, Wash.—Laying about 20,000 sq. yds. of asphalt pavement on Main st., to Independent Asphalt Paving Co., Tacoma, \$71,526.

Seattle, Wash.—Paving Terry ave., to J. Ruthe, 418 Highland Drive, \$2,957.20; 36th ave., to R. J. McHugh; 3d ave., North and Mercer sts., \$35,991.01.

Spokane, Wash.—Street improvements: Bryant ave., Altamont to Woodfern, estimate \$8,900, to C. M. Payne, \$8,100; 18th ave., Martin to Helena, estimate \$10,600, to John F. Costello, \$10,000; Elm st., 20th to 28th, estimate \$7,500, to Mitchell Bros., \$6,400; Madison st., Wellesley to Garland ave., estimate \$8,650, to Massie Bros. & Long, \$6,996.

Spokane, Wash.—Street improvements: Grading, curbing, parking and sidewalking Oak st., Knox to Augusta, estimate \$4,731, to C. M. Payne, \$3,991; same, on 7th ave., Napa to Pittsburg, estimate \$10,000, to Mitchell Bros., \$9,120; same on 16th ave., Crestline to Pittsburg, estimate \$6,750, to John F. Costello, \$6,600; same on 16th ave., Southeast Blvd. to Rockwood Blvd., estimate \$2,850, to Robinson & Foster, \$2,622; same on 20th ave., Lincoln to Adams st., estimate \$4,300, to C. M. Payne, \$3,750; same on 22d ave., Wall to Jefferson st., estimate \$7,500, to C. M. Payne, \$6,500; same on 25th ave., Wall to Jefferson st., estimate \$6,000, to C. M. Payne, \$5,100; sewerage Garfield st., Harrison to 5th, estimate \$3,950, to J. C. Wood, \$3,620; sewerage Sheridan st., Harrison to 5th ave., estimate \$8,916, to G. Burgie, \$7,800; paving with brick Howard and Havermale sts., estimate \$2,500, to Mitchell Bros., \$31,900; maintenance bid rejected; paving with Hassam Washington st., Spofford to Waverly pl., estimate \$42,500, to Inland Empire Hassam Paving Co., \$42,860.

Spokane, Wash.—To R. S. Blome & Co. paving McClellan, Pacific to 2d ave., estimate \$2,940, contract price \$3,212; to C. M. Payne, grading, curbing, parking and sidewalking Euclid ave., Cedar to Maple st., estimate \$2,400, contract price \$2,660; to James C. Broad, sewer in alley between Mansfield and Montgomery from Northwest Blvd. to Wall st., estimate \$6,170, contract price \$5,765.

Victoria, B. C., Can.—Paving 36 miles, to Hill Paving Co., Spokane, Wash., about \$1,250,000.

BIDS RECEIVED

Chicago, Ill.—Paving following streets; work includes concrete curb and gutter, sandstone curbing, manhole and catch basin construction and adjustment and all work necessary for completion of the work: W. 37th st., Halsted st. to Morgan st., 3,900 sq. yds. asphalt, \$8,713; American Asphalt Paving Co., 138 Washington st.; Wilson ave., Lincoln ave. to Western ave., 2,330 sq. yds. asphalt, \$5,261.90, R. F. Conway Co., 138 Washington st.; Burnside ave., system, 10,980 sq. yds. macadam, \$66,334.50, the Farr Bros. Co., 356 W. 111th st.; 90th pl. system, 43,020 sq. yds. macadam, \$66,334.50, the Farr Bros. Co., Greenwood ave., 55th st. to 56th st., 1,900 sq. yds. asphalt, \$4,543.90, American Asphalt Co., Hamlin ave., Armistage ave. to McLean ave., 1,140 sq. yds. asphalt, \$2,468.90, American Asphalt Paving Co.; Maplewood ave., Diversey ave. to Elston ave., 2,410 sq. yds. asphalt, \$5,429, American Asphalt Paving Co.; Medill ave., Kimball ave. to Central Park ave., 3,570 sq. yds. asphalt, \$8,323.60, American Asphalt Paving Co.; Sacramento ave., 37th st. to 39th st., 3,120 sq. yds. asphalt, \$7,063, R. F. Conway Co.; Seminary ave., Maud ave. to Center ave., 2,000 sq. yds. asphalt, \$4,455.45, American Asphalt Paving Co.; 76th pl., Marquette ave. to Coles ave., 1,340 sq. yds. asphalt, \$4,189.70, R. F. Conway Co.; 23d pl., Wentworth ave. to 150 ft. west of Canal st., 6,570 sq. yds. asphalt, \$13,265, American Asphalt Co.; 33d pl., Archer ave. to Ashland ave., 5,600 sq. yds. asphalt, \$12,239, R. F. Conway Co.; alleys, Webster ave., Lincoln ave., etc., 1,110 sq. yds. brick, \$2,951.30, Jas. A. Sackley Co.; 307 Chamber of Commerce Bldg.; alleys, Wilson ave., Sheridan road, etc., 1,220 sq. yds. brick, \$3,136.60, P. J. O'Brien, 145 La Salle st.; alleys, E. 42d st., Grand Blvd., etc., 1,490 sq. yds. brick, \$4,167.40, Jas. A. Sackley Co.; alley, Wisconsin st., Sedgwick st., etc., 1,070 sq. yds. brick, \$2,882, Jno. A. McGarry Co., 188 Madison st.; alleys, Garfield Blvd., Larrabee st., Lincoln ave., etc., 1,290 sq. yds. brick, \$3,674.20, Jno. A. McGarry Co.; 42d pl., Drexel Blvd., I. C. R., 5,120 sq. yds. asphalt, \$11,717.50, American Asphalt Paving Co.; 53d st., Indiana ave. to South Park ave., 3,750 sq. yds. asphalt, \$8,064.40, American Asphalt Paving Co.; Chestnut pl., Delaware pl. to Walton pl., 470 sq. yds. brick, \$1,362.10, Central Paving Co.; 172 Washington pl., etc., 1,220 sq. yds. brick, \$3,192.10, P. J. O'Brien; alley, Superior st., Chicago ave., etc., 620 sq. yds. No. 2 granite, \$2,308.20, P. J. O'Brien; alley, Grant pl. to Webster ave., etc., 1,390 sq. yds. brick, \$3,680.70, Jas. A. Sackley Co.; alley, Shades pl., Willow st., etc., 1,850 sq. yds. brick, \$4,503, P. J. O'Brien; alley, Schiller st., Sigel st., etc., 830 sq. yds. brick, \$2,004.70, Jno. A. McGarry Co.

Morristown, N. J.—Repairing and improvement of county roads: Mendham and Morristown road, Fred E. Smith, \$23,741.69; Ludwig Bott, \$18,400; Osborne & Marcellus, \$27,000; Denahan Co., \$23,000; Morristown and Madison road, Osborne & Marcellus, \$25,444; T. J. Allen, \$21,706.05; Ludwig Bott,

\$20,200; F. S. Smith, \$21,859; James St., Morristown, Osborne & Marcellus, \$6,250; T. J. Allen, \$5,500; Ludwig Bott, \$6,350; F. S. Smith, \$6,624; W. S. Konover, \$5,550.27; Morris ave., Morristown, Osborne & Marcellus, \$7,079; T. J. Allen, \$6,389.16; W. S. Konover, \$6,676.96; F. S. Smith, \$7,069.90; Passaic Valley road, E. Denahan, \$15,305.68; Osborne & Marcellus, \$9,386; Headley Good Roads Co., \$15,127.36; Newark and Pompton Turnpike, Francisco Bros., \$1,866; Colfax & Steel, \$1,820; Paterson and Hamburg Turnpike, Francisco Bros., \$3,733; Colfax & Steel, \$3,266.90; Main st., Butler, Colfax & Steel, \$2,772; Francisco Bros., \$2,631; Cotter & Bergen, \$8,448; Budd's Lake road, Salmon Bros., \$3,520.08; Osborne & Marcellus, \$5,133; T. J. Allen, \$4,399; Flanders and Bartleyville road, E. Trimmer, \$8,233.15; Salmon Bros., \$7,206.52; Osborne & Marcellus, \$7,513.33; Succasunna and Landing road, Salmon Bros., \$2,200.91; Ludwig Bott, \$2,000; Osborne & Marcellus, \$2,201; E. Denahan, \$2,062.27; Kenvil and Mt. Arlington road, Salmon Bros., \$1,276; Osborne & Marcellus, \$1,468; Kenvil, Mt. Arlington and Young's Bridge road, Ludwig Bott, \$3,800; Osborne & Marcellus, \$4,572; Salmon Bros., \$4,248; E. Denahan, \$2,248; Mt. Freedom road, no bids; Chester and Morristown road, Salmon Bros., \$19,116.51; Headley Good Roads Co., \$19,426.57; Osborne & Marcellus, \$16,115; W. S. Konover, \$20,253.17; F. S. Smith, \$11,981.38; Mendham and Bernardsville road, Headley Good Roads Co., \$79,041.07; W. S. Konover, \$80,279.04; total of the lowest bids is \$176,044.

Woodbridge, N. J.—Building roads: For Clifford and Holton st. in Sewaren, M. Irving Demarest, \$1,693.03; L. B. Juan, \$2,495.61; Mutton Hollow road, Thomas F. Dunnigan, \$2,108.27; Juan, \$3,559.25; Ridge-dale ave., Dunnigan, \$2,025; I. B. Juan, \$2,672.

New York, N. Y.—Furnishing materials and reconstructing and surfacing with asphaltic earth mixture the Bronx and Pelham Parkway, from Southern Blvd. to Butler st. road in Bronx Borough, 15,210 sq. yds., (a) price per sq. yd., (b) totals: The Barber Asphalt Paving Co., 30 Church st., (a) \$1.13, (b) \$17,187; Thomas M. Hart, 2356 Lyon ave., (a) 93c., (b) \$14,145; the Sicilian Asphalt Paving Co., 11 Park Row, (a) \$1.14, (b) \$17,339; Uvaldi Contracting Co., 1 Broadway, (a) 99c., (b) \$15,058.

Spokane, Wash.—Street improvements to cost \$200,000: Grade, curb, park and walk, Bryant ave., Altamont to Woodfern st.; estimate, \$8,900; Mitchell Bros., \$8,395; Naylor & Norlin, \$9,889; Abbott & Joslyn, \$8,240; C. M. Payne, \$8,100; Archer & Madison, \$10,144; John M. Costello, \$9,650; Massie Bros. & Long, \$8,225; Robinson & Foster, \$8,990; 7th ave., Latah Creek bridge to Lindeke st., estimate, \$1,250; Mitchell Bros., \$1,325; A. Wold, \$1,325; G. H. Weller, \$1,225; 18th ave., Martin to Helena st., estimate, \$10,600; Mitchell Bros., \$13,782; Naylor & Norlin, \$11,289; Archer & Madison, \$11,451; John M. Costello, \$10,000; Robinson & Foster, \$10,507; 7th ave., Napa to Pittsburg st., estimate, \$10,600; Mitchell Bros., \$9,120; Naylor and Norlin, \$10,989; Robinson & Foster, \$9,235; Elm st., 20th to 28th ave., estimate, \$7,500; Mitchell Bros., \$6,200; Naylor & Norlin, \$7,389; J. C. Kennedy, \$8,500; C. M. Payne, \$6,700; Archer & Madison, \$8,479; Stewart & McLean, \$7,475; 16th ave., Crestline to Pittsburg st., estimate, \$7,650; Mitchell Bros., \$8,130; Naylor & Norlin, \$6,989; Archer & Madison, \$8,769; John Costello, \$6,600; Robinson & Foster, \$6,958; Euclid ave., Cedar to Maple st., estimate, \$2,400; Mitchell & Edwards, \$2,139; James C. Kennedy, \$2,150; C. M. Payne, \$2,060; Archer & Madison, \$2,590; Massie Bros. & Long, \$2,169; Robinson & Foster, \$2,290; Stewart & McLean, \$2,261.15; 16th ave., Southeast Blvd. to Rockwood, estimate, \$2,850; Mitchell Bros., \$2,740; Naylor & Norlin, \$2,989; Abbott & Joslyn, \$2,640; Archer & Madison, \$3,298; Robinson & Foster, \$2,622; Hatch st., 17th to 29th ave., estimate, \$25,670; Mitchell Bros., \$36,000; Archer & Madison, \$31,220; John M. Costello, \$39,600; Robinson & Foster, \$30,998; 20th ave., Lincoln to Adams st., estimate, \$4,300; Mitchell Bros., \$4,379; Inland Engineering Co., \$4,170; James C. Kennedy, \$4,163; C. M. Payne, \$3,750; Archer & Madison, \$4,196; John M. Costello, \$4,400; Lincoln st., Cliff ave. to Wall st., estimate, \$1,650; Inland Engineering Co., \$1,875; 22d ave., Wall to Jefferson st., estimate, \$7,500; Mitchell Bros., \$7,400; Inland Engineering Co., \$6,850; James C. Kennedy, \$7,190; C. M. Payne, \$6,500; Archer & Madison, \$9,137; John M. Costello, \$7,100; Lincoln st., 9th to Cliff ave., estimate, \$3,000; Mitchell Bros., \$3,844; Inland Engineering Co., \$3,386; 25th ave., Wall to Jefferson st., estimate, \$6,000; Mitchell Bros., \$5,498; Inland Engineering Co., \$5,316; James C. Kennedy, \$5,727; C. M. Payne, \$5,100; Archer & Madison, \$7,459; John M. Costello, \$5,900; Madison st., Wellesley to Garland ave., estimate, \$8,650; Mitchell Bros., \$7,200; James C. Kennedy, \$7,980; C. M. Payne, \$7,022; Archer & Madison, \$8,769; John M. Costello, \$8,250; Massie

Bros. & Long, \$6,990; Madison & Foster, \$7,518; Stewart & McLean, \$8,053; paving with brick, 8th ave., Cannon to Chestnut st., estimate, \$3,550; Robinson & Foster, \$1,300; Mitchell Bros., \$1,000; grade, curb, park and walk, Oak st., Knox to Augusta ave., estimate, \$1,731; Inland Engineering Co., \$1,300; Mitchell & Edwards, \$4,189; James C. Kennedy, \$1,336; C. M. Payne, \$3,995; Archer & Madison, \$1,611; Massie Bros. & Long, \$1,090; Stewart & McLean, \$1,527; paving with granitoid, concrete, McClellan st., 2d to Pacific ave., estimate, \$2,910; R. S. Blome Co., \$3,212; paving with brick, Second and Fifth Ward, District No. 3, including Howard and Havermae sts., estimate, \$32,500; John Effe, \$35,500; Robinson & Foster, \$38,823; Mitchell Bros., \$31,960; paving with Hassam concrete, Washington st., Spofford ave. to Waverly pl., estimate, \$12,500; Inland Empire Hassam Paving Co., \$12,860.

SEWERAGE

Dixon, Cal.—Citizens have voted \$40,000 bonds for construction of a sewer system from plans of Reynolds & Whitman, Oehner Bldg., Sacramento.—J. F. Agee, Town Clerk.

Elsinore, Cal.—Frank A. Lathrop, Los Angeles, is preparing plans for sanitary sewer system; cost about \$20,000.

Orland, Cal.—Citizens have voted \$25,000 bonds for the construction of sewer system.—J. N. Tibessart, Town Clerk.

Riverside, Cal.—Contract will be let about June 15 for proposed sewer work.—A. P. Campbell, Engineer.

Arcadia, Fla.—Citizens have voted \$20,000 bonds for sewer extension.

Blakely, Ga.—City has selected H. Jaudon Engineering Co., Savannah, to prepare plans for sewer system.

Cornelia, Ga.—Citizens have voted \$5,000 bonds for sewer system and water works.

Glen Ellyn, Ill.—Bids will soon be received for construction of sewer system, consisting of about 23 miles of 8-in. to 24-in. tile and 24-in. to 30-in. brick sewers; cost \$160,000.—Aetna Engineering Co., Chicago, Engineers.

Avoca, Ia.—Council has approved plans and specifications of John Crick, 821 Brandeis Theater Bldg., Omaha, Neb., for sanitary sewer system; cost \$36,000.

Waterloo, Ia.—Citizens will vote May 29 on tax for construction of storm sewer to carry off flood water in Verden Creek.

Kingsley, Kan.—Construction of sewerage system is now being considered by Special Committee.—M. A. Wilson, City Clerk.

Lafayette, La.—Mayor A. R. Trahan has recommended need of sewerage system.

Lake Charles, La.—Bids are being asked for the construction of system in Sewerage District No. 1 to cost approximately \$150,000.—W. G. Kirkpatrick, Jackson, Miss., Engineer; T. H. Mandell, City Engineer.

Baltimore, Md.—Calvin W. Hendrick, Chief Engineer Sewerage Commission, American Bldg., is completing plans for sewers in bed of Jones Falls between Union Station and water front; cost, \$160,000.

New Bedford, Mass.—Council has concurred with Aldermen in orders appropriating \$1,100 for sewer in Sisson st., from Arnold to Union; \$2,400 for sewer in Arnold st., from Rotch to Sisson; \$12,000 for extension of Grape st. trunk sewer in Reed and Union sts. and Rockdale ave., and \$2,000 for sewer on Lake and Hussey sts.

Duluth, Minn.—Cost of constructing sanitary sewer in three alleys near Grand ave. has been estimated at about \$6,000.

Proctor, Minn.—Citizens will vote on \$25,000 bonds for sewers.

Libby, Mont.—Citizens will soon vote on \$20,000 bonds to install \$15,000 sewer system and make other improvements.

Trenton, N. J.—Council is considering ordinance for issuance of \$10,000 bonds to cover preliminary work necessary to establishment of sewage disposal plant; also passed ordinances for constructing sewers in four streets.—H. B. Salter, City Clerk.

Albany, N. Y.—Council has passed ordinance for construction of intercepting sewer; \$400,000 bonds will be issued.

Buffalo, N. Y.—Mayor Fuhrmann has signed notice of intention for system of trunk and other sewers which it is estimated will cost about \$1,000,000.

Herkimer, N. Y.—Board of Trustees will consider election on raising \$25,000 to build sewers.

Poughkeepsie, N. Y.—Council has ordered construction of sewer in Davis st.

Owasso, Okla.—City has decided to construct sewer mains at cost of \$20,000.

Oregon City, Ore.—Council will sell bonds for sewer work in Dist. No. 6.

Pendleton, Ore.—Citizens have voted to extend sewer system for one mile.

Roseburg, Ore.—Bids will be received until about June 1 for extension of sewer system at cost of \$20,000.—M. B. Gormond, Engineer.

McKeesport, Pa.—City Engineer J. Monroe Smith has submitted to Chief Engineer Snow, of the State Health Department, plans for proposed sewage systems of Eighth, Ninth and Eleventh Wards.

North York, Pa.—Town Council is considering installation of sewer on Eighth ave.—E. M. Bare, Chairman Highway Committee.

Pittsburg, Pa.—All bids for constructing portion of sewer system in Try st. drainage basin have been rejected; new bids will be called for.

Sharon, Pa.—Trimble & Miller, Pittsburg, are preparing preliminary plans for sewage disposal plant.

West Chester, Pa.—Council has adopted plans for proposed sewer system with outfall mains; bids will be asked at once.

Blacksburg, Va.—Citizens have voted \$12,000 bonds for installation of sewerage and water system.

Pomeroy, Wash.—Engineer M. K. Spider, Pullman, will prepare survey and estimate of cost of constructing \$25,000 sewerage system.

Morgantown, W. Va.—Council has decided to hold election on \$40,000 for installation of sewers.

Ingersoll, Ont., Can.—Board of Health has recommended installation of sewerage system.

Neepawa, Man., Can.—Town has selected Chipman & Power, Toronto, Ont., to prepare plans for construction of sewerage and water works system at cost of \$125,000.

CONTRACTS AWARDED

Austin, Minn.—Building sewers on several streets, to J. W. Turner & Co., Des Moines, Ia., about \$5,769.

Dansville, N. Y.—Construction of extension of surface water sewer system, to the lowest bidder, H. C. Schroeder, Rochester, \$2,000; James M. O'Hara, Dansville, bid \$2,407.75, and Kern & Miller, Dansville, \$2,327.12.

Old Forge, N. Y.—Putting sewer through the main street, to the Old Forge Hardware and Furniture Co., \$1,475.

Rochester, N. Y.—Building Humboldt st. sewer, to John Petrossi Co., \$12,531.

Ironton, O.—Building storm sewer in Richell Creek and Cedar Alley, to M. A. Mulligan, city, \$13,859.

Xenia, O.—By County Commissioners for sewage purification plant for Children's Home, to Huonker & Williams, Springfield, \$1,310; for the sewage purification plant for Infirmary, also to same firm, \$1,500.—A. Elliott Kimberly, Columbus, Sanitary Engineer.

WATER SUPPLY

Hot Springs, Ariz.—Fire Chief Blevius has recommended installation of larger mains and additional fire plugs.

Oxnard, Cal.—Board of City Trustees has ordered plans and estimates prepared for water works and also for paving of all streets.—S. G. Bennett, City Engineer.

Vallejo, Cal.—Bids will be readvertised for construction of proposed 13,000,000-gal. storage reservoir; \$35,000 available.

Arcadia, Fla.—Citizens have voted \$20,000 bonds for water works extension.

Ocala, Fla.—Citizens have voted \$100,000 bonds to install water works system.

Claxton, Ga.—Council is considering proposition submitted by capitalists for construction of water works and electric light plant.

Cornelia, Ga.—Citizens have voted \$5,000 bonds for water works and sewer system.

Anna, Ill.—Council has passed ordinance providing for the laying of distributing mains totaling 23,347 ft.; total cost, including fire hydrants, valves and valve boxes, \$20,608.

Canton, Ill.—City is considering construction of water works system.

Carthage, Ill.—City proposes to procure new water supply.—J. J. Welch, Mayor.

New Athens, Ill.—Bids will be received in about 60 days for construction of water works system at a cost of \$35,000.—C. G. Redinger, Chemical Bldg., St. Louis, Mo., Engineer; A. Loos, City Clerk.

Lafayette, Ind.—City is considering installation of system of driven wells, with capacity of 7,000,000 gals. in 24 hours.—J. E. Camardy, Superintendent Water Works.

Leesburg, Ind.—Town Board is considering construction of water works; cost about \$8,000.—Jacob Whitecather, Town Clerk.

Goose Lake, Ia.—City proposes to construct water works at cost of \$3,000.—H. Thiessen, Mayor.

Lafayette, La.—Mayor A. R. Trahan has recommended need of city market and abatement of dust nuisance.

Topsham, Me.—Trustees of the Brunswick & Topsham have voted to have plans and specifications prepared for the construction of large reservoir on Sprague's Hill.

Cumberland, Md.—Citizens have voted \$500,000 bond issue for water works; water to be taken from Eviitt's Creek.

Lynn, Mass.—Council has authorized \$75,000 bond issue for construction of two pumping stations, one at Montrose and the other at east end of Glen Lewis section of Walden Pond, laying of 5,100 ft. of 36-in. pipe from Glen Lewis Pond to Breed's Pond, and preparation of plans for raising Breed's Pond to a height of 51 ft.

South Dighton, Mass.—Citizens have voted \$10,000 bonds for water supply system.—Julius G. Romers, Chairman Water Committee.

Clara City, Minn.—Citizens have voted \$10,000 bonds for construction of water works.

Biloxi, Miss.—Citizens will soon vote on \$70,000 bonds for water works improvements and extensions.

Concord, N. H.—Fire Department Committee of city government and officials of Concord water department are considering advisability of extending high pressure water supply to hydrants in West Concord other than those which are situated on State st.

Bridgeton, N. J.—Bids will be at once asked for erection of pumping and filtration plant; supply will be taken from lakes of City Park property.

Newark, N. J.—Work preliminary to construction of a great impounding reservoir that will reserve flow of the Wanaque River at Midvale will be begun at once by staff of engineers, under direction of Engineer Morris R. Sherrerd, of State Water Supply Commission.

Endicott, N. Y.—Extensive improvements are soon to be made at the Endicott water works plant.

Fredonia, N. Y.—Citizens have defeated proposition to issue \$20,000 bonds to improve water works.

Mexico, N. Y.—W. G. Stone, Mann Bldg., Utica, is preparing plans for construction of water works; estimated cost about \$40,000.

Niagara Falls, N. Y.—Citizens have voted \$360,000 to parallel mains of private water company at south end of city.

Bartlesville, Okla.—E. T. Archer & Co., Kansas City, Mo., have been selected as engineers for proposed water works, which will cost about \$200,000.—C. A. Lamm, Mayor.

Baker City, Ore.—Bids will be received about June 1 for construction of 43,100 lin. ft. of 18-in. concrete or wood-stave pipe for gravity water supply; cost about \$90,000.—I. W. Bailey, City Engineer.

Eugene, Ore.—Council is considering \$55,000 appropriation for betterment in water system and to help install proposed city lighting system.

Pendleton, Ore.—Citizens have voted \$200,000 bonds to construct pipe line from Thomas Hollorn Springs to city; distance 18 miles; two reservoirs are also included.

North Wales, Pa.—Citizens have voted to build up-to-date filtration plant and continued town committee on subject, to procure further data.

Greenville, Tenn.—Citizens will vote June 5 on \$65,000 bonds to construct water and electric light plant.

Lenoir City, Tenn.—Citizens will vote June 3 on bonds for water works.

McKenzie, Tenn.—Citizens have voted \$40,000 bonds for extension of water and electric light systems and street improvements.

Clarksville, Tex.—City will expend \$10,000 on water works extension and repairs; will also install 120-h.p. boiler, air compressor and settling basin.—C. E. Terry, Mayor.

Dallas, Tex.—Board of City Commissioners has given instructions to the City Secretary to advertise for bids for drilling of two and probably more additional artesian wells, to be sunk to Woodbine strata, near Turtle Creek pumping station.

Yorktown, Tex.—Citizens have voted \$6,000 bonds to extend water mains.

Cambridge, Vt.—McIntosh & Crandall, Burlington, are preparing plans for water works; cost \$18,000.—H. N. Gray, Chairman Board of Trustees.

Richmond, Va.—Council Committee on Water is considering plan calling for pumping main from reservoir to standpipe and concentrating at one place all water pumping; cost about \$20,000, of which \$14,000 has been set apart for new pumps.

Seattle, Wash.—Board of Public Works has approved specifications for pipe line and penstock for Lake Union plant.

Snohomish, Wash.—Citizens will vote June 6 on extension of water works.

Neepawa, Man., Can.—Chipman & Power, Toronto, Ont., have been engaged by town to prepare plans and specifications for construction of proposed water works and sewerage systems; estimated cost, \$125,000.

Windsor, Ont., Can.—Ratepayers will soon vote on \$50,000 bonds to extend water mains.

CONTRACTS AWARDED

Chicago, Ill.—Laying water pipe: Torrence ave., 103d st. to 110th st., to David Walsh, 6628 South Chicago ave.; Grand ave., N. 44th ave. to N. 48th ave., to Jas. H. Roche, 222 E. 31st st.

Tipton, Ia.—Drilling artesian well, to J. D. Shaw, Davenport, about \$4,000.

Holyoke, Mass.—Building dam at former storage reservoir, to Connecticut Engineering and Construction Co., Norwich, Conn., \$33,361.

Chappell, Neb.—Construction of water works and an electric light plant, to Des Moines Bridge and Iron Co., Des Moines, Ia.—W. E. Donner, Grand Island, Engineer.

Jersey City, N. J.—By Street and Water Board, to Stillman, Delehanty & Ferris for repairing break in the city's old water main under Hackensack River at foot of West Newark ave., \$40 per ft. for piling under river and \$3,000 for repairs to main.

Perth Amboy, N. J.—Construction of 21-in. main; John H. Gregory, city, bid \$26.75 per ft. for approximately 2,000 ft. of main; the Merritt & Chapman Derrick & Wrecking Co. bid \$15.92 per ft. on specifications and presented an alternate bid on other specifications for \$14.43 per ft., for approximately 2,000 ft. or a total of about \$31,840.

Rahway, N. J.—Installing 5,000,000-gal. per day pump at city water works, to the Snow Steam Pump Company, of Buffalo, N. Y., \$14,335.

Ft. H. G. Wright, N. Y.—Water system: Two pump houses, two electrically driven pumps, motors, etc., conduit and cable line to supply power, to L. B. Jacobs, Newark, Del., \$6,890, and 200,000-gal. reinforced concrete reservoir, to McHarg-Barton Co., New York City, \$11,000.

Geneva, N. Y.—Laying a 20-in. water main, to Lupfer & Remick, Buffalo, N. Y., \$10,640; other bidders: Thomas Fitzgerald, Fredonia, \$10,909; John D. Kuhn, Greensburg, Pa., \$13,741; D. D. Dugan, Olean, \$14,830; Henry W. Golden, Troy, \$14,127; Burns, McConville Construction Co., Ogdensburg, \$12,034.

Mt. Vernon, N. Y.—Sinking four artesian wells on city property in Hutchinson River Valley for the provision of emergency water supply, by Alderman H. J. Stolte, Chairman of Aldermanic Committee on Water and Sewers, to A. L. Washburn, Pleasantville.

Rochester, N. Y.—Laying water pipe in Group 248, to N. Desiderio, \$16,011.00.

Fargo, N. D.—To James Kennedy, for building filtration plant, \$96,220, for furnishing pumping engines, to Allis, Chalmers Co., \$12,625, and the boilers and stokers, to Minneapolis Steel and Machinery Co., \$7,547.

Mansfield, O.—Water works improvements: 260-h.p. Corliss engine, to Hooven, Owens, Rentschler & Co., Hamilton, \$3,200; pumps, to Henry R. Worthington.

Niles, O.—Construction and equipment of filtration plant, to Ensinger Bros., Columbus, \$32,900; all bids rejected on clear well.

Portland, Ore.—Furnishing 1,500 tons of 6, 8 and 12-in. c-i. pipe, to Oregon Iron and Steel Co., \$22,250; 100 tons of specials, to Smith & Watson Iron Works, \$4,900.

Bellevue, Pa.—By Ohio Valley Water Co. for drilling additional 12-in. wells for the water supply on Neville Island, to J. M. Allen, Pittsburg; Chester & Fleming, Union Bank Bldg., Pittsburg, Engineers.

Nashville, Tenn.—To J. N. Stone Construction Co. for building over 41,000 ft. of water mains touching about 50 streets, \$12,294.49; other bidders: M. J. Cunniff, \$15,442.69; Southern Roofing and Paving Co., \$14,178; T. I. Curtis & Son, \$14,250; E. T. Lewis & Co., \$15,724.31; Foy-Proctor Co., \$16,478.17; J. P. Le Sueur & Co., \$18,761; W. M. Leftwich, \$14,113.70; S. T. Stewart & Bro., \$18,572.96; John Broderick, \$13,773.11.

Rockford, Wash.—Furnishing 1,600 ft. of pipe for water mains, to D. C. Farnsworth.

LIGHTING AND POWER

Grandview, Ark.—North Arkansas Power Co. has been organized by E. H. Ingram and J. R. Neff, Berryville, and E. D. Munger, Springfield, Mo.; will build water power, electric plant and construct tunnel 180 ft. long and concrete dam 300 ft. long, dam to give head of water 25 ft. high; will also develop about 2,860 h. p. for transmission by electricity to Northern Arkansas and Southern Missouri cities; will invite construction bids by Aug. 1.

Mammoth Springs, Ark.—Mammoth Springs Light and Power Co. will develop additional water power and extend transmission lines.

Kingman, Ariz.—Arrangements have been made by the Desert Power and Water Co. to issue \$400,000 bonds to be used for enlarging system; proposed improvements include the installation of additional machinery and extension of its transmission lines to chloride district.

Birmingham, Ala.—Board of Commissioners is considering construction of municipal electric light plant, using North Birmingham electric light plant as nucleus.—Maury Nicholson, City Engineer.

Redwood City, Cal.—Board of Supervisors of San Mateo County has awarded franchise to J. J. Gomes and Benjamin Cunha to operate electric light and power system in country north of Half Moon Bay.

Ault, Col.—Establishment of municipal electric light plant is being considered.

Longmont, Col.—Citizens have voted \$16,000 bonds for construction of electric light plant.

Hartford, Conn.—Hartford City Gas Light Co. will construct steel gas containing vessel 150 ft. in diameter and 150 ft. high on Arch st.

Hastings, Fla.—Installation of electric light plant is being considered.

Tallahassee, Fla.—Bids will be received June 8, noon, for \$15,000 bonds for improving and extending electric and gas plants and water works.—A. H. Williams, City Clerk.

Claxton, Ga.—Council is considering proposition submitted by capitalists for construction of electric light plant and water works.

Macon, Ga.—Macon Gas Light and Water Co. will spend \$45,000 on improvements to gas plant.—H. T. Powell, President.

Twin Falls, Ida.—Council has passed ordinance granting W. W. Seymour and F. C. Brewer right to maintain and operate gas plants and lay mains and pipes for purpose of distributing gas through city streets.

Gibson City, Ill.—Council has granted to A. Hood and H. L. Carke, of Chicago, franchise to construct and operate an electric light plant.

Center Point, Ia.—F. J. Cross, Monticello, has been granted franchises to install and operate electric lighting and power systems in the cities of Center Point, Waker, Coggon and Central City.

Hampton, Ia.—Electric light plant has been destroyed by fire; will be rebuilt.

Keokuk, Ia.—Keokuk Railway and Power Co. is considering installation of one 800-h.p. Cross compound Corliss engine and condenser, for 140-lb. steam pressure; one 400-kw., 133-cycle, 1,100-2,200-volt, three-bearing, composite wound Westinghouse generator, with exciter and switchboard panel; one 400-kw., 550-volt. railway generator with switchboard panel, for power house.—A. D. Ayres, General Manager.

Lake Charles, La.—Bids will be asked for sale of franchise for gas plant.—C. B. Richard, Mayor.

Chestertown, Md.—Council has granted franchise to Philadelphia capitalists for gas plant.

Boston, Mass.—Council has rejected unanimously the Rising Sun Street Lighting Co.'s offer to light side streets and alleyways by gas for next 10 years for \$2,500,000, and referred to the Committee on Finance an order for appropriation of \$300,000 for purchase of equipment to enable city to do its own lighting.

Anderson, Mo.—Harry V. Forest, Kansas City, will construct electric light plant.

Moberly, Mo.—Citizens have voted to grant 20-year gas and electric franchise and five-year street lighting franchise to T. F. Fulkerson, Trenton, Mo.

Queen City, Mo.—City will construct electric light plant to cost \$5,000; will invite bids on machinery.—W. M. Saxbury, Mayor.

St. Louis, Mo.—City Lighting Department will recommend addition of 133 blocks to underground wiring district.

Kimball, Neb.—Plans are being considered for installation of electric light plant.

Rockville Centre, L. I., N. Y.—Appropriation of \$17,000 will be made for erection of a power house; two 800-h.p. boilers will be installed.

Durham, N. C.—Southern Power Co. is planning to build steam power plant at cost of \$250,000.—Albert Milmo, Charlotte, Constructing Agent.

Waynoka, Okla.—Town is having plans prepared by William Haviland, Alva, for electric light plant and water works; \$27,000 bond issue has been voted.—C. D. Willard, Town Clerk.

Eugene, Ore.—Council is considering \$55,000 appropriation to install proposed city lighting system and for betterments in water system; \$25,000 has already been voted.

Roseburg, Ore.—Franchise has been granted to W. F. Boardman & Co., San Francisco, to operate gas system in all the streets and alleys for period of 50 years.

Philadelphia, Pa.—Philadelphia Electric Co. will erect auxiliary power plant on Susquehanna ave.

Greenville, Tenn.—Citizens will vote June 5 on \$65,000 bonds to construct electric light and water plant.

McKenzie, Tenn.—Citizens have voted bonds for extension of electric light system and other improvements.

Bryan, Tex.—Council has purchased the local electric light and power plant and will make improvements and extensions.
Knox City, Tex.—R. W. Warren and associates will install electric light plant, ice ant and steam laundry.
Rosenberg, Tex.—Council is arranging for installation of electric light and power ant.
Mayfield, Utah.—Gunnison Valley Light and Power Co. has been granted franchise.
Casterock, Wash.—Council has passed ordinance granting Silverlake Railway and Lumber Co. power to construct and operate transmission lines within town.
Waitsburg, Wash.—Council has passed ordinance granting Waitsburg Electric Light Co. right to maintain electric light and power lines.
Arcadia, Wis.—Vaughn & Meyer, Milwaukee, will prepare plans for reconstruction of village electric light plant.
Baraboo, Wis.—The Baraboo lighting ant has been sold at auction for \$60,000 to bondholders; new company will be organized and plant greatly improved, with ny current.
Stettler, Alta., Can.—Ratepayers have passed bylaw to install electric power plant to provide for 2,500 16-c.p. lights.

CONTRACTS AWARDED

San Bernardino, Cal.—To Pacific Light and Power Co. for street lighting, \$3.73 per light per month; system will be equipped with new direct current magnetite lamps.
Jacksonville, Fla.—By Board of Bond trustees, to Merrill-Stevens Co. for driving necessary piling for foundations to new electric power plant, which is to be erected in city on Talleyrand, \$1.40 per pile; proposals include furnishing material and doing all necessary work; the piles to be 35 ft. in length and for each additional ft., 7c.
Dalton, Ga.—Construction of new pole and wire line for new electric light plant, to E. L. Hedges Co., Chattanooga, Tenn.
Escanaba, Mich.—Constructing concrete ant and pulp mill on Escanaba River for Escanaba Traction Co., to Bragen & Rice, Green Bay, Wis.
Chillicothe, Mo.—Building electric plant; Machinery and building foundation and concrete floor, to E. Meek, Chillicothe, \$28,500; brick power house building concrete, to John Gier, Chillicothe, \$5,740.90; brick or concrete chimney, to Metal Concrete Co., Kansas City, \$1,440; pumps, eaters, steam specialties and pipe work, beam engine and equipments, electric apparatus, dynamos, switch board and regulators, pole line and street lighting system, tower and tank for water storage, to the Quire Co., Kansas City, \$27,765; deep well for water supply, to Bloom & Hinkle, Independence, Kan., \$2,100; total amount, \$5,335.40.—Fuller & Coultre, St. Louis, Electrical Engineers.
Albany, N. Y.—Lighting city streets for years from June 21, to Municipal Gas Co.
Nyack, N. Y.—To Rockland Light and Power Co. for supplying light to village for five years; arc lights, \$88; 50 c. p., \$28; 25 p., \$19.
Rochester, N. Y.—Installing electricity for sewer and lighting purposes in Buildings Nos. 2, 3 and 4, also boiler house at Exposition Park, by Board of Contract and Supply, to Rochester Electric Motor Co., 2,375.
Cincinnati, O.—Furnishing 350,000 arc lights, by Union Gas and Electric Co. of its city, to General Electric Co., New York; about \$1,000,000, including installation of lights.
Hampton, Va.—Lighting streets for period of five years, to Newport News and Old Point Railway and Electric Co. and e Hampton, Phoebus and Fort Monroe as Corporation.
Sheboygan, Wis.—Furnishing and installing a 1,500-h.p. turbine and appurtenances for Sheboygan Railway and Light Co., to General Electric Co., Schenectady, N. Y., \$5,000.

FIRE EQUIPMENT

Fort Smith, Ark.—Council has appropriated \$1,100 for purchase of auto fire engine.
Hartford, Conn.—Mayor Jno. M. Halloran has recommended purchase of auto combination hose wagon.
Tampa, Fla.—City will soon purchase two-driven aerial truck.—B. Torres, Assistant Chief.
La Salle, Ill.—Fire Marshall Matt Bunt has recommended purchase of extension ladders.
Poshen, Ind.—Council has passed ordinance to purchase site for a central fire station and city hall over veto of Mayor Samuel F. Spohn.
Lafayette, La.—Mayor A. R. Trahan has recommended need of electric fire alarm system.

North East, Md. Citizens are considering purchase of steam fire engine.
Chicopee, Mass.—Mayor S. E. Fletcher has signed order for immediate purchase of \$5,000 auto fire truck.
Mason, Mich.—Fire Committee is considering purchase of additional hose.
Butte, Mont.—Fire Chief Peter Sanger has recommended purchase of aerial truck and auto for chief.
Elkhorn, Neb.—Council is considering purchase of fire hose.
Bayonne, N. J.—Bids will at once be asked for rebuilding No. 2 engine and furnishing 2,000 ft. of hose.—Alfred Davis, Fire Chief.
Mountainside, N. J.—Fire Department has been organized.—Wm. Brown, Chief.
West Orange, N. J.—Fire Committee has decided to ask for bids for purchase of auto fire apparatus.—Julius Wiegell, Chairman.
Binghamton, N. Y.—Election on \$15,000 bonds to establish paid fire department is being urged.
Mattewan, N. Y.—Citizens have voted to erect \$15,000 house for W. H. Manse Hook and Ladder Co. No. 1.
New York, N. Y.—Architects Hoppin & Koen, 244 5th ave., have filed plans for erection of \$51,000 truck house at 50th and Lexington sts., \$33,000 truck house on Fulton st., \$75,000 engine house on 111th st. and \$79,000 engine house on 181st st.
New York, N. Y.—Plans have been filed by Architects Hoppin & Koen, 244 5th ave., for erection of \$59,200 fire house on Morris ave., \$31,800 fire house on Castle Hill ave., and \$57,900 house on Bailey ave.
Niagara Falls, N. Y.—Citizens have voted \$42,500 for erection of two fire houses and purchase of three pieces of fire apparatus.
Cleveland, O.—Plans have been completed by Architect Frederic Wm. Striebinger, New England Bldg., for erection of model fire station on W. 112th st.
Massillon, O.—Safety Director Shepley has recommended purchase of 1,500 ft. of fire hose.
Muskogee, Okla.—City is considering purchase of additional auto combination hose and chemical.—John L. Templeton, Chief.
Pottstown, Pa.—Purchase of \$5,700 truck for Empire Hook and Ladder Co. is being considered.
Columbia, S. C.—City will at once erect \$6,000 fire house on Green st.
North Vancouver, Wash.—Fire Chief Turner has recommended installation of fire alarm system, purchase of auto combination hose and chemical wagon and 1,500 ft. of 2½-in. hose.

CONTRACTS AWARDED

San Francisco, Cal.—Erecting fire house No. 43 in Brazil ave., to O. C. Holt, city, \$11,940.
Waterbury, Conn.—To American-La France Fire Engine Co., Elmira, N. Y., for the proposed motor fire engine.
New Bedford, Mass.—Furnishing 3,000 ft. of hose, to American-La France Fire Engine Co., Elmira, N. Y.
New York, N. Y.—Furnishing 500 fire alarm boxes, to Star Electric Co., Binghamton, N. Y.; city will soon need 6,000 additional boxes.
Rochester, N. Y.—Furnishing 3,500 ft. of conductor cable for fire department, to Standard Underground Cable Co., New York, \$609.
Beloit, Wis.—Furnishing 11 fire alarm boxes, to Star Electrical Co., Binghamton, N. Y.; 16 miles of copper-covered steel wire for revamping fire alarm system, to Duplex Metal Co.

BRIDGES

Atlanta, Ga.—Solomon-Norcross Co. of Atlanta has completed plans for viaducts which city proposes to construct on Pryor st. and Central ave. from Decatur to Hunter st.
Fort Wayne, Ind.—Hoomingdale residents are urging County Commissioners to erect bridge across St. Mary's River from Barthold st. to new playgrounds.
Iowa Falls, Ia.—Contract will be let in about 60 days for construction of bridge over Iowa River, to cost about \$15,000.—E. L. Marriage, Eldora, County Auditor.
Independence, Mo.—Jackson County will vote on \$40,000 bridge and culvert construction bonds.
Hacksack, N. J.—Board of Freeholders has instructed the County Engineer to prepare plans for erection of \$200,000 bridge across Hacksack River.
New York, N. Y.—Interstate Bridge Commission has tentatively approved of 57th to 59th st. location for proposed bridge.
Youngstown, O.—Engineer Lillie has prepared plans for erection of bridge for Ardale st. crossing.
Butler, Pa.—Plans for street-wide viaduct for Center ave. have been completed and

drawings sent to J. H. Troutman, Chairman of Committee.
Doylestown, Pa.—Bucks Grand Jury has approved petitions for new bridges over Beaver Creek, Nockamixen Township, and over Tobickon Creek, in Haycock Township.
Tacoma, Wash.—Commissioner of Public Works Owen Woods has received plans and specifications for vertical lift and bascule types of bridges to be built on South 11th st. as designed by Waddell & Harrington.

CONTRACTS AWARDED

Shelbyville, Ind.—By Shelby County Commissioners for construction of Holmes bridge, to Lafayette Engineering Co., \$11,700.
Baltimore, Md.—Constructing concrete bridge over Rock Creek, Montgomery County, to Lutten Bridge Co., \$2,670.
Bradford, Pa.—Bridge over creek at Main st., to Roger Bros., Albion, \$6,868; bridge over creek at Mill st. and abutments for said bridges, to W. B. Bannon, city, \$2,815; repavement of Webster st. with vit. brick, to M. Applegate & Son, city, \$5,757.
Scranton, Pa.—Building Mulberry st. viaduct, to York Bridge Co., about \$225,000.
West Chester, Pa.—By Commissioners of Chester County, to the York Bridge Co. for erection of bridge over Doe Run, near Springdale Station, in West Marlborough Township, \$2,744.41.
Richmond, Va.—Building reinforced bridge over Gillie's Creek on Lester st., to Geo. Donald, about \$10,000.

MISCELLANEOUS

Montgomery, Ala.—Need of new city hall is being urged.
Hartford, Conn.—Mayor Jos. M. Halloran has recommended establishment of more parks, planting of shade trees, appropriation for collection of ashes and consideration of system of street flushing.
Stafford Springs, Conn.—Town has voted to purchase Woodlawn property for park purposes; will be immediately laid out.
Wilmington, Del.—Police Commissioners have decided to buy automobile patrol wagon.
Hastings, Fla.—Erection of city hall and brick jail is being considered.
Pensacola, Fla.—County will vote June 27 on \$180,000 bonds to erect jail.
Atlanta, Ga.—Council is considering \$20,000 appropriation for erection of modern museum in Grant Park.
Decatur, Ind.—Business men of city have decided to build city hall and fire department building.
Manchester, Ky.—Clay County is considering erection of \$10,000 jail.—T. J. Rowlings, Judge County Court.
Easton, Md.—Grand Jury has recommended purchase of new site and erection of almshouse.
Boston, Mass.—Council has authorized \$120,000 loan for municipal building in South Boston, with court house, public hall, branch library and gymnasium; also \$80,000 loan order for playground in Ward 5 and \$50,000 for playground in Ward 20.
Leominster, Mass.—Voters will soon decide on erection of town hall.
Lowell, Mass.—Council is considering erection of \$1,500 shelter house on South Common; plans prepared, Councilman John J. Coughlin is interested.
Ovett, Miss.—City has decided to erect annex to Charity Hospital.
Camden, N. J.—Council is considering improvements to pier at Pyne Point Park.
Hoboken, N. J.—Council has decided to ask for bids for \$125,000 bonds to erect addition to city hall.

New York, N. Y.—Bethesda Fountain in Central Park will be surrounded by mosaic flooring which will cost \$22,000; mosaic design, work of the Park Department, has been approved by the Municipal Art Commission; work of placing mosaic around will be done this summer.
Yonkers, N. Y.—Board of Estimate and Apportionment has approved ordinance providing for purchase of two oil sprinkling wagons.
Beloit, Wis.—Tentative plans have been prepared for erection of two-story \$55,000 city hall.

CONTRACTS AWARDED

Rochester, N. Y.—Cleaning water mains, to Central Park Water Main Cleaning Co., \$2,210.
Saranac Lake, N. Y.—Extra street sprinkling, to Fred Williams, 11c. per hour.
Cincinnati, O.—Building general hospital, to Westlake Construction Co., St. Louis, Mo., \$1,648,717 for 18 buildings complete.
Spokane, Wash.—Furnishing three street flushing machines, to Beall & Co., \$1,115 each.

TOO LATE FOR CLASSIFICATION

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREET IMPROVEMENTS				
Minnesota	Duluth	May 26, 10 a.m.	Grading, paving and otherwise improv. por. of Wyoming st.	Olof G. Olson, Pres. Bd. Pub. Wks.
Kentucky	Louisville	May 29, 2 p.m.	Paving with asphalt 26,237 sq. yds.; 4,521 sq. yds. vitrified brick gutters. Est. cost \$94,000.	Caldwell Norton, Chm. Bd. Pub. Wks.
Ohio	Cincinnati	May 31, noon	Improving Haven Alley, Hooker St. & Buck St. by grading, setting granite curbs, paving roadway with brick macadam and wood block and constructing necessary drains and inlets.	John J. Wenner, Clk. Dept. Pub. Wks.
Pennsylvania	Pittsburg	May 31, 8 p.m.	Grading, curbing and paving various streets, about 6,734 sq. yds. vitrified brick paving and 1,825 sq. yds. vitrified hill-side brick or block.	Jos. Moody, Chm. Street Com. W. G. Stone, Engineer.
New York	Whitesboro	May 31, 8 p.m.	Paving about 7,000 sq. yds. with brick or bitulithic.	Stanley Stuble, Pres. Bd. Co. Comrs. Borough Clerk.
Ohio	Cincinnati	June 2, noon	Repairing Indian Hill avenue in Columbia township.	Stanley Stuble, Pres. Bd. Co. Comrs. Borough Clerk.
Pennsylvania	Arnold	June 5, 8 p.m.	Grading and curbing portion of Kenneth ave.	Stanley Stuble, Pres. Bd. Co. Comrs.
Ohio	Cincinnati	June 16, noon	Improving the Loveland and Madeira road; constructing culvert and approaches on Betts ave. in Springfield township.	Stanley Stuble, Pres. Bd. Co. Comrs.
SEWERAGE				
New York	White Plains	June 1, 1:30 p.m.	Laying in a water tight manner 322 ft. of 48-in. cast iron pipe from the end of the sewer as now laid, extending out into the Hudson river, in a double line 161 ft.	F. N. Glover, Sec'y Bronx. Val. S. C. Olof G. Olson, Pres. Bd. Pub. Wks.
Minnesota	Duluth	May 26, 10 a.m.	Constructing sanitary sewers in various streets.	O. P. Thomas, Boro. Engr.
Pennsylvania	Johnstown	June 1, 4 p.m.	Constr. 1,240 ft. of 8 to 12-in. terra cotta sewers with appurtenances, in Dale Borough.	O. P. Thomas, Boro. Engr.
WATER SUPPLY				
Virginia	Lexington	June 1, noon	Furn. 41,800 ft. of wood pipe and 16,800 ft. of 8-in. cast iron pipe, valves and special castings; also, building a small concrete intake and pipe laying.	N. Wilson Davis, Engr. Harrisb. Va.
Michigan	Marquette	June 9	Constr. an extension to the water works intake, consisting of about 2,230 ft. of 36-in. c. i. pipe with all appurtenances, riprap, dredging, etc.	J. P. Kern, Secy. Bd. Fire & W. C. Geo. H. Davis, Town Clerk.
Wyoming	Upton	June 9	Constructing system of water works.	J. P. Kern, Secy. Bd. Fire & W. C. Geo. H. Davis, Town Clerk.
BRIDGES				
Delaware	Wilmington	May 29, noon	Rebuilding of the long bridge over Northwest branch of Smyrna river in New Castle County.	County Engineer. J. S. Whitaker, County Auditor.
Indiana	Martinsville	June 5, 2 p.m.	Constr. a concrete bridge over White river at Waverly.	County Engineer. J. S. Whitaker, County Auditor.
Indiana	Salem	June 5, 1:30 p.m.	Constr. a concrete bridge at Colvin's Ford in Jackson twp; steel bridge on stone abutments and fills in Brown twp; crossing of concrete at Reymon Ford, Washington twp.	Frank S. Munkelt, Co. Aud. G. B. Huntington, County Aud.
Indiana	Shelbyville	June 6, 10 a.m.	Constructing certain culverts, abutments, etc.	Frank S. Munkelt, Co. Aud. G. B. Huntington, County Aud.
LIGHTING AND POWER				
Virginia	Barton Heights	June 9	Installing a municipal gas plant.	Town Clerk.
MISCELLANEOUS				
Texas	San Antonio	June 12, 10 a.m.	Remodeling the county jail, est. cost about \$50,000.	County Commissioners.

STREET IMPROVEMENTS

Santa Monica, Cal.—Council has decided to widen Peer ave. between Ocean Front and Main st. from 50 to 63 ft.

Canon City, Cal.—Work will soon begin on construction of road between this city and Salida; Legislature has appropriated \$26,000.

Jacksonville, Fla.—County Commissioners have decided to construct remainder of highway leading to Fernandina; cost, including bridge over Nassau River, \$78,942.

Freeport, Ill.—Board of Local Improvements is considering plans for paving Galena st. and Lincoln ave.

Harlan, Ia.—Council has refused to accept all bids for paving fifteen blocks in the business and residence districts of this city for the reason that the lowest bidders failed to file a sufficient certified check; lowest bidders were as follows: G. Mancini, Omaha, \$21,201.10; John Beebee, Omaha, \$21,504.55, and H. C. McMakin & Son, Platte, Neb., \$22,219.75; Council ordered readvertisement for bids, and contract will be let on June 5.

Lexington, Ky.—Council has ordered reconstruction of Maxwell st. from Woodland ave. to High st.

Bemidji, Minn.—Citizens will vote May 31 on \$20,000 bonds to pave eleven business blocks.

Bethany, Mo.—Preliminary surveys covering about 12,000 yds. have been ordered; concrete pavement, curb and gutter are contemplated.—John J. Werninger, County Surveyor.

Jersey City, N. J.—The Street and Water Board has adopted specifications for improvement of Wilkinson ave., Neptune ave. and Pearsall ave.; Chief Eugene Van Keuren has been ordered to prepare specifications for repaving of Tonnele ave. from Broadway to Tonnele ave.

New Egypt, N. J.—Engineer Cranmer is surveying proposed new gravel road between this place and Lakewood.

Trenton, N. J.—Following instructions from State Road Commissioner Stevens, County Engineers of Mercer, Hunterdon, Warren and Sussex counties will shortly begin survey for the Delaware River Drive from Trenton to New York line at Port Jervis.

Penn Yan, N. Y.—Jas. Brennan, Geneva, Engineer, will make survey and estimate of cost of paving Main and East sts. with brick.

Rochester, N. Y.—Council has passed following improvement ordinances: Commer-

cial st. cement walks, estimate \$275; Cumberland st. resurfacing, \$10,000; Delmar st. grading and walks, \$1,900; Magee ave. cement walks, \$1,000; Lyell ave. Medina block pavement, between rails of the New York State Railways, \$32,000; Aves. A and B, Vick Park, care and embellishment, \$440; Massets st. resurfacing, \$3,000; Van Stallen st. brick pavement, \$11,000; Rohr st. brick pavement, \$16,400; Iroquois st. brick pavement, \$5,600; Copeland st. brick pavement, \$9,000; Humboldt st. grading, \$8,000; Winton road N. asphalt pavement, \$13,000; sanitary and storm water sewer in Blossom road, \$25,000; Gardiner ave. asphalt pavement, \$16,000; Lakeview Terrace asphalt pavement, \$6,000; Ave. D asphalt pavement, \$29,000; Sawyer st. asphalt pavement, \$36,000; Zimbrich st. brick pavement, \$6,000.

Bonham, Tex.—Citizens have voted \$100,000 street paving bonds.

Vancouver, Wash.—Tenth st. from Washington to Reserve, the entrance to Vancouver barracks, will be paved with hard surface pavement.

Seattle, Wash.—Board of Public Works has approved plans and specifications for grading and paving University and other streets, filling Fifth ave., South, and grading Twenty-fifth ave.

Spokane, Wash.—City Commissioners have rejected all bids for improving five streets.

CONTRACTS AWARDED

Phoenix, Ariz.—Paving principal business streets, about 25,000 sq. yds., with bitulithic, to Barber Asphalt Paving Co., Los Angeles; Bitulithic paving, per sq. yd., including excavation and grading, \$2.09; gutter, per lin. ft., 50c.; curb, per lin. ft., 27c.; 24-in. drainage pipe, per lin. ft., \$1.50; 18-in. drainage pipe, per lin. ft., \$1; other bidders were: Worsyck Asphalt Paving Co., Fresno, Cal.; Texas Bitulithic Co., El Paso, Tex.; Arizona Paving Co., city; and Federal Construction Co., San Francisco.

Lodi, Cal.—Paving several blocks of Main st. with asphalt, to Barber Asphalt Co., \$35,697.07.

Pasadena, Cal.—To the Barber Asphalt Company, Los Angeles, for paving South Orange Grove ave., \$84,536, or 19½c. sq. ft.; G. M. Gerst, San Francisco, to build underground conduit along same thoroughfare, \$45,000.

Tampa, Fla.—Paving number of streets and roads, Barber Asphalt Co., Birmingham, Ala., only bidder, \$1.25 per sq. yd.

Lewiston, Ida.—Grading and improving streets in Normal Hill residence district, to Miracle Construction Co., Kaispell, Mont.; work involves about 7 miles of street improvements and 14 miles of concrete curb and gutter; about \$74,000.

Boston, Mass.—To James Doherty for tar macadam roadway in Wales st., between Harvard st. and Talbot ave., \$5,139.80; other bidders: D. E. Lynch, \$5,979.70; W. J. Rafferty Co., \$5,556.20; F. S. & A. D. Gore Corp., \$5,175; R. J. Young & Co., \$5,709; Jeremiah J. Sullivan, \$5,476.40; John McCourt & Co., \$5,685.20; Engineer's estimate, \$9,100; artificial stone sidewalks in Spencer st., between Athelwold st. and Talbot ave., to James Doherty, \$3,129; other bidders: Adam Pond Co., \$3,275.02; W. A. Murfield Co., \$3,337.60; Warren Bros. Co., \$3,312.57; Jeremiah J. Sullivan, \$3,233.30; Engineer's estimate, \$3,725; to John Kelly & Co. for tar macadam roadway in Ardale st., between Walter and Centre sts., \$11,513.80; other bidders: Daniel E. Lynch, \$13,551.50; Thomas F. Min-ton, \$12,176.75; West Roxbury Trap Rock Co., \$13,949.50; William J. Rafferty Co., \$12,529.70; Engineer's estimate, \$14,600; to Central Construction Co. for brick block pavement in Geneva ave., between Columbia road and Bowdoin st., Mack block \$23,810.60; other bidders: Peter W. Hill Mack block, \$28,267.50; Coleman Bros. Clearfield and Mack block, \$24,735.30; John F. O'Connell, no block specified, \$25,026.50; William L. Dolan, Bessemer block, \$24,075.50; F. H. Cowin Co., no block specified, \$25,311.50; James Doherty, Mack block, \$24,157.20; Shawmut block, \$23,804.40; Engineer's estimate, \$30,700; to Timothy Coughlan for building retaining walls and fences on westerly side of Washington st., between Kittredge and Albano sts., West Roxbury, \$600; other bidders: Adams Pond Co., \$699; McCarthy & Walsh, \$840; John A. Costello & Co., \$846; West Roxbury Trap Rock Co., \$900; R. J. Young & Co., \$950; M. De Sisto & Co., \$985; R. Cartelle \$997.50; F. Williams & Co., \$1,016; John McCourt & Co., \$1,290; E. De Christoforo \$1,294; to Adams Pond Co. for artificial stone sidewalks in Melville ave., between Washington st. and Dorchester ave., 34.00 sq. ft., \$5,100; other bidders: Warren Bros. Co., \$5,355; James Doherty, \$5,423; Jeremiah J. Sullivan, \$5,440; Engineer's estimate, \$6,000.

Sewaren, N. J.—To M. Irving Demares for construction of macadam road in Hunterdon County extending through Lebanon Township toward Trenton, \$37,780.

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GENERAL VIEW OF OLD BRIDGE AND EXTENDED PIERS FOR NEW ONE PARTLY BUILT

CONCRETE ARCH ROADWAY BRIDGE

cross the Genesee River at Rochester—Reconstructing and Extending Masonry Piers—Details of Concrete Work—Imitation Granite Facing—Tower Distribution of Concrete

A CONCRETE arch bridge is being constructed by the city of Rochester, N. Y., across the Genesee river, on the line of Central avenue, parallel and close to the bridge of the New York Central Railroad, in which several more or less novel features are being introduced. This is to replace a bridge 46 feet wide which was carried on three lines of steel girders supported by nine piers. The old piers are being strengthened and rebuilt to support the arches of the new bridge, which is to be 66 feet wide. The contractor is using the old bridge, which has been closed to traffic, to carry the traveler

by which he is placing the steel latticed arches which form the reinforcement of the arch ribs.

The new bridge consists of 14 lines of arch ribs spaced 5 feet between centers, each line consisting of spans of 18, 25, 33, 39, 47, 53, 61 and 68 feet respectively, these arches supporting a reinforced concrete slab floor. Each arch consists of a steel latticed arch which is constructed complete in the shop and, after being set in place, is completely encased with concrete. There is a roadway 42 feet wide between curbs, and a sidewalk on each side 9½ feet between curb and para-

pet wall. The parapet is surmounted by a balustrade comprising posts, balusters and rail, all of concrete.

In reconstructing the old piers, which were of masonry, more or less of the top masonry of each is removed and a facing of concrete placed enclosing the old masonry, and additional concrete employed to extend the piers to the desired height and for several feet up stream. The piers rest on bed rock which forms the bed of the river, and the concrete extensions also rest on this. To insure a bond between the old masonry and the concrete facing, a great number of iron bolts are inserted and firmly fixed in the old masonry, extending for several inches from the face of this and having their ends turned up for about an inch. These are inserted at an oblique angle with the face of the pier so as not to pull out easily. On these as brackets are placed reinforcing rods; the whole being embedded in the concrete facing. The nosings of the new piers are of cut granite, no course less than 12 inches thick, which were built before the concrete and provided with anchor irons which extend into the concrete bodies of the piers, when they are placed, to tie the two together. The steel arches are placed before the piers have been carried to their full height, and their footings are thus embedded in the concrete of the piers.

One of the illustrations shows a number of the steel arches in place; and this and another show the recesses left in the piers to receive the concrete of the arch ribs.

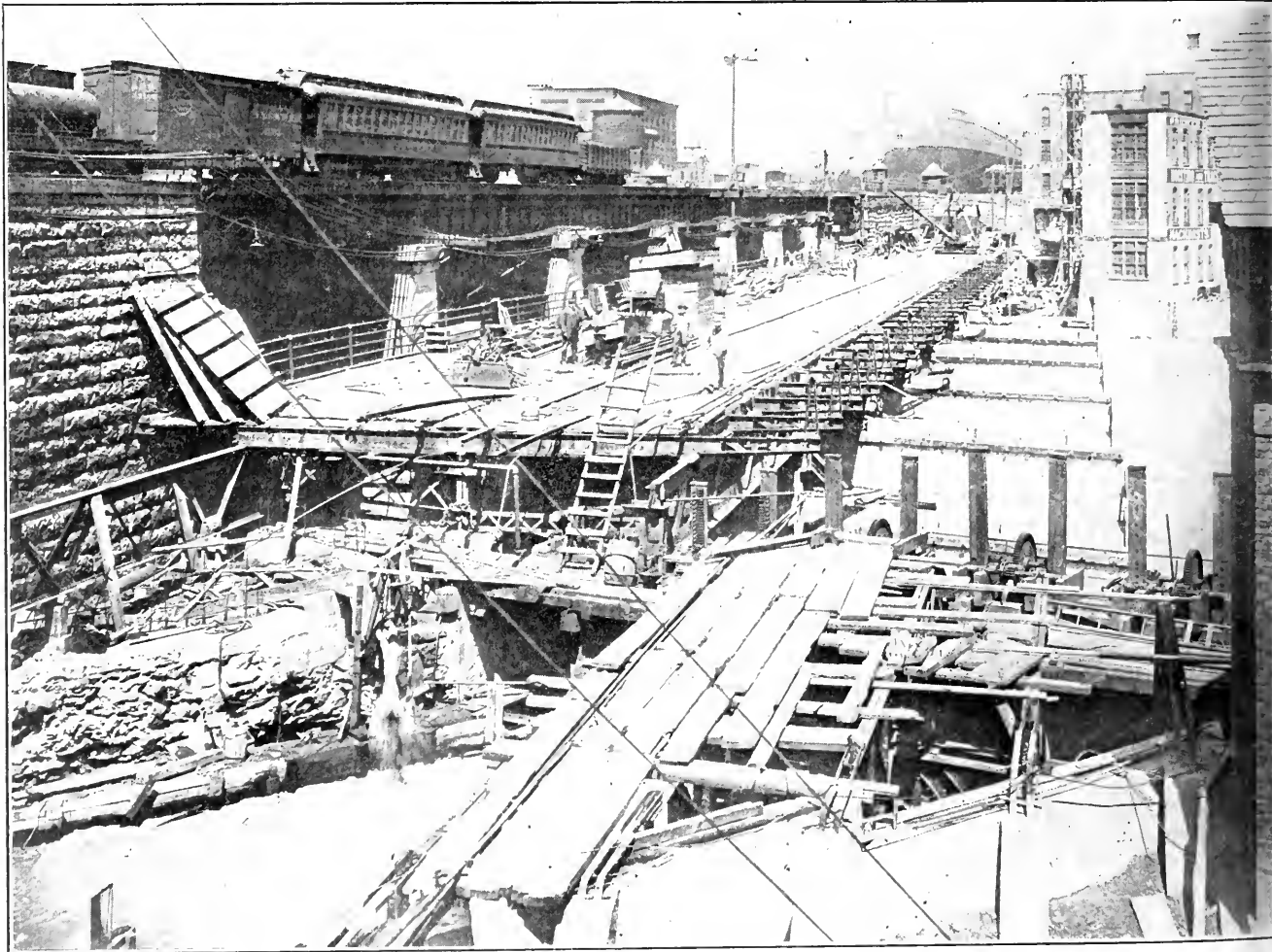
To assist in binding the concrete to the bottom chords of the arches, these are furnished with wires bent to the form of a flat heart or "pretzel" (by which name they are called) spaced 9 inches apart. These are sprung open and placed around the bottom flanges, from which they hang. The same object had been aimed at in a previous bridge by binding the bottom chord

with wire netting, but it was found that the concrete failed to pass through the netting as thoroughly and readily as was desired.

The forms for the concrete of the arch ribs are not supported on centering, but are suspended from the steel arches. This not only obviates the necessity of building centering over a river subject to floods, but also applies a weight to the arch before the concrete has begun to set, and thus to some degree avoids stresses and deflections in the concrete which would occur if the steel arch had carried no weight until after the concrete had set and the centering been removed, when the imposing of the weight on the arch would cause a deflection.

The roadway slabs are to be reinforced transversely with ½-inch square bars spaced 8 inches between centers, and longitudinally with ¼-inch round bars 12 inches between centers. The roadway is to be paved with creosoted wood blocks. The curbs will be of granite. The sidewalk slabs will be of reinforced concrete, surfaced with 2 inches of asphalt mastic. They will have a slope of ¼ inch to the foot toward the roadway.

The balustrade spindles are cast separately in smooth cast iron moulds. Each will have a 1¼ inch wrought iron pipe passing through its center and extending about 2 inches from each end. When the parapet wall is cast, holes will be left regularly along its top, and into the holes will be inserted the ends of the pipes projecting from the lower ends of the balusters. After these are in place and lined up thin grout will be poured into the pipes and fill the holes in the parapet to firmly bind the balusters in place. The top rail will then be moulded in a form around the tops of the balusters and its own reinforcing rods, previously placed in position. Follow-



OLD BRIDGE PARTLY DEMOLISHED

Comparing this with illustration on p. 771 it is seen that buildings in the background have been partly demolished to permit widening Central Avenue. In the foreground is a raceway, and at the right the gearing by which the gates to the same are operated. In the distance, partly hidden by a building, is a tower for distributing concrete.

ing this the posts will be constructed in their forms. The rails will be made of such length as to extend about 6 inches into each post. Before the post concrete is placed, about 2 inches of clay will be plastered on the end of the rail, and the surface where it enters the post washed with clay and wrapped with paper or oakum. This is to permit expansion and contraction in the rail without moving the post.

In the center of each of the heavy balustrade piers, one of which is placed over each pier and abutment, will be placed a 4-inch pipe to carry lighting wires to furnish current to the lamps. A lamp standard will be placed on top of each pier, fastened in sockets left in the tops of the piers.

Beneath each sidewalk the two continuous recesses between arch ribs from end to end of the bridge will be arranged for use as wire conduits. Forty-pound steel rails, spaced 12 feet apart, will be placed across these recesses to support wire ducts. The two outside ones may be reserved for high tension and the inner ones for low tension wires. Near the center of the bridge a manhole opening will be left in each sidewalk to give access to the wire conduits.

A wooden dam about 4 feet high, just up stream from the bridge and making an angle with its direction interfered with the extension of the piers and was replaced by a concrete one parallel to the bridge, the lines of the two intersecting at about mid-stream. A trench about a foot deep was blasted out along the center line of the new dam, to hold it in place against the pressure of ice and logs which come down in considerable quantities at certain seasons. Also on account of the logs there was constructed from each pier nosing to the dam crest, a distance of about 10 feet, a buttress whose top was level with the crest of the dam.

The concrete is mixed in two grades, class A being 1:2:4 and class B 1:2½:5. The former is used in the superstructure, the latter in the substructure, dam and buttresses. Bids were received for class B only; where class A is ordered it is paid for at a rate 8 per cent greater than the bid. The sand is permitted to contain up to 7 per cent of clay, loam or other foreign matter. In proportioning, each bag of cement is considered as one cubic foot when the concrete is machine mixed, but as only 0.9 of a foot when hand mixed.

Forms are of planed pine, the surfaces next to the concrete being given three good coats of boiled linseed oil applied with brush, and not used until the oil is dry.

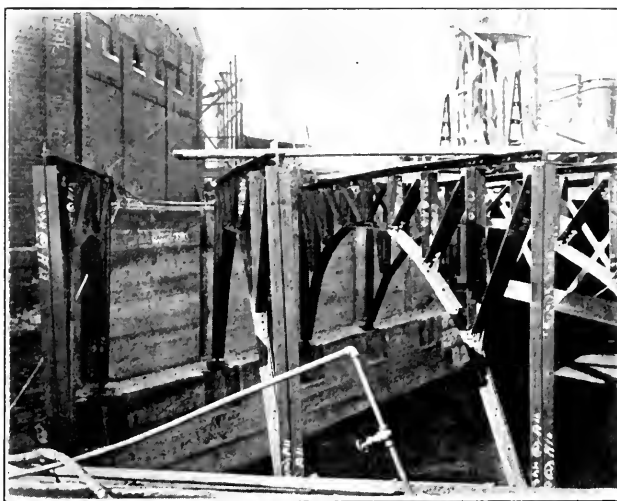
Each arch rib is to be poured continuously so as to form a monolith. A space two feet wide will be left at each pier, between the concrete of successive arches, to be filled with concrete after that in the arches has taken its set. This is to provide for any slight changes in the volume of the concrete while setting.

For the same reason a very unusual provision is made for joining new to old concrete. This and the one just mentioned are the result of experiments conducted by John F. Skinner, principal assistant city engineer, which we expect to describe in a later issue. The specifications read as follows:

Before laying new concrete upon or in contact with that which has been already laid and has set, the old material shall be thoroughly cleaned with water and brooms and, if necessary, roughened. Special care must be taken to remove all loose, inert or foreign material from the old concrete before any attempt at bonding the new work is made. If laitance is collected it must be carefully and completely removed before the new material is added. Upon this prepared surface shall be spread a thin coat of mortar which shall be mixed of one part cement and two parts sand, and which has been thoroughly re-tempered shortly after having taken its initial set. This mortar shall be applied thin, and shall be well rushed into the old concrete with ordinary brooms. After this has been done the new concrete shall be immediately placed on this bonding material. These joints must be made with great care and in a manner satisfactory to the engineer.

The use of *re-tempered* concrete is the special novelty.

A granolithic finish is applied as a facing to all exposed surfaces such as the balustrade, parapet, spandrels and faces of exterior arch ribs. It is 3 inches thick and is placed in the forms just before or at the same time as the placing of the mass concrete. It is composed of one part white Portland cement, two parts clean white sand and three parts crushed



STEEL ARCHES IN PLACE, READY FOR THE ENCASING CONCRETE

Barre granite which will pass a ¼-inch sieve. As soon as possible the forms are removed and the surface washed and scrubbed with water and brushes until the grit is exposed. This gives an excellent imitation of light granite.

Most of the details above described had previously been employed by the city on the Red Creek bridge, a single span bridge in Genesee Valley Park, or had been suggested by experiences with that bridge.

The concrete is being mixed with a Milwaukee mixer, immediately adjacent to which is a timber tower about sixty feet high from which it is distributed. The concrete is raised to the top of the tower, or to some intermediate point, depending upon the distance to the work in progress, in Koppel buckets. Here it is automatically dumped into chutes through which it runs to the point where it is wanted. These chutes consist of 10-foot lengths of U shaped steel troughs 15 inches across, which are suspended by small blocks and falls from a steel cable.

The coffer dams around the foundations are pumped out by a pulsometer. The steel arches and other heavy materials are handled by a traveling boom derrick and four-drum hoist; the traveler running on the floor of the old bridge.

The contractors for the entire work were Whitmore, Rauber and Vicinus. The plans were prepared and the construction is being supervised by the City Engineering Department. E. A. Fisher, city engineer.

WATER WORKS QUESTIONS

At the June 7 session of the convention of the American Water Works Association it is proposed to discuss a number of questions of considerable interest to water works officials, of which the following seem to us to be the most important:

Washing mechanical filters with clear but unfiltered water. Using oil for fuel as compared with coal. Red color in hot water. Calking lead joints with pneumatic tools. Metering free public supplies. Preventing electrolysis. Limitations to the use of hypochlorite. Steam turbine pumps. Under-registration of water meters. Locating leaks in mains under concrete pavement foundations. Connecting electric light wires to mains or fire hydrants. The most satisfactory method of fixing water rates, whether by a minimum charge varying with the size of the meter, an overhead charge varying with the size of the meter, a greater charge for the first few thousand feet than for larger quantities, or a uniform rate for all quantities sufficiently high to produce the necessary revenue. Concerning failures in the pipe system, have these increased during the past twenty years in greater proportion than the increased mileage of the system; are the failures uniformly distributed; are they aggravated by outside influences; in what kind and conditions of soils have most of the failures occurred, and has chemical action from the surrounding soil been the only apparent cause in any cases?

EFFICIENCY RECORDS

Desirability for Municipal Departments—System Employed in New York—Division Into Three Classes—Use by Civil Service Commission

By LEONARD FELIX FULD, LL.M., Ph.D., Examiner, Municipal Civil Service Commission, New York

IN a small private business organization there is no need for efficiency records. The head of the business enjoys a permanency of tenure and he is brought daily into such close and intimate contact with his employees that he possesses personal knowledge of the efficiency of each employee, which he can utilize not only in maintaining the efficiency of his working force, but also in determining which employees shall be promoted in salary or in position. The need of efficiency records first becomes felt when the organization becomes so large that the head of it does not come into personal contact with all of his subordinates, and if in addition either the head of the organization or his principal supervising subordinates do not enjoy a permanent tenure the need of efficiency records kept contemporaneously becomes even greater. In the various departments of the municipal public service the head of department enjoys an exceedingly short tenure of office and comes into personal contact with very few of the hundreds of employees under his jurisdiction. He is obliged to rely upon the reports of his supervising subordinates, who also do not enjoy the same stability of tenure found in the case of similar men in private life. This condition of affairs renders imperative that the records of the employees' efficiency be carefully kept.

Under the efficiency record system which has recently been installed in the civil service of the City of New York the supervising officer most closely in touch with the work of the employees is required to furnish quarterly a descriptive report upon the efficiency of the employees under his jurisdiction. In this report he divides his employees into three classes. In the first class he places those who have performed their duties satisfactorily. In every office this class ought to include a large majority of the employees, and in the case of these employees the reporting officer need only give their names and their titles. In the second class he places those whose work has been more than satisfactory—those who have distinguished themselves by marked intelligence and zeal in the performance of their duties. These employees are selected by the reporting officer by establishing a standard of average efficiency among the subordinates under his jurisdiction and then picking out for special mention those employees whose work has been distinctly superior to the grade of work performed by the majority of his employees. In the case of these superior employees it is required that the reporting officer furnish in addition to the name and title of the employee a specific statement of his reasons for considering his work above the average of his office force. The reason assigned by the reporting officer must give the particulars in which the employee's work excels that of the other employees under his jurisdiction.

In the same manner the reporting officer places in a third class those whose work has been less satisfactory or unsatisfactory. These are the employees whose work has been distinctly below that of the average of his department or bureau. For those who are placed in this unsatisfactory class reasons must also be assigned, giving the particulars of the unsatisfactory character of their work. On the report blank on which these efficiency reports are made a separate page is reserved for the employees of each of these three classes. This report blank is a four-page blank. On the first page are printed the instructions to the reporting officer and at the bottom is a space reserved for the date and the signature of the reporting officer. The second page is for the names and the titles of the employees who belong to the satisfactory class. The third page is intended for the names, the titles and the particulars of those who are considered to be in the "more than satisfactory" or "above the average" class, and the fourth page is reserved for

the names, the titles and the particulars of those placed in the less than satisfactory or unsatisfactory class.

In the preparation of these quarterly efficiency reports each bureau chief and other reporting officer establishes a standard of average efficiency for his bureau and classifies his employees in accordance therewith. When promotions are made, however, as the result of a promotion examination the employees of all the bureaus of the department are brought into competition and it would be unjust to rate competitively their records which have been prepared in accordance with varying bureau standards. Under such a system the employees under the jurisdiction of a lenient marking officer would be rated "more than satisfactory" or "above the average" for the same grade of work as other employees under a more severe marking officer might be rated merely "satisfactory" or "average" or even "less than satisfactory" or "below the average." To obviate this difficulty and prevent this injustice there has been provided under the New York system of keeping efficiency records a board of promotion for each department of the municipal government.

The board of promotion consists of at least three superior administrative officers of the department designated by the appointing officer of the department subject to the approval of the Municipal Civil Service Commission. In the actual administration of this efficiency record system the members of the board of promotion are generally the more important bureau chiefs or other supervisory administrative officers of the department and the appointment is made by the head of the department. This board of promotion holds a meeting quarterly for the purpose of considering the efficiency reports submitted by the rating officers of the departments, and at these quarterly meetings it rates the employees subject to its jurisdiction. The board of promotion organizes by the election of a chairman and the designation of a clerk to keep and transcribe stenographic minutes of its deliberations and to make the entries in the efficiency record book of the department. The board considers each of the reports submitted to it separately. It may in its discretion accept the reports as submitted or it may change the reports as they affect individual employees. If in the exercise of its discretion, however, it sees fit to change a report, the members of the board are required to state the reasons for this change in the minutes of the board of promotion.

Employees who have been reported by their superiors as having performed satisfactory service and in whose case the promotion board agrees with the report of the employee's superior officer are rated "C" on all items of their efficiency record. In the case of those who have been reported for sufficient reasons as being either more or less than satisfactory and in the case of those who having been reported as merely satisfactory are considered by the members of the promotion board for reasons specified in their minutes to be either more or less than satisfactory, the board is required to assign definite marks in each of the six items of their efficiency record. These items are quality of work, quantity of work, general conduct, executive ability and capacity for initiative, average general efficiency, and punctuality. The average general efficiency mark is the average of the ratings given on the first four items of the efficiency record—quality of work, quantity of work, general conduct, and executive ability and capacity for initiative. The mark for punctuality, which includes attendance, is kept separately. No mathematical formula is required to be followed in determining the mark for average general efficiency; the determination of the relative weight to be attached to each of the component elements of this mark is left entirely in the discretion of the promotion board. It is, therefore, allowable to rate an employee "C" in three of the four items of his efficiency record and yet give him an average general efficiency mark of "B," if in the opinion of the promotion board the fourth item of the record on which he was given a rating of "B" is more important in the case of that employee than the other three items of his record.

The marks are entered in specially prepared efficiency record books supplied to each department by the Civil Service Commission. The efficiency record books, the original quarterly re-

ports to the promotion board and the minutes of the promotion board's meetings are inspected at regular intervals by an examiner of the Civil Service Commission. This inspection not only affords an opportunity for the introduction of such additional safeguards as may be deemed necessary to protect the integrity of the records, as, for example, the time-stamping of each report with the date of its receipt, the initialing of all changes in the marks entered in the efficiency record book, etc., but also presents an opportunity to the heads of the various departments to discuss the needs of the department from the point of view of its personnel with a representative of the Civil Service Commission, who can report to the commission such suggestions and recommendations of the heads of departments as seem to possess practical merit. A detailed report is submitted by the examiner after each departmental inspection.

Once each year a transcript of the marks entered in the efficiency record books of each department is sent to the Civil Service Commission and entered upon the efficiency record cards kept by the Civil Service Commission for each employe in the city service. These efficiency records are kept for all employes in the competitive class of the civil service, excepting the members of the uniformed police and fire-fighting forces. Furthermore, no efficiency records are kept by the Civil Service Commission for school teachers, laborers and employes in the city service who are not subjected to examination. In every promotion examination the average percentage of each candidate is determined by his percentage on his written examination and his percentage on his efficiency record and seniority. A weight of 50 per cent is attached to the written examination and a weight of 50 per cent is attached to the efficiency record and seniority. No candidate, however can have his name placed upon a promotion eligible list unless he secures at least 70 per cent in his written examination.

[The writer will be pleased to give any additional information which municipal officers may desire regarding the New York system for the keeping of efficiency records and the rating of these records in promotion examinations.]

LOUISVILLE WATER WORKS FILTERS

The filter plant of the Louisville water works, which has been described by us, was in continuous and successful operation throughout the year 1910, although for a considerable portion of the time it was working under adverse conditions due to the delays in completing the coagulating basin and the cleaning of the reservoirs. During the year 8,315,272,730 gallons of water were filtered at a cost per million gallons of \$3.46. This cost varied from a maximum of \$4.51 in March to \$2.57 in August. The principal item of variation in the monthly cost was the coagulant, this varying from the maximum of \$1,751 to a minimum of \$482.65. The cost per million gallons of the several items was as follows: Superintendence and laboratory pay-roll, 42 cents; filter operators' pay-roll, 92 cents; coagulant, \$1.49; wash water, 5½ cents; heat, light and

power, 23½ cents; supplies, 10 cents; repairs, 15 cents; incidentals, 9 cents.

The average results of the filtration was a reduction of the alkalinity from 68 to 59; a reduction of the bacteria per c. c. from 14,860 to 208; of the turbidity from 196 to zero. The amount of wash water required averaged 2.82 per cent of that filtered, this varying from a minimum of 1.82 in June to a maximum of 6.80 in August. The alumina sulphate used averaged 1.25 grains per gallon, this varying from 0.57 in August to 1.99 in July. The free ammonia was reduced 42 per cent; albumenoid ammonia, 71 per cent; nitrites, 75 per cent and oxygen consumed, 63 per cent.

The bacterial reduction obtained by the filters was not as great in most instances as would be considered desirable, and it was hoped to produce better results by installing a small auxiliary apparatus for supplying hypochlorite of lime in conjunction with the other media used in filtration.

A gratifying reduction in typhoid death rate has occurred since the filter was put in service. The average number of deaths from typhoid for the years 1906, 1907, 1908 and 1909 was 127, equivalent to 58 per 100,000 of population; while for the year 1910—the first full year in which filtered water was used—the death rate was but 26 per 100,000. It is believed this would have been much lower but for the fact that many of the citizens persist in using well water, which is more or less polluted.

As stated, the coagulating basin was not in service during the entire year; in fact, the southerly division was not in use until August 25, and the northerly division had not been accepted from the contractors at the end of the year, owing to the development of certain leaks in the bottom and side walls.

SIDEWALK FALLACIES

By JEROME B. LANDFIELD

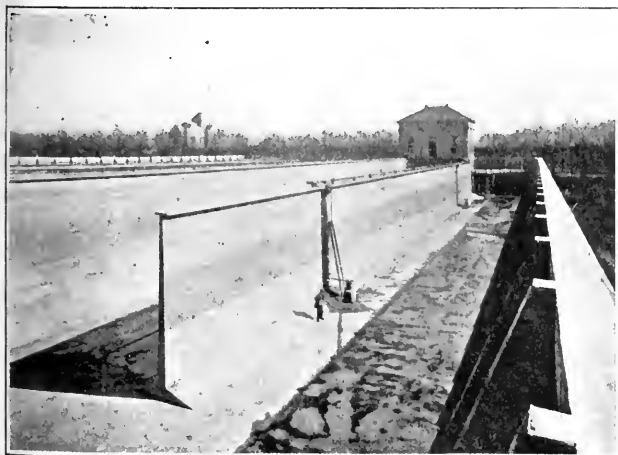
A good proportion of all of the sidewalk work that is being done nowadays is constructed under the direction of engineers, or in accordance with specifications laid down by them. It is therefore strange that there should be such a diversity in the methods employed and in results obtained. This is a curious state of affairs, considering the extent of the work and the opportunities afforded for determining to a nicety the best possible practice.

Where there is such diversity of practice it naturally follows that in some cases it is correct and in others all wrong. There seems to be a mistaken notion that sidewalk work is not deserving of serious attention and may be properly left to the untrained man. What is true of sidewalk work is equally true of concrete curb and combined curb and gutter work. Surely this is a great mistake and municipal engineers in particular should realize that they owe it to their profession to devote sufficient attention to the subject to secure first-class results.

In this paper I desire to point out a few fallacies that have crept into sidewalk and curb and gutter work from different sources, especially those which have been sanctioned in many instances by engineers of standing.

Probably the most generally accepted fallacy is that of the cinder sub-base, and it is a fallacy that has cost our cities hundreds of thousands of dollars. It is probable that the fact that many are to-day specifying that a sub-base of cinders or sand should be put under a walk can be explained in this way. In the laying of flags of natural stone the under side of the flag was nearly always irregular and to dig out and shape the natural soil to fit it was a task quite out of the question. It was far easier and more practical to fill the excavation with cinders or sand, which would naturally mold itself to fit the configuration of the under side of the stone. What was more natural than to continue the same practice when concrete walks came to be laid, and to set up the argument that this sub-base ensured good drainage and was a safeguard against heaving due to frost?

This sounded perfectly plausible. In fact, I presume that a large portion of those who read this article will regard the views expressed in it as heretical. But the following fact



COAGULATING BASIN, SHOWING BAFFLE WALL, LOUISVILLE

appears pertinent. If one lifts a good-sized flat stone from its resting place in a field in the winter time he will notice that there is rarely to be found beneath it any frozen ground, while all around are evidences of frost. The reason is that, first of all, the natural soil that forms its bed is tightly packed so as to make a snug resting place that did not admit water readily, and, next, that the stone itself under these conditions affords good protection.

Now consider for a moment the concrete sidewalk. In constructing this, first the natural soil is removed whether it be clay, gravel or hardpan, making a trench that becomes the finest kind of reservoir to collect moisture. This trench is then filled with porous material that never becomes as compact as the original soil, but which absorbs and holds moisture like a sponge. Even if tile is placed in the bottom of this trench, this does not make the sub-base any the less a sponge. Four or 5 in. of concrete would have protected the compacted natural soil that would hug it so closely as scarcely to admit any water, but severe cold is very liable to freeze the cinder foundation in spite of the concrete. These are some of the consideration that lead me to believe that the cinder sub-base is useless and detrimental, even when carefully drained with tiles, and extended practice bears this out.

Another fallacy that is very prevalent, but which is happily growing less, is the idea that a sloppy top-coat is good practice. Somehow or other many concrete men have got the notion that in sidewalk work the wetter the mix the better. They argue from experience in other kinds of work where they find that poured concrete makes a dense mass and reduces the voids, and do not take into account the points wherein the conditions differ. Let us consider just what the conditions of sidewalk work are and how they affect the question of how much water to use.

In sidewalk work water-tight molds are not used in which to form the blocks. The mass dealt with is thin and has two large surfaces, one of which is exposed to the absorbent action of the ground beneath, and the other to the drying action of the air. If, therefore, too much water is put into the concrete there is a tendency for it to drain away and carry with it particles of cement washed from the aggregate. If less water were used and the mass well mixed, the whole amount of water would be closely engaged with the cement. In warm climates it is frequently argued that more water should be used in order that the surface may not dry out too rapidly. But here we have also a fallacy. If there is more water at the surface than is needed for the setting of the cement, there is almost certain to have been flushed to the surface considerable neat cement and as the surplus water evaporates the foundation is laid for hair-cracks. The correct way is to use the proper amount of water and then protect the surface against the heat.

The lower course should have just enough water so that it will not quake when tamped. The top-coat should be mixed stiff enough so that you can mold it in the hand and it should be put on while the lower course is fresh and green. Then tamp it lightly, remove the surplus material by striking it off, and finish immediately with a wooden float. The tamping of the top-coat is of great importance for fine work and it really does not add to the expense, as it simplifies finishing. The first effect is to make the top-course dense and to bond it mechanically to the base. The moisture is distributed evenly throughout the mass and enough is gently flushed to the surface for immediate finishing. Where the top-coat is put on as wet as mortar, or sloppy, the amount of moisture in upper and lower courses differs, and consequently the change in volume while setting is in different ratios. This is a fruitful source of checking.

There is one more cogent reason why the top-coat should never be put on sloppy. Sidewalks differ from some other kinds of concrete work in that the surface has to be finished by manipulation. If the finished surface is to be durable it should be finished as soon as possible. Now if the concrete is too wet the finisher stands around half an hour or so waiting for the surface to dry out enough for him to do his work. If

he starts to use his trowel while it is too wet he flushes neat cement to the surface and this, being the softest part of the mass, makes a scale that wears away easily if it does not flake off. If, on the other hand, he waits until the surface is just plastic enough he is bound to disturb particles that have begun to set and which for the sake of strength and durability should have been left untouched in their original positions. Is it not strange that in view of these simple facts, easily demonstrated in practice, the big city of Chicago should specify a sloppy top-coat for her sidewalk work?

A number of other minor fallacies in sidewalk work might be pointed out, but they are mainly local and not widespread. One of these, however, which I desire to refer to is the notion that it is necessary to leave the forms in place in sidewalk work until the concrete has set. There is no special objection to this, except that persistence in the idea may prevent a contractor from adopting some of the modern styles of forms, which are usually of steel and more expensive than the old wooden forms, and the outlay for which is reduced if each section of form may be used more frequently. Experience during the past few years with this style of form has shown this to be practicable without any detriment to the pavement.

AUTOMATIC STREET LIGHTING

At the annual meeting this year of the New England Association of Gas Engineers there was a brief discussion of the matter of automatic street lighting. One of the members stated that at Roxbury, Mass., the gas company has installed near the works 93 automatic lights, 43 of which were in use ten months and 50 of another type in use five months; the first named being without chimneys and the second with chimneys. The failures of these automatic lights averaged about 2 per cent, due to various causes, such as frost and inherent defects. The lights without chimneys averaged 1.7 mantles per month and those with chimneys one-half mantle, the breakages of the former being due in the majority of cases to the instability of the lantern itself and to the wind. The former lamps failed to light on an average of once every 54 days and to extinguish once in 150 days. In the other system the average was one lamp failing to light once in 63 days and to extinguish once in 39 days.

The lamps are lighted by pressure impulse from the governor house at the Roxbury station by putting on a momentary pressure of 6½ inches for lighting and 5½ inches for extinguishing. This impulse amounted to a pressure of 4.8 inches at a distance of ⅞ mile from the power house, but is slightly less effective during the winter. Where the impulse system is used it is necessary to take into consideration the fact that the holders nearer the works are apt to take up the impulse and make it less effective at greater distances. Aside from this, however, the impulses are almost instantaneous a few miles away, and lamps have been lighted six miles from the station. Impulses could be intensified by main and outside stations, operating simultaneously.

These lamps are sold under the trade name of Kilchman which is operated by a pressure impulse on a float in mercury and the Monand, which operates by means of a diaphragm which sets clock work in motion. The speaker stated that the experiments made at Roxbury indicated about two minutes as being the most desirable length of time for maintaining the impulse

CONCRETE PAVING IN KANSAS CITY

Kansas City, Mo., is paving roadways in residence street and alleys this year with concrete mixed and laid similar to the concrete foundation for brick and asphalt pavements, except that a little more care is used in tamping it to give a smooth surface and an even crown. No mortar is placed on top of the concrete. Expansion joints are placed every 25 feet. On some streets the curb is built at the same time as the pavement. The city expects to place about 12,000 sq. yds. of this pavement on streets at \$1.10 per square yard and the same amount of alleys at \$1.25 per square yard, including five-year maintenance

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A. PRESCOTT FOLWELL, Editor
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Concrete Methods

The older engineers who may read this will undoubtedly
recall the time 20 or 25 years ago when most engineering
schools taught that the only way to mix concrete was to make
a dry mixture and tamp thoroughly until the moisture was
brought to the surface. During the last 10 years practice in
this respect has changed greatly, and now a wet mixture is
preferred for perhaps the majority of structures. Another in-
stance of changed ideas in cement work is the nature of the
aggregate used, especially the sand or "fine aggregate." It is
no longer considered necessary to exclude all clay, some even
claiming that 5 per cent. of this is beneficial. Probably the fact
is that this amount is beneficial if in such form or such nature
that it will be distributed uniformly throughout the material,
but it is objectionable if it is not.

There are other minor points connected with the use of
cement and concrete concerning which ideas have changed, but

possibly none of these would seem more radical to the con-
struction engineer than the removal of the ban against re-
tempering concrete after it has begun to set. A faithful in-
spector is expected to watch this point carefully and see that
any concrete or mortar which has taken an initial set before
use is thrown away. For the same reason great stress is laid
upon the necessity of not walking upon concrete or masonry
after it is laid, dressing stones upon the wall, etc.; and an
argument advanced in favor of wet concrete has been that the
ramming necessary with dry mixtures is apt to break the set
of that below. In view of this it would seem to be revolu-
tionary to propose the use of re-tempered mortar or concrete,
and yet just this is being done by a conservative engineer of
the highest reputation. In the article in this issue describing
some concrete work at Rochester, a quotation is made from
the specifications which not only permits the retempering of
concrete for certain purposes, but requires it. This, of course,
was not done in order to favor the contractor, but because the
engineers believed that it would be of advantage to the work.
Their reasons for introducing this radical change and some
of the experiments upon which they were based will be the
subject of an article in next week's issue.

Under the heading of sidewalk fallacies a writer who has
had considerable experience in concrete work calls attention to
another old and almost universal practice in connection with
concrete work which he believes to be erroneous in principle
and unnecessarily expensive in practice. While we are not
quite ready to subscribe to his ideas concerning the undesir-
ability of cinders under concrete walks, we believe that they
are worse than useless where they are not underdrained or at
least will not drain naturally toward some low point from
which escape of the water is provided. At any rate the idea
is deserving of serious consideration, especially in view of the
hundreds of miles of concrete walks which are being laid every
year.

Asphalt Repairing in Reading

On August 1st of last year work was begun repairing asphalt
streets in Reading, Pa., with the use of a Hooke portable plant
which, with the necessary tools, cost \$598.70. Five men were
employed to operate the plant and work was continued until
the latter part of November, at which time a semi-portable
plant was leased from a contractor with the idea that the work
could be done with it more cheaply.

The work done by the portable mixer was very satisfactory
in operation, but where all new material was used the cost per
square yard was \$2.50. When it was found that the cost was
running so high it was decided to utilize the old material re-
moved from the streets, and patches were made using one-half
new asphaltic mixture and one-half old asphalt. With this
method of operation the cost was brought down to \$1.35 per
square yard for binder and wearing surface. There was a
source of loss in the use of this mixture, in the idleness of
the men while the mixture was heating, as it required 2½ hours
to heat a panfull of material to the required temperature, and
½ hour to empty and fill the pan again. To meet this objec-
tionable delay Mr. Ulrich recommends the purchase of a dupli-
cate plant in order that the two may be operated alternately.
This method he figures would make the operation of repairs
almost continuous without any increase in labor cost.

The semi-portable plant was started in operation on October
10th and continued until quite cold weather. The cost of
repairing by using this plant varied from \$1.20 to \$1.35
per square yard. "This cost is excessive for a plant of this
kind, owing to short time of operation and to the large number
of men employed, which latter was necessary as our asphalt
pavements were wearing out in far greater ratio than the re-
pairs were being made; and as the time of cold weather was
rapidly approaching it became essential to push the work as
speedily as possible, even at a slightly greater cost. With a
properly regulated plant of this kind, there is no reason why,
under conditions similar to those which existed this year, the

street repairs should exceed a cost of \$1.10 per square yard and the repairing of cuts \$1.20 per square yard. . . . In the economical maintenance of asphalt pavement it may be stated that whenever repairs are needed to 30 per cent of the surface area of any pavement the entire area should be relaid."

NARROWING MINOR RESIDENCE STREETS

Under this title we published last week an abstract of a paper by Charles Mulford Robinson before the Philadelphia Conference on City Planning. Mr. Robinson requests us to state that this paper summarizes two chapters of a book which is now in press entitled "The Width and Arrangement of Streets: A Study in Town Planning," which is being published by the Engineering News Publishing Company.

SEWAGE PURIFICATION AT READING

THE Reading sewage purification plant, which includes screening, pumping, sedimentation and final treatment on sprinkling filters, has been described by us. One of the more unusual features of this was the screen or, as it is called by the inventor, the segregator. This is practically a revolving screen with fine mesh, the sewage discharging into the interior of the screen and flowing through the openings, the suspended matter being strained out and retained within the screen, where it is gradually moved forward to the further end and dropped into a sludge pit. In his report for the year 1910 city engineer Edmond B. Ulrich makes the following statement concerning this appliance:

"During the year the segregator at the pumping station has been out of service 1,500 hours or an equivalent of 63 days of 24 hours each. In 1909 this figure was 77 days. It has been impossible to keep this device in sufficient repair to keep it in constant operation and, therefore, a second device in the spare pump well should be installed.

"During the year the screenings removed by the segregator have amounted to 31 cubic feet of wet solids per million gallons of sewage screened. These screenings contained approximately 90 per cent moisture. This high amount of moisture is an undesirable feature of the segregator, because screenings containing 90 per cent moisture give twice the weight to handle for the same amount of dried material as do 80 per cent screenings. The criterion for screening efficiency should be the thoroughness with which the larger suspended matters are removed and not only mere bulk of removed matters. All materials large enough to clog sprinkler nozzles should be screened out, but it is more economical and just as satisfactory to remove finer solids by sedimentation. The cost of screening has been about \$1 per million gallons of sewage, while the cost of sludge removed from the settling tank has been about 5 cents per million gallons."

In the operation of the sprinkling filters it was found that clogging in the top 6 inches of the filter material is most serious in later winter and early spring. As warm weather comes the accumulated solids are voided by the filters. During the past year there was clogging in the fall, which had not occurred in the two previous years, this being attributed to the increased rapidity of flow through the settling tank, due to the increasing amount of sewage, which increased the strength of the filter influent and made the burden upon the filter heavier. "This shows that the ordinary method of rating the capacity of sprinkling filters at so many million gallons per acre per day is both unscientific and impracticable. The rate depends upon the strength of the influent, the character of the filtering material, uniformity of distribution and atmospheric temperature. With the present strength of influent the filters can be operated at a rate of between 2 million and 2½ million gallons per day."

The riser pipes which carry the sprinkler heads in one of the filters projected about one foot above the surface of the material, because the contractor had failed to fill the bed to the intended depth. During the night of February 7 the temperature fell to minus 10 degrees and in the morning 75 nozzles were found frozen completely shut. In the other bed, where the filter material had been carried up to the end of the riser

pipe, not a nozzle was frozen. "This shows the need of the filtering material coming to the tops of the riser pipes, in order to keep these pipes from cooling off in times of extreme cold."

The effluent from the filters is clarified of the solids voided by the filters by passing it through sedimentation basins. These basins were cleaned seven times during 1910, the amount of sludge in one averaging 1.95 cubic yards per million gallons treated, that in the other 2.09 cubic yards. This sludge has from the first been disposed of by pumping it upon the area adjacent to the basins. It has very little odor and after exposure to the air becomes perfectly odorless and upon drying assumes a humus like consistency.

COST OF PARK MAINTENANCE

Hudson County, N. J., owns and maintains six parks, varying in area from 5.898 to 207.823. The total area of the six is 517.904 acres.

The largest of these parks, West Side park, contains 6.91 miles of graveled paths, 2 miles of driveway, 58 miles of open lawn and meadow, 2¼ acres of water area, 22 acres of planted area. During the year 1910 the cost of maintaining West Side park was \$34,048.02, or \$318.21 per acre. Some of the principal items of labor in this maintenance cost, with the quantities involved, were as follows:

Drives, 42,446 sq. yds. Cleaning, 1.4 cts.; repairing, 0.7 cts. sprinkling, 1.4 cts.; rolling, 0.7 cts.; total, 4.2 cts.

Paths, 50,940 sq. yds. Cleaning, 0.8 cts.; repairing, 0.5 cts. edging, 3.2 cts.; rolling, 0.2 cts.; total, 4.7 cts. per sq. yd.

Fields, 48 acres. Rolling, \$3.515; mowing, \$16.25; cleaning \$11.544; sprinkling, 16.9 cts.; fertilizing, \$1.281; reseeding and sodding, \$1.995; total, \$34.754 per acre.

Lawns, 10 acres. Rolling, \$1.40; mowing, \$88.75; cleaning \$64.749; sprinkling, 95 cts.; manuring, 60 cts.; reseeding and sodding, \$3.15; total, \$159.60 per acre.

Flower gardens, 500 sq. yds. Planting, 45 cts.; manuring 10.1 cts.; weeding, 20.8 cts.; watering, 1.8 cts.; total, 77.6 cts. per sq. yd.

Trees. Planting 49, 86.7 cts. per tree; manuring 8,000 trees 2.2 cts. per tree; watering, 44.8 cts. per tree; pruning 8,000 trees, 0.5 cts. per tree; spraying, 4 cts. per tree; falling 1 trees, 27.1 cts. per tree.

Playgrounds. Cleaning 2,280 sq. yds., 6.6 cts. per sq. yd. repairing, 3.2 cts. per sq. yd.; equipment, 25 pieces of apparatus \$2,770. Instructing, 95,600 visitors, 0.6 cts. each.

Guards for 107 acres, \$45.107 per acre; police, \$89.719.

The above items were for wages only. Under the head of supplies the amount necessary for repairing drives was 0.9 ct per sq. yd.; that for repairing paths, 0.5 cts.; for mowing field 51.5 cts. per acre; fertilizer for fields, 31.3 cts. per acre; seed, 82 cts. per acre; seed for lawns, \$2.636 per acre; manure, 50 ct per acre.

Plants for flower gardens, 46.2 cts. per sq. yd.; trees, \$43.1 each; 25 pieces of equipment, \$237.27.

POLICE SIGNALS AND FIRE BOXES

In his latest annual report the chief of police of Reading Pa., Harry S. Levan, makes the following statement: "I can not speak too highly of the red light signal system. It has aided this department greatly in the apprehension of criminals. Many important arrests have been made through this system. It has been the source of dispatching men quickly to places where riot and gross disorder prevailed. The officers have been educated to such an extent in this signal system that they are constantly on the lookout for its glare, and it is gratifying for me to state that on a number of occasions I have been able to get at least seven men in three minutes' time, which proves that it is working very efficiently."

The Reading Fire Department has adopted the plan of painting a red band about three feet wide around all poles to which fire boxes are attached. This is done for the reason that some of these poles are so thick that the box cannot be seen from the sides. It aims to keep this paint bright and easily recognizable from a considerable distance.

NEWS OF THE MUNICIPALITIES

Current Subjects of General Interest, Under Consideration by City Councils and Department Heads—Streets, Water Works, Lighting and Sanitary Matters—Fire and Police Items—Government and Finance

Street Repair Work Is Begun

Marion, Ind.—Street repairs in Marion have started on an extensive scale, and the city street cleaning department is busy from early morning until late at night. The asphalt manufacturing machine which was purchased by the city several years ago has been brought forth from its winter quarters and placed in position along Spencer Avenue near the end of Boots Street. A large number of workmen are in charge of the machine and the season's patch work has started.

Narrow Street Is Dangerous

Boston, Mass.—Complaints are frequent, particularly from automobilists, on account of the narrowness of Norfolk Street, in the Dorchester District. The street is no wider than an ordinary residence street and two car tracks have been placed in it. A pole line close to the curbing



Courtesy Boston Herald

A DORCHESTER STREET TOO NARROW FOR SAFETY

adds to the danger. There is barely room for an automobile or large vehicle of any kind between the track and curb, and when two cars are passing there is no other choice of roadway.

Mayor Inspects Street Work Done by City Forces

Philadelphia, Pa.—Mayor Reyburn has inspected the street repairs being done by the emergency repair corps of the Highway Bureau, under Commissioner Thomas T. Haines, who has 32 gangs at work on streets occupied by car tracks. There is a total of \$500,000 available for this work and the Mayor has declined to approve contract to a paving company, believing that the city repair gangs can do the work satisfactorily. "The work being done by the city's own forces is all right and so long as that condition prevails there is no need for awarding contracts," said the Mayor.

Citizens Will Give Land for Boulevard

Binghamton, N. Y.—If plans now under way materialize Binghamton will soon be given land for a handsome boulevard along the bank of the Chenango River. Frank B. Newell, who recently acquired a valuable property on Front Street, running to the river, has signified his willingness to deed to the City of Binghamton 50 feet from the rear of his premises to be used for a boulevard, providing his neighbors will give an equal amount. It is understood that Alonzo Roberson, another large property owner, will make a similar contribution, all being required that the city agree to lay out a boulevard along the river bank. The cost of a retaining wall would be small and with cement walks along the shore and seats beneath the large elms which overhang the stream, the boulevard would prove most delightful.

Viaduct to Be Open to Public June 1st.

Milwaukee, Wis.—Grand Avenue viaduct, which was described in the Municipal Journal on May 10, and around which there has been almost constant dissension, frequent clashes and at least one court suit, will be opened to the public on June 1, according to Chairman James Sheehan, County Board. Little remains to be done to place the viaduct in first-class condition, and this is being finished by the county under supervision of Engineer Gustav Steinhagen, despite the protest made by the National Engineering Company against the "arbitrary and unreasonable" action of the county. The east approach is completed with the exception of some little surfacing, and the west approach is nearly paved.

Plan Elimination of Grade Crossings in Pawtucket

Pawtucket, R. I.—A report has been made by a commission having the matter in charge to eliminate grade crossings in Pawtucket, at an estimated cost of \$1,220,247.



Courtesy Providence Journal

GRADE CROSSING TO BE REMOVED

The report, however, does not discuss the question of division of expense between the city and the New Haven Railroad. At the point shown in the plan, Broad Street and Railroad Avenue, the railroad tracks will be relocated, moved to higher ground and depressed. A new street, much needed, will occupy the present railroad right of way.

Water Scarce; Oil to Be Used on Streets

New Britain, Conn.—State Highway Commissioner MacDonald has notified Selectman Newton that he will ship a car tank of road oil here within the next few days to be used on the highways in town. The roads are at the present time in very poor condition as a result of the prolonged dry spell and Selectman Newton has requested the commissioner to send some oil here in the hope that it will improve them. Owing to the small amount of water in the reservoir rigid economy must be used to avoid a shortage this summer unless rain comes to the rescue, and consequently the roads cannot be sprinkled with it. The macadam is so dry that it breaks up easily under the automobiles which go through town at high speed, and unless something is done soon the highways will have to be resurfaced.

Will Try Oiling Streets

Waterbury, Conn.—The Street Department is just entering upon its long period of spring and summer activity. Grading is going on in several sections of the city and Superintendent Benjamin Chatfield has his plans all mapped out for the new departure of oiling the streets instead of depending wholly on water as a dust layer. The oil campaign will start within the next 10 days.

Leads in Mileage of Paved Streets

Kansas City, Mo.—With its 357.59 miles of paved streets and boulevards, Kansas City leads the cities of the country in its paving mileage, it is said. And practically every foot of it has been laid, and much of it relaid several times, since 1880. There was practically no street paving in Kansas City prior to 1880.

New Board Faces Serious Paving Problem

Chicago, Ill.—More than two-thirds of the streets in Chicago's downtown district are in bad condition, and Mayor Harrison's new board of local improvements is facing a huge task in carrying out the program for repaving these thoroughfares. Although the former board of local improvements paved more downtown streets in the last two years than had been resurfaced in the ten preceding years, much of the extensive work planned by the old board remains to be carried out by new men. The condition of some of the streets in the downtown district is declared to be "frightful." Old "turtle-backed" granite blocks, which were laid twenty years ago, still are doing service, a menace to traffic and a disgrace to the city. Inspection of the streets in the downtown district revealed that there are 123½ blocks of pavement in bad condition, either in need of repair or repaving. There are 36½ blocks of good creosoted wood block or asphalt pavement, exclusive of Jackson Street and Michigan Boulevard, which are under the jurisdiction of the South Park commissioners.

City Will Be Improved by Elimination of Grade Crossings

Youngstown, O.—The plans of the Erie grade crossing elimination were explained in detail by City Engineer F. M. Lillie at a recent meeting of the Engineers' Club. By the use of diagrams and maps it was shown how the completion of the proposed plan will give both the railroad and the city better grades. The total cost of the improvement is estimated after careful figuring at \$2,000,000. Under the law requiring the city to pay 35 per cent., the city's portion would be about \$700,000. The street railway, however, pays part of the city's cost, and Mr. Lillie said he thought \$500,000 would cover the city's share. It will be necessary to rebuild parts of several sewers because of the lowering of the tracks. Mr. Lillie mentioned the theory of elevating the tracks, which is advocated by some people, and said the Erie refused to consider that at all. He said he thought it was out of the question for Youngstown to consider an elevated road through the heart of the city also.

Refuse to Pay Twice for Paving

Rensselaer, N. Y.—Interesting developments are anticipated as a result of the action of the Rensselaer Common Council in authorizing a bond issue of \$145,000 to redeem the old bonds issued to pay for the granite block pavement in the old village of Greenbush. Property owners who have paid for the granite block pavement abutting their property are demanding exemption from paying for the new bond issue. They claim it is an injustice and threaten to take the matter to the courts before they will pay for the improvements the second time. Comparatively few of the property owners paid for the granite block pavement and the money realized from this source is to go toward paying for the new bond issue. It has been suggested that the citizens who have paid for the improvement be exempt from the proposed additional expense if it is necessary for a special act of the Legislature to bring about such a thing.

Mayor Persuaded 100-Foot Draw Bridge Is Necessary

Boston, Mass.—The necessity of consulting with the War Department officials on the construction of the Chelsea Bridge took Mayor Fitzgerald to Washington, where he spent the better part of a day. Mayor Fitzgerald will use his influence to have the city of Boston and towns in the neighborhood affected by the Chelsea Bridge appropriate the \$65,000 necessary to build a bridge with a 100-foot draw. Mayor Fitzgerald went to Washington to oppose the War Department's proposition that Boston raise \$65,000 for the Chelsea Bridge. He felt that that was too much money, but after he had talked with General Bixby he changed his mind. The general pointed out how far behind Boston was in the matter of bridges and how necessary it was to have the 100-foot draw.

SEWERAGE AND SANITATION

Sewer Work Halts; Fund Is Overdrawn

Minneapolis, Minn.—Sewer construction work has been ordered suspended all over the city because the main sewer fund is overdrawn \$15,000 at least. More than 400 men employed on the city's ditches must go without their pay for two months pending realization of funds on sewer bond sales. It is patent, say city officials, that the city council has ordered work begun to cost more than \$200,000 when but \$50,000 was available.

School Children Co-operate in Freeing City of Mosquitoes

East Orange, N. J.—The School Board and Board of Health, with the aid of school children, are co-operating in the work of mosquito extermination. The subject of Mosquito Breeding Places is given out as topic for school composition and the children are encouraged to hunt up breeding places and describe them, together with an account of the general theory of the relation of mosquitoes to disease. Each breeding place is reported to the Board of Health, an inspector is sent to investigate, and if the report is correct a prize of a dime is given to the scholar. The board has appropriated \$200 to carry on this work.

Gases in Big Sewer Exploded With Terrific Force

Defiance, O.—A terrific explosion of gas, the detonation of which was heard all over the business part of the city occurred one morning last week in the sewer main extending from First to Second Streets on Clinton. The greatest force of the explosion occurred at the corner of First and Clinton Streets, where the large manhole cover there was blown high into the air and broken in two. The street commissioner has ordered all sewer to be flushed in an effort to prevent a recurrence of similar trouble in the future.

Sanitary Subjects to Be Taught in Schools

Indianapolis, Ind.—Dr. J. N. Hurty, secretary of the State Board of Health, who has been using the common schools of the State, when possible, as a means of spreading the doctrine of disease prevention advocated by the State board, has prepared an outline of sanitary subjects for consideration by the teachers of the schools. The outline will be printed, and a copy placed in the hands of every teacher in the State by the time school opens next fall.

Must Cover the Meat

Indianapolis, Ind.—H. E. Barnard, State food and drug commissioner, has notified meat dealers who have stands at the city market, either to place cases for the protection of their meat displayed there or to show that they have ordered such cases. The corps of field inspectors spent last week, on market days, watching the meat stalls, and reported the necessity at once. Reports of shoppers with soiled hands handling the meat, of its being unprotected from dust and dirt and germs, were made to Mr. Barnard. Butchers who have stands in the city market house have demanded that the city put in a refrigerating plant, and uniform glass covered cases, despite the fact a city ordinance requires the butchers shall put in refrigerated cases at their own expense. Members of the safety board do not believe the City Council will appropriate this money, but are willing to assist the butchers in delaying prosecution by the State Board of Health, if possible. Mayor Shank is opposed to the appropriation, saying he sees no reason why the city should spend \$100,000 for a refrigerating plant for the accommodation of the butchers and fish men, who compose a small part of the total number of stand holders in the market. Butchers say if the city will start the plant they will pay increased rentals.

No Dairies May Be Established in City

Indianapolis, Ind.—The city Board of Health has decided on the enforcement of an ordinance forbidding in the future any person to own more than two cows in the city. The order is not to affect anybody who already owns more than two cows. This will prevent any new dairies from starting inside the city. While the ordinance has been in effect some years, it has not been enforced strictly, and there are several dairies in the city.

WATER SUPPLY

Vote for Municipal Control of Entire Water Supply

Niagara Falls, N. Y.—Pure water for the south end as well as the north end of the city is assured after the magnificent victory last week, when the water proposition to parallel the mains of the Western New York Water Company was carried by an overwhelming vote. The vote of the taxpayers shows in no mistaken terms that the entire water supply of the city must be under municipal control. The south end voters were just as emphatic in favor of the city laying mains in the streets now supplied from mains of the private company as the north end—a stinging rebuke to the company's claims of faithful service and its assertion that it was treating consumers fairly. It was a remarkable exhibition of the sentiment of the people. Men and women voted almost as a unit for spending \$360,000 to extend the city mains to the south end of the city.

New Water Main Bursts

Minneapolis, Ind.—The new 36-inch water main on Aldrich Avenue, put in service last week, burst, flooding basements of business places on Plymouth Avenue from Aldrich Avenue to Third Street. A torrent of water filled the street, rushing over curbs and sidewalks. Where the main burst a hole 20 feet deep, 50 feet long and 20 feet wide, was torn in the street, stopping traffic on the Plymouth & Bloomington Street car line. When the water was finally cut off sand two feet deep covered Plymouth Avenue from Aldrich to Lyndale Avenues. The feeder main extends from Camden Place to Lyndale and Hawthorn Avenues and was laid to supplement water pressure so as to serve a large portion of the city which has long lacked water in sufficient supply to cope with drought.

City Officials Inspect Source of Water Supply

Portsmouth, Va.—The members of the Portsmouth Water Commission, together with the members of the Norfolk Water Commission, are making a visit to the Lake Drummond Canal to inspect the proposed source of supply for city water for Norfolk and Portsmouth. The two bodies are the guests of Mr. M. K. King, president of the Lake Drummond Canal and Water Company. The result of the trip will largely determine the action of the two cities with regard to a new municipal water plant. It is understood that the Lake Drummond Company has made proposition to the commissions of the two cities, which looked upon as being very advantageous. The proposition is that a pumping station will be established on the banks of the Pasquotank River and that water from that river will be pumped into the canal. At this end of the canal another pumping station will be established and from this station the water will be pumped from the canal and delivered through pipes to the city under pressure. This relieves the Lake Drummond Company from getting water from Lake Drummond, there having developed some question as to the ownership of the lake, and gives them their water from a running stream. It also relieves the city of Portsmouth from the necessity of establishing an expensive plant to pump the water from the lake into the city.

Company Considering Plans to Increase Water Supply

New Britain, Conn.—To increase the water supply in the reservoir and thus ward off a water famine, of which there is grave danger within the next few months, unless there is considerable rainfall, the directors of the Plainville Water Company have under consideration the matter of installing a pumping station at Hamlin's pond. The officers of the company admit that the situation is getting quite serious and something must be done if a water famine this summer is to be avoided. The reservoir is a great deal lower at the present time than it has been at this season in any previous year and there is not near enough water in the lake to supply the needs of the town during the summer. The problem has confronted the company for some time and the officers feel that it can only be solved by using the water in Hamlin's pond. Orders have been issued forbidding the use of outside faucets while the reservoirs are in operation and it is now the intention to notify the property owners that until water is more plentiful the use of outside faucets and hydrants must be stopped entirely.

Water Plant May Bring Litigation

Salem, Ore.—Although Mayor Lachmund has won out in killing the ordinance to authorize a bond issue for the purchase of the Salem water plant, it is said that there is a storm brewing due to break in a short time which bids fair to involve the city in litigation. It is rumored that the mayor plans to compel the present owners of the water plant to live up to the franchise and furnish the citizens of Salem with a pure and ample supply of water. If this cannot be accomplished by referring back to the agreement in the franchise granted the company the Mayor will try to secure ordinances to bring about the desired condition. Many of the people of Salem approve of the Mayor's action in vetoing the ordinance, while many others bitterly oppose his attitude. Whether or not the Mayor succeeds in forcing the company to furnish better water, many business men are desirous that the city own its water system, and several have stated they intend to work to this end.

Verdict Against City for \$25,000

Newark, N. J.—After deliberating for a little over an hour the jury in the suit brought by the Weidmann Silk Dyeing company against the city of Newark for damages sustained by the company through the diversion of water from the Passaic river by Newark, brought in a verdict of \$25,000. The Weidmann company had brought suit for \$100,000, and presented claims aggregating about \$75,000, the principal items of which consisted of \$17,000 for money expended in the laying of pipes and the erection of a filter, \$51,000 paid to the Passaic Water company for water, due to the fact that the dyeing concern could not take water for its purposes from the river, and \$5,000 paid to Mr. De-Gray for the use of his land in connection with the securing of water. The claim of the Weidmann company, was that these expenditures were made necessary through the diversion of water from the Passaic river, and that Newark was liable for such part of the expenditure as the diversion of water made by Newark bore to the whole diversion, or about forty per cent. of the amount.

Favorable Report on Water Supply

North Tonawanda, N. Y.—The report of the State hygienic laboratory on the water supply of Lockport, Tonawanda, and North Tonawanda for domestic purposes, which was completed last week, shows that the water supply now taken from the Niagara River for the three communities is the best it has been in years.

Purchase of Water Systems Is Urged

Portland, Ore.—More than 200 residents of Southeast Portland, most of them from the Mount Scott district, appeared before the Water Board recently and urged the early consummation by the board of the purchase of the Woodmere and the Woodstock private water systems. They declared they feared that if the final acquisition of the private plants was delayed much longer they would be unable to secure Bull Run water before the dry summer season, in which case they would suffer on account of shortage of water. In many homes, they asserted, they are now short of water and that conditions will become serious within a few weeks unless relief is given. They also asserted that there is much typhoid fever in the Mount Scott district, which they attribute to the use of water from the private systems which is obtained from wells. The board already has decided to purchase the Woodmere system for \$50,000 and this probably will be taken over June 1 and all the consumers provided with water at city rates. The Woodstock system has not yet been purchased, but members of the board are negotiating with the owners.

Water Supply Grows Short; Sprinkling Is Stopped

Dayton, Ohio.—Service Director Ely has ordered a stoppage of all street sprinkling. This action was taken after a conference of Safety Director Lienesch, Fire Chief Ramby and Service Director Ely. The officials do not wish to alarm the public, but the situation they are facing is considerably worse than it has ever been before at this time of year. The increase in the water consumption of the city over last year can be seen when the average consumption per day for May last year was 9,000,654 gallons, while it now averages above 12,000,000 gallons every day.

STREET LIGHTING AND POWER

Palo Alto Lighting Plant Lowers Rates

Palo Alto, Cal.—As a result of competition from the United Gas and Electric Company rates for electricity for lighting purposes have been reduced by the municipal plant from 10 cents to 7½ cents per kilowatt hour maximum and 4 cents minimum. For motor and power loads the rate for any quantity is reduced to 4 cents. For heating, cooking and household electric appliances the rate is reduced to 3 cents per kilowatt hour for any quantity. The reduction was made possible because of the monthly profits accumulating in the municipal plant amounting to \$2,000 to \$2,500 a month.

Satisfactory Report From Light Plant

Richmond, Ind.—Satisfactory returns from the Municipal Light Plant for the month of April were reported to the council meeting Monday evening. The total receipts were \$8,694.18, while the excess of receipts over the operating expenses was \$6,876.38.

Company Cuts Price of Gas

Tacoma, Wash.—Gas will be cheaper in Tacoma after July 1. Close on the heels of progressive moves that have followed one another so rapidly as to be almost continuous, official announcement has been made by Henry H. Hyde, general manager of the Tacoma Gas Company, that beginning about July 1 the price of gas will be reduced 10 cents per thousand cubic feet. Hereafter the price will be \$1.15 per thousand feet net, grading down as the consumption per meter increases. Hitherto the rate has been \$1.35 per thousand, but a discount of 10 cents per thousand is allowed on bills paid within two weeks after the meter is read, so that the gas consumer who pays his bills promptly has been able to obtain gas for \$1.25. The reduced price, however, will mean a saving of thousands of dollars to consumers in the course of a year.

FIRE AND POLICE

Motor Patrols Prove Economical

Detroit, Mich.—The Detroit police department has issued a statement bearing on the use of motor patrols in the police service for six months from October 1, 1910, to April 1, 1911. "The installation of automobiles in place of horse-drawn patrols has been remarkably successful in this department," says Police Commissioner Croul. "During the six months we have shown a saving of \$7,112.51 in favor of the automobiles and in addition we have derived most endless benefits on account of the greater speed and distance the automobiles travel."

Police Dogs Presented by Citizen

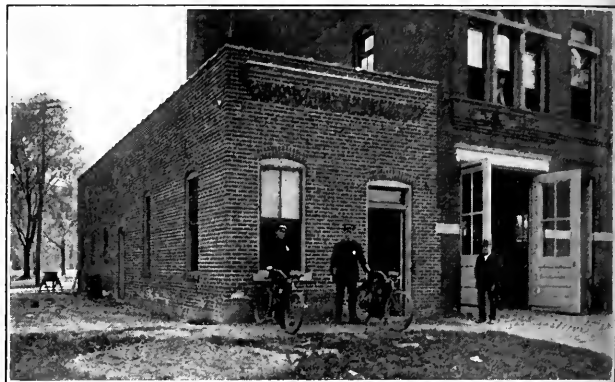
Cincinnati, O.—Two genuine police dogs, at present members of the Paris (France) force, will be sent to Cincinnati within the next few weeks as adjuncts to the local department. Safety Director Small has been offered the canines by Henry Ziegler, who is at present in France, and he immediately replied that the gift will be greatly appreciated. These dogs have been specially trained for their peculiar work, and those who have seen them on duty in Paris say they seem to possess almost human intelligence. They not only aid the police in making arrests and in locating criminals, but also guard the prisoner so that he will not make his escape. The two bloodhounds which the local department tried out some months ago did not come up to expectations, and consequently were not retained by the police.

Report Approves Work of Fire Department

Los Angeles, Cal.—The work of the fire department and the new high-pressure salt-water system at the blaze at Twelfth and Webster Streets recently was commended in a letter by W. J. Duval, district secretary of the Board of Fire Underwriters of the Pacific, read before the ordinance and judiciary committee of the City Council. A report from Mr. Duval was called for by the president of the board, in view of a request to the underwriters to lower the insurance rates. The report found that the work of the department was only handicapped by a lack of high pressure hose tenders.

New Police Motorcycle Sub-Station a Benefit

Toledo, O.—Since the new police motorcycle sub-station, which adjoins No. 4 engine house at Monroe and Bancroft Streets, was placed in commission, April 20, the efficiency of the police force has been increased to such an extent that Chief Perry D. Knapp has announced that he will recommend that similar sub-stations be established as soon as possible in the north and south sections of Toledo. At the new station, which is a one-story brick structure, equipped with desk, chairs and telephone, two motor patrolmen are stationed daily from 3 P. M. until 7 the following morning, working in 8-hour shifts. The men at the new station respond to calls and complaints from that section of the city west of Collingswood Avenue and the Air Line Junction district. In addition they go to all fires to which the firemen of No. 4 engine house are summoned, and when not



Courtesy Toledo Bl.de

POLICE SUB-STATION FOR MOTORCYCLE MEN

otherwise engaged one of the men patrols the streets in the vicinity of the station and tries the doors of business houses, while his partner remains in the station. In cases of emergency the men at the sub-station are assisted by motor patrolmen and detectives from police headquarters. "The speed with which motor patrolmen work," said Chief Knapp, "is of great benefit to the police department, and I hope soon to have the motorcycle squad increased so that two men can be kept on duty at the new sub-station every hour of the day and night."

Automobile Fire Engine Test a Success

Washington, D. C.—The new automobile fire engine sidled up to a fire hydrant in front of No. 2 engine house one day last week and went through its paces to the great delight of a large multitude. Several hundred thousand gallons of perfectly good water was squirted all over Fourteenth Street during the test, and many a coal cart driver, truckman and automobilist who tried to dash too close to the five-hundred-gallon-a-minute stream, emerged looking as if the clouds had broken loose upon him. The opinion of the officials who watched the test and took measurements is that the automobile fire engine is a success. Commissioner Rudolph, Commissioner Johnston, Chief Wagner, Fire Marshal Nicholson and T. M. Robinson, superintendent of machinery, were among the officials making the test.

New Automobile Engine Damaged in Accident

New York, N. Y.—The new automobile engine of the Fire Department was returning from a small fire in a tenement house when an automobile express truck ran into it at Fifth Avenue and 115th Street. The front wheels of the engine were broken and it was put out of commission. Dennis O'Connor, on the truck, was thrown to the ground and had two ribs broken.

Fire Chief Twenty Years

Paterson, N. J.—May 5 marked the twentieth anniversary of Chief John Stagg's being at the head of the paid Fire Department, and while he might retire on half-pay, he will continue in his present position until the new fire headquarters are completed and the automobile apparatus installed therein. Thus he will have seen the fire-fighting paraphernalia change from the days of old goose-neck engines throwing water through leather hose to the modern gasoline-propelled and driven apparatus.

GOVERNMENT AND FINANCE

Refuses Offices to Commission

Oklahoma City, Okla.—This city has two sets of contending municipal officers as the result of a refusal of the Mayor and city council to turn over the city offices to the newly elected Mayor and commissioners. Court proceedings will be brought by the officers-elect to secure possession of the offices. The holdover Mayor and council claim that the election by which a commission form of government was adopted was illegal.

City to Collect Franchise Fees

Spokane, Wash.—Commissioner C. M. Fassett is going to get after the public service corporations, with a view of forcing the collection of franchise fees which past administrations have allowed to accumulate. The commissioner has introduced a resolution, which was passed, instructing that a list of all public service corporation franchises be made, with amount of fees which should be paid to the city, how much of this has been collected and how much is still due. The street car and telephone companies, the Western Union, the Postal and a number of smaller corporations are included in the order.

Portland Inspects Spokane's City Government

Spokane, Wash.—Portland may adopt Spokane's plan of city government, according to Councilman George L. Baker of the Rose city, who is here examining the way the Inland Empire capital conducts its municipal affairs. "At the recent election," said Mr. Baker, "a charter commission was provided for with the idea of instituting the commission form of government. As a member of the council, which elects the commission, I am in Spokane to study what you have done and are doing. From reports I have heard the plan in your city is working beautifully."

Large Bond Issue Easily Carried

Oakland, Cal.—By better than the required two-thirds majority of the votes cast, the people of Oakland recently passed the three bonding propositions presented for their consideration, thus taking another big step in placing Oakland in the forefront of western municipalities. The bonds carried by about a 2½ to 1 ratio and are for school buildings and an auditorium building, the latter to cost \$500,000. The total amount of bonds authorized by the election is \$2,993,700. In addition to the increased school facilities and many things in favor of the city owning the big convention hall, there is an additional advantage in the passage of the bonds—that of increased property values in those sections of the city where improvements are contemplated under the various issues. This is an immediate gain to a large number of Oakland residents and a prominent factor in the adoption of the bonds. The individual outlay in the slight increase in taxation is more than compensated by this one feature alone.

City Borrows Half Million at Lowest Rate in Its History

Birmingham, Ala.—At a meeting of the Commissioners one day last week, the city borrowed \$500,000 from the Birmingham Trust and Savings Company at the lowest rate ever given Birmingham in the history of the municipality. A loan was made bearing interest at 3¾ per cent. for four months at the discount rate. The offer to lend Birmingham money at such a low figure is taken to be a splendid tribute to the integrity of the city and the personnel of the commission. In commenting on the loan one of the officers of the Trust Company said: "The figures laid before us that Birmingham owned \$1,000,000 were sufficient to discourage almost any banker. However, our bank had faith in the integrity of the Commissioners, their determination to get Birmingham on a financial basis and their serious task facing them. We have been fully informed of the condition of Birmingham financially. From the figures Birmingham will be in good shape within a short time. We took the view that all interests here should co-operate with the Commissioners. Our institution always endeavors to connect itself with the best interests here. We did not fail to grasp the fact that the Commissioners needed every assistance that could be rendered by the people of this community."

STREET CLEANING AND REFUSE DISPOSAL

Watervliet Will Clean Up June 12

Watervliet, N. Y.—The Municipal Improvement League of Watervliet has selected the week beginning June 12 for the annual clean up and the Executive Committee is working on the general plan. As Mayor Hanratta has already come out in favor of the movement when the committee meets with him he will ascertain in what respects the league will expect the city authorities to help. The Mayor has said that he believed that everybody should assist in this matter and is willing to have the police and firemen help. The general plan calls for the division of the city into districts by wards. The Chairmen of the Ward Committees are to secure the services of enough aides so that one man may look after a block. It is not likely that the league will give any prizes this year.

Night Removal of Garbage Indorsed

New York, N. Y.—Asserting that his experiments in collecting ashes and garbage in the night had been successful, William H. Edwards, Commissioner of Street Cleaning, has recommended to Mayor Gaynor that the night plan be adopted in the five boroughs. He said citizens, civic bodies, boards of trade and other organizations had given hearty indorsement to the system. Night collection, he said, would cost more, but the benefit to horses and men, particularly in summer time, would be worth the expense. The Commissioner's letter to the Mayor, in part, reads:

"Very few complaints have been registered, and those were based on noise. Conditions in this respect cannot be expected to be perfect at first. We have the hearty co-operation of citizens and various organizations. This system should be extended. It will undoubtedly cost some extra money, but the conditions which are improved under this new system warrant the expenditure."

The Commissioner says the system is the most successful one that had ever been undertaken in his department. The nuisance of ash dust flying in the air and the unsightly removal of garbage, are done away with, and the streets and sidewalks made more presentable in the day time.

Starts Free Collection of Garbage

Beaver Falls, Pa.—Having once come to a definite decision on the garbage question, the members of the sanitation committee lost no time in starting the good work. At the last meeting of Council it was decided to gather garbage free and this committee was instructed to procure several one-horse wagons and start the good work.

Garbage Reduction Company Sues City

Dayton, Ohio.—The City is involved in a law suit with the Dayton Reduction Company and has appealed from a judgment the company secured in the sum of \$79,000 for failure to furnish the Dayton Reduction Company as much garbage as the city had rashly bound itself to furnish in a rather absurdly framed franchise. Later \$89,000 more was demanded of the city, raising the total obligation alleged to be approximately \$160,000. The second part of the suit, that calling for an additional \$89,000, is now pending in the Common Pleas Court.

Clean-up Day a Big Success

Montgomery, Ala.—"Clean-Up Day" was a success far beyond the expectations of the officials of the sanitary department of the city. Throughout every section of Montgomery both sides of the streets were dotted with metal receptacles, barrels, boxes and devices of all descriptions, which contained one of the most varied assortments of refuse and rubbish that could be found in any city of the size of Montgomery. With one accord the people co-operated with enthusiasm with the sanitary department in making "Clean-Up Day" the best Montgomery ever had and they were successful. School children were given a package each of disinfectant to sprinkle around their homes, and Wednesday noon about 2,500 pounds of it had been sent out by the sanitary authorities.

Street Oiling Is Proving Popular Dust Preventive

Altoona, Pa.—Employes of the highways department this morning began the work of cleaning off the loose dirt from Fifth Avenue between Tenth and Eleventh Streets, preliminary to oiling the roadway as per an agreement entered into between the city and the property owners, whereby each shall pay half the cost of the oiling. Other streets have already been treated.

RAPID TRANSIT

Electric Lines Will Soon Be Completed

Burlington, N. C.—The management of the Southern Traction and Power Company has announced that contracts have been given for the completion of its electric lines for the city of Burlington and extension to Graham and Haw River, and that cars are to be in operation July 1. Work on this line was practically completed a year ago, when matters were tied up in court. All legal complications have been adjusted.

Motor Busses to Take up Passenger Traffic

Indianapolis, Ind.—A company capitalized at \$150,000 has been organized in Indianapolis for the operation of regular automobile passenger service in Meridian street, from Monument place to Thirtieth street. It will be a competitor of the street car lines in Illinois and Pennsylvania streets and the fare probably will be placed at 5 cents. It is planned to put six cars in service. If the Meridian street line is a financial success the company plans to extend the service to other parts of the city.

Considering Consolidation of Lines or 50-Year Lease

Boston, Mass.—A new and important alternative for the proposed consolidation of the Boston elevated and West End street railway properties is now before the legislative committee on street railways. The bill for the consolidation of the properties on which the joint commissions made report to the legislature is still before the committee. The controversy relative to the dividend rate to be assured the West End stockholders has been the most important issue. Instead of the proposed consolidation the committee is now considering the alternative of substituting a 50-year extension of the West End lease at $7\frac{1}{2}$ per cent. on the West End common stock.

To Build its Own Subways

Chicago, Ill.—Chicago's policy regarding construction of proposed subways under the present administration has been agreed upon. At the suggestion of Mayor Harrison, who took part in the discussion, the Council Committee on Local Transportation placed itself on record as favoring absolute municipal ownership of the subways, the construction to be paid for entirely by the city without aid from the traction companies or any other outside source. The decision was regarded as a blow to all advocates of subway construction by private capital.

Trolley Line Gets Franchise

Salt Lake, Utah.—By an unanimous vote, the Davis county commissioners have granted to the Utah Light & Railway company a franchise for a street car line from North Salt Lake through Bountiful to Centerville. The city council at Bountiful has already granted the company a franchise through the town, and now a committee of prominent citizens is going before the officials of the street railway company with a request that the proposed extension be built at once.

City Fight on Trolley Service

Jersey City, N. J.—Trolley traffic conditions in Jersey City were discussed at length at a recent conference in City Hall and further plans were made for the appeal which is to be presented to the Board of Public Utility Commissioners urging that body to exercise its rights under the new law and enforce adequate trolley service. The conference was called by Police Commissioner Job Lippincott, who recently assigned detectives on the job of carefully noting the overcrowded trolley cars and incorporate their observations in affidavits. It was decided to employ six citizens to follow up the findings of the detectives, to corroborate their discoveries and back up their statements to the Board of Public Utility Commissioners. The cumulative evidence is expected to accomplish some real results. "The appeal to the Utility Board," said Commissioner Lippincott, "is the quickest way to end the intolerable conditions on the Jersey City trolley lines." Mayor Wittppenn suggested that an engineer be engaged to look over the situation, suggest a system of trolley loops and prepare himself to contest any engineering objections that may be offered to the citizens' demand for more trolley cars.

MISCELLANEOUS

Proposes Bond Issue for New Playground

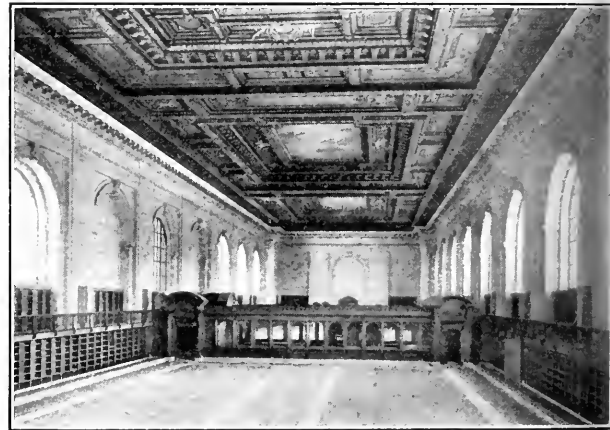
Dayton, O.—Dr. Lefkowitz and Dr. Curtiss interviewed Mayor Burkhart recently about the chances of a bond issue campaign to provide an extensive addition to the city's playground facilities carrying with the people. The Mayor proposed that the campaign be instituted with the Chamber of Commerce.

Park Playgrounds Are in Full Swing

Rochester, N. Y.—With the park playgrounds in six of the city parks open, the Children's Playground Association started in the fifteenth season of the work that it does for children who are forced by circumstances to spend the summer in the sweltering streets of the city instead of in the cool shade of the countryside. Four playgrounds opened last week, two were already open and two more will be placed in commission as soon as necessary arrangements can be made.

New York's Public Library Opened.

New York, N. Y.—The New York Public Library, was opened on the 23rd with impressive ceremonies, in which participated the President of the United States, the Governor of the Commonwealth, the Mayor of the city and distinguished civil and religious dignitaries. Noted scholars, artists, scientists and educators were in the company of five hundred which gathered in the vestibule for the exercises of dedication and at the public reception which immediately followed six thousand persons, representatives



DELIVERY ROOM, NEW YORK LIBRARY

of the metropolis, traversed the corridors of the great structure and inspected its manifold beauties. Other libraries in the world, as Mr. Taft pointed out in his address, exceed this which is given forever to the people, but none excels it in the manner in which its contents are made available for the education of mankind. Erected at a cost of \$10,000,000, standing on ground appraised at double that sum and containing almost priceless treasures of literature and art, it is a fane which millions of pilgrims are to visit in years to come. The accompanying illustration of the delivery room and desk is typical of the general style of the interior of the building. The finish is oak and the mural decorations are rich in coloring. The panels on the ceiling represent sky and clouds.

New Housing Code

Columbus, O.—Columbus took a long step forward recently when the City Council passed a housing code which is a distinct advantage over the housing regulations of any other American city. If properly maintained and enforced it will add much to the beauty as well as to the healthfulness of the capital city of Ohio. The distinctive point of the code is that it regulates the construction and use of dwelling houses as well as of tenement houses, guaranteeing to the tenant a minimum standard of light, air, water, toilet facilities and general sanitary conditions.

Citizen Offers Electric Sign Ordinance

Toledo, Ohio.—An ordinance pertaining to electric light signs has been presented to the City Council by Safety Director Mooney and was referred to the committee on ordinances. Mr. Mooney explained in a letter accompanying the ordinance that it was presented to the building inspector by a citizen, who was interested in the better regulation and maintenance of signs. Director Mooney also explained that the ordinance does not comply with the underwriters' rules and would affect insurance rates. It also permits signs in alleys, a condition which the city abolished after a hard fight. The ordinance places all signs under the jurisdiction of the building inspector, provides for annual inspections of electric signs, with a fee to cover the cost of these inspections, the number of lights to be used in signs of various sizes and makes signs in alleys possible.

Civic Association Plans Safe and Sane July 4

Tampa, Fla.—At the regular meeting of the Tampa Civic Association held one day last week a resolution was passed endorsing the campaign being made by the press and civic organizations of the country for a "safe and sane Fourth of July," advocating a celebration that will not endanger human life and limb in giving vent to patriotism.

Playground Work Is Taken Over by a City Commission

Worcester, Mass.—Work that is being done for the young folks of Worcester under the parental care of the municipality was shown at the meeting of the city council last week, when the ordinances were amended to provide for the appointment of a playground commission which will take over and continue the work that was started last year by the public playground association under the leadership of George F. Booth as president and Rev. Dr. John J. McCoy, pastor of St. Anne's church, as one of the prime movers. In appointing his municipal playground commission under the new ordinance, Mayor Logan showed his appreciation of the work done by the private association by making Mr. Booth a member for five years and Rev. Dr. McCoy a member for four years.

Neglected City Park is to be Beautified

Leavenworth, Kan.—After several years of neglect, the city park, Seventh and Spruce streets, is to be beautified this summer at the petition of residents of that part of town. Workmen are engaged now in repairing the fountain and raking rubbish from the place. They will plant flowers there and mount two bronze cannon souvenirs of the Civil War, given to the city by an act of Congress. Work will not stop then, according to Charles T. Cox, commissioner of parks and public property. Prisoners will keep the grass cut and keep the little triangular lot orderly through the summer.

Planning Trade School for Girls

Worcester, Mass.—The practical value of the work done by the boys in the Worcester industrial school is shown by the plans of the trustees in connection with the establishment of a trade school for girls. The trustees intend to have the new school ready for use in September if the \$6000 they have asked from the city council is appropriated.

Street Trees for Whole City Chosen

Pasadena, Cal.—The advisory committee on street tree planting has announced its last list of official street trees for every street in the city. Unless something has been unintentionally overlooked, an official tree has been designated for every street and avenue in Pasadena. The city will plant out the proper trees as fast as it can do so. In the meantime, those who wish to plant on their own account must observe the prescription.

Call Box for Sunday Mail is New System

Indianapolis, Ind.—A change in the system of Sunday delivery at the Indianapolis postoffice has taken place. Call boxes for that day have been established at the local office. This is the first postoffice in the country to try the call box system, which was suggested locally. By the new plan patrons of the office who rent "Sunday boxes" may get their mail at any time from 4 o'clock Saturday afternoon to 6 o'clock Monday morning.

Park Land Donated to City

Harrisburgh, Pa.—Mr. Isaac Freed has turned over to the Park Commission another link in the chain of river front parkway. The tract of land is 125 feet long and about 90 feet from the western line to low water mark. It is already parked to conform with the other river front parks. In 1892 Mr. Freed planted some handsome trees, and he has cared for the property every since to such good effect that it will become a part of the park system without any work being necessary by the Park Commission. Every year the property has been assessed for taxes and they have been paid by Mr. Freed. Members of the Park Commission, in announcing the gift, expressed their satisfaction with the generosity of the donor.

City Chemist's Department Inaugurated

St. Paul, Minn.—The city gas inspecting department is now a matter of municipal history, Mayor Keller having terminated its existence. At the same time he began the organization of the city chemist's department, authorized by the last Legislature. Victor Koehrich, chief gas inspector in the old department, was appointed city chemist in the new department. The work of the new department will be the testing of cement, asphalt, coal, paving and other materials used by the city in the making of public improvements. Gas and electric current used by the city will be tested, and probably street lights will be inspected. Among the first tasks to be undertaken will be the preparation of specifications for coal purchases on the B. T. U. basis, and specifications for city lighting.

City Declares Bill-Board War

Leavenworth, Kan.—The first step in what is expected to be an extended crusade against the bill-board nuisance in Leavenworth was taken before Judge Wendorff in the district court when Benjamin F. Endres in behalf of the city asked a temporary injunction against David Atchison, to restrain him from completing a board at the intersection of Fourth and Miami streets. The case was temporarily disposed of by the defendant promising to discontinue construction of the bill-board, pending the finding of another site for it. The specific reasons as set forth in the city's complaint for its cause for action were that, in the first place, the defendant had not secured a permit for the construction of the bill-board, as required by a city ordinance. Then, too, it was set forth that material being used in the work was of such inferior quality as to make the completion of the board dangerous to pedestrians.

City Will Receive War Memento

Birmingham, Ala.—Congressman Richmond P. Hobson, the hero of the Merrimac, is going to give Birmingham a conning tower. A letter has been received by the commission from Captain Hobson, in which he says the conning tower from the wrecked gun-boat Isla de Luzon, sunk by Admiral Dewey in Manila bay, is ready for Birmingham. The memento of the fearful sea battle at Manila was secured by Captain Hobson for Birmingham after it was reconstructed at Hong Kong. It is the suggestion of Captain Hobson to set the conning tower in a public place in Birmingham similar to the cannon from a battleship secured from the Cuban campaign.

City Officials Visit Adjoining Town to Inspect Playgrounds

Perth Amboy, N. J.—Accompanied by Mayor Bollschweiler, President C. C. Baldwin and Commissioners George F. Reynolds and Armin Tomaschoff, of the playground commission, visited New Brunswick recently to see what progress that city has made in the playground idea. The park commission of that city has donated a park to the playground commission about 200 by 500 feet, which is used as a playground site. Highland Park was visited where the private playgrounds of Watson Whittlesey were visited. The arrangement of the grounds attracted much admiration of the local officials and may be put into effect in this city. Next week the playground board will visit Morristown, where it is understood that considerable progress has been made with the idea. Mayor Bollschweiler, who accompanied the commissioners, is highly enthusiastic over the proposition for playgrounds in this city and stated that he would do all in his power to assist in the work.

LEGAL NEWS

A Summary and Notes of Recent Decisions—Rulings of Interest to Municipalities

Removal of Snow from Sidewalks—Obligations

Jefferson vs. City of Sault Ste. Marie.—It is a fact of common knowledge that a snowplow does not and cannot clear the walk in the center as well as it does at the edges where people have not trodden. A city is not liable for injuries from slipping on an icy sidewalk resulting from the fact that a snowplow belonging to the city, after passing over the walk, left a ridge of snow and ice which had become compacted by the tread of pedestrians or congealed by the dripping of water from buildings; the city being under no obligation to remove snow and ice from its streets.—Supreme Court of Michigan, 130 N. W. R., 610.

Assessments—Relevy—Laches

Byron Reed Company et al. vs. City of Omaha.—If the taxing officers of a city of the metropolitan class fail for more than ten years to relevy a special assessment after it has been adjudged invalid, or after other like assessments in the same district have been adjudged invalid for a reason that will control all the assessments levied at the same time, the delay will estop the city from relevying the assessment upon lots that have been transferred subsequent to the date the original assessment was levied, unless for some lawful reason the owner of the property is estopped to avail himself of the defense of laches.—Supreme Court of Nebraska, 130 N. W. R., 748.

Ordinance—House Moving—Electric Wires

Edison Electric Light & Power Company of St. Paul et al. vs. Blomquist et al.—St. Paul city ordinance, March 31, 1910, requiring electric light and power companies, telephone, telegraph and street railway companies at their own expense to remove or displace their wires lawfully in the street when a licensed house mover permitted to move a house through the streets requests them to do so, is invalid, in so far as it requires such companies having acquired the right to erect and maintain their poles and wires in the streets to cut or remove the same at their own expense to permit the moving of buildings, as a taking of private property for a private use.—United States Circuit Court, 185 F. R., 615.

Contracts—Power of Council

Audit Company of New York vs. City of Louisville et al.—A city had for several years owned all of the stock of a private water company which had been purchased from its sinking fund, and, as a preliminary step to the formal taking over of the property and operating it as a city department, its council by a joint resolution directed an investigation of the company and authorized the employment of experts and accountants for the purpose. Held that, although such action involved the expenditure of money raised by taxation, it was not governmental, but was the act of a proprietor with respect to property acquired for business and not governmental purposes, and that as such the delegation of authority by the resolution to the mayor and a commission to contract for the work directed to be done was within the powers of the council.—United States Circuit Court of Appeals, 185 F. R., 349.

Charter Construction—Initiative and Referendum

Rushton et al. v. Handley, City Clerk of City of Los Angeles.—City Charter of Los Angeles, permitting amendments to an initiative petition after the expiration of a certain number of days, in case the petition is found insufficient, is inapplicable to a petition to invoke a referendum with reference to an ordinance already passed, notwithstanding section 1, providing therefor, declares that the petition shall be in all respects, etc., in accordance with the provisions of the former section; and shall be examined and certified by the clerk in all respects as therein provided, since such provision refers solely to the form and substance and certification of the original petition.—Court of Appeal, California, 115 P. R., 56.

Highways—Public Easements—Right of Owner of Fees

In re Opinion of the Justices.—The public acquires an easement in the land of a highway, including a right to occupy the same for every kind of travel and communication of persons and every movement of property that is reasonable and proper in the use of a highway; but, subject to this right, the owner of the fee retains his ownership of every valuable interest in the land, and he may use it in any way not interfering with the rights of the public.

The Legislature may enlarge or limit public rights acquired in public highways, having due regard to private rights of property secured by the Constitution, and the Legislature may confer on municipalities the power to erect structures across public streets, or to permit individuals to erect structures bridging public streets; but the Legislature may not, without the consent of the abutting owners, take away any valuable right in their property, except for a public use and on compensation made.

The Legislature may authorize a municipality, owning the premises on the opposite sides of a street and the fee of the street, to erect a bridge across the street.

Where land over which a bridge across a street is to be built belongs to a private person, the bridge can be built without his consent only by paying him compensation, and then only for public purposes, as distinguished from an existing or intended use in a private business.

The Legislature may confer on any municipality the power to grant permits to individuals to erect structures which will bridge a public street connecting premises owned on both sides of the street, provided the individuals own all the land on or over which the structures are to be erected.

The Legislature may confer on any municipality the power to grant permits to bridge public streets connecting premises on opposite sides, subject to revocation at any time, and subject to the payment of rent to the municipality.

An abutting has, as against the easement acquired by the public for travel and communication, the right to have the street open for light and air, so long as there are no uses affecting his enjoyment of light and air to which the public desires to put the street, under the easement acquired by it.

Where the Legislature authorizes the imposition of an additional burden on property abutting on a public street for a different kind of public use, which will interfere with the abutting owners enjoyment of light and air, by erecting structures on or over his land within the limits of the street, he is entitled to compensation.

One has no right to have adjacent premises remain open for the admission of light and air.—Supreme Judicial Court of Massachusetts, 94 N. E. R., 849.

Covenant to Pay Public Taxes—Construction

J. W. Perry Company and John L. Roper (Plaintiffs in Error) vs. City of Norfolk, Va.—The covenant of a perpetual leaseholder with his municipal lessor to pay the public taxes which shall become due on the land embraces municipal taxes whenever they can thereafter be lawfully assessed on the land or the improvements which are part of the land, although when the lease was made the municipality had no power of taxation.—United States Supreme Court, 31 S. C. R., 465.

Taxation of Municipal Waterworks

In re Village of Delhi, Delaware County.—Though under tax law exempting from taxation the property of a municipal corporation held for public use except the part of municipal property not within the corporation, a municipality owning and maintaining a water works plant, a part of which is a tract of land partly within and partly without the corporation, is not subject to taxation on the land within its limits, but the part outside the limits is subject to taxation, an assessment of the entire tract is not void on its face, nor a manifest clerical or other error, but it is an illegal and improper assessment so far as it includes the land within the village; and hence where the municipality, with knowledge of the facts, paid the tax for several years without protest, it was not entitled to recover the taxes paid. The property of a municipality acquired and held for public use is not subject to taxation within the tax law, unless specially included.—Court of Appeals of New York, 94 N. E. R., 8731.

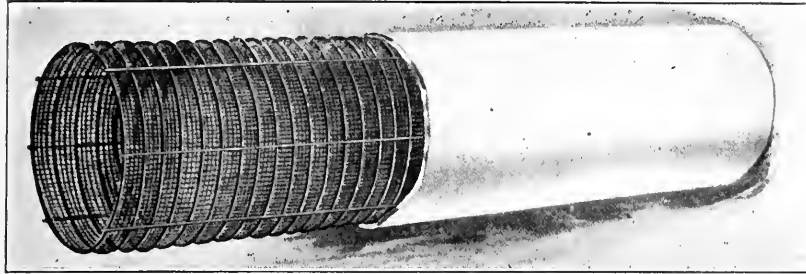
MUNICIPAL APPLIANCES

Sewer Pipe with Hy-Rib Reinforcement

The Trussed Concrete Steel Company, Detroit, Mich., manufacture a sheet steel reinforcement which may be used in the manufacture of sewer pipes and conduits. Hy-Rib is a steel sheathing stiffened by rigid high ribs. The ribs and lath are manufactured from a single sheet of steel. This re-

streets, and even more in parks, are often injured by the heat and smoke from a steam roller. The gasoline roller does no damage.

The contractor's engine made by this company is built very heavy to meet the requirements of road building, plowing up old streets and for extremely hard work. It is geared to move a trifle slower than the regular engine,



SEWER PIPE OR CONDUIT REINFORCED WITH HY-RIB

inforcement is furnished in three thicknesses of metal, represented by U. S. Standard Gauges Nos. 28, 26 and 24. Standard lengths are 6, 8, 10 and 12 feet. Four-rib Hy-Rib is bent in the shops to any desired arc of circle with radius varying from 13 inches to 20 feet. The shop-bending is said to insure absolute accuracy and smoothness of curve and avoids the necessity of expensive special field labor. In constructing a conduit or sewer a few rods, as shown in the illustration, extending the length of the conduit, should be provided to keep the Hy-Rib straight in line and as an additional safeguard against any shrinkage and temperature cracks. Either side of the reinforcement may be plastered first.

Petroleum Tractor-Roller

A COMBINATION gasoline or kerosene driven contractor's traction engine and road roller is made by the Ohio Tractor Manufacturing Company, Marion, O. The use of a petroleum product for motive power for a contractor's traction engine has an advantage as compared with steam in that the troublesome problem of supplying water for the boiler is eliminated. For use in a city as a roller or tractor it has a special advantage in that it avoids the smoke nuisance. Trees in city

has extra wide face gearing, large diameter shafts and axles, extra heavy drive wheel rims, bearings of the loose-running shafts are lined out with brass bushings, and everything is made to insure strength and long life.

The tractor-roller is the same machine as the contractor's engine. The front wheels of the machine are made regular, but are easily and quickly removed, and a roller of good weight and rigid construction, built upon its own frame, takes the place of the regular axle and wheels, thus changing the machine from a tractor to a practical roller in a short time. The maximum width of the machine in 45-horsepower size is 9 feet when 24-inch drive wheel is used. The drive wheel stands 68 inches to 72 inches and the front roller 37 inches. Weighs complete 12 tons. This is also built with an 84-inch drive wheel, the front roller standing 45 inches, and when built in 70-horsepower tractor, weighs 15 tons. With the large wheel and roller the 45-horsepower weighs 13 tons. When built from the 30-horsepower tractor, weighs 10 tons.

The general construction of the operating parts of the engine are shown in the illustration, which is of the regular traction engine. The cut shows the engine, hub, friction pulley, friction shaft and bearings of the same, the flywheel and its relation to the friction

drive and steering gear. The internal friction wheels are located and hung on pivoted bearings between the hub and rim of engine flywheel. These friction wheels transmit the power from the engine to the traction gearing. They occupy a neutral position and are brought in contact with the rim of the flywheels for the forward motion and against the hub of the flywheel for the backward motion.

Iron Fences

THE Vulcan Company, Detroit, Mich., manufacture plain and ornamental iron and steel fences, as well as other architectural iron work, in many designs. Standard designs of fence are made with extra heavy channel steel rails, into which pickets are calked by pneumatic power. This construction is much superior to the old construction of light channel rails and hand calking. Adjustable connections are provided at the ends of each panel, allowing of adjustment to meet the expansion and contraction of the metal, due to different weather conditions. These adjustable features allow of perfect alignment at all times. Adjustable center supports are placed under



LINE POST

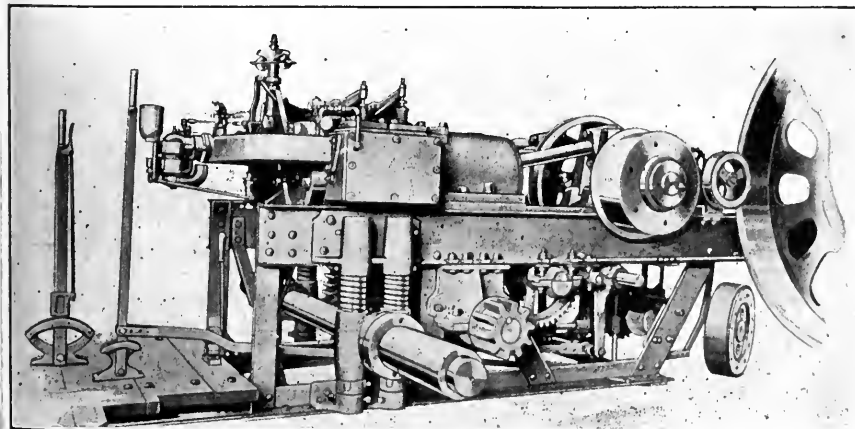
the center of each standard panel of fence, making it more substantial and keeping it in line. All picket heads, rosettes and connections used in the construction of Vulcan fences are made of the best malleable iron. In selecting fences for municipal purposes, surrounding reservoirs, parks and public buildings it is desirable, for reasons of economy, to select standard heights. The height is measured from the ground to the top of the picket, allowing the fence to stand three inches from the ground.

The illustration shows an ordinary standard picket used as a line post with a patented Vulcan foundation base. The base is connected to the picket by an adjustable brace clamp. The foundation is heavy and substantial. The picket and base have a common bed plate. This is movably attached to a table at the top of the base piece. When the picket is accurately set to line a bolt is tightened and the picket is held rigidly in place.

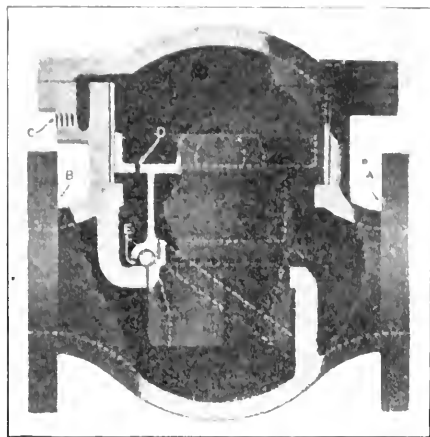
Fences made of pickets similar to that shown in the cut, where the rod is $\frac{3}{8}$ or $\frac{1}{2}$ round or square, are made in standard heights of 37, 42 and 48 inches high, when set as described. Pickets $\frac{3}{8}$ or $\frac{3}{4}$ inch in diameter, or square, are made in standard sizes of 37, 42, 48 and 60 inches in height.

Tubular fencing, suitable for bridges, with ball fittings, comprise another line of goods. They are made ordinarily with two or three rails of $1\frac{1}{4}$, $1\frac{3}{8}$, $1\frac{7}{8}$ and $2\frac{3}{8}$ -inch diameter.

For the construction of plain or ornamental entrances for public grounds this company offers a variety of styles to harmonize with the kind of picket chosen for the fence. If cement gate posts are desired the Vulcan Company can offer a number of designs which will look well with the fence. Any good carpenter, they state, can make the forms. Gates are made to match design of fence selected. Walk gates are 3 feet 2 inches wide between posts; drive gates 8 feet 6 inches.



WORKING PARTS OF PETROLEUM TRACTOR ROLLER



VALVE FOR MAINTAINING WATER LEVEL

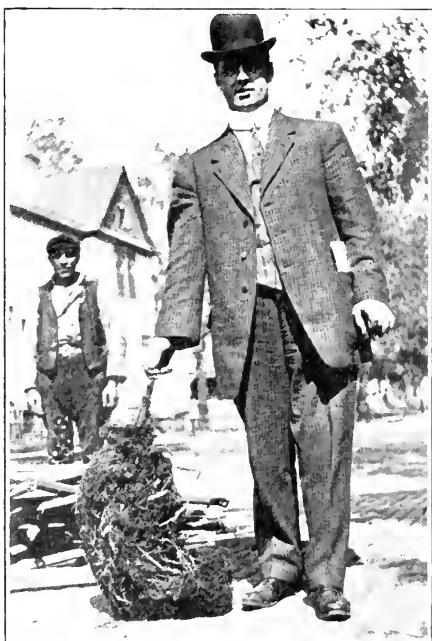
Paper Drinking Cups

The American Water Supply Company, 118 East Sixteenth Street, New York City, manufacture sanitary paper drinking cups. During the last year or two they have come into extended use as a result of the action of the boards of health of many states in prohibiting the use of the common drinking cup. The cups are made in folding and open patterns. They are strong and rigid, as the paper of which they are made is of a special manufacture, treated with paraffine.

Sieben Sewer Cleaner

The accompanying reproduction illustrates the work that may be done with the turbine sewer cleaner made by the Sieben System of Sanitation Company, Kansas City, Mo. The compact mass of tree roots was recently removed from a sewer in Cleveland, O., when a demonstration of the efficiency of the system was being made.

The cleaner itself consists of a nozzle supported on runners which discharges through a small turbine water motor, causing one or two sets of hook-shaped blades to revolve rapidly. The waste water carries away the dirt thus stirred up.



TREE ROOT REMOVED FROM SEWER BY SIEBEN MACHINE

Valve for Controlling Water Level

The Cleveland Steel Tool Company, Cleveland, O., has placed on the market a new valve, called the Hydromatic, for controlling the water level in stand-pipes, tanks, and the like. The special advantages claimed for this valve, which is made in ten sizes, ranging from one to eight inches in diameter, are the maintaining of the water level constant at all times within one inch; the elimination of leaky balance valves and the regrinding of balance valve seats; tanks are prevented from overflowing, and a saving in water is effected. The capacity is claimed to be greater than that of other valves of a similar rating, which is due to the form of its construction and the manner of its operation. The only part of the valve subjected to wear is the ring, which can be replaced without disturbing the piping in about ten minutes at a trifling cost. The illustration shows an interior view of the valve; A is the inlet and B the outlet; C is a 1/4-inch pipe through which water passes from the head chamber above the plunger to the tank when water has been drawn from the latter. Vent holes in the plunger top are located at D, and a lead or rubber gasket at E makes a tight joint between the plunger and its seat. As the copper float is lowered by the withdrawal of water from the tank, the pilot valve D is opened. This causes water to flow from the head chamber above the valve plunger through the 1/4-inch pipe C, and relieves the pressure on the upper part of the plunger enough to enable the pressure of the water entering the inlet A to force the plunger up. The flow of water through the valve into the tank then starts, and when the water level is re-established the pilot valve D closes. The pressure above the plunger is then built up through the vent holes D in the plunger top and the plunger is forced down against the gasket E and the flow of water through the valve shut off.

The valve body is of cast iron and has a removable cover plate of the same material. The brass plunger is made in two parts and the lower portion is threaded to screw into the upper one at E. The top of the plunger is piston-fitted into a brass bushing. A 5-inch seamless Hercules copper float is used in all sizes of valves, and is set at the height of the required water level inside the tank or in a casing on the outside. When mounted in this way the float casing is connected by a 1 1/2-inch pipe below and a 1/2-inch pipe above. The valve is connected in the supply pipe at any distance either above or below the float.

Grapple for Handling Garbage

The Browning Engineering Company, Cleveland, O., manufacture an automatic grapple or fork which successfully handles a class of materials which have hitherto proved difficult to handle by mechanical means. Garbage, for example, has been handled by hand at many of the reduction plants in the country. Recently the Chicago Reduction Company, Chicago, Ill., has installed a Browning automatic grapple in connection with a stiff-leg derrick and hoisting engine for handling their garbage, and have, it is said, saved \$20 a day in labor thereby. One of the accompanying illustrations shows this grapple just after it has taken its load



BROWNING AUTOMATIC GRAPPLE

from the pile below. The other illustration shows the construction of the device. The Browning automatic grapple is of the two-rope type, for use in connection with locomotive cranes, derricks, overhead trolleys, etc., for the rapid and economical handling of pulp or cordwood, manure, garbage and like materials. The yoke from which the tines of the fork are suspended is a solid casting, so constructed as to allow the grapple to hang vertically under all conditions. To it is attached the opening or lowering line and a guide sheave for the closing and hoisting line. The side arms are of forged steel, with removable bushings of either tool steel or phosphor bronze at each end. The forks or tines are of cast steel, rigidly braced together at the corners by angles strongly riveted to them. The opening of the grapple is governed by a chain which is fastened to the yoke casting and is wound or unwound on the extended hubs of the drum as the closing line is drawn in or let out, thus closing or opening the device.

Indirectly the use of this grapple diminishes the nuisance of odors from garbage, by providing a means for quickly handling it. The principal cause of objectionable odors about reduction plants is said to arise from standing garbage.



BROWNING AUTOMATIC GRAPPLE LIFTING LOAD OF GARBAGE

NEWS OF THE SOCIETIES

New York State Conference of Mayors.—The second annual convention opened at Columbus Institute, Poughkeepsie, N. Y., May 25. Mayor Charles Duryee, Schenectady, opened the meeting and presented Mayor John K. Sague, Poughkeepsie, as the chairman. In his address of welcome Mayor Sague spoke of the inclination of the citizens to celebrate because of the completion of the \$50,000 guarantee fund raised for the purpose of securing industries for Poughkeepsie. The first address was by City Engineer E. A. Fisher, Rochester, who spoke on paving and care of streets. The speaker suggested as essential to proper work in paving the establishment of municipal testing laboratories. He believed that property owners should select the kind of paving and that the city at large should pay for at least 25 per cent. In repaving the city should pay a larger per cent. Regarding widths of residence streets he favored 26 feet, or if they had car tracks 38 feet. A. Prescott Folwell, editor of the Municipal Journal, in a paper on "Paving Policies and Modern Streets," made the suggestion that where streets are cleaned regularly municipalities should also clean the sidewalks. He contended that the sources and nature of dust are the same and equally objectionable. He further argued that the modern standards of health and comfort demand the removal of filth and slime as well as dirt and mud. In regard to the cost of paving Mr. Folwell suggested that a municipality assess on property the cost to such roadway and sidewalk paving as will be suitable for side residence streets; if more expensive paving is required because of traffic the municipality should pay the balance from its treasury.

Following Mr. Folwell's paper, Mr. W. D. A. Ryan, head of the illuminating department of the General Electric Company, discussed "Street Lighting, Artistic Modern Methods Adapted to Cities." Mr. Ryan's address was illustrated with stereopticon slides. He said that one great difficulty is to get cities to realize that there is a proper height for hanging each particular kind of lamp and that the best results cannot be obtained unless the lamps are hung at that height. "Most lamps," he said, "are hung too low. To hang a powerful light too low is positively criminal." He urged cities not to place large lights where there are no large buildings to help in reflecting the light and contended that the reverse of the proposition is equally true. Mr. Ryan emphasized very strongly the difference between the American and European light and showed that we are not one-half lighted on this side of the water. He said that the best lighting in this country is done in Minneapolis. Not that more light is used there, but because what they use is used judiciously. Conditions were studied and the lamps so selected and placed as to get the greatest amount of good.

Governor John M. Dix delivered an address on "The Attitude of the State Toward the Municipality." He spoke for municipal home rule, declaring that the theory that legislators from widely diverse sections of the State could make provisions for the control of cities in every other section was false logic. Homer Folks, secretary of State Charities Aid Association, spoke on "Budgetary Provisions for Social Work in Mu-

nicipal Life." In the evening the delegates, including the Governor and his suite, were given a sail down the river to West Point, where the Governor's salute was fired and a parade and artillery drill was witnessed.

The first paper presented at the second day's session was by Edward L. Heydecker, assistant tax commissioner, New York City, on "Municipal Taxation and Assessment." He dwelt on the deficiencies of the law, which permit municipal funds to be spent without any report being made of them. Neither the State Board of Taxation nor the Comptroller are able to get full returns. "The Social Usefulness of the Police Force" was the subject of an address by John A. Kingsbury, general agent New York Association for Improving the Condition of the Poor. He made a plea for a broader view of the duties of the policeman and said if he must carry a billy he should also wear a red cross on his sleeve. Robert L. Owen, United States Senator from Oklahoma, made an address on "Commission Government." He reviewed the history of commission government and described the reforms that had been accomplished through its agency in a number of cities.

On account of the length of the program it was found necessary to omit most of the discussions of papers which had been announced. These, however, will be printed in the proceedings of the meeting. The events of the last two days of the convention will be given in these columns next week.

New England Conference on Street Cleaning.—The second annual conference was held at the Board of Trade, Springfield, Mass., May 17. The meeting was held under the auspices of the Bureau of Social Research of Rhode Island and the Springfield Board of Trade. One of the scheduled speakers, Dr. George A. Soper, president of the Metropolitan Sewage Commission of New York, was unable to attend, but sent a telegram, which was a brief but instructive document. It was an address in 16 words covering the subject, "Some Lessons to be Learned From European Street Cleaning Methods," and read as follows: "My entire paper here follows. Experience teaches that for clean streets we must organize, systematize, deputize, energize, supervise, economize, and philosophize. With hearty wishes for a successful conference, George A. Soper." This message was read by Carol Aronovici, director of the Social Research Bureau, and was heartily applauded. Dr. Ernest Meyer, United States Census Bureau, Washington, D. C., spoke on "Uniform Methods of Accounting in Street Cleaning Work." He said that many different equations in the matter of paving, litter, amount of travel, etc., enter largely into street cleaning cost and that they should be systematized for the best results to the city. Wallace Hatch, secretary of the Rhode Island Anti-Tuberculosis Association, spoke on the "Relation Between Tuberculosis and Dust." He said that according to different authorities the relation of dust to tuberculosis was near or remote, but all agreed that it was one of the predisposing causes. Carol Aronovici spoke on "Street Cleaning in City Slums." He said that a street should be considered as more than a connecting link from one portion of the city to another, but should be looked on as an approach to a home from school, factory and workshop. Considering the

street as a part of a home, it was a gathering place, especially in the slum districts, where the street is used as a nursery, meeting place, ventilating spot and common bedroom of a district. If it is accepted that the street is the main factor in the social intercourse of the poor, the construction and care of streets implies more than the requirements of accessibility, easy grade and safety. The streets should be constructed of smooth, washable and sweepable material. He favored the system of washing streets in preference to oiling, where, he said, greasy and contaminating dust results. Speaking of refuse removal, he favored the intelligent supervision and co-operation of the police. S. H. Stone of the Boston Anti-Tuberculosis Association made an address on the relation of street dust to tuberculosis. He argued that the dust itself, even though sterile, is a dangerous irritant, lacerating the air passages and thus making them less able to resist the planting and growth of the germs when they arrive. To avoid this danger three conditions of street management were necessary. Smooth paving cleaned by flushing, a minimum height of buildings, so as not to shut out sunlight, and the immediate removal of garbage so as to minimize the danger from flies. Prof. H. A. Blanchard, Providence, R. I., gave a very practical address on "Dust and Its Prevention," in which he advocated combined sweeping and flushing.

City Marshals' and Police Chiefs' Union of Texas.—The seventeenth annual convention was held in the main auditorium of the City Hall, Fort Worth, May 17-19. President John M. Brown, Weatherford, opened the convention. He made a sensation by saying that the unwritten law and habeas corpus proceedings in criminal trials were the two great loopholes of escape for criminals. Mayor W. D. Davis made the welcoming address in behalf of the city and Walter B. Scott in behalf of the people. Former City Marshal Fred Long, Itaska, responded. Dr. Samuel P. Benbrook, Dallas, made an address on the "Positive School of Criminology," the followers of which believe that the environment of the individual has much to do with determining the matter of crime. The speaker ascribed most of the anti-social acts of the criminal to failures in their full duties of the home, church and schools.

The recent ruling of the Supreme Court in regard to the right of a Texas city to set aside a reservation was made the basis for assault by speakers before the assembly. This ruling says that it is unlawful for a city to maintain a reservation, and was the result of an appeal from the city of Dallas. The decision was severely criticised, and chiefs of police and city marshals from all the larger cities in the State made known their intention of openly defying the order.

The association decided to use its influence to bring about a reform in the manner of handling the juvenile offenders against law or those juveniles who are waifs.

Henry De Spain, Sherman, was elected president; vice-presidents, Police Chief Hollis Barron, Waco; John R. Snyder, Amarillo, and W. L. Sallis, Brenham; M. T. Forrest, Houston, continues as secretary and treasurer; Charles W. Newby, Fort Worth, was elected assistant secretary. San Angelo was selected as the next meeting place.

International Association of Chiefs of Police.—Major Richard Sylvester, as president of the association, has called a meeting of the board of governors of the National Bureau of Identification to be held in Washington, D. C., June 10. The members of the committee are Frank J. Cassada, Elmira, N. Y.; John T. Janssen, Milwaukee, Wis.; Col. William Young, St. Louis, Mo.; William A. Pinkerton, Chicago; John B. Taylor, Philadelphia, Pa.; J. J. Donahue, Omaha, Neb.; T. A. McQuaide, Pittsburg, Pa.; T. F. Farnan, Baltimore, Md.; J. J. Downey, Detroit, Mich.; J. W. Reynolds, New Orleans, La., and Major Sylvester.

The meeting of the board will be held in the office of Major Sylvester at police headquarters, and a social session will follow the meeting. Members of the board will go from here to Rochester, N. Y., where they will attend the annual meeting of the International Police Association, June 13.

It is expected that there will be a large attendance at the convention in Rochester. Major Sylvester, as president, having already been assured by many members of the association that they will be in attendance.

Washington Society of Engineers—Members of the society made a trip of inspection to the concrete dam and generating station at McCalls Ferry, Pa., May 21. The party went by special train to Baltimore, where they were joined by a delegation of the Engineers' Club of that city. Local members from both cities of the American Institute of Electrical Engineers also took part in the excursion.

National Fire Protection Association—The fifteenth annual meeting was held at the Waldorf-Astoria, New York City, May 23. According to reports presented, the fire waste of this country so far this year is \$16,000,000 more than the average, and 1911 is the most disastrous year since that of the San Francisco catastrophe. The average yearly fire waste has jumped to \$250,000,000.

H. L. Phillips, chairman of the Committee on Resolutions, presented the appeal to the public in the form of resolutions which were adopted promptly as well as unanimously. The appeal is:

"The National Fire Protection Association, with all the force at its command, wishes to place before the public in the strongest possible terms that the situation in connection with the fire waste is becoming so acute that there is necessity for action.

"Action by all cities and towns in adopting proper building codes, which will call for improved conditions and the use of fire resisting construction in congested districts.

"Action by the State and municipal authorities covering the regulation of the transportation and storage of inflammable oils and explosives.

"Action by those in authority to the end that all buildings where people congregate, such as schools, theatres, factories and hotels, shall be so constructed and equipped that the lives of persons within them will be safeguarded.

"Action by the proper authorities requiring the introduction of automatic fire extinguishing apparatus in all commercial establishments and city blocks.

"Action by the proper authorities prohibiting the manufacture and sale and use of the snap match, and requiring the universal adoption and use of the safety match.

"Action by the public in bringing about a safe and intelligent celebration of Independence Day; and, above all

"Action by every citizen of the land in using his individual effort in the cause of educating the public in regard to the dangers from fire, not only in so far as it applies to the personal and immediate consideration, but also from the broader standpoint, namely, that of the welfare of our land.

"For the adoption of these principles for which it stands the National Fire Protection Association asks immediate action."

Calendar of Meetings

- May 29-June 2.**
National Electric Light Association.—New York City.—T. C. Martin, Secretary. 31 West 39th St.
- June 5-14.**
National Probation Officers' Association.—Boston, Mass.—Roger N. Baldwin, Secretary, 903 Security Building, St. Louis, Mo.
- June 6-8.**
Engineers' Society of Pennsylvania.—Annual Meeting at State College, Pa.—E. R. Dasher, Secy., P. O. Box 704, Harrisburg, Pa.
- June 6-10.**
American Water Works Association.—Thirty-first Annual Convention, Powers Hotel, Rochester, N. Y.—John M. Diven, Secretary, 14 George street, Charleston, S. C.
- June 7-14.**
National Conference of Charities and Correction.—Boston, Mass.—Alexander Johnson, Secretary, Ft. Wayne, Ind.
- June 7.**
National Association for the Study and Prevention of Tuberculosis.—Denver, Col.—Dr. Livingston Farrand, Executive Secretary, 105 East Twenty-second street, New York City.
- June 8-10.**
National Association of Comptrollers and Accounting Officers.—Annual Convention, Arlington Hotel, Washington, D. C.—George M. Rex, Secretary, 525 Industrial Trust Building, Providence, R. I.
- June 11-16.**
International Association of Chiefs of Police.—Eighteenth Annual Convention, Rochester, N. Y.—Major Richard Sylvester, Superintendent of Police, Washington, D. C., President.
- June 13-18.**
New York State Association of Chiefs of Police.—Annual Convention, Rochester, N. Y.
- June 13-16.**
American Society of Civil Engineers.—Annual Convention, Chattanooga, Tennessee.—Charles Warren Hunt, Secretary, 220 West 57th St., New York.
- June 21-22.**
National Conference of Poor Law Officials.—Boston, Mass.—Dr. Robert W. Hill, President State Board of Charities, 105 East Twenty-second street, New York City.
- June 22-24.**
Intermountain Good Roads Association.—Annual Convention, Pocatello, Ida.—Caleb Tanner, State Engineer.
- June 28-29.**
South Carolina Water Works Association.—Meeting for Organization, Columbia, S. C.—W. F. Steiglitz, Temporary Secretary, Columbia, S. C.
- June 28-30.**
International Association for the Prevention of Smoke.—Annual Convention, Newark, N. J.—R. C. Harris, Secretary, City Hall, Toronto, Ont.
- August 15-18.**
Firemen's Association of the State of New York.—Watertown, N. Y.—A. H. Otto, Secretary.
- September 12-15.**
International Association of Municipal Electricians.—Annual Convention, St. Paul, Minn.—Clarence R. George, Secretary, Houston, Tex.
- September 18-30.**
International Municipal Congress and Exposition.—Chicago, Ill.—Curb M. Treab, Secretary, Great Northern Building, Chicago, Ill.
- September 19-22.**
International Association of Fire Engineers.—Annual Convention, The Auditorium, Milwaukee, Wis.—James McFall, Secretary, Roanoke, Va.
- September 19-22.**
American Hospital Association.—New York City. J. N. E. Brown, M.D., Secretary, Toronto General Hospital, Can.
- September 24-30.**
International Congress on Tuberculosis.—Rome, Italy.—Professor Ascoli, Secretary-General, Via Lucina, Rome, Italy.
- September 26-29.**
American Society of Municipal Improvements.—Grand Rapids, Mich.—A. Prescott Folwell, Secretary, 239 West Thirty-ninth street, New York City.
- October 4-6.**
League of American Municipalities.—Annual Convention, Atlanta, Ga.—John MacVicar, Secretary, Des Moines, Ia.
- November 13-17.**
National Municipal League.—Annual Meeting, Richmond, Va.—Clinton Rogers Woodruff, Secretary, North American Building, Philadelphia, Pa.

PERSONALS

ALVORD, E. B., was elected Mayor of Henderson, Tex.

BECK, HARRY N., has been appointed City Engineer of Muskegon, Mich.

BELLIS, ROGER, has been elected Mayor of Hyattsville, Md.

BEMIS, EDWARD W., of New York, has been appointed appraiser to make the valuation of Toledo Rail-Light property in connection with its being taken over by the city.

BETZ, CHARLES, has been appointed Superintendent of Streets of Belleville, Ill.

BLISS, GEO. N., is the new Mayor of Port Arthur, Tex.

BROWN, T. C., has been elected Mayor of Tazewell, Va.

BUCK, H. M., of Waukeshas, has been elected president of the Wisconsin Gas Association for the ensuing year.

CAREY, FRANCIS K., has resigned as head of the City Plan Commission of Baltimore.

CONAWAY, JAMES C., is the new Mayor of Grass Valley, Cal.

CURTIS, DR. HENRY S., has recently visited Dallas, Tex., in the interest of the playground movement.

FOOTE, JOHN, has been appointed assistant city engineer of Little Falls, N. Y.

GRANT, WHIT M., is the new Mayor of Oklahoma City, Okla.

HAYNES, ROWLAND, field secretary of the Playground Association of America, has just paid a visit to Erie, Pa., where he gave illustrated talks in the interest of playgrounds.

KIRBY, E. N., is the new Mayor of Abilene, Tex.

MANDELL, T. H., has been re-appointed City Engineer of Lake Charles, La.

MCKENZIE, RODERICK, has been appointed by the Mayor as a member of the Board of Public Works of Salt Lake, Utah.

NIEDHAM, MRS. MABEL R., has been appointed secretary of the Board of Park Commissioners of Indianapolis, at a salary of \$1,200 a year, succeeding Leroy E. Snyder, who resigned to become secretary of the Indianapolis Trade Association.

O'CONNOR, THOMAS, the oldest fire chief in the United States, both in point of service and age, committed suicide recently following an illness which seized him several months ago. He became head of the New Orleans Fire Department in the spring of 1869, and has served in that capacity ever since. He was 72 years of age.

RANKIN, J. E., is the new Mayor of Knoxville, Tenn.

ROBINSON, CHARLES M., will shortly visit Binghamton, N. Y., to work on the new city plan system fathered by the Mercantile Press Club that is to be inaugurated.

SMITH, FRANCIS V., chemical engineer of New York City, has just completed an investigation of the asphalt pavements of Syracuse, N. Y.

STOWASSER, W. H., has resigned as Mayor of Barboursville, W. Va.

VELLA, T. C., who was recently appointed Chief of Police of San Bernardino, Cal., has been obliged to resign, as he is not a citizen of the United States.

WHIPPLE, GEORGE C., New York, N. Y., Consulting Engineer, who has been appointed Professor in the sanitary engineering department, Harvard University, will retain his present office, 103 Park avenue, New York City, and continue to carry on his work as Consulting Engineer.

WILSON, DR. C. S., has been appointed City Bacteriologist of Tacoma, Wash.

INDUSTRIAL NEWS

Cast Iron Pipe.—Chicago: Inquiries are good and a number of municipal contracts are pending. Prices are firm. Quotations: 4-inch, \$25.50; 6 to 12-inch, \$24.50; 16-inch and up, \$24. Birmingham: The demand and general inquiry are reported good. Quotations: 4 to 6-inch, \$22.50; 8 to 12-inch, \$22; over 12-inch, average, \$21. New York: Inquiries are good and large municipal contracts are pending. Quotations: 6-inch, car loads, \$21 to \$22.

Lead.—Lead is weaker and demand is light. Quotations: St. Louis, 4.225c.; New York, 4.375c.

Valves.—The Chapman Valve Manufacturing Company, Springfield, Mass., has carried through its plan of financial reorganization. A new corporation has been organized under the same name, with the exception that a "the" has been introduced before the corporation title. The nominal capital stock is reduced from \$1,300,000 to \$1,000,000, but the actual cash capital is \$200,000 greater. Of the shares \$500,000 are 7 per cent cumulative preferred and an equal amount common stock. The incorporators are members of the old board, namely, Adolph W. Gilbert, Edwin A. Carter, George B. Holbrook, Dwight O. Gilmore and William C. Godfrey.

Auto Combination Wagon.—One of the American Fire Apparatus Company's auto chemical and hose wagons was exhibited at Westfield, N. J. Frederick Bryant, 1 Madison Avenue, New York City, accompanied the car and gave Fire Commissioner Hohenstein, Chief Dicher, Assessor Appley and representatives of the press a good demonstration of the machine.

Rapid Pipe Laying.—Forty-three miles of pipe, ranging from 2 to 12 inches in diameter, have been installed in San Leandro and the district recently annexed to Oakland, Cal., within the last six months by the Bay Cities Water Company, a subsidiary corporation of the United Properties Company. This achievement, involving an expenditure of almost \$500,000, has never, according to Manager Charles E. Gilman, been duplicated in any city in the United States of a similar size and in the same given time. So quietly has the company worked that it is not generally known that such progress has been made. Two hundred and fifty carloads of pipe will arrive in Oakland from the East within the next three months, and is to be installed from Seventy-sixth avenue, the street to which the system is now built, to Lake Merritt, completing the entire annexed district and East Oakland. This work will also cost close to half a million dollars. Sufficient revenue is now being taken in by the new company to pay the expenses of the office force in the First National Bank Building. This money is being taken in through the service to 1,250 residences in which the Bay Cities Company has installed pipe and meters. Although the new company invaded the local field less than a year ago, it is delivering on an average 750,000 gallons of water daily, secured from artesian wells at Roberts' Landing, near San Lorenzo, where the auxiliary plant is located. It is claimed that new customers are being secured at the rate of 25 a day.

Large Order of Motor Engines.—The Seagrave Company, Columbus, O., has received, through President Culpepper Exum, of the Board of Commissioners, Birmingham, Ala., an order for nine motor-propelled combination chemical and hose fire wagons. In addition to the nine wagons ordered, it is the ultimate intention of President Exum and Fire Chief Bennett to order nine additional wagons of the same type. The city will have, when the nine arrive, 12 Seagrave wagons, two Webb wagons and one fire engine, auto-propelled.

New York Fire Alarm Boxes.—The New York Fire Department recently awarded a contract for 150 fire alarm boxes to the Star Electric Company. The contract was awarded after a careful investigation, from which the following is quoted. As the competition was principally between the Star and Gamewell boxes, the report regarding the other boxes on which bids were made is omitted. J. C. Rennard, electrical engineer of the Fire Department, says:

"In accordance with the conditions of the specification and the resolution of the Board of Estimate and Apportionment, a test of the boxes submitted by the companies bidding was conducted at Fire Department Headquarters by the Chief Engineer of the Board of Estimate and Apportionment and the Fire Commissioner on March 20, 1911. At this test were present: Nelson P. Lewis, Chief Engineer, Board of Estimate and Apportionment; John C. Rennard, Electrical Engineer, Fire Department; George F. Sever, Consulting Electrical Engineer, Department of Water Supply, Gas and Electricity; Otto Klein, Chief Engineer of the Commissioner of Accounts; George L. Foote, Henry G. Pierson, representing Foote, Pierson & Company; C. E. Beach, G. E. Morley, representing Star Electric Company; A. H. Cross, F. W. Cole, representing Gamewell Fire Alarm Telegraph Co.

"The test consisted in a practical demonstration of the operation of the various boxes under conditions simulating actual service, and in a detailed examination of the mechanism of each box by the Committee with the assistance of the experts of the manufacturers.

"A further examination and test was made on March 27 at Fire Department Headquarters by Messrs. Lewis, Rennard and Sever. As a result of these tests the following conclusions are drawn:

"1. That the boxes submitted by the Gamewell Fire Alarm Telegraph Company and the Star Electric Company are non-interfering and successive and fulfil the conditions of the specification.

"2. That the successive feature of the Gamewell box is limited in that if more than four boxes on the same circuit are pulled at the same time not more than three or four boxes will transmit their signals. The Star Electric Company box will transmit its signals in succession up to the limit of the spring power, which in the box under test was thirty-six rounds of the circuit wheel, thus permitting nine boxes to be pulled together on the same circuit when each box in succession would send in a complete signal.

"3. That the Star Electric Company

box sends in signals with less loss of time than the Gamewell box in that it tests the circuit after every round of the circuit breaking wheel, whereas the Gamewell box tests the circuit only after every fourth round of the circuit breaking wheel, thereby causing a possible delay of the time required for three complete revolutions of the circuit wheel.

"4. The circuit breaker contacts in the Star box are mechanically snapped open and closed, giving an efficient sliding contact. On the Gamewell box the circuit breaker contacts are opened by the straightening of a flat spring which is bent by a tooth of the circuit wheel to make contact with another flat spring for closing the circuit. Practically no sliding movement is caused in this contact.

"5. The circuit breaker contacts of the Star boxes are normally open when the box is shunted out and are not liable to weld together by the passage of an abnormal current. On the Gamewell box this circuit-breaking contact is closed when the box is shunted out and the passage of a current may weld them together and thus prevent the further operation of the box.

"6. The Star box will properly operate on an increase of current that will make the Gamewell box interfering.

"7. If the Gamewell box is pulled on an open circuit it will run for about two minutes and stop, having, of course, not transmitted its signal. If the circuit should be closed immediately after the two-minute period still no signal would be received from this box. The Star box if pulled on an open circuit will not run at all until the circuit is closed, and will then send in its signal. This is considered an important advantage in that the circuit might easily be opened for a period of two minutes, due to a change being made in a cable or the replacing of a blown fuse, and while the length of time the circuit is open would be known there would be no indication of a Gamewell box having been pulled during this time. If the Gamewell box is allowed to run down from lack of winding, it may leave the circuit open, and, therefore, inoperative, until the box is rewound. If the Star box is allowed to run down it will mechanically close the circuit before stopping.

"8. The mechanism of the Star box is more complicated than the Gamewell box, and is so of necessity, because it accomplishes more. It is not believed, however, that the Star box is more difficult to maintain than the Gamewell box in actual practice. Each box is sufficiently complicated to practically require removal to a shop for any material repairs.

"9. The component parts of the mechanism of each box are well and substantially made and the adjustments are all practical.

"10. Both of these boxes have been tried in actual service a sufficient length of time to demonstrate practicability for operation under the conditions named.

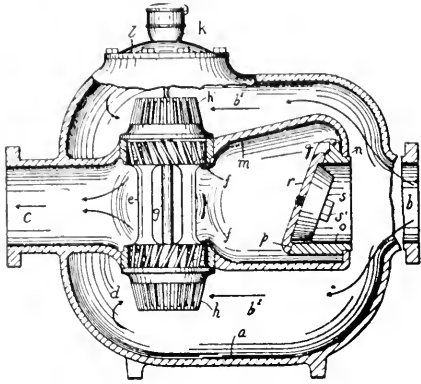
"11. Both boxes will operate in connection with the apparatus now installed in the Fire Alarm Telegraph central offices of the city of New York.

"For the above conclusions the Committee unanimously recommend the acceptance of the bid of the Star Electric Company, who are also the lowest bidders for the fire alarm boxes complying with the specification requirements."

PATENT CLAIMS

992,951. **WATER METER.** Ernest E. Gamon, Newark, N. J. Serial No. 496,851.

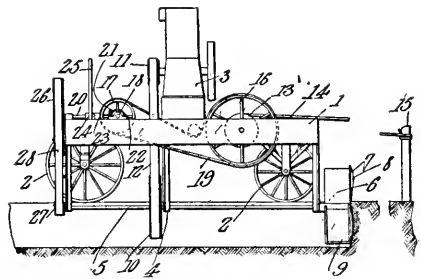
In a water meter, the combination with a main casing having inlet and outlet spuds, upper and lower receiving chambers and an intermediate supplemental chamber, propeller wheels mounted in said supplemental chamber for measuring the



flow of water therethrough under normal conditions and automatic means inserted in said supplemental chamber for permitting direct communication between said spuds and supplemental chamber under abnormal conditions when the difference in pressure between said spuds reaches a certain predetermined point.

992,866. **DITCHING MACHINE.** Horace G. Francis, Dexter, Mo., assignor, by direct and mesne assignments, of one-half to Emmett S. Willis and one-fourth to James K. Robinson, Dexter, Mo. Serial No. 561,632.

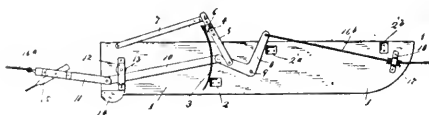
A ditching machine comprising a frame mounted at its end portion upon supporting wheels, an engine mounted upon the frame at a point approximately midway between the ends thereof, hangers depending from said frame, a shaft journaled in said hangers and at its end portions pro-



jecting beyond the ends of the frame, a cutter mounted upon the forward projecting end of the shaft, means operatively connecting the engine with the shaft at an intermediate point thereof, a winding mechanism mounted upon the forward portion of the frame, and a reducing gear operatively connecting the winding mechanism with the rear projecting end portion of said shaft.

991,665. **SCRAPER FOR CLEANING LAKE AND RIVER SHORES.** Charles W. Stubbs, Maple Plain, Minn. Serial No. 589,718.

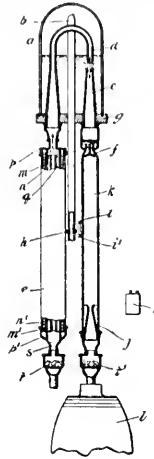
In a device of the kind described, the combination with a carriage and a scraper mounted for movements thereon to and from operative position, of connections for moving said carriage to and fro on a dis-



tant point including means for automatically throwing said scraper into operative position when said carriage is drawn in one direction and for throwing said scraper into inoperative position when said carriage is drawn in the other direction.

992,980. **OZONE-PRODUCING APPARATUS.** Octave Patin, Paris, France. Serial No. 454,260. Divided. Serial No. 584,434.

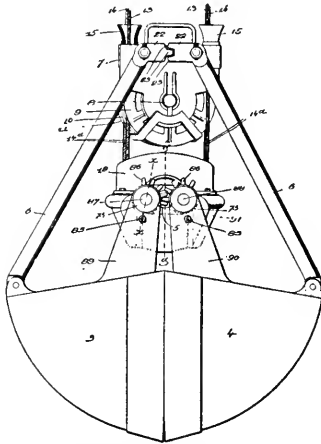
An ozone apparatus comprising two con-



centrically positioned tubes having an annular space therebetween, an electrode positioned within the inner tube, and a second electrode formed of a coil of wire, said coil being wound spirally upon the outer tube.

992,799. **HOISTING BUCKET.** Almon E. Norris, Cambridge, Mass. Serial No. 346,380. Renewed Sept. 29, 1910. Serial No. 581,575.

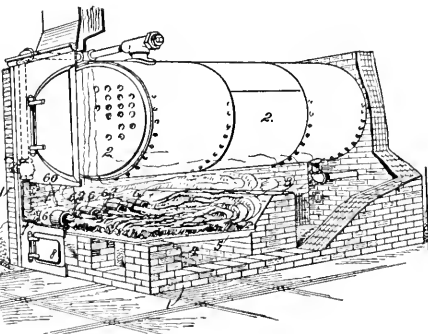
In a bucket, the combination with two bucket segments, of a head to which said



bucket segments are secured, three axially aligned sheaves carried by the head, a holding rope passing around one sheave, and an opening-and-closing rope passing around the other sheaves.

993,148. **SMOKE CONSUMER.** George Bromm, Saginaw, Mich., assignor of one-third to John Dengler and one-third to John L. Schwab, Saginaw, Mich. Serial No. 598,893.

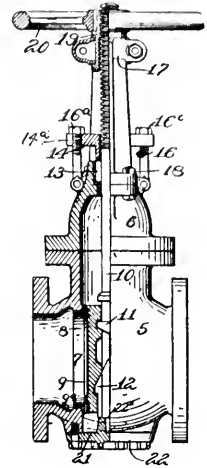
The combination with the furnace, of a smoke consuming attachment comprising a main flue having a series of smoke flues projecting through the side wall of the fur-



nace, said flues being projected at right angles from the main flue, a series of supplemental nozzles that project from the upper edge of the flue and incline downwardly with respect to the smoke flues and blower devices that enter the main flue and eject into the supplemental nozzles thereof.

992,933. **GATE VALVE.** Frederick R. Banks, Paterson, N. J. Serial No. 576,589.

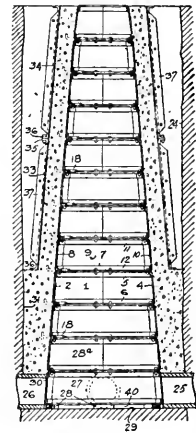
In a gate valve, a casing having valve seats therein, disk valves co-operating with said seats, a rod independent of the valves and having projections thereon engaging with the valves to open and close



them, detachable means for moving the rod, said casing having an opening in its bottom in line with said valves and rod and through which the same may pass, and a removable cover for closing said opening to the casing.

992,782. **FORMING CONCRETE MANHOLES.** Charles S. Lambie, Wilkensburg, Pa. Serial No. 572,026.

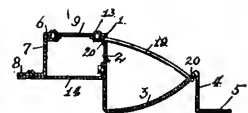
The herein described method of forming concrete manholes, consisting in supporting within the excavation a form composed of downwardly flaring sectional annular shells



by means of a removable support, molding the concrete around the form, removing the support and dropping the lowest sectional annular form into the space so provided, separating it into sections and removing the sections upwardly from the manhole and dropping and removing the other annular shells in the same way.

993,244. **METALLIC CURB AND GUTTER.** George W. Hanbrough, San Francisco, Cal. Serial No. 549,669.

In curb and gutter structures, a metallic plate fashioned to present in cross section a vertical inner wall having an offset top flange, a gutter floor, an outer abutment wall and an outer retaining flange for the adjacent edge of the pavement to rest upon; in combination with a second plate



fashioned to present in cross section a laterally extending base-retaining part, a vertical wall and a top flange; and a top resting upon and removably secured to said top flanges of the vertical walls of the respective plates, and constituting with the first and second mentioned plates a curb.

THE WEEK'S CONTRACT NEWS

Relating to Municipal and Public Work—Street Improvements—Paving, Road Making, Cleaning and Sprinkling—Sewerage, Water Supply and Public Lighting—Fire Equipment and Supplies—Bridges and Concrete Work—Sanitation, Garbage and Waste Disposal—Police, Parks and Miscellaneous—Proposals and Awards.

To be of value this matter must be printed in the number immediately following its receipt, which makes it impossible for us to verify it all. Our sources of information are believed to be reliable, but we cannot guarantee the correctness of all items. Parties in charge of proposed work are requested to send us information concerning it as early as possible; also corrections of any errors discovered.

BIDS ASKED FOR

Table with 5 columns: STATE, CITY, RECEIVED UNTIL, NATURE OF WORK, ADDRESS INQUIRIES TO. Includes sub-section 'STREET IMPROVEMENTS' and lists various projects across multiple states like Ohio, New York, Pennsylvania, etc.

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREET IMPROVEMENTS (Continued)				
New Jersey	Camden	June 14, 11 a.m.	Resurfacing the Camden and Westfield Turnpike, material to be applied by the ton, consisting of about 4,065 tons asphalt concrete, 3,677 tons 1½-in. stone, 3,465 cu. yds. gravel	J. J. Albertson, County Auditor. Win. E. Munchenburg, County Aud.
Indiana	Winamac	June 15, noon	Constructing a highway on line bet. Paluski & Starke Counties.	
Tennessee	Chattanooga	June 15, 1 p.m.	Improving various streets, consisting of about 32,000 sq. yds. paving; 19,000 lin. ft. concrete curb and gutter.	E. D. Bass, Chm. Road Com.
New Jersey	Elizabeth	June 15, 8:30 p.m.	Paving various streets with brick, asphalt and trap rock, setting curbs and gutters.	N. K. Thompson, Street Comr.
Ohio	Cincinnati	June 16, noon	Improving the Loveland and Madeira road; constructing culvert and approaches on Betts ave. in Springfield township.	Stanley Stuble, Pres. Bd. Co. Comrs
New York	White Plains	June 19	Constr. a ten foot center strip of macadam asphalt in portion of Church street.	John J. Brown, Pres. Bd. Trustees.
Tennessee	Springfield	June 20, noon	Grading, ditching and macadamizing about 50 miles of public roads in Robertson County.	Jos. E. Washington, Chm. Bd. Co. C.
SEWERAGE				
New York	Fort Hamilton	June 2, 11 a.m.	Constructing a sanitary sewer.	Constructing Quartermaster.
Ohio	Bellefontaine	June 2	Constr. reduction tank, primary contact beds, outlet drains, etc	Dir. Public Service.
Wisconsin	Richland Center	June 2	Constructing sanitary sewers and appurtenance	W. F. J. Fogo, Chm. Com. Pub. Wks.
New Jersey	Englewood	June 3, 3 p.m.	Constructing a sewage disposal plant complete.	Oliver Drake Smith, Secy. Sew. Com.
Illinois	Ft. Sheridan	June 5, noon	Constr. sewage dis. plant complete, at Fort Sheridan.	Capt. M. E. Saville, Constr. Q.M.
Ohio	Willoughby	June 5	Install a san. sewer with manh., house and lot con. in Euclid st.	C. C. Jenkins, Village Clerk.
South Dakota	Plankington	June 5	Disposing of sewage now emptied into small nearby dry creek.	C. E. Goodlad, City Auditor.
Dist. of Col.	Washington	June 5	Constructing sanitary sewers in various streets.	Cuno H. Randolph, Comr.
Pennsylvania	Chester	June 5, 8 p.m.	Constructing pipe sewers.	Jos. H. Griffith, Boro. Clerk.
New Jersey	Perth Amboy	June 5, 8:30 p.m.	Constr. sewers in Johnstone and Jeffreys sts.	Geo. M. Adair, Street Comr.
Nebraska	Omaha	June 5	Constr. 400 lin. ft. 6-in., 2½ ring brick circular sewer; 1,342 lin. ft. 6-in. reinforced concrete sewer; 16 lin. ft. funnel section; 1,392 lin. ft. 5-ft. 2-in., 2 ring brick circular sewer; 1,227 lin. ft. 3-ft. 4-in., 2 ring brick circular sewer; 556 lin. ft. 3-ft., 2 ring brick circular sewer; 420 lin. ft. 4-ft. 6-in. brick circular sewer; 1,710 lin. ft. 3-ft., 6-in. brick and plain concrete sewer; 510 lin. ft. 5-ft. reinforced concrete sewer; 510 lin. ft. 7-ft. 2½ ring brick circular sewer; 1,220 lin. ft. 5-ft., 2-in., 2-ring brick circular sewer.	Geo. W. Craig, City Engr. Harry B. Salter, City Clerk.
New Jersey	Trenton	June 6, 8 p.m.	Constr. sanitary and storm water sewers in various streets.	
New York	Ossining	June 6, 8 p.m.	Constr. the Kill Brook Trunk Sewer; bulkhead dock and screening chamber at outfall end; also other sewers.	J. M. Terwillinger, Village Clerk. Boro. Council.
Pennsylvania	Bristol	June 7, noon	Constr. complete system of sewerage and disposal plant.	E. H. Christ, Pres. Bd. Pub Wks.
Michigan	Grand Rapids	June 8	Constr. a public sewer to be known as the East Side Trunk Sewer	A. B. Maupin, City Engr.
West Virginia	Huntington	June 10, 1 p.m.	Constructing sewers in various streets, size 12 to 18-in.	Grover E. Yerdon, City Clerk.
New York	Jamestown	June 12, 7:30 p.m.	Constr. about 30,000 lin. ft. vitrified tile sewer 30 and 24-in.	Robert Tait, Treasurer.
Alabama	Montgomery	June 13, noon	Constr. sanitary sewer on Sayre St. and necessary inters. sewer	Boro. Clerk.
Pennsylvania	West Chester	June 14	Constr. of outfall sewers and disposal plants.	Chas. A. Trimmer, City Engr.
South Dakota	Madison	June 20	Installing a sewer. Estimated cost \$65,000.	A. B. Pearsall, Chm. Bd. Pub. Wks.
North Carolina	Red Springs	June 27, 3 p.m.	Constr. a sewer system including 4½ miles of 8 to 15-inch pipe.	City Clerk.
California	San Jose	July 3	Construct septic tank for County hospital.	
WATER SUPPLY				
North Dakota	Mandan	June 2	Improving water works.	Lee Nichols, City Auditor.
Alabama	Ft. Morgan	June 2	Furn. a motor driven deep well pump, elec. trans. line, 4-in. cast iron water main, etc.	Lieut. E. F. Barlow, Con. Q. M.
Missouri	St. Louis	June 2, noon	Furn. detailed drawing, constructing and erecting at Low Service Pumping station two steam, turbine-driven centrifugal pumping units, complete with condensing apparatus.	Board Public Improvements. Henry S. Thompson, Comr. W. Sup.
New York	New York	June 5, 2 p.m.	Furn. pipes, valves and pipe fittings, boiler and pipe covering.	
New York	Yonkers	June 5	Furn. 513 lengths of 30-in. water pipe, 4,700 lbs. to the length, total of 1,205 tons. 32 tons of special castings; 5 24-in. geared gate valves.	James V. Mahoney, Secy. B.C. & S. J. W. Jacobs, City Recorder.
Oregon	Central Point	June 5, 5 p.m.	Extending water mains.	W. R. Salisbury, Village Clerk.
Minnesota	Eden Valley	June 5, 8 p.m.	Constr. about 2,200 ft. of 2-in. water pipe.	H. J. Leland, County Clerk.
California	Los Angeles	June 5	Constr. a one-story brick power house at County Farm.	City Clerk.
Iowa	Leon	June 5	Constructing water works system.	Village Clerk.
Minnesota	Slayton	June 5	Constr. water mains in var. sts., about 3,650 ft.	C. H. Rust, City Engr.
Ontario, Can.	Toronto	June 6	Furnishing vertically driven pumps.	
New York	Schenectady	June 6, 1 p.m.	Installing pneumatic water system complete consisting of one direct electric driven pump, capacity 200 gals, per hour, one electric motor, automatic starting device and pressure regulator and two 1,500 gallon tanks.	John H. Peters, Clerk, Bd. Superv. F. L. Austin, Secy Water & Lt. Com.
Minnesota	Chisholm	June 6, noon	Furn. 57 tons of 4 and 6-in. c. i. water pipe.	
Ohio	Kenton	June 6, noon	Constr. a reinforced concrete reservoir, about 2,000,000 gals. capacity. Also building additions and making alterations to pumping station.	G. S. Binckley, Clk. Bd. Pub. Serv.
Texas	Winters	June 7, 6 p.m.	Furnishing material for construction water works system including engines, pumps, boilers, pipe, valves, hydrants, tank and tower.	Guy T. McDonald, City Secretary. A. H. Crowell, Superintendent.
New Jersey	Perth Amboy	June 7, 8:30 p.m.	Furnishing 4,000 ft. of 6-in. B. & S. water pipe and 6-in. specials	
Pennsylvania	Bristol	June 7	Constr. complete system of w. w. and filtr. plant of 2,000,000 gals. capacity.	Boro. Surveyor. James F. Ewers, Town Clerk. C. T. Church, Superintendent.
Wyoming	Basin	June 7	Constructing water works and electric light plant.	
New York	Geneva	June 8, 7:30 p.m.	Constr. concrete covered reservoir 2 million gallons capacity.	
Michigan	Marquette	June 9	Constr. an extension to the water works intake, consisting of about 2,230 ft. of 36-in. c. i. pipe with all appurtenances, riprap, dredging, etc.	J. P. Kern, Secy. Bd. Fire & W. C. Geo. H. Davis, Town Clerk.
Wyoming	Upton	June 9	Constructing system of water works.	J. D. Hunter, Mayor.
Louisiana	Rayne	June 10	Furnishing 4, 6 and 8-inch cast iron pipe, gate valves, hydrants, etc., 5,000 lbs. of pig lead, and 300 lbs. of tarred hemp.	H. M. Hammond, Chm. Bd. Pub. W.
Indiana	Richmond	June 12, 10 a.m.	Furnishing water to city for period of 25 years.	
North Carolina	Tarboro	June 15, 3 p.m.	Improving water works consisting of 500,000 gallon concrete filter plant 260,000 gallon concrete storage reservoir, auxiliary electric pumping station and 1 mile of 10 inch cast iron pipe.	W. O. Howard, Mayor. Henry L. Heilman, Secy. Bd. W. C.
Indiana	Evansville	June 17, 10 a.m.	Furnishing about 250 tons of c. i. pipe and spec. valves, meters.	
Quebec, Can.	Montreal	June 29, noon	Installing pumping machinery, blower and cranes at filtration plant.	L. N. Senecal, Secy. B.1. Comrs.
BRIDGES				
Kansas	Hutchinson	June 2	Constr. reinforced concrete slab and girder bridge 50 ft. long and 90 ft. wide.	Ed. Metz, City Clerk.
Ohio	Cleveland	June 3, 11 a.m.	Repairing and general bridge work.	John F. Goldenbogen, Clk. Co. Comrs
California	Richwood City	June 5, 10 a.m.	Constr. a concrete arch bridge over Woodruff Creek.	Jos. H. Nash, Clk. Bd. Supervisors.
Kansas	Leavenworth	June 5, noon	Repairing bridge No. 8 over Nine Mile Creek, Delaware twp.	J. A. Hall, County Clerk.
Indiana	Martinsville	June 5	Constr. a concrete bridge to cost \$38,000.	J. S. Whitaker, County Auditor.
Illinois	Pekin	June 5, 1:30 p.m.	Constr. 2 small reinforced concrete bridges in Tremont twp. and Tazewell County.	County Clerk.
Indiana	Greensburg	June 5	Repairing bridges.	Frank E. Ryan, County Auditor.
Indiana	Franklin	June 5, 1 p.m.	Constructing 7 small reinforced concrete bridges.	Wm. B. Jennings, County Auditor.
Indiana	Salem	June 5, 1:30 p.m.	Constr. a concrete bridge at Coivin's Ford in Jackson twp; steel bridge on stone abutments and fills in Brown twp; crossing of concrete at Reymann Ford, Washington twp.	Frank S. Munkelt, Co. Aud. G. B. Huntington, County Aud.
Indiana	Shelbyville	June 6, 10 a.m.	Constructing certain culverts, abutments, etc.	Jesse M. Stone, County Auditor.
Indiana	Rushville	June 6, 2 p.m.	Constructing 6 bridges and repairing others.	

BIDS ASKED FOR

Table with columns: STATE, CITY, RECEIVED UNTIL, NATURE OF WORK, ADDRESS INQUIRIES TO. Includes sections for BRIDGES (Continued), LIGHTING AND POWER, FIRE EQUIPMENT, and MISCELLANEOUS.

STREET IMPROVEMENTS

Bakersfield, Cal.—Council will soon ask bids for paving about 38 city blocks with asphalt and perolithic.
Trinidad, Col.—County Comrs. are receiving bids for constructing 21 miles of highways between Trinidad and Aguilar.
Albany, Ga.—Citizens will vote June 12 on \$100,000 bonds for paving streets in business section.
Tampa, Fla.—Paving of Ruby st. and Nebraska ave. is being considered.
Sylvestor, Ga.—West County Commissioners are considering \$100,000 bond issue for road construction.
Chicago, Ill.—West Park Commissioners have decided to improve side drive in Humboldt Boule. near Logan sq.; cost about \$24,000.
Fort Wayne, Ind.—Engineer Frank M. Randall has submitted tentative estimates of the costs of opening Webster st. under Pennsylvania and Wabash tracks.
Indianapolis, Ind.—Board of Public Works has decided to improve Harmon st., from Henry st. to South st.
Fort Dodge, Ia.—Bids have been rejected for constructing concrete pavement near Reynold's Park; new bids will be asked.
Greensfield, Ia.—Town Council is considering paving of public square and streets leading into square; cost about \$30,000.
Mapleton, Ia.—Council is considering oiling of 15 blocks business district.
Henderson, Ky.—Council has adopted ordinance providing for seven miles of granitoid pavement.
Adams, Mass.—Town is considering paving Commercial st. with brick at a cost of \$45,000.
Detroit, Mich.—Contract will soon be let for resurfacing portion of 2d ave. at cost of \$9,453.
Royal Oak, Mich.—Citizens have voted \$40,000 bonds for macadamizing Woodward ave.

Bozeman, Mont.—Council has decided to pave North Wallace st.
Carthage, Mo.—Council is considering re-grading and oiling of Main st. from 5th st. to Centennial ave.
Atlantic City, N. J.—Preliminary experiments are under way by the Boardwalk Committee of Council to ascertain what material would be most advisable for use in rebuilding Boardwalk; work must be taken up in near future.
Atlantic City, N. J.—Mayor Stoy has signed ordinance to issue \$22,000 bonds for paving Massachusetts and other avenues; also ordinance providing for the paving of Chalfonte ave., Spring lane, Graff lane, Indiana ave. and Canal st. and other avenues.
Jersey City, N. J.—For repaving Tonnele ave. from Broadway to Pavonia ave., Street and Water Board has asked Board of Finance to appropriate \$3,799.70.
Madison, N. J.—Council has decided to widen Main st.
Newburgh, N. Y.—Cost of a bituminous macadam road in Mill st. from Broadway to Bridge st. will be \$10,300, according to estimate prepared by City Engineer Blake; this includes \$675 for engineers' services and other incidentals, and \$9,625 for furnishing and laying material.
Newburgh, N. Y.—Paving anew of Colden and Water sts. between Broadway and South st. has been ordered by Council; estimated cost of the improvement, if streets are paved with new granite blocks, is \$31,600; if streets are paved with vitrified brick, \$28,100; if granite block now there is raised and re-laid, approximately \$21,200.
New York, N. Y.—Board of Estimate is considering bond issues to extend 7th ave. through Varick st. into Hudson; at a cost of \$6,000,000; opening of Irving pl. through to the south through private property to 4th ave. at 12th st. at a cost of \$2,500,000; also \$500,000 appropriation for street paving in Manhattan in addition to \$1,000,000 already appropriated and \$20,000 for asphalt repair plant.

Nyack, N. Y.—Board of Trustees has decided to reject all bids for improvement of North Broadway; new bids will be asked for road composed of one-half tarvia and one-half asphalt.
Schenectady, N. Y.—Board of Contract and Supply will ask for bids for paving Bradley st. with cement concrete.
White Plains, N. Y.—Village Board has decided to spend \$20,000 for permanent improvements to four streets.—John J. Brown, President.
Charlotte, N. C.—Citizens will vote July 4 on \$865,000 bonds for street work and other improvements.
Kings Mountain, N. C.—Kings Mountain Precinct, Cleveland county, has voted \$25,000 bonds for construction of sand-clay roads.
Louisburg, N. C.—Township and Louisburg road committee propose to issue \$20,000 bonds for road construction, work to be in charge of W. S. Falls; material and equipment will be purchased.—Thomas B. Wilder, Secretary.
Niles, O.—Council has decided to pave and curb Vienna ave. and Beaver st.
Baker, Ore.—Mayor C. L. Palmer is investigating paving in other cities.
Junction City, Ore.—Citizens will vote July 3 on \$17,000 bonds to grade and gravel streets.
New Brighton, Pa.—Council has decided to expend \$67,000 on street improvements.
Philadelphia, Pa.—Citizens have voted \$500,000 loan for repaving streets not occupied by car tracks, \$500,000 for improving boulevard from 2d st. to Rhawn st., \$500,000 for opening streets between Richmond st. and Kensington ave., \$300,000 for repaving streets with wood blocks; \$150,000 for grading streets, \$150,000 for improvement of South Broad st. plaza, and \$100,000 for surfacing and resurfacing country roads.
Sharpville, Pa.—Paving of Ridge ave. is being considered.
Chattanooga, Tenn.—Bids will soon be asked by Engineer Betts for paving Main

st. from East End ave. to foot of Mission Bldg.; specifications have been approved by Hamilton County Road Commission.

Liberty, Tex.—Liberty Precinct, Liberty county, has voted \$250,000 bonds for construction of about 30 miles of roadway.

Colfax, Wash.—City is about to let contracts for paving with Blasam or bitulithic, also for small amount of concrete curb and sidewalk. J. H. Miller, City Engineer.

Sultan, Wash.—Bids will soon be received for grading and graveling 1st st. after plans by Coast Engineering Co.

Morgantown, W. Va.—Citizens will vote June 21 on \$100,000 bonds to pave streets and lay sewers.

Superior, Wis.—Board of Public Works has rejected all bids and will readvertise for construction of between three and four miles of cement sidewalks.

CONTRACTS AWARDED

Phoenix, Ariz.—By Board of Supervisors to Good Roads Company for surfacing of the roadway of the bridge, the approaches and stretch of the adjacent road, altogether 6,780 ft.; \$1,600.

Los Angeles, Cal.—Proposed street work to Barber Asphalt Paving Co., \$35,097.07; other bidders: Hansome-Crummey Co., \$37,789.97; Federal Construction Co., \$38,313.79; Clark & Henry Construction Co., \$40,420.54.

Bridgeport, Conn.—To U. S. Wood Preserving Co. for furnishing wood blocks for paving Barnum ave., \$1.84 per sq. yd. with guarantee; laying same, to W. H. Arthur, Stamford, \$1.33 per sq. yd.

Lewiston, Ida.—Excavating 69,500 cu. yds. rolling roadway, 16,300 lin. ft. of field stone gutters, 59,350 lin. ft. of concrete curbs, 1,940 lin. ft. of 8-in. steel or concrete drainage pipe, 108 concrete ends for drainage pipe to Two Miracle Co., Minneapolis, Minn.

Chicago, Ill.—Paving by Board of Improvements: Chestnut pl., Delevan pl., to Walton pl., to Central Paving Co., \$1,362; 172 Washington st., alley, Fullerton Parkway, Arlington pl., to P. J. O'Brien, 145 La Salle st., \$3,192; alley, W. Chicago ave., Superior st., to P. J. O'Brien, \$2,308; alleys, Webster st., Cleveland ave., etc., to Jas. A. Lackley Co., 307 Chamber of Commerce Bldg., \$3,681; alley, Shades pl., Willow st., etc., to P. J. O'Brien, \$4,503; alleys, Schiller st., North Park ave., etc., to John A. McGarry Co., 188 Madison st., \$2,005; alleys, Webster ave., Orchard st., etc., to Pas. A. Sackley Co., \$2,951; alleys, Wilson ave., Leland ave., etc., to P. J. O'Brien, \$2,137; alleys, Bounn ave., Grand Blvd., etc., to Jas. A. Sackley Co., \$4,167; alley, Wisconsin st., Sedgwick st., etc., to Jno. A. McGarry Co., \$2,882; alleys, Garfield ave., Larrabee st., etc., to Jno. A. McGarry Co., \$3,675; E. 42d pl., Drexel Blvd., to I. C. R. R., to American Asphalt Paving Co., 138 Washington st., \$11,717; E. 53d st., Indiana ave. to South Park ave., to American Asphalt Paving Co., \$8,064; Greenwood ave., 55th st. to 56th st., to American Asphalt Paving Co., \$4,544; Hamlin ave., Armitage ave. to McLean ave., to American Asphalt Paving Co., \$2,469; Maplewood ave., Diversey ave. to Elston ave., to American Asphalt Paving Co., \$5,433; Medill ave., Kimball ave., to Central Park ave., to American Asphalt Paving Co., \$3,324; Sacramento ave., 37th pl. to 39th st., to R. F. Conway Co., 138 Washington st., \$7,063; Seminary ave., Maud ave. to Center st., to American Asphalt Paving Co., \$4,455; E. 76th pl., Marquette ave. to Coles ave., to R. F. Conway Co., \$4,190; W. 23d pl., Wentworth ave. to Canal st., to American Asphalt Paving Co., \$13,265; W. 33rd pl., Ashland ave. to Archer ave., to R. F. Conway Co., \$12,239; Wilson ave., Lincoln ave. to N. Western ave., to R. F. Conway Co., \$5,262; 90th Pl. System to Farr Bros. Co., 256 W. 111th st.

Marion, Ind.—To Wm. Yates for paving with brick portion of Garfield st., \$7.50 per lin. ft.

Vincennes, Ind.—By Board of Public Works for improvement of Dubois st., 1st st. to 11th st. to Wm. H. Moore & Son.

Wabash, Ind.—Improving Cass st. to Western Construction Co., Lafayette, \$26,199.93.

Cedar Rapids, Ia.—Paving 16th ave. bridge with crosote block, to Mike Foud, Cedar Rapids, \$2 yd.

Catlettsburg, Ky.—To Daniel Trapp, 725 Mammoth ave., Newport, for construction of approximately 25,000 sq. yds. of block pavement, \$1.69 per sq. yd.; 15,000 lin. ft. of concrete curb and gutter, 50c. per lin. ft.

Boston, Mass.—Paving Geneva ave., from Bowdoin st. to Columbia rd., Dorchester, is to Central Constr. Co., about \$21,000.

Holyoke, Mass.—Building embankment wall in Railroad st., by Board of Public Works, to P. J. Kennedy, Jr., city, \$11,720.

Holyoke, Mass.—Spreading oil over 10 miles of city streets, to American Car Sprinkler Co., Worcester.

Bay City, Mich.—Laying sidewalks on city account, to Ryan & Son in the first district, 10c.; to John Dardas in second district, 9½c., and to William Green in the third district, 9½c.

Duluth, Minn.—To P. McDonnell for paving Grand ave. West between 54th and 59th aves. with vitrified brick, with granite curb and asphalt filler, \$50,500; E. 5th st., between 11th ave. E. and Woodland ave. will be graded and gravelled.

Fulton, Mo.—Paving Court, 5th, Market, E. 5th and W. 7th sts to Jno. Pope, \$35,219.

St. Louis, Mo.—Paving with wood block, Benton st., to Parker Washington Co., 4500 Duncan ave., \$45,948; with bitulithic, 25th st., Granite Bituminous Paving Co., \$31,731; with asphalt, 21st and Howard st., Green and Clay aves., to G. A. Heman, for \$77,141.

Bozeman, Mont.—Building cement pavements during year to S. Birch & Son.

Concord, N. H.—Paving 3½ miles in Hinsdale, to Lane Construction Co., Meriden, Conn.; paving 4,500 ft. in Bethlehem, to Martin & Conelin, Watertown, Mass.

Atlantic City, N. J.—Paving Vermont ave., to United Paving Co., \$109,218; Congress ave., to same company, \$10,311.

Camden, N. J.—To Gibbs & Co., for resurfacing White Horse turnpike between Berlin and Kirkwood, for \$43,302.70, and to J. F. Shanley & Co. for work on other part of pike at \$73,259.35; to the E. E. Humphreys Co., for resurfacing Browning rd. from Merchantville to Marlton ave., Camden, \$9,930.

Haddon Heights, N. J.—Laying of macadam roads in all of principal streets to James McGowan, 65c. per ton.

Kearney, N. J.—Paving Berlin st. to Van Keuren & Son, \$9,457; grading, curbing and flagging Highland and Brighton aves. and building sewer in Brighton ave. to Dennis Dunn, Jr., \$2,103.75, \$2,233 and \$878.

Morristown, N. J.—By Board of Freeholders for repairing and improving county roads: The Budd Lake rd., distance 1,000 ft., to Salmon Bros., \$3,520.08; the Succasunna and Landing rd., distance 1,300 ft., to Ludwig Bott, \$2,000; Kenvil and Mt. Arlington rd., distance of 1,200 ft., to Salmon Bros., \$435; the Kenvil and Mt. Arlington rd., distance 3,300 ft., to Salmon Bros., for \$1,276; Kenvil, Mt. Arlington and Youngs Bridge rd., distance 2,700 ft., to Ludwig Bott, \$3,800; the Chester and Morristown rd., distance 31,000 ft., to Salmon Bros., \$11,573.24; Morristown and Madison rd., distance 11,000 ft., to T. J. Allen, \$21,706.25; James st., Morristown rd., distance 1,500 ft., to W. S. Conover, \$5,550.27; Paterson and Hamburg Turnpike rd., distance 7,000 ft., to Colfax & Steele, \$3,266.90.

Nyack, N. Y.—Building tarvia filled macadam road from New st. to Upper Nyack village line to Jas. Duell, Tarrytown, \$1.21 per sq. yd.; this contract was given up by John M. Rooney.

Richmond Hill, L. I., N. Y.—To Paul Elbner, Sea Breeze Heights, Tottenville, S. I., for laying concrete sidewalks and grading roads for Richmond Hill Investment Company, of Long Island, \$10,000.

Schenectady, N. Y.—Paving River road with sheet asphalt to Schenectady Contracting Co.; same thoroughfare from Mill Lane to city line with macadam pavement to same firm; paving De Graf st. with brick to Thos. R. Crane; portion of Church st. with sheet asphalt to Schenectady Contracting Co.

Syracuse, N. Y.—Grading Oakland ave. to Anthony Sposato, \$811.20; Greenway ave. to same, \$9,692.35; Hawley ave. to Samuel Bonn, \$1,008.

Yonkers, N. Y.—Regulating and grading of Alexander ave. to Jos. Cuzzo, \$1,460.88; other bidders: O'Rourke Construction Co., \$1,813; William J. Watson, \$1,502; McDonald & Murray, \$1,599; Thomas F. Grady, \$1,600; Kelly & Hannifan, \$1,545; N. Mangini, \$1,534; F. Cianfaglione, \$2,000; A. Fisher, \$1,625; Joseph Canepigo, \$1,956; Joseph Cuzzo, \$1,460.88; Coutant ave., from Sterling ave. to Kimball ave., to T. J. Watson, \$5,802; other bidders: O'Rourke Co., \$9,969; McDonald & Murray, \$8,637; Thomas Grady, \$11,750; Kelly & Hannifan, \$10,864; N. Mangini, \$7,950; F. Cianfaglione, \$9,300; A. Fisher, \$10,159; Joseph Canepigo, \$8,810.20; Joseph Cuzzo, \$6,454.55; Glover ave. to same, \$1,845; other bidders: O'Rourke Co., \$3,424; McDonald & Murray, \$3,839; Thomas F. Grady, \$3,200; Kelly & Hannifan, \$2,960; N. Mangini, \$3,500; F. Cianfaglione, \$3,100; Anthony Fischer, \$3,376.25; Joseph Canepigo, Jr., \$3,248.75; Joseph Cuzzo, \$2,198.25.

Chardon, O.—Paving South Pike, 2.04 miles Hamden Township, to Cement Products Co. of Erie, Pa., \$20,385.

Dayton, O.—Paving Huffman ave., Overlook to Mary sts., to J. E. Conley & Co., \$40,483.

Dayton, O.—Macadamizing Cincinnati pike, from Miamisburg to West Carrollton, to Gebhart & Kline, \$10,212.50; Mudlich bridge at Germantown, to E. H. Fauver, \$677.

Elyria, O.—Paving West River st., to Sol. Mendelson, \$14,000.

Montpelier, O.—To H. S. Enck, Lima, O., for paving Empire and Main sts., about \$48,908.

Napoleon, O.—Mess rd., to W. H. Jeakle, Jr., \$13,613; Bevelheim rd., to Rasmus & Clark, \$14,188; Young rd., to George W. Cody, \$8,971; Cavanaugh rd., to J. W. Ritz, \$4,095; Ragan rd., to George Dull, \$6,146; Linthicum rd., to Vajan & Rauch, \$8,205; Gramling rd., to Conway & Harper, \$5,319.

Portsmouth, O.—To Kaps Bros., Portsmouth, improving 8th st., \$15,207; Offener st., \$12,799; to Kelly Bros., Portsmouth, Broadway, \$6,477; Monroe st., \$1,099; Lawson st., \$1,275.—H. F. Thompson, Clerk Department Public Service.

Youngstown, O.—Paving, to Turner & Olsen, Rigby st., \$14,530; to Mullin & Quinn, Rose st., \$4,937; to Kennedy Bros., Plum st., \$10,376; to Charles Harris, Lydia st., \$18,536.

Klamath Falls, Ore.—Paving of 10 blocks of Klamath ave. and eight blocks on eight intersecting cross streets, to Warren Construction Co., \$2.20 per yd. for bitulithic; Clarke Construction Co. bid \$2.27 for asphaltum.

Pittsburg, Pa.—By Mayor W. A. Magee and Director Joseph G. Armstrong, of the Department of Public Works, for improvement of South 18th st. and repaving and improving of a number of other streets; successful bidders were: South 18th st., M. O'Herron & Co., \$88,300; paving Coleman st., R. D. Thomas & Co., \$4,190.13; paving Industry st., Ott Bros., \$9,013.25; paving Ewer alley, J. B. Sheets Co., \$1,378.55; paving Meadow st., Barber Asphalt Paving Co., \$5,880.81; repaving with blockstone, 47th st., H. C. Howard, \$2,774.10; Davison st., H. C. Howard, \$3,344.65; Locust st., H. O'Herron & Co., \$2,355.55; South 19th st., Booth & Flinn, \$2,837.05; Mulberry alley, Evan Jones Co., \$1,069.65; Milbridge st., Ott Bros. Co., \$2,166.40; Penn ave., M. O'Herron & Co., \$12,911.96; Grandview ave., \$2,628.41; 20th st., Evan Jones Co., \$650.70; Gibbon st., M. O'Herron Co., \$1,487.30; repaving with brick, Pleasant Valley, H. C. Howard, \$1,239; Lotus alley, H. C. Howard, \$1,902.80; Tustin st., Tvan Jones Co., \$1,599.60; Fox alley, Thomas Cronin Co., \$3,129.60; repaving with asphalt, Holmes st., Barber Asphalt Paving Co., \$7,699.77; 42d st., Booth & Flinn, \$2,398.45; 5th ave., Booth & Flinn, \$8,437.90; repaving with blockstone and asphalt, Greenfield ave., Booth & Flinn, \$6,395.20; repaving with brick and asphalt, Adelaide st., Booth & Flinn, \$4,243.10; repaving with creosoted wood block, Ohio st., M. O'Herron & Co., \$8,346.25.

Milwaukee, Wis.—Street contracts, bituminous pavement, to Badger Construction Co., Greenfield ave., Clinton st. to 11th ave., \$1.40 sq. yd.; to R. F. Conway Co., North ave., 7th to 26th st., \$1.45, and Greenfield ave., 11th ave. to Layton Blvd., \$1.40 sq. yd.

BIDS RECEIVED

New Orleans, La.—Constructing Colfax-Rochelle rd. in Grant Parish: A. L. Patterson & Co., New Orleans, \$60,833; Francis T. Constant, Alexandria, La., \$56,920.

Atlantic City, N. J.—Paving St. James st.: Atlantic Construction and Supply Co.: brick, 3 in. thick, \$3.45; ½ in. thick, \$3.75; 4 in. thick, \$3.92. Bitulithic, \$2.75 and \$2.10. E. L. Bader: brick, 3 in., \$3.49; 3½ in., \$3.70; 4 in., \$3.90. United Paving Co.: bitulithic, \$2.70 and \$2.00. Both brick and bitulithic for Virginia ave. were as follows: E. L. Bader: brick, \$2.70; no bid on bitulithic. Atlantic Construction & Supply Co.: brick, \$2.65; bitulithic, \$2.75. United Paving Co.: brick, \$2.65; bitulithic, \$2.70.

New York, N. Y.—Constructing the transverse road at E. 170th st., in connection with the Grand Blvd. and Concourse, McHarg Barton Co., 165 Eway, lowest bidder, as follows: 16,300 cu. yds. of earth excav., 70c.; 24,800 cu. yds. rock excav., \$1.32; 4,400 cu. yds. filling and back-filling, 1c.; 50 cu. yds. cinder fill, 60c.; 5 M. ft. lumber, \$40; 480 cu. yds. Class "A" concrete, \$8; 4,000 cu. yds. Class "B" concrete, \$5; 25 cu. yds. cinder concrete, \$5.20; 9,300 sq. ft. waterproofing, 4c.; 250 cu. ft. granite newels, fenders and coping, \$3.50; 820 lin. ft. vitr. stoneware pipe drain, 15 in., \$1.50; 400 lin. ft. vitr. stoneware pipe drain, 12 in., \$1.50; 300 lin. ft. vitr. stoneware pipe drain, 10 in., \$1.50; 46 spurs for house connections, \$1; 12 manholes, \$75; 4 standard receiving basins, \$115; 4 Type "A" inlets, \$45; 2 Type "B" inlets, \$35; 2 Type "C" inlets, \$15; 80 sq. yds. paved gutters, \$2; 300,000 lbs. steel and iron, exclusive of railings, 3.2c.; 1,660 sq. ft. woven wire fabric, 6c.; 180 lin. ft. standard water pipe

2 in., \$2; 135 lin. ft. standard water pipe, 0 in., \$3.50; 2,800 lin. ft. new bluestone curb, \$1; 90 lin. ft. new granite curb, \$1.70; 30 lin. ft. old bluestone curb, 35c.; 20,300 sq. ft. cement flag, 23c.; 200 sq. ft. old bluestone flag, 5c.; 600 sq. ft. new bridge-stone, 85c.; 1,050 sq. ft. old bridge-stone, 6c.; 7,450 sq. yds. asphalt block pavt., 2.20; 1,600 sq. yds. macadam pavt., 80c.; 1 lin. ft. Type "A" railing, \$5; 970 lin. ft. type "B" railing, \$2.50; 100 lin. ft. guard all, 40c.; 18,300 sq. ft. surface treatment of concrete, 4c.; maintenance of traffic and leaning up, lump sum, \$1,000; total, \$111,445; totals of other bids: Leahy Cont. & Constr. Co., \$138,053; McDonald & Barry, 125,300; J. B. Alalatesta, \$130,745; Godwin Constr. Co., \$131,705; T. Crimmins Contr. Co., \$129,298; T. J. & G. L. Brown, \$143,477; J. C. Rodgers, \$130,170; A. J. Schwartzler, \$118,591; Burnside Contr. Co., \$122,985; Rodgers & Haggerty Co., \$122,993; Voorhies, Sullivan Contr. Co., \$118,449; Handy Bros. Contr. Co., \$117,899; following are the totals of the lowest bid on other streets: Paving with asphalt on concrete foundation, Hastings Pavt. Co., 25 broad st., bid for Kingsbridge rd, from erome ave. to Preston st., \$8,708; E. 166th run Webster ave. to Morris ave., \$11,802, and E. 178th st., from Burnside ave. to park ave., \$4,231; for paving with sheet asphalt, Freeman st. from Stebbins ave. to Intervale ave., Asphalt Constr. Co., Madison ave. and 137th st., bid \$7,936; and regulating, grading, flagging, etc., Van Cortandt ave., from Moshulu Parkway to Jerome ave., De Manna & De Paola, \$4,722.

Oklahoma City, Okla.—Paving with asphalt Linwood blvd., (a) from 10th st. and Pennsylvania ave. to 16th st. and Pennsylvania ave., estimated cost, \$140,000; (b) from 16th st. and Pennsylvania ave. to Grand blvd. and Linwood ave., estimated cost, \$60,000; Swatek & Parker, (a) and b) \$2.24 per sq. yd.; Severens Paving Co., a) \$2.15, (b) \$2.17; Western Paving Co., b) \$2.25.

Madison, Wis.—Paving with creosoted block Webster st. and brick on E. Wilson st., Nicholas Quinn, lowest bidder, \$7,956 and \$11,995, respectively; with asphalt on State st., John Blake, \$30,000; with asphalt on Park st., Andrus Asphalt Co., \$10,015; with creosote block E. Johnson st., John Cullinane, at \$16,709.

SEWERAGE

Ozark, Ala.—Citizens have voted \$15,000 bonds to install sewers.

Ansonia, Conn.—Sewer Commission is planning extension of the sewer system through First Ward. Vincent B. Clark, City Engineer, will prepare the plans.

Windsor Locks, Conn.—J. E. Egan & Son have completed plans for construction of proposed sewer system.

Albany, Ga.—Citizens will vote June 12 on \$100,000 bond issue for extension of sewer system, erection of gas plant, paving streets in business section, opening new streets, and enlargement of park and cemetery.

Blackshear, Ga.—Town is considering construction of sewer system.

Ft. Valley, Ga.—Bids will be received June 15 for \$15,000 sewerage, \$5,000 water works and \$20,000 school bonds.

Savannah, Ga.—Extension and improvement of the storm water drainage system is being considered.—John W. Howard, City Engineer.

Sylvester, Ga.—City is considering \$20,000 bond issue for extension of sewer system and water mains.—T. J. Bridges, Mayor.

Unadilla, Ga.—Citizens will vote June 15 on \$15,500 bonds for sewer construction.

Goshen, Ind.—Plans are being prepared and bids will soon be asked for construction of sanitary sewer system beginning in North 5th st.

Valley Junction, Ia.—The Iowa Engineering Co., Clinton, has completed plans for seven miles of sanitary sewer and disposal plant; cost, \$40,000.

Nashville, Mich.—Council has decided to construct sewer in section of village.

Reed City, Mich.—Mayor M. W. Brown has secured Engineer to plan erection of disposal plant.

Albany, N. Y.—Board of Contract and Supply has selected Rudolph Hering, of New York City, as engineer for proposed intercepting sewer.

Newburgh, N. Y.—City Engineer Blake is to prepare plans and specifications for sewer to border and cross Erie property on south and east of Washington Heights.

Schenectady, N. Y.—Bids will be asked by Board of Contract and Supply for building sewers in Baker ave. from Eastern ave. to City line.

Charlotte, N. C.—Citizens will vote July on \$865,000 bonds for sewer work and other improvements.

Clinton, N. C.—Citizens voted \$30,000 sewer and water bonds.

Niles, O.—Council has decided to construct street sewers on portions of four streets.

Reading, O.—Citizens will vote July 30 on \$20,000 sewer bonds.

New Philadelphia, Pa.—Citizens will vote June 5 on \$140,000 bonds for installation of about 12 miles of sanitary and three miles of storm sewers and a disposal plant.—G. E. Arnold, City Engineer.

Philadelphia, Pa.—Citizens have voted \$50,000 loan for reconstruction of Conocksink Creek sewer and \$160,000 for construction of main sewers.

Forney, Tex.—Citizens will vote June 5 on bonds for construction of sewer system.

Colfax, Wash.—City is about to let contract for proposed sewer work, J. H. Miller, City Engineer.

Morgantown, W. Va.—Citizens will vote June 24 on \$100,000 bonds to lay sewers and pave streets.

CONTRACTS AWARDED

Mullan, Ida.—Constructing sewage system to R. M. Bardsen & Co., of Butte, Mont., \$15,714.

Humboldt, Kan.—Furnishing material and constructing a system of sewerage and drainage in Sects. 1 and 2, from plans of J. S. Worley Co., Engrs., Reliance Bldg., Kansas City, Mo., to Launder & Linder, Kansas City, Mo., \$21,410.

East Las Vegas, N. M.—To Thomas McGovern and P. J. Ryan, Pueblo, Col., for construction of sewer system, \$20,663; other bidders: J. A. Pringle, Kansas City, Mo., \$24,347.50; W. F. Dicus, Douglas, Ariz., \$22,800; Rushmore & Gowdley, Hutchinson, Kan., \$23,840; Stokes Construction Co., Oklahoma City, Okla., \$24,952.50; J. C. Huff, Deming, N. M., \$24,200; National Construction Co., McAlester, Okla., \$34,872.50; Foster & Doll, Denver, Col., \$32,261.50; F. J. Gehring, East Las Vegas, N. M., \$29,516; Westcott & Doan Investment Co., Denver, Col., \$32,017; Peter O'Brien Construction Co., Denver, Col., \$25,737.50.

Syracuse, N. Y.—Building Colvin st. trunk sewer extension to Patrick & Kiely, \$51,703.50; building lateral sewers to following: Lancaster ave. sewer, James Swift, \$4,449.50; Livingston ave., James Swift, \$1,223; Sumner ave., Philip Thomas, \$1,294.50; Ackerman ave., Philip Thomas, \$4,066.75; to Jas. Swift for sewer through Dunn and Gore lots, across Hamilton st. and through Schuyler st., \$1,549.80.

Central Point, Ore.—Building sewer system, to Jacobson-Bade Co., 407 Stanton st., Portland, \$64,495.

Centralla, Wash.—Building trunk sewer, to F. A. Kessal, city.

BIDS RECEIVED

San Diego, Cal.—Furnishing f. o. b. San Diego 171,455 ft. 14 to 6-in. vitr. salt glazed sewer pipe and 5,520 yds. different sizes, Pacific Sewer Pipe Co., J. W. Hellman Bldg., Los Angeles, lowest bidder, \$31,542.

Syracuse, N. Y.—Building Colvin st. sewer extension; lowest bid was \$51,703.50, by P. R. Kiely, on specifications for reinforced concrete pipe; for brick, specifications designated as (a), and for concrete, specifications designated as (b). Frank George, Batavia, was lowest bidder, \$54,428.25 on specifications (a) and \$54,748.70 on specifications (b). On specifications (d), calling for concrete block, the lowest bid was submitted by John Davin, Jr., at \$51,888; Albert Gaffey, specifications (a) \$92,595, (b) \$92,295, (c) \$78,965, (d) \$92,595; John Young, (d) \$55,912.50; Samuel Bonn, (a) \$59,758, (d) \$59,019.50, (c) \$60,740.25, (d) \$59,110; Nicholas Marnell (a) \$65,543; Frank George, (a) \$54,128.25, (b) \$54,718.70, (c) \$57,269.45, (d) \$56,457.25; C. T. Hookway, (c) \$74,751; P. R. Kiely (c) \$51,703.50; John Davin, Jr., (c) \$54,888; lateral sewers of the same system were as follows: Lancaster ave. and Pooler st., A. Sperato, \$4,763.20; C. Bonn, \$4,813.75; John Davin, Jr., \$4,968; A. Barr, \$4,605.75; James Swift, \$4,449.50; S. Bonn, \$4,586.25; Philip Thomas, \$4,661.75; C. T. Hookway Construction Co., \$5,243.50; Ackerman ave., John Davin, Jr., \$4,693.50; A. Sperato, \$4,740; C. Bonn, \$4,462; A. Barr, \$4,672; James Swift, \$4,408; Philip Thomas, \$4,066.75; C. T. Hookway Construction Co., \$5,113.50; Sumner ave., C. T. Hookway Construction Co., \$1,579; S. Bonn, \$1,801; A. Sperato, \$1,137.20; C. Bonn, \$1,491; J. Swift, \$1,251; John Davin, Jr., \$1,385; P. Thomas, \$1,291.50; Livingston ave., A. Sperato, \$1,295.30; J. Davin, Jr., \$1,361; S. Bonn, \$1,389.50; C. Bonn, \$1,357; J. Swift, \$1,223; P. Thomas, \$1,233.50; C. T. Hookway Construction Co., \$1,412.50.

Syracuse, N. Y.—Constructing sewer across the Dunn and Gere lots, between Hamilton and Schuyler st., as follows: James Swift, \$1,549.80; Charles Bonn, \$1,918.20; Samuel Bonn, \$3,929.50.

WATER SUPPLY

Hamilton, Ill.—L. P. Wolff, of St. Paul, Minn., is preparing plans for proposed water works.

Peoria, Heights, Ill.—Village is considering bond issue for establishment of water plant; Engineer will be selected to prepare estimates. Jos. Downs is interested.

Clinton, Ind.—City is considering construction of two miles of 4, 6 and 8-in. c.-i. pipe.—Wm. Hamilton, Superintendent of Water Works.

Morocco, Ind.—Council will soon ask for bids for installation of modern water works plant.

Lawrence, Kan.—Lawrence Water Co. is contemplating expenditure of from \$40,000 to \$50,000 this summer in improving and increasing efficiency of system.

Topeka, Kan.—Purchase of 8,000,000-gallon pump is being considered by water works officials.

Baltimore, Md.—New bids will be asked for suction and installation of pump at Mt. Royal pumping station.

La Plata, Md.—G. E. A. Haerley, 511 Equitable Bldg., Baltimore, is preparing survey preparatory to construction of proposed water system.

Boston, Mass.—Council has authorized \$300,000 loan for purchase of equipment for lighting side streets by gas with automatic devices for lighting and extinguishing.

Franklin, Mass.—Town has voted \$50,000 to extend and improve water works.

Biloxi, Miss.—E. C. Castanera, Superintendent of Water Works, has estimated that extension of water works will require 16,000 ft. of 4-in. mains, 45,200 ft. of 6-in. mains, 2,000 ft. of 8-in. mains, 112 new fireplugs, reservoir, two pumps and a fire-house, costing about \$10,000. Citizens will vote June 27 on \$70,000 bond issue.—E. Glennan, Mayor.

Millard, Neb.—Citizens have voted \$10,000 bonds for water works.

Manchester, N. H.—City will install water mains on east and west sides at cost of \$30,000.

Conklingville, N. Y.—State Water Supply Commissioner has made final order approving plan for regulation of flow of upper Hudson River by the construction of a storage reservoir on Secandaga River, near Conklingville, at a cost of \$4,650,000.

Charlotte, N. C.—Citizens will vote July 4 on \$865,000 bonds for water works and other improvements.

Clinton, N. C.—Citizens have voted \$30,000 water and sewer bonds.

Cleveland, O.—Bids will be received about July 1 for construction of proposed water tunnel.

Dayton, O.—Council has voted to acquire land for sinking proposed well and as site for giant underground reservoir, which will be connected with present water-works pumping station by concrete conduit.

East Liverpool, O.—Mayor Samuel Crawford has signed ordinance appropriating \$50,000 for installation of a well system. C. V. Beatty, Director Public Service.

Old Harbor, O.—Installation of \$31,000 water works plant is being considered.

Wanoka, Okla.—Wm. Haviland, Alva, is preparing plans for construction of water works and electric light plant.—C. D. Willard, Town Clerk.

Philadelphia, Pa.—Citizens have voted \$500,000 loan for construction of mill district high-pressure fire main system.

Henry, S. D.—Town is arranging for construction of municipal water system.

Greeneville, Tenn.—Citizens will vote June 5 on \$65,000 bonds for construction of water works and electric light plant.

Haskell, Tex.—Extension of water mains at cost of \$5,000 is being considered.

Nocona, Tex.—City will construct water system at cost of about \$20,000; erect concrete pumping station; steel tower and tank of 50,000 gallons capacity; concrete reservoir, 100,000 gallons capacity. Fountain-Shaw Engineering Co., Dallas, Engineers.—Walter Hodges, Mayor.

Yorktown, Tex.—City will install 6-in. pipe for water mains extension; cost, \$6,000.—L. W. Hoff, Mayor.

Santaquin, Utah.—Town is considering bond issue for establishment of water system.

Point Pleasant, W. Va.—Council of North Point Pleasant has passed ordinance providing for \$6,000 bond issue for construction of water works.

Shinnston, W. Va.—Citizens have voted bonds for improving of water works, sewers and streets.

Montreal, Que., Can.—Plans and specifications have been completed for six-acre final sand filter plant for the Montreal water works; it is expected that specifications will be printed and tenders formally called for by Board of Commissioners, City Hall, during the first few days in June, tenders to be opened about five weeks

later, also that plans and specifications for filtered water reservoir and preliminary filters will be completed during latter part of June, ready for advertising.—Geo. Janin, Chief Engineer, Department of Public Works; Hering & Fuller, New York City, Consulting Engineers.

CONTRACTS AWARDED

Tucson, Ariz.—Building reinforced concrete standpipe, 1,000,000 gals. capacity to the Concrete Constr. Co., of Tucson; the structure is to be 90 ft. high by 45 ft. diam., with dome-shaped roof; the plans were prepared by L. A. Waterbury, Tucson.

Sacramento, Cal.—To Braun, Williams & Russel, Inc., 303 Market st., San Francisco, for erecting steel smoke stack 8 ft. in diameter by 188 ft. high for city.

Pittsfield, Mass.—Laying 10,500 ft. of 18-in. water main from the Farnham dam toward center of city, to Daniel A. Dory, Natick, \$10,018; other bidders: S. Camisia, of West Medford, \$10,474; Crowe & Walsh, of Pittsfield, \$12,456; Spinach Contr. Co., of Waterbury, Conn., \$13,645; Michael Russo, of Boston, \$14,148; Winston & Co., of New York, N. Y., \$16,762; Andrew Cusack, of Boston, \$17,693; Danis O'Riley & Co., of Pittsfield, \$20,723.

Lakewood, O.—Erecting steel water tower to Des Moines Iron & Bridge Co., Pittsburg, Pa., \$13,560.

Sapulpa, Okla.—Building water system to cost \$230,000, to Southwestern Engineering Co., Oklahoma City.

Willamina, Ore.—To Jacobson-Bade Co., Portland, for constructing water works.

Springdale, Pa.—Constructing 33,660 lin. ft. sewers, 35,660 lin. ft. c. i. water lines and a 350,000-gal. capacity reservoir, etc., from plans of Engrs. Douglass & McKnight, 1709 Union Bldg., Pittsburg, to McGlathery & Robb, Philadelphia, \$17,993.

Penticton, B. C.—Water works material: to Crane Co. for 10,000 ft. 12-in. pipe steel, lap welded, at \$1.1969, and 400 ft. 14-in. at \$1.6801, and gates for \$3,719; to Simson, Balkwell & Co., of Vancouver, for hydrants, \$2,668; to Canadian Fairbanks Co. for galvanized pipe, \$1,248, and to Drummond, McCall & Co., Montreal, Que., for steel pipe, \$2,850. F. H. Latimer, Consulting Engr., Penticton, B. C.

LIGHTING AND POWER

Fayetteville, Ark.—Fayetteville Electric Light & Power Co. will enlarge plant and install new machinery, cost \$20,000.

Oneonta, Ala.—D. M. Farson & Co., Chicago, Ill., are considering establishment of electric light plant; cost \$6,000.

San Bernardino, Cal.—The Southern California Gas Co. has petitioned Board of Supervisors for franchise for a period of five years to construct gas mains and laterals on all the roads within county; about \$100,000 will be expended first year.

Wilmington, Del.—Street and Sewer Department is testing street lighting system, whereby arc lights are replaced by numerous incandescent lamps strung along streets.

Wilmington, Del.—Street and Sewer Directors are seeking cost of conduit to carry all wires underground on Market st.

Blackshear, Ga.—Town is considering construction of electric light plant.

Manito, Ill.—Erection of a new power station for municipal electric light plant is being considered.

Terre Haute, Ind.—The Citizens' Heating Co. will soon ask for a heating plant to be located on Tippecanoe st.; also for laying main in Tippecanoe st.

Humboldt, Ia.—Northern Iowa Power Co., Humboldt, has been incorporated to operate light, heat and power plant; capital, \$1,000,000. N. T. Guernsey, F. A. Brown, A. G. Ripley and others, all of Des Moines, incorporators.

Lafayette, La.—Superintendent W. L. Eryls of Electric Light and Water Works has recommended that plant be changed from direct current to alternating system; improvements planned will cost \$40,000.

Boston, Mass.—Council has accepted legislative act authorizing city to borrow \$1,000,000 for installation of high-pressure water system.

Eveleth, Minn.—Bids will be asked for installation of four white way standards on Pierce st.

Rochester, Minn.—Earle D. Jackson, St. Paul, is preparing plans for street lighting system.

Miss Point, Miss.—F. Lynn Brown, Chicago, will at once erect \$150,000 gas plant.

Belton, Mo.—Citizens have voted to construct electric light system.

St. Louis, Mo.—Arcadia County Club will construct a dam and hydro-electric plant; cost \$50,000.—Dixon-Smith Engineering Co., 818-820 Wright Bldg., St. Louis, Mo., Consulting Engrs. Henry C. Muskoff is Landscape Engineer.

Billings, Mont.—Steps toward the erection of an improvement district for decorative lighting purposes have been taken by council.

Albany, N. Y.—Municipal Gas Co. has accepted city lighting contract and proposes to enlarge and improve plant on Trinity Place for generating sufficient electrical power to supply city and commercial supply.

Rockville Centre, L. I. N. Y.—Citizens have voted \$11,000 bonds for addition to the electric light plant. F. G. Hooley, Village Attorney.

Syracuse, N. Y.—Public Service Commission of the Second Department has authorized the Syracuse Lighting Company to issue additional bonds to amount of \$456,000 for general extension and improvement work in both gas and electric service.

Glen Ullin, N. D.—C. E. V. Draper, Mandan, has petitioned Council for franchise to install electric light plant.

Greenspring, O.—D. M. Scott has been granted franchise for 25 years to operate electric light and power plant.

Pleasant City, O.—The Midland Power & Traction Co. will extend lines to Pleasant City in near future.—W. A. Gibbs, Cambridge, General Manager.

Wanoka, Okla.—Wm. Haveland, Alva, is preparing plans for installation of electric light plant.—C. D. Willard, Town Clerk.

Claysville, Pa.—Council has granted franchise to the Claysville Electric Light, Heat & Power Co. A. C. Whitaker, Wheeling, W. Va., and M. G. Hertzog, Claysville, are interested.

Edgefield, S. C.—Citizens have voted \$15,000 bonds to establish electric system.

Faith, S. D.—Mills & Harrington will construct 100-kw. electric light, heat and power plant; cost about \$10,000; steam equipment is needed.—M. E. Brookman, Eagle Butte, S. D., Engineer.

Gallatin, Tenn.—City let no contract May 5 for supplying Corliss engine, two 100-kw., 3-phase engine-type generators, two marble switchboards and two electrically-operated pumps of 500 gals. capacity per minute; specifications will be changed and new bids called for.—L. Anderson, Chairman Water and Light Commission.

Greenville, Tenn.—Citizens will vote June 5 on \$65,000 bonds for construction of electric light plant and water works.

Knox City, Tex.—R. W. Warren and associates have decided to construct electric light plant.

Radford, Va.—Dominion Power Co., Radford, has been chartered by State Corporation Commission to operate water, electric, steam and other power plants.—J. J. Mott, Statesville, N. C., President.

CONTRACTS AWARDED

Jacksonville, Fla.—To the James N. Bruin Company for building certain portions of new electric light power station, which the city is arranging to erect on Talleyrand ave.

Uxbridge, Mass.—Building electric light plant addition for Worcester Suburban Electric Co., to E. W. Ward & Co., Worcester.

Barberton, O.—Council has passed resolution accepting bid of the Sun Vapor Street Light Company, of Canton, for lighting streets of the city for period of three years.

Ogden, Utah.—By Merchants' Light & Power Co., Ogden, which has recently been granted franchise for the lighting and power, and which has also obtained the municipal arc lighting contract to the Falkenau Electrical Construction Co., of Chicago, general contract for the complete installation and construction of system. Work will be undertaken immediately and pushed to rapid completion.—H. A. Strauss, Consulting Engineer. Stock Exchange Bldg., of Chicago, has prepared plans and specifications for system and is now engaged in making the necessary purchases.

FIRE EQUIPMENT

Los Angeles, Cal.—Establishment of fire station in Wilshire District is being urged.

San Francisco, Cal.—Fire Chief Murphy is advocating motor chemical engines and auto for Battalion Chief.

Hartford, Conn.—Fire Board proposes to expend \$65,000 for erection of fire house, \$6,500 for water tower and \$4,000 for rebuilding Truck No. 1.

Boise, Ida.—Citizens will vote on \$35,000 appropriation to purchase 80-ft. hook and ladder truck, 3,000 ft. of hose and 50 fire alarm boxes; also minor equipment.

Fredport, Ill.—Citizens will soon vote on \$15,000 bonds to purchase fire apparatus.

Decatur, Ind.—Business men of city have decided to erect fire house and equip it with combination auto truck, hose cart and chemical engine.

Fort Wayne, Ind.—Board of Public Safety has decided to ask bids for 500 ft. of fire hose.

New Albany, Ind.—Site at Culbertson ave. and Thomas st. has been purchased for erection of reel house for fire department.

Toileston, Ind.—Council is considering erection of fire station on Ridge road.

Lewiston, Me.—Board of Fire Commissioners has recommended purchase of auto fire truck.

Blackstone, Mass.—Fire department has been organized.—John H. Dwyer, Chief.

Holyoke, Mass.—Fire Commissioners have voted to secure a 35-ft. ladder aerial truck at once, appropriation being available.

Lawrence, Mass.—Chief Engineer D. E. Carey has recommended purchase of 3,000 ft. of 2½-in. hose and at least two wagon guns.

New Bedford, Mass.—Board of Fire Engineers has voted unanimously to recommend to Council purchase of automobile for Chief Dahill.

Waltham, Mass.—Board of Aldermen is considering \$2,000 auto wagon for Chief Johnson.

Lansing, Mich.—Fire Chief H. R. Delfs has recommended purchase of 2,000 ft. of hose, 15 fire alarm boxes, 6 circuit repeaters for alarm system, auto truck for use of electrical department, also erection of fire station.

Norway, Mich.—Town is considering purchase of equipment.

Eveleth, Minn.—City is planning to erect two-story \$10,000 fire hall.

Laporte, Minn.—Town is considering purchase of auto fire truck.

St. Joseph, Mo.—Fire Chief P. P. Kane has recommended erection of fire station at 6th and Jule sts., rebuilding of hook and ladder house at 7th and Charles sts., erection of new fire houses at 4th and Sycamore where city has a lot, and one in eastern part of city, somewhere between Faraon st. and Mitchell ave.; better fire protection in South St. Joseph, new, up-to-date aerial water tower, new hose wagon for No. 2 fire house, and placing all wires underground within the first-class fire limits.

Hackensack, N. J.—Mayor Chas. W. Bell has recommended need of auto pumping engine.

Passaic, N. J.—No bids were opened May 19 for furnishing and installing police signalling system, fire-alarm equipment and municipal telephone exchange for city; specifications will be revised and new bids called for. Thos. R. Watson, City Clerk.

Westfield, N. J.—Fire Chief Decker is receiving information concerning auto apparatus.

Yonkers, N. Y.—Council is considering ordinance for purchase of three autos for Fire Chief and his assistants; cost \$1,500 each.

Raleigh, N. C.—National Board of Fire Underwriters has recommended establishment of paid fire department, purchase of additional hose and auto combination engine and hose wagon, also minor equipment.

Hamilton, O.—Council has purchased site on West High st. for erection of central fire station and city hall.

New Carlisle, O.—Town has decided to purchase fire engine.—C. E. Meredith, Chief.

Springfield, O.—Fire Chief S. F. Hunter has recommended purchase of four auto engines.

Baker, Ore.—Mayor C. L. Palmer is investigating merits of auto-fire engine, which city contemplates installing.

Patton, Pa.—Patton Volunteer Fire Co. No. 1 has decided to erect \$6,000 fire hose at Fourth and Magee aves.—F. H. Kinkead, Chairman Plan Committee.

Philadelphia, Pa.—Citizens have voted \$300,000 loan for fire house and police station and \$140,000 for fire and police apparatus and fire boat.

Pittsburg, Pa.—Council is considering purchase of three fire trucks.

Sumter, S. C.—Council has decided to ask for bids for auto fire equipment. Address Chairman Glenn of Fire Department.

Waco, Tex.—Fire Commissioner John F. Wright is securing bids on auto patrol wagon.

Salina, Utah.—Organization of volunteer fire department and purchase of hose cart and ladders are being considered.

CONTRACTS AWARDED

Springfield, Mass.—By Board of Fire Commissioners, to J. G. Roy, for erecting addition to Pine st. engine house, \$23,550.

Paterson, N. J.—Conversion of hose wagons of Engine Companies Nos. 1 and 2 to gasoline-propelled machines, to the William J. Tynan agency, \$6,000 each; contracts for conversion of the steamers of above companies to self-propelled apparatus, to Nott Fire Engine Co., \$6,000 each, supplying self-propelling hook and ladder truck, to William J. Tynan agency, \$5,225.

BIDS RECEIVED

Oakland, Cal.—Furnishing fire engines and other apparatus for the fire department. For three combination chemical and hose wagons: Consolidated Motor Car Co., \$7,750; Olsen & Hunter Auto Co., \$15,000; Cobb Motor Fire Apparatus, Co., \$15,375; Alliance Automobile Co., No. 1, \$14,940; Renesse Automobile Co., No. 2, \$16,440; The Grange Co., \$14,685; Kanawah Chemical Engine Co. (per wagon), \$4,950; for a hose wagon, Joseph Peirotti, \$494.95. Paterson, N. J.—Converting present chemical engine, which is to be stationed at West Paterson, into self-propelling apparatus: James Boyd & Son, 40-h.p. machine, \$2,935; William J. Tynan Agency, Simpson truck, \$3,200; William J. Tynan, 4-h.p. Knox, \$5,000; William J. Tynan, 40-h.p. Knox, \$3,700; Hughes Garage Co., 2-h.p., 32-h.p. Kelly truck, \$3,365. Syracuse, N. Y.—Gamewell Fire Alarm Telegraph Co. submitted lowest bid, \$23,000, for installing central office fire alarm system to the Board of Contract and Supply; only other proposal was by Star Electric Company, \$29,100.

BRIDGES

Tampa, Fla.—Council has adopted resolution instructing Board of Public Works proceed at once with matter of building bridge at Lafayette st., of dimensions adequate to needs of the city at that point. Indianapolis, Ind.—The County Commissioners have appropriated \$3,500 for the construction of bridge over the canal at West ave., and \$5,000 for bridge over the little Eagle Creek at West Washington st. Mishawaka, Ind.—Bridge over St. Joseph river at Logan st. has been assured by county Commissioners. Eldora, Ia.—County Commissioners have decided to construct two new steel bridges with concrete floor, one at Eldora, 400 ft. long, and one at Iowa Falls, 350 ft. long; cost about \$15,000 each.—E. L. Marriage, Eldora, County Auditor. Topeka, Kan.—The City Engineer is drawing up plans and specifications for reconstruction of Fillmore st. bridge. Topeka, Kan.—County Board of Shawnee and Jefferson Counties have decided to erect \$21,000 bridge across Kaw River. Independence, Mo.—Citizens will vote June 13 \$40,000 bonds for bridge and culvert construction. Watertown, N. Y.—Citizens have defeated proposed \$135,000 bond issue for Jackson st. bridge. Toledo, O.—Bids will be received June 1, 1.30 p. m., for \$150,000 bonds for building bascule lift draw for bridge now being constructed.—J. J. Lynch, City Auditor. Philadelphia, Pa.—Citizens have voted \$100,000 loan for construction of bridges. Benton, Tenn.—Folk county has sold \$5,000 bonds for bridge and road construction and erection of two school buildings. Collins, Wis.—Construction of a bridge over Manitowoc River is being considered, cost \$12,000. Milwaukee, Wis.—Council has authorized issue of \$120,000 bridge at Oneida st.

CONTRACTS AWARDED

Louisville, Ky.—By Board of Public Works, for building of Underhill concrete arch bridge at Churchill st., to the National Concrete Co.; other bidders: L. R. Gigg & Co., \$14,147.45; the Henry Bickel Co., \$13,939.08; the L. W. Hancock Co., \$12,936.48, and H. H. Snyder, \$11,815.60. Foxcroft, Me.—Constructing concrete bridge, 120 ft. long, with 94-ft. roadway, to Bearce & Clifford, Lewiston, \$20,926; other bidders were Cyr Bros., Waterville, \$22,593; F. A. Rumery Co., Portland, \$21,246.—W. M. Denman, Engineer. Mechanic Falls, Me.—Building the superstructure of a single-span bridge, 122 ft., with 20 ft. roadway and two 6-ft. walks, to Penn Bridge Co., Beaver Falls, Pa., \$6,047 for wood block floor; company bid \$5,387 on plank floor; other bidders: Boston Bridge Works, \$6,300 plank floor, \$7,387 wood block floor; United Construction Co., \$5,981, \$6,451; Canton Bridge Co., \$5,656, \$6,347.—E. E. Greenwood, Engineer in charge. Barnstable, Mass.—Constructing a reinforced concrete bridge, 289 ft. long and 20 ft. wide, with steel draw span, to George M. Byrne, 79 Milk st., Boston, \$12,750. Missoula, Mont.—Building bridge over Mission Creek to J. F. Harrington, \$1,950. Fargo, N. D.—To Fargo Bridge & Iron Works, for building bridges in Pembina County after plans by Grand Forks County Surveyor, Thos. L. Lawson. Washington, Pa.—Construction of Main st. span over South Main st., to Wm. Acket & Co., \$1,924.95; substructure for McClane bridge on improved road between Washington and Meadowlands, to same, \$1,116.29; superstructure, to the American Bridge Co., \$1,615; the bridge will be of concrete substructure and structural iron superstructure; Applegate bridge over Sugar Run in Independence Township, to W. F. Kline for substructure, \$1,068.18, and to Penn Bridge Co. for superstructure, \$859; concrete arch in Twilight Borough, to Forrest Construction Co., \$464.22. Chattanooga, Tenn.—Rebuilding bridge over Southern Railway tracks on McCollie ave., to Chickamauga Quarry and Construction Co. Richmond, Va.—Constructing 118-ft. concrete bridge with six 16-ft. clear slab spans over Pole Cat Creek in Caroline County, to the Owego Bridge Co., Owego, N. Y. Lewisburg, W. Va.—Constructing two bridges over Meadow River, to Lutin Bridge Co., York, Pa., for reinforced concrete structures, \$7,380 and \$2,316; other bidders on steel structures with concrete floor as follows: Virginia Bridge & Iron Co., \$6,930 \$1,740; York Bridge Co., York, Pa., \$5,800; Owego Bridge Co., Owego, N. Y., \$6,500, \$1,900; Roanoke Co., Roanoke, Va., \$5,700, \$1,257; Farris Co., Pittsburg, Pa., \$5,857, \$1,557.—John E. Dougher, County Road Engineer.

BIDS RECEIVED

Hackensack, N. J.—By the Freeholder Committee: Bridge at Alpine—Ernest Abraham, \$300; Geo. Brewster Co., \$250; Paziniere & Johnson, \$225; Herbert Howland, \$496. Culvert at Palisade Park—John Wehr, Jr., \$390; Herbert Howland, \$468; Ernest Abraham, \$408. Extension to Bridge at Closter—Paziniere & Johnson, \$1,500; George Brewster Co., \$1,550. Dayton, O.—Building Wolf Creek bridge: Al S. Fox, lowest bidder, \$11,886 for construction of bridge as a whole or \$13,600 for construction of bridge with floor of creosoted beech wood block and \$14,000 for creosoted floor of yellow pine; next bidders were Kephart and Kline, with bid of \$13,500 and the Jacob Gabler Sons Co., \$15,155; other bidders were Geo. K. Cetone and Geo. Bair; engineer's estimate for work was \$15,000 and bond issue, \$16,000.

MISCELLANEOUS

Bridgeport, Conn.—Police Board has adopted plans by E. G. Southey for \$26,000 police station in West End. Wilmington, Del.—Police Commissioners are considering installation of auto patrol wagons. Sarasota, Fla.—Plans are being made for securing of a city park. Springfield, Ill.—Citizens have voted \$10,000 bonds for purchase of Alhred Park. Fort Wayne, Ind.—Dr. E. A. Crull, of Health Board, has recommended need of new crematory. Indianapolis, Ind.—Council is considering plans for erection of two buildings, cost \$110,000, at city hospital. Logansport, Ind.—Council has appropriated \$5,000 for auto police patrol. Webster, Mass.—Board of Selectmen will purchase auto police patrol.—Geo. J. Brunell is interested. St. Paul, Minn.—Council has authorized City Engineer Claussen to ask for bids for three high-pressure street flushers and one oil sprinkling wagon. Virginia, Minn.—Park Board is having plans prepared for erection of rest house in park. Biloxi, Miss.—Council is considering plans for public pier, parks and playgrounds and athletic park. Independence, Mo.—Citizens will vote June 13 on \$10,000 bonds for market square. Maryville, Mo.—Citizens will vote June 6 on \$15,000 bonds to erect city hall. Manchester, N. H.—Council has decided to raise \$300,000 by bond issue to erect city hall. Manchester, N. H.—City will erect \$10,000 comfort station under Merrimack Common and \$5,000 addition to city library. Irvington, N. J.—Bids will be received June 5, 8 p. m., for \$10,000 improvement bonds.—M. Stockman, Town Clerk. New York, N. Y.—Board of Estimate and Apportionment has decided to establish Fuel Testing Laboratory; following supplies will be needed: Pulverizing machinery, \$600; repairs and additions, \$400; chemicals and apparatus, \$200; new standard calorimeter, Mahler Atwater, \$800; crusher outfit, \$5,500; oxygen, 135 tanks at \$5, \$685. Syracuse, N. Y.—Board of Contract and Supply has directed Secretary John J. Halloran to advertise for proposals to excavate by steam shovel about 135,000 cu. yds. of earth in Onondaga and Lincoln parks, and for bids for constructing concrete basin for fountain in Forman Park. Yonkers, N. Y.—Council is considering ordinance for purchase of two auto ambulances at cost of \$2,000 each. Michigan City, N. D.—City hall will be erected in near future. Akron, O.—Council has passed ordinance to improve Pleasant Park by building retaining wall on one side of park; cost, \$1,550. Dayton, O.—Landscape Architect Olmstead has completed and turned over to City Park Board plans for extensive park system; work includes appropriation of hundreds of acres of land in and about city, scores of miles of boulevards, reclamation of Pearl st., Tenderloin district and of waste bottom lands; \$500,000 bond issue is asked. Massillon, O.—Safety Director Shepley has asked \$2,500 appropriation for purchase of two street flushing machines. Durant, Okla.—Bryan County is considering bond issue for erection of jail and court house.

Scranton, Pa.—Bids received May 15 for construction of Mulberry st. viaduct.—(A) Fort Pitt Bridge Works, Pittsburg, Pa.; (B) The Jebson-Gifford Co., New York; (C) M. H. Stebbins, Wellsboro, Pa.; (D) Oswego Bridge Co.; (E) W. W. Lindsey & Co., Philadelphia, Pa.; (F) York Bridge Co., York, Pa.; (G) Carlucci Stone Co., Scranton, Pa.; (H) Penn Bridge Co., Beaver Falls, Pa.; (J) The Pennsylvania Steel Co., Steelton, Pa.

Table with 11 columns (A-J) and multiple rows of bid amounts for various construction items like 'Work complete, except piles', '15 piles, 25 ft. long', etc.

Baker, Ore. Mayor C. L. Palmer is investigating street cleaning in other cities.

Doylestown, Pa.—Bucks County Commissioners will erect dykes in Falls Township along banks of Delaware, to prevent destruction of property by overflows of river.

Erie, Pa.—Council has decided to purchase horses and wagon at once to care for garbage until proposed plant can be erected.

Oxford, Pa.—Council is considering election on \$10,000 bonds for improvements.

Philadelphia, Pa.—Citizens have voted \$11,500,000 loan for following improvements: Erection of convention hall, \$1,500,000; purchase of property, improving Delaware and Schuylkill River fronts, \$600,000; improving League Island Park, \$500,000; Fairmount Park, \$400,000; new police stations and fire houses, \$300,000; building for care of feeble minded, \$250,000; building for treatment of contagious diseases, \$150,000; police and fire alarm apparatus and fire boat, \$140,000; soldiers' and sailors' monument, \$100,000; reconstruction of city hall elevators, \$100,000; improvements to Hunting and Pennypack Creek parks, \$100,000, and children's playgrounds, \$100,000.

Sioux Falls, S. D.—Moody County is considering erection of \$75,000 court house.

Dyersburg, Tenn.—Citizens have voted \$30,000 bonds for improvements.

Humboldt, Tenn.—Citizens will vote June 27 on \$15,000 bonds to erect city hall.

Nashville, Tenn.—Council is considering \$3,000 appropriation for purchase of auto patrol wagon and \$2,400 for purchase of auto runabout.

Waco, Tex.—Mayor H. B. Mistrot and Fire Commissioner John F. Wright are securing bids on combined auto patrol wagon and ambulance.

CONTRACTS AWARDED

Hagerstown, Md.—Furnishing 25 waste-paper cans to be placed in different parts of the city to the Hoch Manufacturing Co., \$1.72 each.

Utica, N. Y.—Construction of subway extension to Safety Insulated Wire & Cable Co., 114 Liberty st., N. Y., \$29,906.20; other bidders: J. R. Baxter, Jr., \$33,846.10; Harry W. Roberts & Co., \$36,645.20; N. D. Peters & Co., \$37,296.80; Warner Quinlan Co., Syracuse, \$37,619; T. M. McLeod Co., \$40,131; The Hickey Contracting Co., \$44,917.89; J. R. O'Rourke & Co., \$45,486.

Scranton, Pa.—By Director of Public Works C. V. Terwilliger for building city market to the Hagen Lumber Company, \$1,653 for 32 stalls and \$51 for each additional stall.

Bingham, Utah.—By Town Board to D. H. Clayton, Jr., for erection of jail and to Pauly Jail Co. for steel work; cost about \$3,500.

New York City, lowest bidder, as follows: 3,800 cu. yds. excava., 78c.; 40 cu. yds. class "A" concrete, \$7.90; 810 cu. yds. class "B" concrete, \$6.30; 13,600 sq. yds. cinder and gravel pavt., 28c.; 500 lin. ft. 2-in. gal. w. water pipe, 35c.; 4 street washers, \$5; 40 lin. ft. 12-in. vitr. drain pipe, 88c.; 500 lin. ft. 8-in. vitr. drain pipe, 50c.; 4 brick catch basins, each \$50; 2 drinking fountains, each \$48; 1,480 lin. ft. w. l. picket fence, \$2.50; 635 lin. ft. pipe rail and wire-mesh fence \$2.40; 260 lin. ft. bluestone curb set in concrete, \$1; 1,700 sq. ft. cement sidewalk 15c.; 450 cu. yds. top soil, 50c.; 1,800 sq. f sod, 3c.; total, \$19,465; totals of other bid Geo. P. Driscoll, 548 Union St., Brooklyn \$19,978; Wm. J. Garcey, 544 Bway, L. I. City, \$19,731; Kelly & Kelley, Inc., 12th at L. I. City, \$21,727; Norton & Gorman Conf. Co., 339 Douglass st., Brooklyn, \$23.84; O'Grady Bros., 69 N. 8th st., Brooklyn, \$22,229.

BIDS RECEIVED

Indianapolis, Ind.—Removing garbage for period beginning May 26, 1912: Indianapolis Sanitary Co. asked \$63,000 a year for five years and \$62,000 a year for a 10-year contract; Gemmer & Henry asked \$69,000 a year on 5-year contract and \$64,000 a year on 10-year contract; the Indianapolis Sanitary Co. is the present contractor at \$52,000 a year, having a 5-year contract.

Brooklyn, N. Y.—Constructing Bushwick playgrounds, bounded by Putnam ave. and Woodbine st. extension, between Knickerbocker ave. and Irving ave., Borough of Brooklyn, Cosgrove-Daly Co., 1968 Bway,

Buffalo, N. Y.—Construction of foundation for a Heenan-Froude 40-ton, three grate destructor, a 125-h.p. boiler, fan blower and engine, air duct, flue and opening in stack for the refuse utilization plant at the old Hamburg Canal site at Hamburg and Scott sts., B. I. Crooker Co., lowest bidder, \$3,377.

New York, N. Y.—Furnishing pedestal lampposts on Jay st., from South st.; retaining walls, railing and tablets on Stuyvesant pl.; retaining wall and curb lamp posts on Jay st., South st., Hyatt st., Stuyvesant pl., Central ave., Arietta st. and Griffin st., being part of street improvements authorized for the St. George Ferry approach, Contract No. 6; Vulcan Rail and Construction Co., 172 North 9th st., Brooklyn, \$24,057; Charles Meades & Co., \$33,99; J. L. Mott Iron Works, \$34,410; McNair Barten Co., \$25,700.

TOO LATE FOR CLASSIFICATION

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREET IMPROVEMENTS				
Colorado	Denver	June 3	Paving South Broadway	Board Public Works.
Pennsylvania	Pittsburg	June 3	Paving and re-paving with block stone portions of various streets, and constructing cement sidewalks	Jos. G. Armstrong, Dir. Dept. P. W.
Pennsylvania	Mt. Oliver	June 5, 8:30 p.m.	Grading, curbing and paving portion of Carbon street	Wm. McClurg Donley, Boro. Engr.
Pennsylvania	Etna	June 5, 5 p.m.	Grading and paving Kraus Alley	J. C. Armstrong, Boro. Cler.
Florida	Tampa	June 6 noon	Clearing and grubbing county road from Ballast Point to Catfish Point, 60 ft. wide. Bids to be made per acre	George Fuchs, County Engr.
Pennsylvania	Natrona	June 6	Grading, curbing and paving 7,000 sq. yds.	T. R. Kennedy, Township Engr.
California	Stockton	June 6	Grading and paving about 25,800 lin. ft. Davis & Tele. roads	Eugene D. Graham, Clk. B. Sup.
New York	Great Neck	June 6, 2 p.m.	Grading, and laying concrete sidewalk from station to village	David C. Will, Engr.
New York	Dunkirk	June 6	Grading and paving Leopard St.	R. H. Heppell, City Clerk.
Washington	Pasco	June 6, 8 p.m.	Excavating 6,950 cu. yds.; 78,690 sq. ft. sidewalk; 16,660 lin ft. curb	L. H. Koontz, City Clerk.
Pennsylvania	Sharon	June 6, 5 p.m.	Paving about 4,430 sq. yds.	Briff W. Nicholls, Boro. Engr.
Ohio	Cincinnati	June 9, noon	Improving Springfield Pike	Board County Comrs.
Maryland	Upper Marlboro	June 6	Grading and macadamizing about 1 mile of Queen Chapel Rd.	County Commissioners.
Iowa	Washington	June 7	Paving with brick North Iowa avenue	Carl M. Keck, Chm. Imp. Com.
Washington	Auburn	June 7	Paving with hard surface paving about 16,000 sq. yds.; constr. 30,000 sq. ft. conc. walks and 7,000 conc. ft. curb	Geo. Meade, Town Clerk.
New Jersey	Paterson	June 14, 2 p.m.	Improving Midvale-Greenwood Lake road by macadamizing	Wm. H. Mason, Chm. Road Com.
SEWERAGE				
Washington	South Bend	June 5	Constructing sanitary and storm water sewers. Est. cost \$26,000	Chas. H. Mills, City Clerk.
Pennsylvania	Eddystone	June 5, 8 p.m.	Constructing pipe sewers	Jos. H. Griffith, Boro. Cler.
New York	Brooklyn	June 7	Constr. 12 and 15-in. pipe sewers in portions of various streets	Alfred E. Steers, Boro. Pres.
Utah	Salt Lake	June 9	Constructing pipe sewers in various streets	H. G. McMillan, Chm. Bd. Pub. Wks.
Kentucky	Dawson Springs	June 10 noon	Constr. sanitary and storm water sewers, consisting of about 2,640 ft. 12-in. vitr. pipe sewer; 540 ft. 10-in.; 1,400 ft. 9-in.; 3,400 ft. 8-in., m. h., &c.	C. A. Niles, Mayor.
WATER SUPPLY				
Pennsylvania	Pittsburg	June 3	Installing two 20,000,000 gal. engines; new water ends and steam ends of 2 engines; also 6 water tube boilers in 3 batteries of 2 each; 6 mechanical stokers and appurtenances	Jos. G. Armstrong, Dir. Pub. W. I.
Nebraska	Emerson	June 3	Constr. 4,000 ft. of water mains 4 and 6-in. pipe	Guv Inman, Village Chm.
Montana	Lewiston	June 12	Trench and lay 56,000 ft. of 4 to 12-in. water mains	Phil. A. Chasz, City Clerk.
Massachusetts	Williamsburg	June 15	Constr. a rubble masonry dam, 425 ft. long 40 ft. high with 2 spillways each 60 ft. long	City Clerk.
LIGHTING AND POWER				
Indiana	Brazil	June 6	Lighting streets for period of 5 or 10 days	J. M. Williams, Clk. B. I. Pub. Wks.
MISCELLANEOUS				
Pennsylvania	Etna	June 5, 5 p.m.	Erecting a 70-ft. steel bell tower capable of carrying bell and fixtures 2,500 lbs.; includes removing bell from old to new tower	J. C. Armstrong, Boro. Cler.
Pennsylvania	Scranton	June 7, 10:30 a.m.	Constr. 3 buildings to be used as fire houses	W. G. O'Malley, Dir. Pub. Safety.
Indiana	Indianapolis	June 21	Collecting and disposing of garbage	E. W. A. Ramsay, City Clerk.



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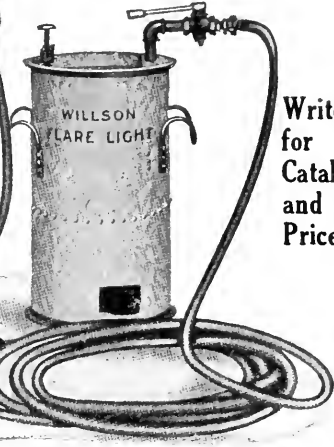
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STREET IMPROVEMENTS

Los Angeles, Cal.—Tentative plan for proposed parkway and boulevard has been prepared by Laurie D. Cox, Landscape Engineer for Park Department.

Evansville, Ind.—County Commissioners have ordered building of First ave. road at cost of \$7,000.

Evansville, Ind.—Board of Public Works has ordered improvement of Blackford ave. between Evans and Kentucky Aves. with asphalt.

Gas City, Ind.—County Commissioners will macadamize west end of Main st. from terminus of brick paving to river bridge.

Leavenworth, Kan.—City Engineer O'Neil has recommended cost of laying brick on Shawnee St. at \$22,472.77.

Colesville, Md.—Colesville District will vote June 10 on \$12,000 bonds to purchase portion of pike lying in district and to improve 1 mi. of Columbia road.

Saginaw, Mich.—Township of Richland has voted \$20,000 for stone road purposes, and township of Maple Grove \$10,000 for same purpose.

St. Paul, Minn.—The Board of Public Works is preparing to let contract for grading Goodrich, Osceola and Fairmount aves. from Hamline ave. to Griggs st., six blocks of grading in all. Excavation will amount to about 26,750 cu. yds. and the fill to 6,474; also 3,389 ft. of surfacing.

Mechanicville, N. Y.—Citizens have voted \$17,000 bonds to pave Saratoga st.

Hastings, Neb.—Council has decided to ask for bids for paving Denver and St. Joe aves. districts, and granted petition for paving Seventh st.

Cincinnati, O.—Board of County Commissioners have passed resolutions to oil Loveland and Madeira roads, Miami ave. and the Springfield pike; total cost, \$3,000.

Hillsboro, Ore.—City Council has adopted ordinances providing for bitulithic pavement on 11 blocks of streets.

Meadville, Pa.—All bids have been rejected and new proposals will be asked for paving Center st.

Woonsocket, R. I.—Macadamizing and widening of Harris ave. is being considered.

Sumter, S. C.—Council has decided to ask for bids for paving of various sorts.

Johnson City, Tenn.—Council has passed ordinance in which is outlined the boundaries of a new paving district; district embraces one and a quarter miles of streets. As soon as contracts can be let work of paving will go forward.

Dayton, Tex.—Precinct has voted \$275,000 bonds for building good roads; Liberty County Commissioners now have \$575,000 available for road work.

Brigham City, Utah.—Box Elder County has voted \$200,000 bonds to build roads and bridges.

Fort Worth, Tex.—City Commissioners have ordered grading and graveling of Ellis ave. and paving portion of East Front st. with vitr. brick.

Monroe, Wash.—Council has decided to pave Main and Lewis sts.

Welland, Ont., Can.—Herbert J. Bowman has recommended construction of 134 mi. of good roads throughout Welland County at cost of \$375,000.

CONTRACTS AWARDED

Long Beach, Cal.—Paving with four inches of crushed rock, Tenth st., from Pine ave. to Main st., Park Circle to Ninth st., and Main st. from Ninth to Tenth, to White & Gaskell, 9 2-3c. per lin. ft. for curbing, and 24c. per sq. ft. for gutter.

Ocean Park, Cal.—Paving all alleys south of Windward ave. with vitr. brick and all alleys north of avenue with asphalt concrete, to Chas. H. Mattier, Los Angeles.

Virginia, Minn.—Laying 21,804 lin. ft. of cement curbing and gutter, to the C. C. Butler Contracting Company, Virginia, \$11,922.20; also seventy-two catch basins, \$900; cement alley crossings, 22½c. sq. ft.; cement sidewalks, 12½c. sq. ft.; excavating below grade, 40c. sq. yd.; refilling below sub-grade, \$1.53 sq. yd.; other bidders were the H. L. Bartlett Company of Virginia and Johnson & Moynihan of Hibbing.

Bordentown, N. J.—Resurfacing Farnsworth ave. to Thos. J. Barrett, city, \$8,188.

Rochester, N. Y.—Goldsmith place, asphalt pavement from Troup to Spring sts., to Whitmore, Rauber & Vicinus, \$2,599; Depew st., asphalt pavement, Rochester, to Vulcanite Pavement Company, \$14,512; Nellis Park, asphalt pavement, to Whitmore, Rauber & Vicinus, \$6,895.25; Kenning alley, asphalt pavement, to Whitmore, Rauber & Vicinus, \$2,984.80; Heberling alley, asphalt pavement, to Whitmore, Rauber & Vicinus, \$1,148; Agnes st., sewer, cement walks and grading, to W. H. Madden, \$3,141.30; C'een st., sewer, walks and grading, W. H. Madden, \$3,177.20; Harvard st., sewer, John Petrossi Company, \$168; Anthony st., cement walks, to Crouch Brothers, \$630; Hoffer st., brick pavement, to

F. C. Lauer & Sons Company, \$4,080.

Cincinnati, O.—To R. E. Cash, to improve Bond road from Montgomery pike to Carriage pike, \$15,500; to E. Robinson, to repair Colerain pike from Mount Airy to Poole road at estimated cost of \$5,893, and for improving Compton road \$1,952; macadamizing Struble road to H. E. Steele, \$4,053.

Youngstown, O.—Bruce st. paving to Turner & Olsen, \$7,219; Grace st., paving, to Miller Brothers, \$2,800.50; Floral avenue sewer, to E. Dioro, \$745.50; Hawthorn, sewer, to E. Dioro, \$543.12; Clifton ave., grading, to Shook & Gray, \$1,832.12; Ayers st., grading, to M. P. Connelly, \$755.

Fort Worth, Tex.—Paving Allen ave., North and other streets, to Texas Bitulithic Co., \$2,034.

Dallas, Tex.—Grading Bishop st., to A. F. Moberly, \$3,551.70; other bidders were: Doty & Conley, \$3,659.48; Rex Tune, \$3,759.75; Cullom & Bavouset, \$3,985.33; M. C. Shipley, \$4,061.53; Will Coats & Co., \$4,515.70.

Tacoma, Wash.—Paving work in Local Improvement District No. 434, to Keasal Construction Co., \$59,471; estimate, \$68,729; grading Madison and Monroe sts., to Galluci & Rose, \$5,973; paving with concrete alley between G and Yakima aves., to Ollar Robinson & Co., \$1,125.

WATER SUPPLY

Laporte, Ind.—City has authorized preparation of plans for auxiliary water plant on shore of Stone Lake.

Sylvan Grove, Kan.—Citizens will vote June 26 on \$35,000 bonds for water works and electric lighting.

Las Cruces, N. M.—Bids will be received by Board of Trustees, July 1, 10 a. m., for \$40,000 bonds for construction of water works.

Price, Utah.—Citizens have voted \$9,000 bonds for extending water system and creating public park.

CONTRACTS AWARDED

Sioux City, Ia.—To U. S. C. I. Iron Pipe & Foundry Co., for 2 cars of 6-ft. pipe and 1 car 10-in., \$24.95 per ton; steel tank and tower, to Kennicott Co., 100,000-gal. cap., \$1,846; gate valve, to Rensselaer Valve Co.; three centrifugal pumps with D. C. motors, to Geo. J. Caldwell & Co., \$4,300; two gas-oil pumps and engines, to Fairbanks, Morse & Co., \$2,730.

New York, N. Y.—Construction of deep-pressure tunnel from Union Sq., Manhattan, to Fort Greene Park in Brooklyn, to the Holbrook, Cabot & Rollins Corporation, \$5,272,475; next lowest bid was that of the United Engineering & Contracting Co., \$5,295,218.50; to Mason, Hanger & Co., for construction of tunnel from Burnside ave., Yonkers, to 99th st. and Central Park West, \$3,709,372; next lowest bidder, Grant Smith, Locker & Co., \$3,775,552.

Cincinnati, O.—Laying water pipe to Mount Washington, to J. M. Quill, \$8,931.

Dallas, Tex.—Sinking three Woodbine wells for city, to Sharp & Company, \$2.50 per ft.

Sherman, Tex.—Sinking two additional wells, to Green Well Co., city.

MISCELLANEOUS

Cambridge, Mass.—Mayor Barry has recommended \$8,000 appropriation for erection of office building and other improvements at Cambridge cemetery.

Saginaw, Mich.—Park Board has decided to ask for new bids for erection of waiting room at entrance to Forest Lawn Cemetery; estimate, \$11,000.

Harrisburg, Pa.—Board of Public Works has selected James H. Fuentes as Consulting Engineer of river front and Paxton creek improvements.—William Jennings, President.

CONTRACTS AWARDED

Haddonfield, N. J.—Removing garbage, to Marmaduke Still, Lawnside.

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PROPOSALS

BRICK AND GRANITE BLOCK PAVING

Portsmouth, N. H.

The Board of Public Works, Portsmouth, N. H., asks proposals for the following brick and granite block paving on a concrete base:

Furnishing and laying about 1,540 lineal feet of straight edgestone;

Furnishing and laying about 510 lineal feet of circular edgestone;

About 7,890 lineal feet existing edgestones to be reset;

About 14,250 square yards to be made in preparing roadway excavations;

About 14,250 square yards concrete base to be furnished and laid;

About 3,200 square yards granite block paving to be furnished and laid;

About 11,050 square yards brick block paving to be furnished and laid.

The proposal, with certified check for \$250.00, is to be left at the office of the Board of Public Works, before 12 o'clock noon, of June 5, 1911.

J. E. PARKER,

Engr. & Supt.

(24-31)

ENGINES, BOILERS, GENERATORS AND SWITCHBOARD EQUIPMENT

Dyersburg, Tenn.

Sealed proposals will be received by the City Water and Light Department, Dyersburg, Tenn., until noon, June 13, 1911, for engines, boilers, generators and switchboard equipment for additions to the electric light plant.

Specifications furnished on application to the department or to M. W. EWELL, Mayor.

City of London, Ontario

Engineering Department

Applications are invited by the City Council for the position of Assistant City Engineer of London. Such applications must be enclosed in plain envelopes and marked "Assistant City Engineer," and filed with the City Clerk not later than five o'clock on Thursday, June 1, 1911. A full statement of qualifications and references must also be enclosed.

S. BAKER,

City Clerk.

(26-31)

CIVIL SERVICE

NEW JERSEY CIVIL SERVICE

COMMISSION

Trenton, N. J.

Examination will be held as follows:

On June 15th—

Traffic Inspector—Public Utility Commission, salary \$1,800 per annum. Open to candidates between the ages of 25 and 40 years.

Inspector of Gas and Gas Meters—Public Utility Commission, salary \$2,500 per annum.

Applications must be filed up to noon, June 12th, 1911.

For particulars address

GARDNER COLBY, Chief Examiner. Civil Service Commission, Trenton, N. J.

Junior Engineer—The United States Civil Service Commission announces an examination June 14 to fill vacancies in the position of junior engineer Water Resources Branch of the Geological Survey. Salaries \$900 to \$1,200, with expenses when on field duty. Form 1312.

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No. 23



HORTENSE PLACE, ST. LOUIS, SHOWING PROVISION FOR INCREASE OF ROADWAY AND SIDEWALK TRAFFIC

STREET STANDARDS AND "ELASTIC" STREETS

Street Planning to Provide for Both Present and Future—Scientific Calculation of Traffic Requirements—
Initial Provision for Widening Roadway and Sidewalk

Papers before National Conference on City Planning by JOHN NOLEN and B. A. HALDEMAN

STANDARDIZED STREET WIDTHS

By JOHN NOLEN

PERMANENT progress in city planning will not result usually from spectacular schemes for the sudden transformation of our cities, nor from revolutionary programs and proposals. Advances will come more often from a patient but open-minded and scientific study of such problems as are represented by the title of this paper, followed by a close co-ordination of one subject with another in a comprehensive plan, thus recognizing the unity of the city and the inter-relation of all its parts.

At the present time an average of 20 to 40 per cent of the total area of cities is devoted to streets, rising in the case of Washington, D. C., to 54 per cent. Therefore, even a slight variation in the width of the streets of a city becomes a mat-

ter of importance, not only in the area of land involved, but also in hindrance to traffic caused by too narrow streets and the enormous sums required for future widening.

Some students of this subject are of the opinion that the existing difficulties connected with street widths are due, in part at least, to the fact that city councils or other municipal authorities have heretofore fixed upon a certain number of feet, usually 40, 50 or 60 feet, as standard widths for all streets. Undoubtedly such action has proved a handicap to many a city. Not standardization itself, however, but the arbitrary and unintelligent character of that standard is the evil, and the remedy is not the abandonment of all standards, but the adoption of more intelligent standards.

It would seem that street widths could be satisfactorily standardized because the facts upon which such widths rest

are capable of definite classification and it is practicable to collect scientific data concerning these facts, and from these data to reason to sound conclusions with a considerable degree of confidence.

The facts which should determine street widths are: (1) The width required for "a line of vehicles," thus fixing roadway units; (2) the width required for "a line of pedestrians," thus fixing sidewalk units; (3) the classification of the streets of a city according to the traffic requirements put upon them, or the other functions that they are to serve; and (4) an estimate of the present and future traffic of the streets of any given class, the width required to meet that traffic, and then the standardization of that width.

(1) It is not yet possible to fix with scientific accuracy the width required for a line of vehicles, partly because the data as to the actual average width of present day vehicles are inadequate, and partly because that width is just now in process of change, due mainly to the increasing size and use of the motor truck. Nevertheless, the conclusions on this point are already fairly definite. One set of investigators holds that 9 feet or thereabouts should be fixed as the width required for a line of vehicles, basing their opinion upon the fact that some motor truck bodies to-day have a width of 8 feet and that the tendency of manufacturers is to increase the width of trucks. The margin for safe clearance, taking into account average skill in driving, would require about another foot for each line of vehicles, making the total width 9 feet. Other investigators find that to-day very few vehicles, even large motor trucks, measure more than $6\frac{1}{2}$ or 7 feet in width, and that conditions of construction or laws are likely to place a limit upon advantageous width close to 7 feet. This view has the support of some of the vehicle companies who hold, in the interest of the manufacturer as well as of the public, that $6\frac{1}{2}$ or, at most, 7 feet should be the maximum width.

As a matter of fact, not only the width of vehicles but also the load is likely to be standardized by law, so that the engineer, landscape architect, or city planner will have a definite maximum figure to work with. These limits may have exceptions, but the exceptions should be discouraged by a vehicle license tax, which would increase very rapidly on vehicles above certain dimensions.

In addition to the space required for vehicles, allowance must be made on many streets for electric cars. Assuming double tracking, which is the most economical method usually, this allowance should be not less than 20 feet.

(2) Various methods have been devised and followed for determining the width of sidewalks. The most customary is to make the sidewalk some fixed proportion of the roadway, in some cases one-half, in others one-third. The latter appears to represent the most frequent practice and has proved fairly satisfactory. This method, however, appears arbitrary and, in some instances, would be unsound, because the use of the sidewalks does not necessarily increase and diminish with the amount of traffic on the roadway. Adopting the plan used for streets and fixing the width for a line of pedestrians at 2 feet, this allows for ten lines of pedestrians on a 20-foot sidewalk. The proper width of sidewalks, the method of determining that width, and a more rigid control of encroachments upon sidewalks, all deserve more attention than they have heretofore received.

(3) The classification of the streets of a city according to the traffic requirements put upon them or the other functions that they are to serve is, of course, one of the fundamental requirements of any attempt to standardize street widths. European countries have made such classifications. The London Traffic Commission made five divisions, as follows:

Main avenues.....	140 feet
First class arterial streets.....	100 feet
Second class streets.....	80 feet
Third class streets.....	60 feet
Fourth class streets.....	40 to 50 feet

No street was to be less than 40 feet. This standard classification, applying to London and its suburbs, is a great advance over the London Building Act of 1894, which put the average width of streets "in the public interest" at 40 feet clear or 20 feet from the centre of the roadway to the nearest external wall; and the Council could not require a greater width than 60 feet.

The standard classification for German cities of the second size, cities like Leipzig and Frankfort, is as follows:

Main thoroughfares.....	85 to 118 feet
Secondary thoroughfares.....	50 to 80 feet
Local streets.....	35 to 47 feet

A Prussian law, in force since 1875, apparently drawn to meet the requirements of Berlin, fixes the following dimensions for the laying out of new streets and for the alteration of old ones:

Main thoroughfares.....	95 feet or over
Secondary thoroughfares.....	65 to 95 feet
Local streets.....	40 to 65 feet

The width of streets in different American cities varies greatly. There are very few that have adopted standards for the classification of streets according to traffic requirements. Probably the best classification is that of Washington, D. C., which is as follows:

Main thoroughfares.....	160 feet
Secondary thoroughfares.....	120 feet
Local streets.....	60 to 90 feet

The German city standards, given above, appear to be more reasonable and logical than those of London or Washington, and there is a distinct advantage in having more or less range within each classification, as against fixing the width hard and fast to a single figure. It ought to be practical to classify most of the streets of a city either as main thoroughfares, secondary thoroughfares, or local streets, and to apply to them one of the standard widths adopted for their respective classifications.

(4) To determine such classification, however, requires an estimate of the recent and future traffic requirements of the streets of any given class. It does not seem wise to begin by fixing the width of a street at, say, 50 or 60 or 100 feet, and then apportioning that width as favorably as may be between roadway and sidewalk. It is better to begin at the other end and try to decide what traffic capacity in roadway and sidewalk the street should provide for, thus determining which class it falls in; and then, applying the unit of measurement adopted for car lines, for vehicles, for pedestrians, for trees, etc., decide upon the required width. For example, here are three illustrations of this method.

- I. An *average main thoroughfare* is to have, say,

A double-track car line.....	20 feet
6 lines of vehicles, 3 on each side of tracks, 8 feet each.....	48 feet
20 lines of pedestrians, 10 lines on each of the two sidewalks, 2 feet each.....	40 feet
Total for an average main thoroughfare.....	108 feet
- II. An *average secondary thoroughfare* is to have, say,

A double-track car line.....	20 feet
4 lines of vehicles, 2 on each side of tracks, 8 feet each.....	32 feet
16 lines of pedestrians, 8 lines on each of the two sidewalks, 2 feet each.....	32 feet
Total for an average secondary thoroughfare.....	84 feet
- III. An *average local street* is to have, say,

Roadway for 3 lines of vehicles, 8 feet each.....	24 feet
12 lines of pedestrians, 6 lines on each of the two sidewalks, 2 feet each.....	24 feet
Total for an average local street.....	48 feet

These are only averages and are given simply as illustrations of the method of standardization proposed and its application. The range of street widths for such a classification might be as follows:

Main thoroughfares.....	from 90 to 180 feet
Secondary thoroughfares.....	from 60 to 90 feet
Local streets.....	from 40 to 60 feet

Such a standardization would naturally differ from city to city as conditions and requirements differed. Its advantages could be twofold; first, in fixing the range of normal street requirements of three or more important classes; secondly, in infinitely and conscientiously trying to determine in advance to which class a particular street belonged. Of course, even with such a classification there would be many exceptions—special streets, having special requirements and, therefore, calling for special provisions. But if no standards whatever are fixed—and this is the important practical point—there is danger that the normal differentiation of the streets of one class from those of another will be constantly overlooked, or that private interests through pressure and influence may succeed in securing action which is in conflict with the public requirements. It was largely to prevent these results that street width standards, in most cases unintelligent and indiscriminating, were adopted by cities in the past. Where no standards whatever have been adopted many illustrations can be found of the abuses that have crept in, particularly the failure to allow sufficient street width for main and secondary thoroughfares.

In the discussion thus far no reference has been made to trees, grass strips or other planting in the streets or of space aside primarily for the adornment of the street or for securing the benefits of light and air and an appearance of spaciousness. Such reference was omitted merely to simplify the subject and bring it within the compass of a brief paper. Of course, trees are desirable not only in residence streets, but also in most business streets. Of the many arguments against the greater use of trees in our business streets, the only sound argument in most instances is that there is no room for them. But as with traffic so with trees. The same method could be applied. If we are to have trees we must determine the width requirements of a line of trees or two lines of trees, or whatever else is needed. Except for temporary effects, it is not good policy to plant trees in a space that is needed for roadway or sidewalks; nor is it good policy to plant one or more lines of trees in a space that is inadequate for their successful growth. If, for instance, it is decided that a street is the minimum space in which a line of trees of a given species can flourish, then we should standardize that width for that species of tree and provide it. Exceptions there would undoubtedly be to standards for trees as for roadways and sidewalks, but they would be recognized as exceptions and justified because of exceptional conditions.

The traffic and use of many city streets increase from year to year, tending to shift some streets from one classification to another. How to provide a method of meeting this increase is a difficult question to answer. The utmost foresight must be exercised and then adjustments and widenings made to meet new conditions. The problem is how, by the exercise of skill and foresight, to design and arrange streets to fulfill their functions and then from time to time how to re-design and re-arrange them to meet new requirements. In the case of streets where increased traffic is expected, the most practical method of providing for it, perhaps, would be to reserve the extra space between the roadway and sidewalk, or in the center of the roadway, or between the sidewalk and the buildings, utilizing this space temporarily as an area planted with trees and shrubs or merely with grass.

The evils that might follow from the adoption of an indiscriminating set of standards or from an unintelligent application of a discriminating set, have not been overlooked. They might be serious. But it is my opinion that under our present organization such evils would ordinarily be less than

those that almost inevitably follow from a lack of any established standards and from the policy of determining street widths piecemeal as each is presented for decision.

STREET WIDTHS AND SUB-DIVISIONS

Standards of Widths Universal—Change of Desirable Widths with Traffic Development—"Elastic" Streets Provide for This

By B. ANTRIM HALDEMAN, Ass't. Engineer, Bureau of Surveys, Philadelphia

It is generally agreed that the healthy, progressive development of a city depends primarily upon the opportunities offered by the street system for unlimited and untrammelled circulation, and the experience of all large industrial cities has been that the demand for better and greater facilities for such circulation is increasing more rapidly than means for supplying it can be found; therefore, the wise determination of street widths is one of the most important of the practical and economic problems of city planning and should be subjected to a much closer study than has heretofore been the practice of town planners.

The failure of streets in the busiest sections of large industrial cities to provide adequate facilities for general circulation, and the wastefulness of unused street areas in other sections of the same communities, are too well known to need any lengthy comment. Although much of the annoyance, waste of time and energy, and pecuniary loss due to congestion of traffic and lack of rapid transit on the one hand, and the uselessness, extravagance and unloveliness of barren areas on the other, may be traced to unwise street planning, it is doubtful whether any amount of human skill, wisdom and foresight can entirely eliminate the danger of the recurrence of these unfortunate conditions. The future requirement of a street is a dark mystery which only time will fully reveal; replanning and rebuilding will probably always remain municipal liabilities; but although our prevision may not be sufficiently unerring to enable us to fully anticipate the future the knowledge gained by unfortunate experience should make us more cautious and painstaking in our study of the problem and should enable us to plan streets which will not be entirely wasteful and ugly during the period when their ultimate destiny is uncertain and yet will have a reasonable prospect of successfully meeting every demand of the years to come.

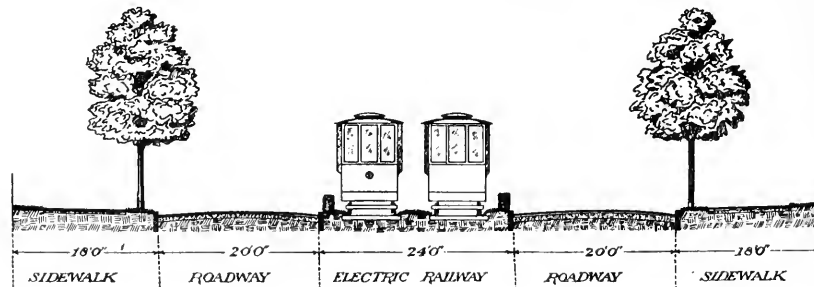
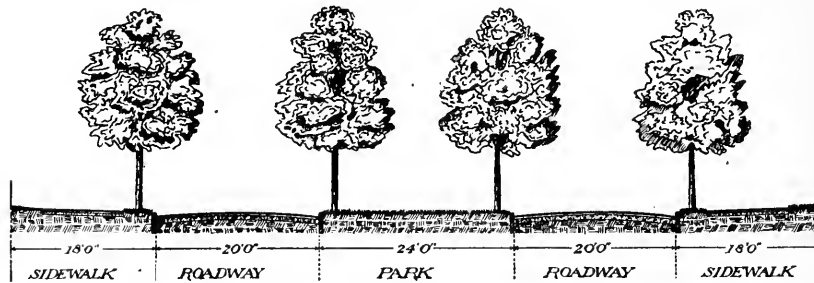
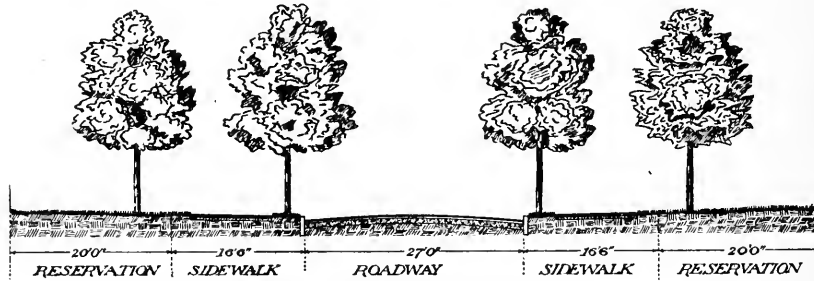
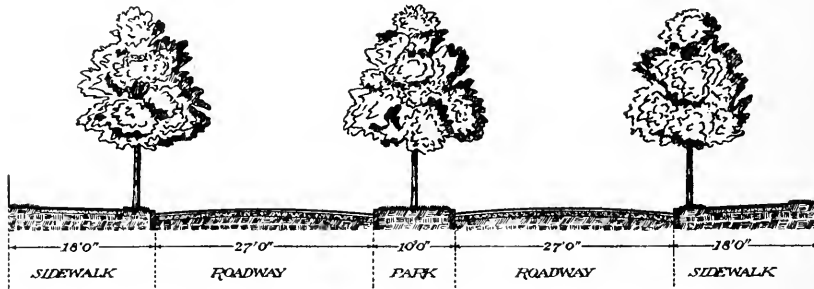
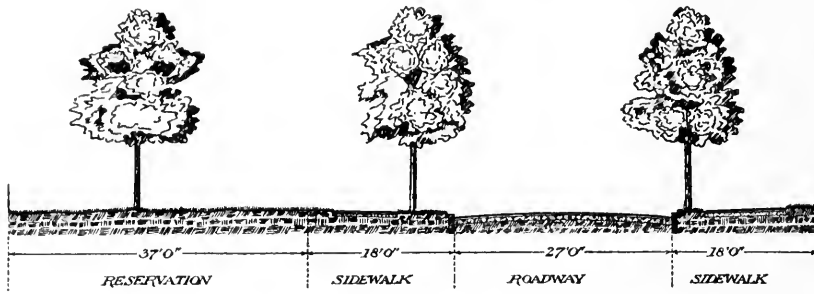
That "there is nothing new under the sun" is as true of street planning as of other things. The street planner has the physical example of every width and form of development to choose from, from the narrow unloveliness of the back alley to the splendid breadth of the Avenue du Bois de Boulogne; whether standards be established or not, his judgment, wisdom and skill will be the true measure of his success in the final analysis of the problem, and it is much more necessary that complete power over the establishment and maintenance of streets be vested in able and responsible hands than that their widths should be either standardized or de-standardized.

There seems to be an abundance of reasonable argument both for and against the standardization of street widths and



WASHINGTON TERRACE, ST. LOUIS
Room for roadway expansion

SUGGESTED CROSS SECTIONS~ONE HUNDRED FOOT STREET.



CITY OF PHILADELPHIA
BUREAU OF SURVEYS
GENERAL PLANS DIVISION
JANUARY 1911

J.M. RITCHIE

CROSS-SECTIONS OF STREETS, ARRANGED FOR VARIOUS REQUIREMENTS.
Suggested by B. A. Haldeman, Asst. Engineer, Bureau of Surveys, Philadelphia.

There is no doubt that our street planning methods can and should be improved, but until there shall be a larger consideration for the general public welfare in methods of land development and a strong central authority which can effectively control such development we cannot hope to be very successful in reducing street planning to an economic or scientific basis. The most successful experiments which have been carried out under modern economic theories of town planning have been where the proprietors of large tracts of land, or municipal governments such as exist in some of the cities of Europe, have been able to absolutely control the character of the improvement and the number and kind of buildings to be erected; such control does not obtain in American cities and cannot obtain without the enactment of restraining laws which would be violently opposed by property owners as restricting their right to do as they please with their property; we will, of course, have such laws in time, but the time is not yet, and until we have them our safest course of procedure is our present practice, exercised with a greater degree of judgment, discretion and firmness.

If there has been one influence more potent than any other in the establishment of street widths in American cities it has been the influence of standards, unconscious and unintentional, perhaps, and the result of long established custom, but yet standards. Most of our cities have a comparatively limited variety of street widths, or standards. Eastern cities, as a rule, have a greater variety than western ones, and where their use has been found to be economical and generally satisfactory in practice, standardization is a success, elsewhere it is a failure. That it is at least a partial failure in most cases seems evident in the fact that this Conference is treating it as a serious problem, but its failure may be due to the unwise distribution of the various widths.

If we eliminate streets less than 40 feet in width, which are no longer permissible here, Philadelphia has been a standardized city since its foundation. William Penn's standard was 60 feet, but he laid out one street of each of the widths of 60, 100, and 113 feet. For a longer time than the oldest resident can remember new streets have been 40, 50, 60, 70, 80, 100 and 120 feet in width, the two latter widths being exceptional and applied to few streets, while 50 and 60 feet have been the widths most frequently used. These widths have not been established by any law but have resulted from long established custom; they are standards, and if applied with proper judgment and discretion should give as good results as any scheme of standardization.

The suggestion has been made that streets might be classified and standardized as follows:

Main thoroughfares	from 90 to 150 feet
Secondary thoroughfares	from 60 to 90 feet
Local streets.....	from 40 to 60 feet

But this offers such a wide latitude of choice that it seems to lean very far toward de-standardization, since any width from 40 to 150 feet is allowable. The so-called German standards are subject to the same objection, while those of Washington and those recommended by the London Traffic Commission, although they establish definite widths, ignore many widths which seem both desirable and economical.

It is extremely doubtful whether any sharply discriminating scheme of classification or standardization would be permanently beneficial or economical even if firmly established by law or practice. A street system designed to efficiently fulfill all its functions during a long period of usefulness must be planned far in advance of improvements; and, in the absence of any power to control such improvements, the planner cannot predetermine their class or character in any given locality. The development of a new town or a new suburb always begins with the erection of dwellings, whether the streets be wide or narrow and whether planned to be industrial or residential. After the community has attained a substantial growth gradual changes come through natural causes; the residential street may become a business street; the first-class

business street may lose its importance as trade drifts to a more popular locality. This has been the experience of Philadelphia, and probably of every large city. The width of the street has little influence in determining the character of the improvement on abutting property, or even on the flow of traffic. Although Market street is 100 feet wide, Chestnut street, 50 feet wide and one square south, was for many years a much more important business and traffic street and only its congestion has forced trade and traffic from it into Market street. The section that held the homes of the best families a hundred years ago is now occupied largely by the foreign element and part of it has become slums; the best families have moved westward, beyond Broad street, and they are now being driven out of that section by the resistless tide of trade. Although Washington street, Boston, is very narrow its great importance as a business and traffic street is undeniable.

Mr. Robinson strikes the keynote of the objection to standardization when he says that "it results in misfits and means extravagance and maladjustment," (See Municipal Journal, page 745, May 24, 1911), but until we have a thoroughly efficient system of control over the sub-division and use of land we must continue to take chances of these misfits and extravagances or we will gravitate to an even worse condition, as intimated by Mr. Nolen (see p. 805 of this issue), when he says that "if no standards are fixed there is a danger of private interests, through pressure and influence, succeeding in securing action which is in conflict with public requirement." This pressure of private interests with sufficient influence to obtain special privileges would become a serious menace wherever any abrupt change from long established practice was attempted. In such a city as Philadelphia, where the only limit to the number of houses which may be placed upon an acre is that each shall have at least 14 feet frontage and 144 square feet of open space, or yard area, attached, the abandonment of standards would have none but disastrous results. Only a few years ago a real estate operator asked that a certain unopened street be reduced from the planned width of 80 feet to 60 feet, arguing that it was a suburban, residential street so far from the center of the city that the greater width would never be required; the request was very properly refused, but it is probable that only the fact that it was upon the confirmed city plan of a standard width common in that section saved it from being narrowed; to-day it is one of the finest, most important, and most heavily traveled streets in that section of the city. This is not an isolated case and results have not always been so happy; streets which have been upon the city plan, but not open, have frequently been narrowed or otherwise changed under the pressure of real estate influences to the very great disadvantage of adjacent property in the subsequent development.

Taking the position that the adoption of arbitrarily fixed standards of width offers little, if any, economy over present general practice, and that de-standardization is not safe where the planning is subject to selfish political or private influence, there yet remain two methods, or, rather, a combination of two methods, which seems to be both practical and economical in its initial application and ultimate results; one is the standardization of units for determining the widths of streets and the other is the "elastic" street.

The standardization of the units upon which the widths of streets may be based appears to be an entirely logical proposition; if definitely established it could not fail to result in large economy; its ultimate efficiency, used in connection with the "elastic" street, would, of course, involve wisdom, skill, and foresight in the planner, and to obtain permanently beneficial results its application must eliminate some of the moments of "inertia" and require much of the "thinking and surveying" so darkly hinted at by Mr. Robinson. The units of measurement suggested by Mr. Nolen are probably ample to satisfy present conditions, but restrictive legislation might be necessary to prevent a future increase in the width of vehicles. As there is no likelihood of any early legislation of that kind it might be wise to adopt 9 feet rather than 8 feet for that unit. The 2-foot unit

for determining the width of sidewalks might not be sufficient for fat men, baby coaches, push carts or wheelbarrows, but they may safely be classed as allowable exceptions.

If the "street beautiful" is to be a factor in the problem, a unit width for planting spaces must be provided. Grass plats in streets seem to thrive only under German municipal regulations or in cities where the property owners have a superabundance of civic pride; even in Paris, world-famed for its beauty, the streets contain no grass plats. Much of the beauty of the old-world cities is due to the scientific planting and care of street trees and if our streets are to achieve the full measure of attractiveness we wish for them we must look hopefully forward to a time when trees and other plants will be properly cared for under municipal authority. To this end there should be a planting space unit of 4 feet for narrow streets and 8 feet for wide ones. These units would fit naturally into the unit schemes for sidewalk or cartway in the event of the abandonment of the planting.

The "elastic" street offers an opportunity for obtaining all the advantages of wide streets with little of their extravagance or wastefulness during the years they are growing to their greatest usefulness; it contemplates a gradual development through various forms from the time it is opened, perhaps as a minor residential street, until the time it may become a great business or traffic highway. It involves in its origin one of two conditions: Opening to the full ultimate width intended for it, or the restriction of building lines to such a distance from the center line as will keep the maximum width presumed to be needed for future use clear of permanent obstructions. The opening to full width may be the most economical in the long run and would be feasible where it might be difficult to obtain a law requiring the observance of re-

strictions. In either case the first form of improvement might be a roadway only wide enough for two vehicles to pass, with narrow footwalks and with grass plats and rows of trees occupying the remaining width, the trees being planted in such locations that they would not be disturbed during subsequent changes. Where restrictions can be effectively applied the original opening need not be more than is necessary for two vehicles to pass, with allowance for pedestrians on either side, say, 16 feet for roadway and 6 feet for each sidewalk; these widths would be governed by the probable use and requirement of the street in the near future.

The adoption of a method whereby fixed units may be used for determining the widths of elastic sub-divisions is suggested as a compromise between the advocates and opponents of standardization. This would provide for a minimum width of the sub-divisions as the first form of development for a minor residential street with the possibility of a future widening to the maximum, if necessary, without great cost, and with the certainty of having an attractive street if it never gets beyond the residential state. This method could be applied to the development of any street, no matter what its width or how established; its adoption would lead naturally and directly, in time, to a logical standardization involving comparatively few widths, possibly not more than four, and those would approximate certain standards now in use in almost every city; its practical efficiency and economy, like that of any other method, would depend upon the wisdom and skill with which it is applied. It involves the accuracy of human judgment, which may be prone to err; but any scheme of planning is subject to the same limitations, for it does not seem possible to lay down any hard and fast rule for obtaining ideal results in the planning of city streets.

CONCRETE METHODS IN ROCHESTER

Retempering Concrete an Advantage, for Certain Purposes at Least—Experiments Showing Strength Increased by Retempering, and Deformation Decreased—Use of Clay for Expansion Joints

AS STATED in our issue of May 31 there has been introduced into the use of concrete by the city of Rochester an idea which will probably seem as revolutionary to engineers as did the change a few years ago from dry to wet mixtures. It has been the common practice to not only specify but stringently enforce that no concrete shall be used which has once taken an initial set and been retempered. The latest Rochester specifications require the use of retempered concrete for binding new concrete to that which has already set, and there is even a possibility that this use may be extended. Assistant City Engineer John F. Skinner two years ago conducted some experiments to determine the effect of concrete on retempering, and, in brief, interpreted the experiments as indicating that retempered concrete was even stronger than that which had not been retempered, providing the retempering be done before final set had begun; also that the retempered concrete did not undergo nearly as great variations in temperature and in volume as did that which had not been retempered.

Experiments to determine the former point were made as follows: Sufficient material for twenty briquettes was mixed up of American Alsen cement, and four briquette molds were at once filled with the mixture. At the end of one hour sufficient material for four briquettes was retempered and the briquettes made with this. Similarly at the end of two hours, three hours and four hours a sufficient amount of the concrete was retempered for making four briquettes. These were tested at the end of seven days, and in each case the result of all four briquettes showed the same kind of result, although, of course, varying in amount. Those which were made of concrete retempered after one hour developed a greater strength than those made of un-tempered concrete; those retempered at two hours showed still greater strength, and those retempered at three hours were the strongest of all.

Those made at the end of four hours showed less strength than those made from the original concrete. The final set of the concrete was found to take place in about 3½ hours. From these tests it appears that if concrete be retempered at any time before final set begins the strength of the concrete is even greater than of that which has not been retempered.

To determine effect of setting upon temperature and change in volume a special appliance was made which consisted of a tin trough or rectangular pan 18 inches long, 4 inches wide and one inch deep. One and one-half inches from each end there was placed in the center of the pan a hole in the bottom ⅜ inch in diameter. Through each of these holes was passed a ¼-inch steel rod which extended 3 inches below the pan, where the end was fixed, and 9 inches above the pan, where the end was free to move and sharpened to a point. At the elevation of the upper ends of these rods a boxwood scale was fastened in horizontal position in such a way that it could be moved a short distance horizontally in order to set one of the rod points at zero. Fitting loosely over each rod was a short tube or thimble of steel which was placed in the concrete with its top extending slightly above the level of the top edge of the pan. In the bottom of the pan was placed a piece of paraffine paper, on this a layer of fine sand smoothed off to a uniform surface, followed by another piece of paraffine paper. This was to permit deformation of the concrete unhindered by its adhering to the bottom of the pan. The pan was then filled with concrete, in the body of which was inserted the bulb of a thermometer which had been wrapped in cotton and waxed paper to protect it. As soon as the concrete was in place the scale was set so that one rod read at zero and the reading of the other taken. This reading was approximately 15 inches. The temperature of the thermometer also was read. After this readings were taken at 10-minute intervals for one hour, and

at 15-minute intervals for four hours more. As the concrete slab was 3 inches above the bottom or fixed end of a rod, and the rod was 12 inches long, any variation in distance between the rods at the concrete was shown increased four times on the boxwood scale. The distance between the rods at the concrete was 15 inches; consequently, the variation in the distance between the rods on the scale showed the change in length of a slab 5 feet long.

This apparatus was used for making a number of tests on neat cement both fresh and retempered, and three to one mortar both fresh and retempered.

In the case of slabs of neat cement the temperature rose in every case during the first 10 to 25 minutes, the total rise during this period being in most cases from 2½ to 5 degrees, although in two cases this was about 6½ degrees. The temperature then fell slowly for from 2½ to 5 hours, reaching from one to 3 degrees below the original temperature, after which it rose again. When the neat cement was retempered before being placed in the pan, the temperature rose more slowly, reaching not more than one degree in the first 20 minutes. In two cases out of five it then fell slowly to several degrees below the starting point; while in the other three cases it continued to rise more slowly than at first for two or three hours, when it again began to fall; the maximum temperature reached being 2¼, 4½ and 7½ degrees respectively.

Where the slabs were made of a 3:1 mixture of sand and cement the temperature, when not retempered, rose slowly for 15 to 30 minutes, but only about ¼ or 1/10 as high as with the neat cement. The mortar which had been retempered showed a fall in temperature for the first two or three hours, after which there was, in most cases, a slight rise. No explanation of this was offered by Mr. Skinner, but it occurs to us that this change in temperature was probably about that which would have occurred with a mortar which had not been retempered, beginning an hour or two after the first mixing; in other words, that the change in temperature continued practically uninterrupted by the retempering.

The change of volume of cement while setting is probably due in part at least to the change in temperature. In the case of the neat cement we find a more or less rapid deformation continuing for from 15 minutes to one hour, after which the deformation was much slower up to about 2½ to 3½ hours, at which time there was a longer or shorter period of decreased rate of deformation. The interval first mentioned was probably that of initial set; that last mentioned, the time of permanent set. In the case of the neat cement retempered, the deformation seemed to continue for a longer time, and to be more irregular.

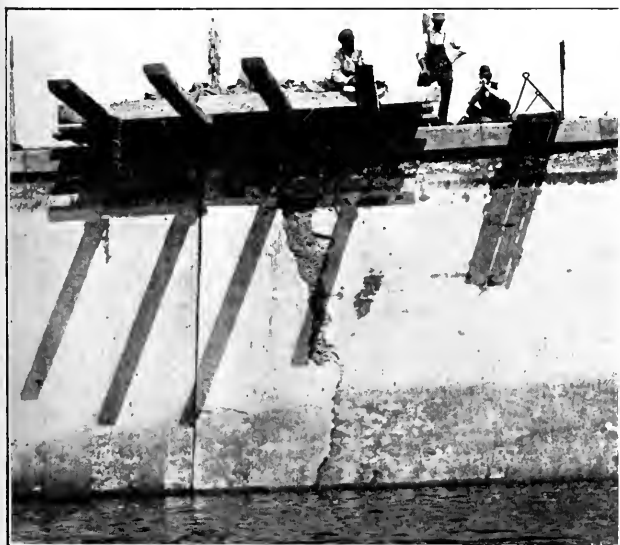
In the case of 3:1 mortar, that retempered showed a more

gradual deformation than the neat, the rate remaining nearly uniform for from 2½ to 3½ hours, at which time it ceased to increase and began decreasing in some cases, in others the volume remained constant after about 3½ hours. In the case of retempered mortar the increase in volume was not so great as with the neat, and after this had reached its maximum it did not appear to be followed by a contraction.

A practical use of retempered concrete was made by the Rochester Engineering Department in connection with the Cobb's Hill reservoir, in which about half an acre of concrete lining of the bottom proved to be somewhat defective on the surface, and this was removed and a patch of retempered concrete applied in place of it. This patch appears to have retained a firm bond on the concrete beneath, although it has been in place for several months. Retempered concrete was also used to patch the wall of the same reservoir at a point where the surface had been broken off in making the expansion joint. This patch also, although it has been on for a year or two, appears to have adhered firmly throughout.

In the Cobb's Hill reservoir just referred to a method was employed for making water-tight expansion joints, of which there were about 180 in the wall. The wall was constructed of blocks 20 feet high, 20 feet long and 14½ feet thick at the base. A tongue and groove joint between the blocks was formed by setting a narrow plank in the faces of the blocks first cast (alternate blocks were first cast and then the spaces between them filled), the object of these being to hold the blocks in line, but reliance as not placed upon them for water tightness. To effect the latter, a key-way was formed consisting of a channel 8 inches square set diamond-wise one foot from the face of the wall, one-half of the diamond in one block and one-half in the other. After the concrete had set, this key-way was filled with clay and sand thoroughly mixed and tempered with water, placed in the opening and rammed with a 20-pound hammer falling upon a steel rod. The clay used was a blue clay obtained from Albany which was believed by the contractor to be better than any to be obtained in the immediate vicinity. It was found not at all difficult to thoroughly compact the clay mixture in this way; in fact, it so nearly approached the condition of a fluid that the face of one block at the joint was forced off from the top almost to the bottom by too severe ramming of the clay. Had the clay filling not been acting as a fluid the effect, it would appear, would have been to break off merely that part of the face nearest to the end of the tamping bar.

In order to learn how tight the wall, and especially these joints, might be, a gallery was run through the body of the wall at the bottom around the entire perimeter of the reservoir. Every few days a measurement is made of the amount of water leaking into this gallery. In February, 1909, the total amount



BLOCK SPLIT BY TAMPING EXPANSION JOINT FILLING



WALL BLOCK, COBB'S HILL RESERVOIR, SHOWING BONDING GROOVE AND KEYWAY

leaking in through the 3,600 linear feet of wall averaged 5½ gallons per minute. By May 1 this had decreased to 1.7 gallons per minute, and by July to 0.8 gallon. By December it had increased to 14.9 gallons owing to the contraction of the concrete, and remained at approximately this figure through the winter, being 14.1 gallons in February, 1910. In March it was 8.5 gallons, and in the latter part of April, 0.8 gallon, running about 0.7 gallon from May to August. By December this had again increased to 15.1 gallons, to 20.5 gallons in January and to 22.5 gallons in February. On April 7, 1911, this had decreased to 12.2, on April 28 it was 5.1 and on May 8 it was 1.3. It is seen that the winter rate of 1910-11 was much higher than that of 1909-10, and that the leakage at the present time is nearly double what it was a year ago. It is believed that this is due to the fact that the clay, owing to the change in cross-section of the key-way due to the contraction and expansion of the concrete, no longer fills this as completely as when it was first placed, and thus allows leakage through it. This was anticipated, and it is expected to again compact the clay in the several key-ways before the leakage becomes serious in amount.

In compacting this, it is proposed to drive into the center of the clay filling a bar carrying on its end a pointed bulb similar in shape to a plumb bob; the object of this being to expand the clay filling and force it into the angles of the key-way. When this has been done the hole which has been formed will be filled with additional clay and sand mixture, tamped with the tamping bar as at first.

In tamping the clay a light portable pile driver was used carrying a 20-pound hammer which was raised by hand. A tamping bar was placed with one end on top of the clay and struck with this hammer, the instructions being to allow this to fall not more than four feet. It is suspected by the engineers that the breaking off of the face above referred to was caused by allowing the hammer to fall considerably further than this.

One practical point in connection with the key-way, or slot, which had probably been learned by experience, was that boys and other idlers about the work would be almost sure to amuse themselves by dropping stones, sticks and other matter into the key-way before it was filled with clay. For this reason a clean-out hole was left leading from the bottom of the key-way to the face of the wall, through which these things could be removed.

Another use for clay in concrete work was mentioned in the description of the Central Avenue bridge described in our issue of May 31. This consisted of placing clay in the end of a recess in a concrete post, in which recess the concrete baluster rail was left free to play in and out by the temperature expansion and contraction of the concrete. This suggests the use of this material for expansion joints between masses or sections of concrete in other portions of exposed structures.

DUST PREVENTION AND CITY STREETS

IN a paper before the New England Conference on Street Cleaning, Prof. A. H. Blanchard stated that there is one way and only one way to satisfactorily prevent dust on bituminous, cement, concrete, brick, wood block and stone block pavements which are subject to excessive horse drawn vehicle traffic; this being to remove the refuse by hand sweeping during the day, mechanical sweeping of the streets at night (which should be preceded by sprinkling) and finally flushing with water to remove fine dust and thoroughly cleanse the surface of the pavement. "Under certain conditions, dependent upon the amount and character of traffic and the uses to which the street is subjected it is feasible to omit the mechanical sweeping. It must be realized that it is absolutely impossible to economically remove fine dust by either hand or mechanical sweeping. The use of the so-called dust palliatives and surface treatments on pavements subjected to heavy mixed traffic is entirely wrong in principle, as sanitary conditions require the constant removal of filth from streets, and if this is removed periodically by flushing, the effectiveness of these processes is

curtailed. Again, periodical watering of pavements to lay dust throughout the day is fundamentally wrong, as the fine dust which necessitates sprinkling should have been removed."

Where these hard surface pavements are used principally by motor car traffic and horse drawn vehicles are infrequent, as on boulevards, flushing is not necessarily a prerequisite of cleanliness. Generally patrol hand sweeping throughout the day will be sufficient. On residential streets with bituminous surfaces, where the traffic is comparatively light, patrol hand sweeping may be sufficient, the nature of the surface being such as to absorb fine dust and render the street practically dustless. In the case of macadam streets in poor condition for superficial treatment or when financial conditions do not render expedient the use of surface treatments and patrol sweeping, recourse must be had to the use of palliatives such as light oils or light tars. To attain successful results it is necessary that light products having the proper chemical and physical properties should be used in small amounts periodically during the season of dust.

In slum residential districts the streets, unless subjected to heavy horse drawn vehicular traffic should, provided grades will permit, be constructed of water bound macadam with a superficial coat of refined tar or as bituminous pavements with a seal coat of refined tar, although the gradient may require the use of an asphaltic-tar compound or asphalt for the seal coat. These forms of construction give a sanitary surface from which the dust can easily be removed by patrol hand sweeping and which will permit thorough cleaning by flushing at night. The nightly flushing with water will perceptibly cool the atmosphere during hot summer nights, which will add materially to the comfort of the residents.

CONTROL AND CLEANING OF STREETS

Entire Control of Street Pavement, Including Sidewalks, under One Authority—Suggested Method of Assessing Cost—Broom Cleaning and Flushing

Slightly condensed from address before Annual Conference of Mayors of New York State by A. Prescott Fowell.

THE entire control of city streets (exclusive of cleaning) should be in charge of some one department or individual, who would have not only supervisory duties but also authority to enforce regulations and ordinances upon other municipal departments as well as upon private corporations. This is becoming more generally appreciated; but few cities have sufficiently developed the idea. There should be some one head which should have complete control of the street from property line to property line, in which should rest the authority to decide when and how a street shall be paved and to regulate all departments and corporations in their tampering with such pavement after it is laid. I do not mean, of course, that this power should be absolute, but that it should be exercised in the enforcement of regulations and laws passed by councils or formulated under their authority.

A partial illustration is the Board of Highway Supervisors of Philadelphia. This is composed of the heads of the Department of Public Works and Bureaus of Highways, Surveys, Water, Electricity and City Property. This board requires the sewer and water departments to certify that their respective conduits have been laid in a street which it is proposed to pave, before it will authorize the beginning of work on the paving; it notifies all public service corporations which have franchise privileges in the street that it is proposed to pave it, and that they will not be permitted to do any excavating therein for 5 years after the pavement is laid—except of course for emergency causes. No cuts can be made in a pavement, new or old, without its permission, and it sees to it that the guarantees of the paving contractors are not rendered void by any such excavations. It also keeps a complete record of all underground structures, and specifies the exact locations for all new ones.

Although altogether too uncommon, such concentration of

control is not unique, in theory at least; but I wish to suggest an extension of this to include the sidewalk also. In most cities the roadway paving is all done by the city, even though the property owner may pay for it; but the sidewalk pavement is laid by the owner, generally of such material as he may select out of a few which are permitted by city ordinances. He is required to conform to the curb grade as given by the city engineer, but the transverse slopes of adjacent sidewalks often vary, and breaks in their surface planes are of more or less common occurrence.

It is generally considered desirable to use the same kind of pavement throughout the roadway of a given street, for a number of blocks, at least; and no one would consider for a moment using brick, asphalt and wood block in alternate stretches of 50 or 100 feet each. But the sidewalk is often a crazy quilt of cement, brick and flagstone, not only alternating but sometimes all jumbled in front of a single property, to the great disfigurement of the street and annoyance if not inconvenience of the pedestrian.

The sidewalk is as much public property as the roadway; it is used by practically all the citizens, while comparatively few ride; and its treatment adds to or detracts from the appearance of the street fully as much as does that of the roadway. In other words, its usefulness and appearance are fully as much matters of public interest and public welfare as are those of the roadway; and the public have just as much right of control over the one as the other. I can therefore see no reason—except precedent—why the treatment of the two should not be the same. Roadway, gutter, curb and sidewalk all are closely related, and should be considered and treated as one. All should be constructed by city authority and be under complete city control.

And this applies to maintenance as well as to construction. A city is responsible for accidents caused by defective sidewalks and can best meet this responsibility by itself maintaining them in safe condition. The plan of the city council notifying a property owner, through the city engineer or a committee, that his sidewalk needs repairing, and then forgetting the matter until attention is again called to it by an indignant citizen or a law suit, is a common one but is not sufficiently effective.

Such construction and maintenance of the sidewalk by the city would certainly be no hardship to the property owner, even though all the cost be charged against him. With all allowance for those conditions which make municipal work cost more than private, I believe that the construction of sidewalks by the city in large contracts let by competitive bidding would result in a lower cost than when let by the owners to small contractors without any real competition as to price; especially when we consider the effect upon value received of the fact that sidewalks laid for a private owner are almost never inspected, while walks contracted for by the city would be laid under more or less effective inspection.

What has been said of the walks applies also to the trees and grassed strips. It is generally agreed by foresters and experts that both the appearance and thriftiness of shade trees are improved by planting a long stretch of street with the same variety and at the same time; and this means by one authority. Being planted, they are a public asset and should not be entrusted to the possible carelessness or ignorance—generally both—of the average citizen. The necessity for municipal supervision of street trees is being recognized more and more generally; and in an increasing number of cities it is becoming the practice not only to spray the shade trees to destroy ravaging insects, but also to trim them as well and give them such attention from the "tree doctor" as they may require.

ASSESSING COST

Streets serve two general purposes: First, to give access, light and air to abutting property; and, second, as thoroughfares for foot and wheel traffic. The first might be called a private use, the second a public one. The first is essential to the use of the property for residential or business purposes;

the second is for the convenience of those who have no rights or interests in the property. In addition the city, when the owner has donated or sold a strip of his land for use as a public highway, grants rights to public service corporations to make other uses of the street, because such uses *are* for the public service.

It is or should be the fundamental theory of assessments to distribute these in proportion to the benefit received. Let us apply this idea to street construction and maintenance.

If a land owner opens up his property but does not dedicate the streets to public use, as in the case of so-called "residence parks," he or the purchasers of the lots therein pay the entire cost of constructing and maintaining the roads in that property, as they should do, since no one else benefits by them. These roads are comparatively inexpensive because of the light use they receive. The owners also use other streets in the city or town, and should bear a part of the expense of *them*.

A resident on a *public* street enjoys a similar benefit from the street in front of his property; but, because it may carry much more and possibly much heavier traffic, the cost of constructing and maintaining the street paving may be considerably greater. The difference in cost between the two is therefore necessitated by the use made of the street by the general public.

If now we endeavor to assess the cost of such a public street in proportion to the benefits conferred by it or use made of it, it would appear that the simplest plan which seems to be approximately equitable is to assess against the property the cost of such a private road as I have referred to, and arrange that the public at large pay the balance of the actual cost. In practice it would probably be better to use as a standard, not a private road, but the last subdivision of residence streets—such standard road as is considered suitable for a residence street used only by the residents thereon and those delivering goods to them or visiting them for social purposes. Width of roadway as well as nature of surface would enter into this consideration. Perhaps the standard for the majority of cities would be a roadway 25 to 30 feet wide paved with a good macadam—possibly a bituminous macadam.

The same idea would apply to the sidewalk also. There is ordinarily little difference in character of surface between sidewalks on different streets, except such as may be occasioned by the use made of it by the owner. The *width* of the walk, however, is increased with increasing public use even more than is that of the roadway.

The element of individual preference on the part of the property owner may be allowed to enter into the determination of the character of street surface where this preference can be humored without sacrificing public interests in any degree. But if this increases the cost this increase should be assessed against the owner.

To illustrate: Suppose a 30-foot roadway of macadam costs \$3 a running foot in a given city, and this be assumed as the standard. The highway department, after considering the traffic and other requirements of a certain street, decides that asphalt pavement is the most suitable for it; the cost of which is \$1.75 a square yard. Also that the roadway should be 40 feet wide. The cost per running foot will then be \$7.78, or \$4.78 more than for a 30-foot macadam street; which sum would be paid by the city at large, the \$3 being assessed against the owners. But suppose these should petition for wood block, which would cost about \$2 a running foot more than would asphalt; then this \$2 also should be assessed against the property owners.

So far no consideration has been given to the business street; and here a new element enters—the additional use made by the abutting owner and the additional benefit derived. It is conceivable that the space required by delivery teams standing at the curb and the number of such teams and of carriages which are attracted to the street by the business houses on a given block would require most of the width allotted to the street, and also a pavement as durable and consequently as expensive as that required for the combined services. It there-

fore seems necessary to establish standard business streets as well as residence ones, distinguishing between that roadway and sidewalk traffic which enters the block in question for business purposes and that which uses it as a thoroughfare only. On the principal retail shopping streets it is probable that a very considerable percentage of both roadway and sidewalk width is required for local traffic—for persons and teams which the abutting owners are only too glad to see on the street, and the presence of which adds to the value of their property. The percentage of cost assessed against the abutters would therefore be high on such streets.

It is not claimed that it is possible to secure perfect equity in all cases by any practicable application of this plan; but it is believed that it makes possible a much nearer approach to this in a greater percentage of cases than is secured by the plan of assessing on the property the whole or some fixed percentage of the cost of paving in every case.

STREET CLEANING

What has been previously been said about including sidewalks with the roadway applies to cleaning them also. An inspection of the dirt on the sidewalks of a paved street will show that it has practically the same source and nature as has that on the roadway—in fact, that most of it originated on the roadway and was blown onto the sidewalks; the principal exception being paper. With plenty of neat, unobtrusive trash cans, *systematically located*, and an enforcement of the laws against littering streets, including the throwing of store sweepings into them, practically all street dirt would originate in the roadway. And if it is the admitted duty of the city to remove roadway dirt, then they should clean the sidewalks also.

Even assuming that there is no such duty, and that municipal cleaning is a matter of policy only, a clean sidewalk is fully as desirable as a clean roadway, if not more so. And as sidewalk cleaning by property owners generally consists of merely sweeping the dirt into the gutter to be removed by the city employees; as such sweeping is not so effective as other methods might be, or as sweeping itself would be if the dirt be removed at once from the gutter instead of blowing back onto the sidewalk—for all these reasons I venture to believe that it is as much a matter of duty and policy for the city to clean the sidewalks as for it to clean the streets.

This applies especially to business streets. On residence streets there is less roadway dirt, less frequent cleaning of the roadways, and the sodded strips commonly found there both protect the walk from wind-blown dirt and serve to receive and assimilate sidewalk sweepings.

Modern standards of health and comfort demand the removal of dust and slime as well as of dirt and mud. The machine broom is good for rough cleaning only. A hand broom with a real man behind it—not an object of charity or of political favor—is much better, since it can clean joints between paving blocks and depressions which a machine broom only fills up. But both stir up a dust, unless the street first be sprinkled; and if it be sprinkled they leave a thin smear of mud on the high points with heavier collections of mud in the joints and holes. And this mud is soon dust again.

So far as experience has yet been had, the only method of removing dust is to wash it off. The modern pneumatic cleaners used for sucking up household dust have suggested to many the idea of employing a similar appliance for removing street dust, and I have received scores of inquiries concerning its applicability to this use; but so far I have not learned of a single machine of this kind. Several have been proposed and three or four actually used in which suction is employed to raise into a contained bin the dust brushed off the street by a rotary broom; but this is entirely different from removing dirt from the street surface by suction.

The objections are made to flushing pavements with water, that it wastes the water, is destructive to the pavement and causes deposits in the sewers. The first may be a most valid and serious objection and absolutely bar flushing where water is a scarcity. About half a gallon per square yard per cleaning is required, or approximately 10 per cent of the ordinary

daily consumption in the residences fronting on the length of street cleaned.

As to destruction of pavement, the water jet certainly scours out sand-filled joints and particles of brick or stone which have been chipped off by traffic. On the other hand, the grit thus removed would have served as a grinding medium, assisting traffic to wear out the pavement by attrition; as sand is used in grinding down stone in a stone yard. There is yet no evidence that the best class of pavements are injured by flushing. And if flushing is considered necessary, then it is as proper to adapt pavements to withstand it as to require them to withstand traffic, to be noiseless or possess other desirable characteristics.

As to deposits in sewers, the flushers should wash the dirt to the gutters only, where the heavier matters would be dropped and only the floating matter be carried to the sewer. Although I have inquired I can not learn of any instances of deposits in sewers actually occasioned by street flushing. If it is found that heavier matters are washed into the sewer, it should be a simple matter to devise a temporary dam to be placed at the mouths of street inlets which, while holding back these matters, would permit the water to overflow into the sewer.

Flushing should be used only after brooms have rough-cleaned the pavement. Brooms, on the other hand, should not be expected to remove dust. And scrapers are best for removing matters, like horse droppings, which adhere to smooth pavements. Even the familiar "man with the hoe" has his place on the macadam street. The place of the newer appliances in street cleaning is largely supplementary to the older ones, to give modern perfection to the imperfect work of the latter.

WIDTH OF WHOLESALE STREETS

In a paper before the City Planning Conference Geo. W. Tillson gave some figures to be used in determining the widths of streets used for wholesale business, a class of streets not referred to by other speakers. "As a rule," said he, "a wholesale street is not a thoroughfare, and consequently a width that will fill local requirements is ordinarily sufficient. For the same reason a wholesale street is used but little for pedestrians, so that a wide sidewalk is not necessary. A wide sidewalk is even a detriment, for, as in most cities goods are taken from the buildings across the walks to the trucks, these walks should be no wider than is absolutely necessary." Large trucks in Manhattan backed up to the curb, occupy 13½ feet. As they would seldom be opposite each other, room for one line of moving teams between two trucks, or 36 to 38 feet, would seem to be ample roadway width. Eight to 10 feet should suffice for each sidewalk.

COST OF OILING ROADS

THE accompanying table showing the cost of oiling roads of various widths and using different quantities of oil was published by *Paving and Roads*, a trade organ of the Texas Company. It may be handy for reference, especially as it also gives the number of square yards per mile for roads of various widths between 10 and 48 feet.

COST OF OILING ROADS OF DIFFERENT WIDTHS AND WITH VARYING QUANTITIES OF MATERIAL.

Width of Rd. Feet	Sq. Yds.	COST PER MILE AT 4½¢. PER GALLON.				
		¼ Gal.	¼ Gal.	½ Gal.	¾ Gal.	1 Gal.
10	5866	\$65.97	\$87.97	\$131.98	\$197.95	\$263.96
12	7040	79.20	105.62	158.40	237.60	316.80
14	8212	92.38	123.16	184.77	277.15	369.54
15	9384	105.57	140.17	211.14	316.71	422.28
18	10560	118.80	158.40	237.60	356.40	475.20
20	11732	132.00	175.50	263.97	395.97	527.94
22	12904	145.17	193.55	290.34	435.51	580.68
24	14080	158.40	211.19	316.80	475.20	633.60
26	15252	171.58	228.68	343.17	514.75	686.34
28	16424	184.80	246.34	369.54	554.34	739.08
30	17600	198.00	263.98	396.00	594.00	792.00
32	18772	211.18	281.14	422.37	633.55	844.74
34	19944	224.37	299.16	448.74	673.11	897.48
36	21120	237.60	316.80	475.20	712.80	950.40
38	22292	250.78	334.35	501.57	752.35	1003.14
40	23464	263.97	351.94	527.94	791.91	1055.88
42	24640	277.20	369.58	554.40	832.10	1108.80
44	25812	290.38	387.18	580.77	871.15	1161.54
46	26984	308.57	404.73	607.14	925.71	1214.28
48	28160	316.80	422.37	633.60	950.40	1267.20

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JUNE 7, 1911

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Retempering Concrete

As concrete enters now into almost every class of structure, from the sewer underground and the pavement on it to the buildings above the ground, any idea which is novel and valuable concerning the use of concrete is perhaps of more general interest than almost any other class of information. The experiments described generally in an article in this issue are, it is realized by the experimenter, far from exhaustive, and it is hoped that the publicity given to the matter will lead to experiments in laboratories and tests in actual practice by others which will demonstrate either the truth or the fallacy of the conclusions derived from the Rochester experiments. As stated in the article, the decision to use retempered concrete in Rochester is based fully as much on practical experience as upon laboratory tests.

As we go to press we receive a letter from Ernest McCullough, of Chicago, which informs us that the idea is not entirely novel—in fact, that he had written for a technical paper about five years ago an article recommending the use of retempered concrete for patching old concrete and for joining fresh concrete to that which had fully set. The idea, he

stated, he obtained from an old English mason who regarded it somewhat in the nature of a trade secret and was remarkably successful in the use of retempered concrete for the purposes just named. In patching sidewalk surfaces this mason would clean the surface thoroughly with a wire brush and soak it with diluted acid to obtain a clean and porous surface. Mortar which had been allowed to stand for one-half to three-fourths of an hour was retempered, being worked over most thoroughly and energetically, with the occasional addition of water, and was then placed upon this surface, trowelling it in place much harder than is the ordinary practice. Mr. McCullough states that he has used this idea in his own work, and also has experimented with the use of fresh and retempered cement and lime, alone or in combination, for bonding new work to old, and as mortar between cement blocks. For both purposes he found retempered mortar containing from 10 to 15 per cent of lime to be the strongest of any of these and to be free from discoloration due to the lime. He also found that retempered mortar made from briquettes was stronger than briquettes made into fresh mortar. Mr. McCullough's book, "Engineering Work in Towns and Cities" contains a description and discussion of retempered mortar.

We are glad to have corroboration of the value of retempered concrete brought to our notice at this time, so that we can publish it in connection with the description of the Rochester work. While it would appear from the above that the idea is not new, we still feel that it is so little known or appreciated by engineers generally that we are justified in giving it the space which we have in the last two issues. In some cases the absence of joints of weak bond between old and fresh concrete is so essential that considerable expense is incurred in carrying on the work continuously until the completion of the desired monolith. If retempered concrete serves to make a perfect bond between the two it would seem possible to avoid the greater part of the expense, and frequently the annoyance and interruption with other work, occasioned by the continuous placing of the concrete. Its use for patching concrete sidewalks, curbs, etc., is of the greatest importance to municipal engineers and contractors.

City Plans Commission for Salem

Salem, Mass., has created a Board of City Plan Commissioners of five, none to be an officer or employee of the city, to serve without compensation; one member to go out of office each year, his successor to be appointed by the mayor. In addition to these, the mayor, president of the Board of Aldermen and president of the Common Council are ex-officio members. This board is to employ the necessary experts and report a city plan to meet present and future needs of the city; giving special consideration to elimination of grade crossings, grade and alignment of existing streets and extensions, parks and parkways, preserving historical landmarks, improvement of the water front, and the general industrial and commercial development of the city.

Street Cleaning Accounting

Speaking before the New England Conference on Street Cleaning Dr. Ernest Meyer, of the United States Census Bureau, made a strong plea for the adoption of cost accounting methods in street cleaning departments, and preferably the adoption of uniform methods by all cities. As between cash accounting and cost accounting the latter is far superior for practical purposes, as cash accounting does not offer any gauge of efficiency. Boston, he said, is the only city which has made a detailed study of the cost of street cleaning, this cost being shown separately by districts.

In formulating a method of accounting we are confronted at the outset with the problem of what accounts should be kept and what physical data collected. There can be no question that the records should include the kind of paving cleaned, the condition of the pavement, the intensity and volume of traffic, the amount of litter found on the streets, the stringency of

police regulations, the kind of machines and methods employed, wages paid, organization of the force, and length of haul of dirt removed.

Should the cities of New England, or any considerable number of cities in the country, agree upon some uniform method of keeping their accounts and records relative to street cleaning, the Census Department could, he stated, tabulate and publish the results within a month or two of the end of the year and thus give out by far the most comprehensive and accurate study on street cleaning ever attempted. The idea of conservation which, in private enterprises, finds its expression in the application of scientific principles of business management, must and will invade public enterprises and functions and bring about an enormous increase in economy and efficiency in these.

SOUNDING BAR FOR LOCATING ROCK

In a paper before the journal of the American Society of Engineering Contractors, calling attention to the importance of investigating geological conditions preliminary to planning contract work, the author, John W. King, described a simple device which has proved serviceable not only to contractors but also to engineers; one use being to locate the depth of rock along a line of proposed sewer or water main. The device is described by Mr. King as follows:

The instrument referred to is a bar of hexagon or octagon steel, the end of which is swedged and enlarged at the butt and tapered to a point at the end; the sides of the head being corrugated with a cutting edge. On the opposite end the bar has a T handle riveted firmly to the shank, and this shank or rod may be 20 to 25 ft. long—often more. The method of operating is to raise this rod to a vertical position with the sharp bit on the ground, and then, by churning the rod, drive same into the earth until the bit reaches a resistance. If continued churning does not remove or penetrate the obstacle in its path, several hard churns will dislodge particles from the obstruction, and by twisting the handle around several times the particles will lodge within the cutting edge of the bit, and may be brought to the surface where they may be examined and their substance determined.

In open-cut mining work, where the writer first employed this method, it was customary to lay off our tract of land to be examined in squares of 10 ft., so that each square contained 100 sq. ft., staking the corners, and at each stake we sounded with the above method and charted the results, and in this way determined the extent of our beds, with the amount of overburden necessary to be removed. We always found this method very satisfactory.

As to the cost of making these soundings, we found that two men were sufficient, and they were capable of sounding from ten to fifteen holes per hour.

HIGH BUILDINGS AND CITY ARCHITECTURE

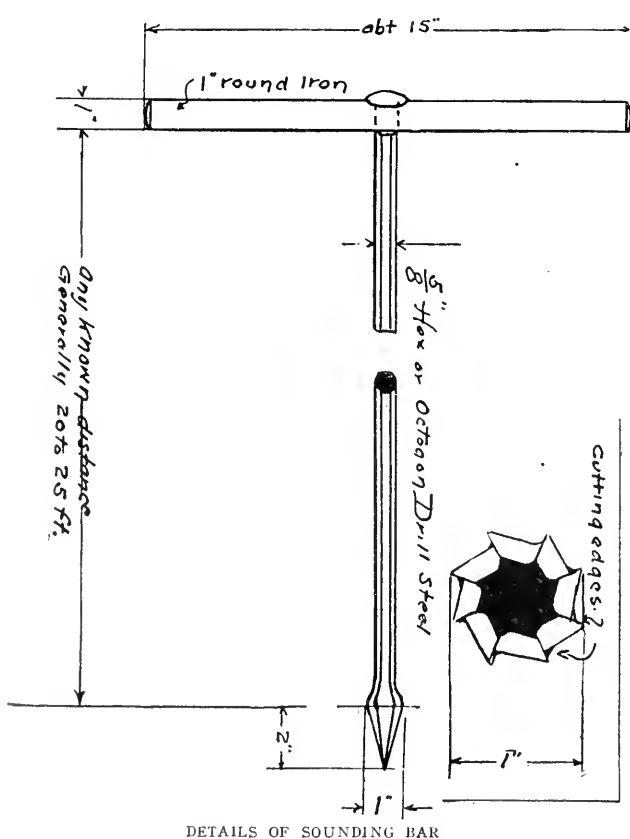
In a paper before the Conference on City Planning, Mr. Ernest Flagg discussed, among other things, the effect which modern systems of construction have and should have upon the architecture of buildings. He concluded that very high building had come to stay and that it would be impossible to enforce legislation prohibiting them. Taking these for granted, he found the ordinary style of architecture usually adopted for city halls and other public buildings to be incongruous unless these buildings could be located in large grounds with no skyscrapers for a background.

"Should our public buildings then be low and massive of a different type and of a different kind of architecture from the surrounding structures, or should they out-Herod Herod, and dominate them in height and extravagance of design? I think there is little doubt but that the latter course will be preferred." This would require the development of a new style of architecture—one which has not found its expression in any public buildings yet constructed. Mr. Flagg believes that height in itself is not inconsistent with dignity, and that the time will come when public buildings in the United States "will be carried to such amazing heights that the tallest commercial building will be dwarfed by them. I have no doubt that heights approximating 2000 feet will be reached within the next 25 years, for I see no reason why such heights should not be practical."

Concerning the location of public buildings, he advocates substituting them for tenements in the slum districts, arguing that in this way sufficient land could be obtained for a civic center or even for a single public building at much less cost than if it were located in the heart of the business district; that such a location would enhance property values and the increased taxes would assist greatly in paying for the improvement; and that it would involve the added benefit of cleaning out objectionable conditions. "Under favorable conditions a whole new civic center could be created at no greater cost than would be involved by the erection of a single building in the old locality."

Concerning the effect of tall buildings in cutting off the light and air from streets and adjacent buildings, he said: "The time will come when something must be done to counteract this evil, and if the remedy takes the form of a limitation of the area which can be occupied above a certain limit of height, as I think it will, great good, both practical and artistic, may come of it. It is useless to expect that we in this country will limit the height of buildings at a point sufficiently low to be effective for securing light for streets and buildings. Such a limit would require that their height should not exceed the width of the narrow streets or be more than $\frac{1}{2}$ times as high as the width of wide streets, and a similar limit would even be agreed to here. It may be that a similar limit will be tried, but if so it will be found ineffective and some other expedient will have to be resorted to.

"Now my doctrine is that above a certain limit, say at a height equal to the width of the street, only a small part of the area of every lot should be built over to a further height and that the high part of every building should be set somewhat back from the street. If a plan of this kind were adopted there would be space for light and air to play around the upper parts of the structures and to find its way to the streets."



DETAILS OF SOUNDING BAR

NEWS OF THE MUNICIPALITIES

Current Subjects of General Interest, Under Consideration by City Councils and Department Heads—Streets, Water Works, Lighting and Sanitary Matters—Fire and Police Items—Government and Finance

ROADS AND PAVEMENTS

New Boulevard Will Be Ready by Winter

Oklahoma City, Okla.—The park commissioners are preparing to finish the new Grand Boulevard, which will circle about the city and be nearly twenty-eight miles in length. At present two-thirds of the thoroughfare is completed, and the rest in litigation. The board is to meet with the State School Land Commission and arrange for the purchase of certain school sections and also to decide upon securing other ground. If the owners refuse to make terms the board plans to bring suit to condemn the land and have the courts appraise its value. The northeast and east portions of the boulevard are in fine condition and the board hopes to have the southwest and west parts completed before winter.

Must Clear Roadway of Trees

Spokane, Wash.—In its policy of preserving the natural scenery in Rockwood addition, even to the extent of allowing huge trees to grow in the roadways and sidewalks, the Spokane-Washington Improvement Company has run athwart the cold-blooded calculation of the city commissioners. Foreseeing damage suits against the city for accidents the commissioners will order the cutting down of many a monarch of the forest in this new exclusive residence district of the South Side. The city commissioners made a trip of inspection over the addition. While the natural beauty of the scene, resulting from the preservation of the big trees, did not escape them, the consensus of opinion among the city fathers was that the roadways and sidewalks should be kept open.

Plan to Make Grand Rapids a City of Parkways

Grand Rapids, Mich.—When the Common Council and Board of Estimates placed \$2,600 in the budget for the protection and care of street trees, the city government took another step toward placing Grand Rapids in an advanced position and on an equal footing with other progressive cities. An ordinance to regulate the planting, preservation and care of trees growing on the streets and boulevards of Grand Rapids was passed by the Common Council April 7, 1910, and first put in force May 16, 1911. It is the duty of the Board of Park and Cemetery Commissioners to enforce this ordinance and this board will receive the hearty cooperation of every citizen that Grand Rapids may always be known as the beautiful city of homes and shade trees. It is not expected that all evils that years of neglect have brought about can be cured at once. This would be impossible, but it is timely to make an intelligent start in order to prevent mistakes in the future.

Improvements Under Way to Cost Large Amount

Rochester, N. Y.—Figures as to the improvements now under way in Rochester, prepared by Assistant Chief Clerk Marks, of the City Engineer's Department, give an idea of the immense amount of public works undertaken by the city last year. Mr. Marks in his statement said: "The city is now completing the work on improvements and sewers that were begun in 1910, to the amount of \$336,500; also a concrete bridge over the Genesee River at Central Avenue, at an estimated cost of \$160,000; and also a concrete bridge over Bed Creek at the Westfall Road, Genesee Valley Park, at an estimated cost of \$15,000. The N. Y. C. & H. R. R. also began the erection of a new station north of Central avenue, between Clinton avenue North and Joseph avenue, with the widening of three bridges over several streets and the changing of the grade and improving streets, at an estimated cost of \$1,500,000. The work begun this year, including contracts let, amounts to the sum of \$1,000,000. Also contracts have been let and work is under way from the sewage disposal contracts already let for \$303,184.50. The estimated cost of the entire new sewage system is \$1,500,000."

SEWERAGE AND SANITATION

Sewers Faulty; Property Owner Collects Damages

Syracuse, N. Y.—Damage done the property of Joseph Oot in Manlius Street when the drainage system of East Syracuse became disabled, was assessed at \$1,545 by Justice William S. Andrews in his decision in the action brought against the village. The cellar of the house was flooded a number of times between 1896 and 1908, and damages were awarded for the loss in rents and the general depreciation of the property due to the condition of the sewers in that time. The judgment also orders the village of East Syracuse to remedy the condition of the sewers at that point to prevent a recurrence of the floods.

Children Help Board of Health Clean City

Indianapolis, Ind.—An effort made by the City Board of Health to enlist school children in making the city more sanitary and more beautiful is getting results. Reports are being received by the board to the effect that school children in all parts of the city are cleaning alleys and back yards, whitewashing fences and otherwise giving material aid in cleaning up Indianapolis. Some time ago Dr. Charles S. Wods, secretary of the board, sent out-lines of a course of municipal civics to school teachers, suggesting that the school children investigate the collection of ashes and garbage, among other things, and where conditions were not right report matters to the health board. As a result the inspectors of the health board are unable to keep pace with the complaints made by the children. At school No. 9, Vermont nad Fulton streets, the school district has been divided into areas, and children are assigned to look after sanitary conditions in their respective areas. At least two hundred complaints have been made by children from that school, calling attention to ash piles in alleys and back yards, and to uncovered garbage cans, as well as to general conditions tending to make the city unsanitary or unsightly.

Sewer Collapses.

Portland, Ore.—Tanner Creek sewer, from Morrison street to the river, a distance of three-fourths of a mile, is in a state of collapse. This condition was discovered when two sewer inspectors traversed the entire length of the conduit and found the drain to be in a dilapidated condition. Nearly one-half of the entire length of the drain is minus a bottom, the stone blocks having been washed out and the sewage was found running on the earth. Much of the top of the sewer was bowed down and was found in a highly dangerous condition. In several places bricks were loose and easily fell from their places. Another more careful inspection will be made to determine the extent of the repairs necessary, but it is believed from the reports brought in that the entire conduit, from Morrison street to the river, will have to be reconstructed. This will cost approximately \$50,000, and the cost will have to be paid by the owners of property affected.

Clean-up of Hotels Ordered.

Fort Scott, Kan.—The State Board of Health of Kansas has instituted another very badly needed and commendable reform in the way of public sanitation and cleanliness. An order has been issued to the several drug and food inspectors to get busy with a detailed and careful inspection of all hotels and restaurants in the state. Assistance from the local county health officers and fire marshal of the several counties is imperative, and the several health officers and fire marshals will be required to attend and be present at all the inspections. All places found to be dirty or unsanitary, will be notified to clean-up at once and continue their operations in sanitary manner. If violations of the orders ensue, the county attorneys of the several counties are to begin prosecution and compel enforcement of the law.

Health Board for Better Inspection at Abattoirs

Sacramento, Cal.—The proposition of having a central abattoir erected on the outskirts of the city, where all meat that is shipped outside the city can be inspected, as well as that used in Sacramento, has been submitted to the City Board of Health by Dr. J. W. James. The idea was to have the abattoir supported by the butchers of the city and have an official inspector present at all times to inspect all meats. It was argued that, under the present plan, one inspector could not keep in close touch with the four or five slaughter houses, whereas if there was a central place his work would be thorough. In this connection Dr. F. G. Fay stated that Oakland was stealing the credit on Sacramento meats by placing an Oakland stamp on the product shipped from this city to the Bay. Drs. James and Fay were appointed a committee to take up this work.

Circuit Court Says Sewage Disposal Plant Law Is Invalid

Columbus, O.—The Darke County Circuit Court holds the Bense act, giving the State Board of Health authority to compel municipalities to install filtration and sewage disposal plants to be unconstitutional because it exempts some Ohio River cities. The State will carry up the case.

Law Requiring Screening of Food Will Be Enforced

Richmond, Va.—Clerks of the two markets report to the Council Committee on Markets that hucksters had been informed that the Board of Health would require hereafter a strict enforcement of the Mills ordinance, requiring screening of all food exposed for sale, and also of a health regulation forbidding the storing of live fowls in market stalls after market hours. The committee directed the clerks to give the sanitary officers every possible assistance in enforcing both measures.

Pure Water is Killing Typhoid.

Toledo, Ohio.—Typhoid fever cases in Toledo have decreased nearly 200 per cent in two years, according to the report for the first four months of the year compiled Monday by Health Officer Becker. During January, February, March and April of 1911, there were 55 cases of typhoid, and but 10 deaths. This is compared to 73 cases and 17 deaths in 1910, and 142 cases and 23 deaths from typhoid during the first four months of 1909. Health Officer Becker attributes part of this improvement to the purification of the water supply, and another cause for the decrease is the number of houses compelled to provide for sanitary disposal of sewage.

Deep Wells to Prevent Typhoid Fever Epidemic.

Hutchinson, Kan.—To safeguard the city against typhoid epidemics and other diseases, the city plumbing board presented an ordinance to the city commission which will prohibit the sinking of wells less than thirty feet deep in the city. The board will require that wells should be driven to the second strata of water. A good many shallow wells are in use over the city, only a few feet deep, and tapping a surface water which is impure. Thirty feet is not far to drive a well, and a good pure supply of water can be had at that depth.

Bacteriologist Reports City Water Safe.

Binghamton, N. Y.—Although the Susquehanna river water, from which the city's drinking supply is drawn is bad, containing sewage bacteria and vegetable growth, the drinking water is pure as a result of filtration, according to the report of the city bacteriologist. From a sample of river water taken May 22 it was ascertained that there was 98.92 per cent of sewage bacteria in the raw water, but that it was absent from the filtered product. During recent hot and humid weather algae has grown abundantly in the river water, causing a pronounced swampy odor and taste and has fouled the filters repeatedly. This condition, the bacteriologist says, will probably continue until the weather changes markedly.

Score System As Check on Restaurants

Spokane, Wash.—Health Officer J. B. Anderson has completed details of his new restaurant inspection system, authorized by the city council as a result of the uncleanly conditions found recently in many eating houses. On the new inspection system a "perfect" restaurant scores 100 points, and any place scoring 40 points or less must be closed until the sanitary conditions are improved.

WATER SUPPLY

Ottawa Complains of Water.

Ottawa, Ontario.—Hypochloride of lime, which the city of Ottawa is using in its water supply, following a typhoid fever epidemic, is causing bitter complaint. The lime has killed all the gold fish in private aquariums, is eating away the rubber washers in taps, and now it is feared that it is going to kill the grass lawns where sprinklers are used. The complaints do not disclose its effect on humans, who use the Ottawa water.

U. S. Furnishes City Water

Carlsbad, N. M.—The town will receive its water supply from the irrigation system of the Carlsbad project. A contract for five years, which has been approved by the Secretary of the Interior, provides that the town is to pay the government at the rate of \$1.25 per acre foot, which is the price at which water was rented to agricultural lands within the project. This represents a net annual income of eight per cent on the construction charge investment.

Jersey Water Company Adds to Reservoir Capacity

Oradell, N. J.—The Hackensack Water Company is building a dam at Oradell which it is said will increase its reservoir capacity to about 150 million gallons, and it is hoped will save them the necessity of buying water from Jersey City to supply the towns Bergen and Hudson counties where it has franchises. The illustration shows the temporary earth dam built to hold back the water during the



Courtesy Jersey Journal

TEMPORARY DAM AT ORADELL

construction of the concrete dam 200 feet long about 75 feet below. The depth of the new reservoir will average only about three feet deep, and will be half a mile long. It will hold over 10,000,000 gallons. Commissioner George J. Brackner, of the Jersey City Street and Water Board, is quoted as saying that in view of the rapid growth in population in Bergen County the new reservoir would not afford much relief.

Plans to Increase Water Supply by Raising Dam

Baltimore, Md.—Having in mind a possible abandonment of the more expensive and elaborate plan proposed by the consulting engineers of the Water Department, Mayor James H. Preston has announced that he was considering a suggestion for the improvement of the city's water supply which, instead of requiring the erection of a new dam on the Gunpowder River, would simply provide that the present dam be raised. In further explanation of the reasons prompting this suggestion, the Mayor took the position that in ten or fifteen years it is possible that the city will have outgrown the Gunpowder supply, inasmuch as it is the tendency for streams all over the country to diminish in stream flow, and that Baltimore in that event would have to turn to a larger source of supply, such, for example, as the Susquehanna River. Should that prove to be the case, he said, the money spent in carrying out the plan of the consulting engineers would have been wasted. During the same period, he declared, he thought it possible, by raising the present dam at Loch Raven, to provide for the needs of the city.

City Asks Water Company for Offer

Oakland, Cal.—Frank C. Havens, president of the People's Water Company, and the board of directors of that corporation will submit an offer for the sale of that part of the concern's system known as the "Oakland division" to the Oakland City Council, as soon as the corps of engineers now employed can get together all the necessary data. It is known that the city, through an indirect source, has asked the water company to make an offer on its Oakland division. This offer will be submitted to the City Council within a very few weeks, after which negotiations for the purchase of the system for a municipal water supply will begin. Officers of the corporation refused to discuss the probable sum to be asked of the city, but it is estimated that it will exceed \$10,000,000.

First City Well Great Success

Moorhead, N. Dak.—The sinking of a well, which is a 12-inch bore, without casing, was an experiment and is the first of four which will be used to give Moorhead an adequate supply of the purest water. Superintendent Warner, of the city water plant, states that the present well will be capable of giving 100,000 gallons of water daily to consumers. The water in the pipe comes within six feet of the top of the well, and while maintaining the 100,000 gallon test the water was lowered to the thirty-foot level. Within five minutes after the pumps stop the water is back at the six-foot level. It is the purpose of the city commission to sink at once three more wells of 10-inch bore, and to connect all with a large reservoir. The well is 187 feet deep. Moorhead uses an average of 350,000 gallons of water a day, and with the large reservoir all emergencies will be cared for.

Would Charge for Water Now Furnished Free

Spokane, Wash.—Commissioner C. M. Fassett is considering a revolutionary recommendation in regard to water rates. The city water department annually gives away over 1,506,300,000 gallons of water, and receives only a small return (amounting sometimes to less than the cost of pumping), from 22,800,000 gallons more. To make a charge for the greater part of this free water and to raise the rate paid on the other amount, which is now pumped practically free, is the proposition being studied by the commissioner. In this regard Commissioner Fassett is considering the policy of making the general fund, or the taxpayers at large, stand for the water used to fight fires, flush sewers, sprinkling streets and now given away to the schools, Fort Wright, city buildings and charitable institutions. The burden of supplying this free water now falls on the water consumers alone. The free water list and the estimated amount used annually, which it has been urged should be paid out of the general fund, is as follows:

For fighting fires, 600,000,000 gallons; flushing sewers, 750,000,000 gallons; public schools, 12,000,000 gallons; street sprinkling, 8,000,000 gallons; Fort Wright, 37,500,000 gallons; cleaning sidewalks, 2,000,000 gallons; water troughs, 2,000,000 gallons; city buildings, 3,800,000 gallons; charitable institutions, 3,000,000 gallons.

City Making Tests of Water Pipes

Akron, Ohio.—Under the direction of Service Director J. W. Gauthier extensive tests are being made of the condition of the water pipe of the Akron Water Company in various parts of town. Holes are dug at various points and the pipe examined at first hand. A complete record of the result of the tests is being kept and this will be used when the city again approaches a decision as to whether or not to buy the Akron Water Company's plant as the basis of a municipal water plant. The city has records showing just how long all the different sections of pipe have been in the ground. For instance, all the pipe laid fifteen years ago is tested, and careful comparisons made. Then all the pipe laid ten years and eight years or whatever the time may be is given similar tests. Server Gauthier reports that some of the oldest pipe is found to be in excellent condition and that other pipe laid a shorter time is sometimes found so thin that a knife blade can be stuck through it. Much of the trouble encountered is attributed to electrolysis and is found in the vicinity of the electric power lines.

New Street Light Being Tried

Council Bluffs, Ia.—A new light has been hung at the intersection of Pearl Street and Broadway by Manager A. L. English of the Citizens' Gas and Electric Company. Mr. English is a strong advocate of the new light, which is a high candle power flaming arc lamp. Its brilliance exceeds anything else known in street lights. Despite the 5,000 candle power, the globe is arranged to make the illuminating element mellow and not at all hard on the vision. Should such style lights be placed at intervals along Broadway that street would be more efficiently illuminated than any other street in this part of the United States. Such lights as the one on exhibition are being used in Boston and in other large cities and are proving extremely desirable. The light will be left in indefinitely,

City Has Demonstration of New Lighting System

Wilmington, Del.—Market street as it should be lighted was demonstrated last week by the lighting department of the Wilmington and Philadelphia Traction Company on Market street between Ninth and Tenth. With arcs and incandescents, the company showed that it could light the street with a bright but pleasant light and leave no dark or shady spots in the thoroughfare. Members of City Council, the Board of Trade and the directors of the Street and Sewer Department were interested observers at the demonstration. A large crowd was attracted by the novelty of the illumination. The incandescent lights were strung in arrangements of two each at intervals. The arc lights on the corner were turned off and the new system, which was erected temporarily by the use of wires, demonstrated that it is far superior to the "arc at each corner" plan. The lights demonstrated are of eighty-candle power each, being the new Tungsten lamps, which give a very true white, cheerful light. Lamps of the larger size each giving 120-candle power were shown first, but the smaller ones were more satisfactory.

Company Gets Twenty-five Year Franchise

Chisholm, Minn.—A new franchise has been granted the Range Power company by the village, to continue for twenty-five years; the village, however, retaining the right to revoke the franchise, and purchase the plant at its option, at the expiration of the first three years, and at every five-year period thereafter, during the existence of the franchise. The company agrees to put in an auxiliary plant to provide against any possible break-down of the plant now running. It is to furnish a day current within ninety days and reduce the rates on both the street arc lights and the lights used by the ordinary consumer.

Elsmere Gives Right to Gas Co.

Elsmere, Del.—Residents of Elsmere are so pleased to have the service of the Wilmington Gas Company extended to that suburb that they have given the company the right to use the streets and many houses have ordered gas installed.

New Light Plant.

Crowley, La.—The new switch-boards for the city electric light plant have arrived and it is expected that the new electric lighting installation will be completed within two weeks. Since the destruction of the power house by fire in November, 1909, a temporary electric plant has furnished an inadequate electric light supply.

Lighting Scheme Opposed.

Washington, D. C.—The plan for a double row of lights in the center of Pennsylvania avenue from the Capitol to the Treasury has been abandoned by the District Commissioners following unfavorable report by the Fine Arts Commission. The scheme for lighting the avenue was recently recommended by W. C. Allen, electrical engineer. It is contended in the report that although the method has been tried in other cities with some success, it is not thought feasible for Washington, as it is thought it would destroy the beauty of the avenue. The commissioners referred the Fine Arts Commission's report to Engineer Allen with the request that he devise another plan.

FIRE AND POLICE

Atlantic Highlands Fire Company Proud of Auto Engine

Atlantic Highlands, N. J.—The new combination chemical automobile engine has arrived for the Navisink Hose Company from New York. The trip was made from the city to this place by road.

Committees See Demonstration

Mishawaka, Mich.—Committees representing the city governments of Fort Wayne, South Bend, Michigan City, Hammond, Ind., and Monroe, Mich., were in the city to witness the official test of the motor car truck for Mishawaka's central fire station. They came because a special car had been made for this city following special specifications given by Fire Chief Albert Buyssee, which included a 40-gallon chemical tank under the seat instead of in sight. There are some other special features which add to the beauty and usefulness of the truck. It is the first of the kind ever built. All the committees were well pleased with the car which sells for \$5,500.

An Alarm System at Last

Syracuse, N. Y.—The Gamewell Company has bidden sufficiently low on specifications for a fire alarm system. It was to this company that it was proposed to award the contract two years ago under specifications which the court disapproved. The agitation which some good people felt lest the city should instal a system not of proved reliability now evaporates. The administration gets the alarm apparatus it wanted at a price lower than it had hoped. The way is now open for the prompt installation of this necessary feature of an efficient system of fire protection.

GOVERNMENT AND FINANCE

Exhibit of City Methods Planned

Kalamazoo, Mich.—If the plans of Mayor Charles Farrell are carried out, Kalamazoo will be the first city in the middle west to have a municipal exhibit. It is his idea to bring together different department officials of cities from all over the country and let them compare and display their ways of running the business of the cities represented.

Expert Reports on City's Books

Tacoma, Wash.—Declaring many of the municipal records "crude," Herbert E. Post, certified public accountant, who has spent more than five months auditing the records of Tacoma, has filed a complete report, covering the entire period of nine months in which the city has operated under the commission form of government. He says all the money received by the city treasurer has been properly accounted for, but that the office stubs show many receipts which could not be verified on account of the system formerly followed. Mr. Post was employed by the mayor and municipal commission the first of the year to make the nine months' check required by section 52 of the new charter, which says the city books shall be audited at the beginning of each year. Although the bookkeeping methods are not approved by the expert, only a few errors are noted in the report, which covers each department thoroughly and gives a list of 19 schedules and statements of the operations of funds during the nine months' period. During that time the city's volume of business was noted in the receipts, disbursements and balances on hand as follows: Balance, March 31, 1910, \$1,137,582.27; receipts, \$2,882,578.83; total, \$4,020,161.10. Disbursements were \$2,912,555.10, leaving a balance on December 31, 1910, of \$1,107,606. Much of this balance, however, has been wiped out in the five months of this year.

Tax Rate Drops From \$15 to \$3

Orleans, Mass.—John Kenrick, chairman of the Board of Assessors, has officially announced that the 1911 tax rate is \$3 on \$1,000. The drop from \$15 is the result of Sidney W. Winslow, the president of the United States Machinery Co., taking up his residence in South Orleans, increasing the town's valuation from \$700,000 to \$1,500,000.

STREET CLEANING AND REFUSE DISPOSAL

To Clean Streets Nights

New Britain, Conn.—President Moore of the board of public works has arranged to carry out the recommendation in Mayor Halloran's message to have the streets cleaned at night. The squeegee machine will be used. It can be used to better advantage when the traffic is lighter.

Curb Garbage Collection

Toledo, O.—Service Director Cowell started a crusade Thursday which will result in the arrest of all persons collecting garbage in the city without proper authority. Members of the police department received orders to make arrests. "The city has been blamed repeatedly because garbage is hauled through the streets in all kinds of receptacles exposed in such a way as to be offensive, and this simply must stop," said Director Cowell. "The department has taken special pains and incurred additional expense to provide for the proper collection and disposal of garbage and people do not generally know that some of it is being carried away by individuals other than those employed by the city." City ordinances provide that all garbage collections should be taken care of through the board of public service and that no individuals, partnerships, or corporations can do so without permission from the department. The penalty for violation is a fine of from \$5 to \$50.

City Will Collect No More Rubbish

Columbus, O.—The rubbish department of the city of Columbus is clogged up, and no more cogs will turn in the wheels of the campaign of cleanliness for several days. The work is rather contrary to what was expected, because some people have been storing rubbish in their cellars and back rooms for years, awaiting just such a chance as was made possible when council appropriated money to begin the work of cleaning the city. The order of the mayor to have rubbish placed in the back yards is rescinded, and if the good housewife wants it removed, the best and surest way is to hire a man to haul it away. Otherwise it may remain all summer. The municipal rubbish department has about all it can do to keep up in the board of health's campaign to rid Columbus of flies.

Mayor Will Visit Cities Investigating Garbage Question

Indianapolis, Ind.—An investigation of garbage contracts and means of collecting and disposing of garbage in several cities will be made by Mayor Shank. The mayor will go with the board of park commissioners and board of public works to Chicago June 7 to investigate the park and boulevard systems, and from there will begin an extensive trip to investigate the garbage question. The mayor expects to visit Cleveland, Buffalo, Rochester, New York, Philadelphia, Washington and Columbus, O. He will be accompanied by Superintendent of Police Hyland, who will attend the annual convention of the National Association of Police Chiefs, to be held in Rochester. The mayor expects to return to the city June 17. On the garbage investigation trip the mayor will pay his own expenses, and the members of the park board will pay their own expenses on the trip to Chicago.

Clean-Up Week Holds Over Three Days

Knoxville, Tenn.—Chairman John W. Flenniken, has found it necessary to keep the clean-up crew busy for a few days as it did not get all of the refuse hauled away during clean-up week. The total number of wagon loads of garbage hauled during the six days was 947. This is one of the largest week's work ever done by the department. Chairman Flenniken states that it will take at least three more days to complete the work.

Has Surplus of Chloride

Duluth, Minn.—The Board of Public Works is somewhat "up against it" for a place to store the calcium chloride which has been consigned to it in this city. It was estimated that 400 tons would be needed for the first application in the districts which will not be sprinkled with water. About half the territory has been covered and approximately sixty tons have been used. The other half will likely take about the same amount, which will leave the board with 280 tons of the dust-laying preparation on its hands.

RAPID TRANSIT

Rushing Work on Extension of Trolley

Syracuse, N. Y.—Just when Syracuse people will be able to charge for transfers has become an actuality. At a meeting of the directors in the office of President Stanley of the Cleveland Railway Company recently it was decided that Commissioner Dahl's order calling for the abolishment of the transfer charge should be observed. The directors gave notice that, in view of the elimination of the transfer charge, they will in the near future ask the Council for an increase in the maintenance and renewal reserve funds.

Cleveland Now Has Three-Cent Trolley Fare

Cleveland, O.—Straight three-cent fare without any charge for transfers has become an actuality. At a meeting of the directors in the office of President Stanley of the Cleveland Railway Company recently it was decided that Commissioner Dahl's order calling for the abolishment of the transfer charge should be observed. The directors gave notice that, in view of the elimination of the transfer charge, they will in the near future ask the Council for an increase in the maintenance and renewal reserve funds.

Trolleys to be Built Under 20-Year Franchise

Jersey City, N. J.—After having declared for years that it would never invest money on trolley extensions or new lines as long as the twenty-year limited franchise act is in force, the Public Service Corporation has now receded from that position. The belief in some quarters is that the trolley company, fearing that the Board of Public Utility Commissioners under the new Egan utilities act might exercise its right to order extensions off hand not exactly to the liking of the trolley company, has decided to treat with the local municipal bodies as the lesser evil and accept ordinances under the limited franchise act.

Experts Point Out Defects in Rapid Transit System

Philadelphia, Pa.—A comprehensive plan of rerouting the lines of the Philadelphia Rapid Transit Company for the purpose of bringing every section into easy communication with the main centers of travel, and of relieving the pressure of traffic at particular points and at particular hours, proves to be the principal topic of discussion in the elaborate report upon the property and the service of the company made to the State Railroad Commission by Ford, Bacon & Davis, engineers, of New York. This report is issued in two paper-bound volumes, of about 150 pages each. The experts' plan, which is explained with 35 maps and diagrams, contained in Volume II, is an attempt, says the report, to help solve the problem of "providing rapid, direct lines between points of travel, arranged to furnish facilities for the entire city, systematically, uniformly, consistently and impractically." The present Philadelphia routes, say the experts, are far from conforming to this ideal, owing to the fact that the city plan is not conducive to good transportation facilities; that subsequent additions to the city have been made without due attention to intercommunication; that the original systems were built as competitive lines, and that the management of the consolidated lines has made little effort to correct the defects.

Suburban Trolley Contract Let

Charlotte, N. C.—The Charlotte Rapid Transit Company, a suburban railway, has let the contract for the construction of its line. The contract embraces grading, subways, bridges and track laying, and calls for the operation of the system by August 15. The amount named was not given out. The line will begin at a terminus of the city system and open up distant suburbs for development, and the Beach storage battery cars will be used, doing away with the trolley.

Street Poles Go

Spokane, Wash.—Street car poles on the main streets of Spokane are to be done away with, according to the superintendent of railways of the Washington Water Power company. The company is carrying out this work at the request of the city commissioners, and wherever buildings are of modern construction the span wires are being attached directly to the building and the poles discontinued.

Already a number of the larger buildings on River-side avenue have the span wires attached direct, among them being the Old National bank and the Paulsen building. The only place where the poles can not be removed is where the strain wires, which hold up the slack, are fastened, the fire ordinance prohibiting their removal. The work will take some time to complete, as all the poles can not be removed until the main streets are lined with modern structures that will permit the necessary strain. In many of the new buildings going up the builders have requested the company to furnish them eye bolts, by means of which the wires are attached to the building, the bolts being built in the building. About a year ago the work was started at the request of the chamber of commerce, but met with such a storm of protest that steel poles were put in instead. Lately the city commissioners requested again that the plan be tried. At corners, where the lines intersect, it is sometimes very difficult to get into buildings to hold the complex overhead layout, and then it becomes necessary to put in poles. The span wires are properly insulated from the trolley wire, and there is absolutely no danger of the current entering the building.

MISCELLANEOUS

City Pier Nearing Completion

Philadelphia, Pa.—Announcement has been made by Acting Director Hasskarl, of the Department of Wharves, Docks and Ferries, that the substructure of the new municipal pier in course of construction on the Delaware River, below Vine Street, has been completed and turned over to the city. Work is now being rapidly pushed forward on the superstructure, and it is expected that this portion will be finished in record time. When completed, it is declared, the new pier will be one of the best on the Atlantic seaboard.

Want Municipal Telephone

Independence, Kan.—Petitions asking that the city commissioners call an election for a vote upon the question of establishing a municipal telephone system have been filed with the local board, signed by nearly 2,000 of the voters of Independence. The plan meets with popular approval. This is the outcome of the rebellion against the Kansas City Long Distance Telephone Company and its "party" phone system.

City Has Spent Important Sum on Parks

Kansas City, Kan.—In the fiscal year just ended Kansas City's expenditures for its park and boulevard system since its beginning in 1893 passed the \$10,000,000 mark. The expenditures last year were \$516,640.64. The total for 18 years is \$10,372,876.67.

No More Roller Towels After July 1st

Erie, Pa.—Time for the replacing of roller towels by individual towels in places where roller towels have been used has been extended by the Board of Health till July 1. At that time a sanitary towel approved by the Board of Health must be installed. When the resolution was adopted by the Board that the roller towel must go, the intention was to have the rule effective June 1, but complications having arisen regarding the execution of the order the time was extended. The extra time allowed is thought to be sufficient to allow all towel dealers in the city who have made a business of supplying offices and public places to make the change.

Playgrounds Approved by Expert

Erie, Pa.—Playgrounds in this city and the playgrounds movement underwent an expert investigation last week by Rowland Haynes, of New York City, field secretary of the Playgrounds Association of America. Mr. Haynes states that he had learned no reason why Erie with beautiful parks and open spaces should not be one of the ideal playground cities in America. He was surprised that the people had not been awakened to the movement sooner, and spoke in approval of all the local playground advocates had accomplished.

LEGAL NEWS

A Summary and Notes of Recent Decisions—Rulings of Interest to Municipalities

Telephone Ordinance—Validity

Ex parte Farnsworth.—Special Acts 30th Legislature, enacted a city charter containing initiative and referendum provisions, which empowered the city to regulate and fix charges of local telephones, and delegated such power to the board of commissioners or city council, who were required to give notice and grant hearings to parties affected by the regulations, and provided for petition for a proposed ordinance and a submission of it to vote. The board without itself enacting any ordinance relating to telephone rates or making rules for notice and hearing of a proposed ordinance relating thereto received a petition for a proposed ordinance regulating telephone rates, and submitted it to the people at a special election, at which it received a majority of votes, and by order of the board was placed with the city ordinances as an enacted ordinance. *Held*, that the ordinance as enacted was invalid. No ordinance of an incorporated city is valid unless and until the statutory prerequisites to its enactment are substantially complied with.—Court of Criminal Appeals of Texas, 135 S. M. R., 338.

Street Encroachments—Awnings

City of Helena v. Wooten.—Kirby's Dig., providing for the prevention and removal of encroachments or obstructions upon any city street or sidewalk, contemplates that cities shall have control of their streets, and that an unauthorized private stationary awning extending in whole or in part over the sidewalk, which is in a good and safe condition, but which might interfere with the fire department, is an "encroachment" on the street, and an ordinance requiring its removal is authorized. It is no objection to the validity of a city ordinance requiring the removal of a stationary awning as an encroachment upon the street that at the time it was put up it was lawful, since it will be presumed that the owner has been fully compensated by the use and enjoyment of the same for all expenditures made upon the faith of the permission or license obtained from the city.—Supreme Court of Arkansas, 135 S. W. R., 828.

Injury in Public Place

City of San Antonio v. Ashton.—In an action against a city for injuries from falling over a tent stake in a plaza which stake had been used in connection with a tent of an amusement association, and had originally been with the others roped in to prevent injury therefrom, but which stake, there was evidence to show, was entirely outside of the inclosure when the accident happened, a charge that if the city used ordinary care in protecting persons traveling across the plaza from falling over the stake by roping it in, and if it could not reasonably be anticipated that any one using ordinary care in crossing the plaza would cross such rope and be injured by falling over the stake, the verdict should be for defendant, was properly refused, since under such charge, if the rope had originally been with due care placed to inclose the stake, the exercise of due care by the city would not require the maintenance of the rope in such position.—Court of Civil Appeals of Texas, 135 S. W. R., 257.

Independent Contractors—Acts of City Engineer

Denny vs. City of Burlington et al.—Where a city hired an independent contractor to construct a reservoir and the work was proper and lawful, and not intrinsically dangerous, the city is not liable for injuries received by one of the contractor's servants while doing the work, unless the city retained control or supervision over it. A city engineer having no authority to assume control over the work of an independent contractor did not bind the city by making suggestions as to how the contractor should perform his work thus removing the relation of master and independent contractor.—Supreme Court of North Carolina, 70 S. E. R., 1085.

Water Bonds—Ultra Vires—Defences

Wykes v. City Water Co. of Santa Cruz et al.—Where a city with power to purchase, hold, and enjoy real estate, and to sell and dispose of the same for the common benefit, in order to obtain a water works system, conveyed certain rights of way and other property to a private corporation in order that the corporation might issue bonds secured by a mortgage on the property for an amount required to build the works beyond the limit of the city's indebtedness as then fixed and after the city's debt limit was extended, the city regained control of the water works system in accordance with a vote of the people, it was estopped to claim that the bonds so issued by such private corporation which the city assumed were invalid, as ultra vires, because the entire scheme was a mere device to evade the debt limit.—United States Circuit Court, 184 F. R., 752.

Vacation of Streets—Public Use

City of Gary v. Much.—The existence of the power to take private property for public use by eminent domain excludes the idea that it might be taken for private use or under semblance of public use, and immediately or ultimately conveyed to private uses, and land cannot be taken under such power because the public will be incidentally benefited by the use to which private persons will put the land, so long as the public has no right of control, and a city could not vacate a highway to make it possible for several railroad companies to convert it into an exchange yard for the handling of the product of a large industry in the city, though the city would be thereby indirectly benefited together with individual property in the city because of the increased facility with which the product of the industry could be handled; such vacation of the highway being for a private use.—Appellate Court of Indiana, 94 N. E. R., 583.

Paving—Public Improvements—Districts

State ex rel. Granite Bituminous Paving Co. v. City of St. Louis et al.—Under a charter making one-half of each block fronting on a street chargeable with the cost of improving it, and providing that lots used as one parcel of ground shall be regarded as one lot for the purpose of issuing tax bills, the fact that lots fronting on an improved street are used in connection with rear lots fronting on the next parallel street does not authorize the extension of the boundary of the benefit district to the latter street.—Supreme Court of Missouri, 135 S. W. R., 928.

Regulating Exercise of Street Railway Franchise

Brode vs. City of Philadelphia et al.—The constitution does not prohibit the General Assembly from empowering a municipality to contract for payment to it by a street railway company or motor power company operating such other company's property of fixed sums in lieu of the performance of certain duties, or of the payment of license fees or charges imposed in its favor by general law or ordinance, or by the charter of the leasing or operating company; and the Legislature, in the exercise of such power, may direct that a municipality in making such contract may, for protection of its rights under the contract, provide that a certain number of persons shall act as directors of the company, and in conjunction with the directors elected by the stockholders thereof.—Supreme Court of Pennsylvania, 79 A. R., 659.

Construction and Maintenance of Lighting Plant—Statutes

State ex rel. City of Chillicothe v. Gordon, State Auditor.—Since the title of Laws 1897, enabling cities, etc., to issue bonds for the purpose of constructing or purchasing electric light plants, etc., purports to specifically enumerate all the powers intended to be granted, but does not contain the words "to maintain and operate," such powers are by necessary implication excluded, and hence so much of section of said act as purports to grant power to issue bonds to maintain and operate an electric light plant conflicts with Constitution, requiring the subject of each bill to be clearly expressed in its title. Where a statute authorized a city to issue bonds to erect an electric light plant, the use of the word "construct," instead of "erect," in city ordinances providing for the issuance of bonds was immaterial; the word "erect" meaning "to construct."—Supreme Court of Missouri, 135 S. W. R., 929.

MUNICIPAL APPLIANCES

Buffalo Duplex and Triplex Pumping Engines

The Buffalo Steam Pump Co., Buffalo, N. Y., manufacture duplex and triplex pumping engines for water works and general service. The steam and water ends are both simple, and the valve areas are ample, with water passages carefully proportioned, permitting high speeds in case of fire or other emergencies without jar or water hammer. These pumps are made in seventeen sizes, having rated capacities varying from 233 to 1598 gallons per minute. The dimensions of the smallest size are as follows: Diameter steam cylinders, 12 inches; diameter water pistons, 6 inches; length of stroke, 12 inches; rated piston speed, feet per minute, 233; rated capacity, gallons per minute, 233; diameter steam pipe, 2½ inches; diameter exhaust pipe, 3 inches; suction, 6 inches; discharge, 5 inches; approximate width and length, 31 by 94 inches. The dimensions of the largest size pump are: Diameter steam cylinders, 20 inches; diameter water pistons, 14 inches; length of stroke, 18 inches; rated piston speed, feet per minute, 100; rated capacity, gallons per minute, 1598; steam pipe, 4 inches diameter; exhaust pipe, 5 inches; suction, 12 inches; discharge, 10 inches; approximate width and length, 50 by 116 inches.

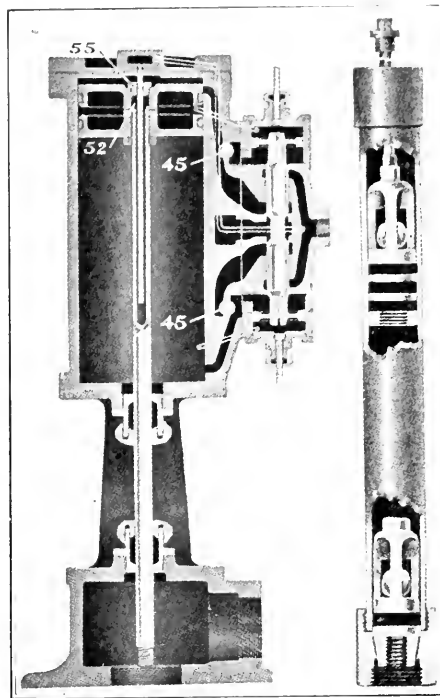
Buffalo Class N triplex pumps are made in capacities varying from 293 to 1500 gallons per minute. The frame consists of four vertical standards of box design, giving great strength with moderate weight. These bearing supports are mounted directly on the heavy cast-iron sub-base and are spaced and held together by the cross-head guides bolted between them. This construction affords a bearing each side of each crank and avoids using gears as crank discs, thereby preventing gear wobble and noisy operation. The crankshaft is of open-hearth steel, forged from the solid billet and machined all over. The crankshaft and pinion bearings are very large and babbitted, peined and scraped. Double gears and pinions are of the best charcoal iron cut from the solid. Gear guards are furnished for the pinions.

Crossheads are fitted with adjustable babbitted shoes which run in bored guides. Crosshead pin is of steel, under oil. Connecting rods are open-hearth steel castings with large babbitted boxes with wedge adjustment at crank end, and bronze boxes with wedge adjustment at crosshead end. Cylinders consists of three separate castings of close-grained iron, all machined to template, and provided with raised edge at top to catch all drip. Plungers are of hard cast iron. Glands are cast iron, allowing ample packing space. Valve boxes are multiple type, machined to template, with ample hand-hole openings and covers, large valve areas, no air pockets and direct water ways. The valves are medium rubber disc valves on bronze grid seats with cylindrical brass springs.

The details of the smallest size pump are as follows: Diameter plungers, 8 inches; stroke, 10 inches; gallons per revolution, 6.5; revolutions per minute, 45; gallons per minute, 293; maximum working pressure, pounds, 200; suction, 6 inches; discharge, 6 inches; gear ratio, 5.5 to 1; tight pulley, with outward bearings, 48 x 10 inches. The details of the largest engine are: Diameter plungers, 16 inches; stroke, 16 inches; gallons per revolution, 41.7; revolutions per minute, 36; gallons per minute, 1500; maximum working pressure, 150 pounds; suction, 12 inches; discharge, 10 inches; gear ratio, 6 to 1; pulley, special size as ordered. The truck horse-power required to operate this pump against a head of 100 feet is 58.

Deep Well Pump and Cylinder

The American Steam Pump Company, Battle Creek, Mich., manufacture the Marsh deep well engine and several styles of well pump cylinders. The accompanying sectional cut of well engine illustrates the construction. In operation the steam piston head contains a reservoir of live steam which is supplied from the upper chamber of the chest above the valve, following the passage indicated by dotted lines to the central cap in cylinder cover, through attached tube and hollow piston rod. This pressure is used only for "tripping" or reversing the valve

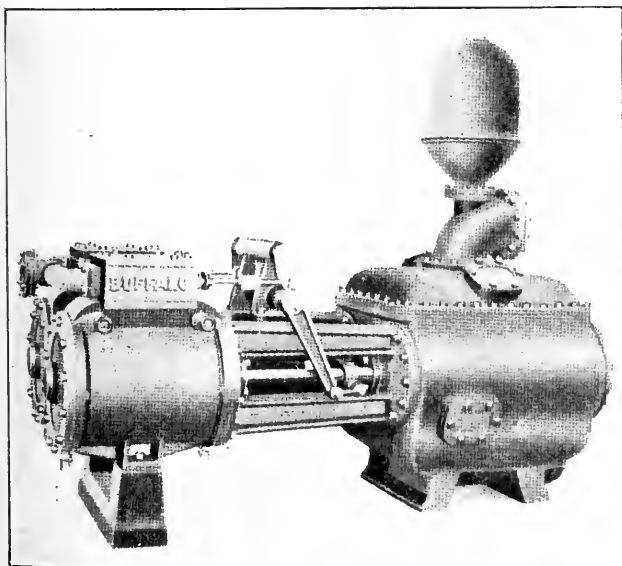


DEEP WELL PUMP AND CYLINDER

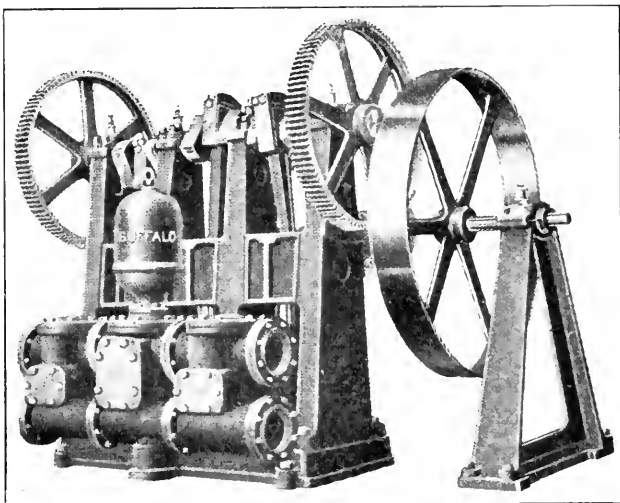
by admitting steam alternately against the enlarged heads of the valve through the connecting passages at either end of the steam cylinder.

The regulating valves, No. 45, are for equalizing the motion of the rod when used in connection with single-acting water cylinders, where the work is all on the "up" stroke, and the weight of a heavy rod might otherwise cause the piston to drop too suddenly, the lower screw restricting the exhaust and the upper screw limiting the amount of steam admitted for down stroke. In regulating these valves they should not be closed entirely, for the engine would stop. When properly adjusted the piston speed will be about alike in both directions.

These engines are made in eight sizes, varying from 4 by 6 to 10 by 36. The sizes of the water cylinder are varied according to the height to be pumped. For instance, the 4 by 6 engine, with 40 revolutions per minute, elevates 900 gallons per hour a height of 25 feet; with a 4½-inch cylinder or with a 1½ cylinder, 110 gallons 300 feet. The 10 by 36 engine, 18 revolu-



BUFTALO DUPLEX PUMPING ENGINE



BUFTALO TRIPLEX PUMPING ENGINE

tions per minute, with 8½-inch water cylinder, elevates 9,400 gallons per hour 80 feet, or with a 4¼-inch cylinder 2,350 gallons 300 feet.

The well pump cylinders with bronze ball valves are intended for the heaviest and most exacting service. The shells are of heavy seamless drawn brass tubing; the valves, plunger, caps, etc., are of the best phosphor bronze. Top attachment is always made larger than inside bore of water cylinder to allow withdrawal of plunger and lower valve cage without disturbing well pipe.

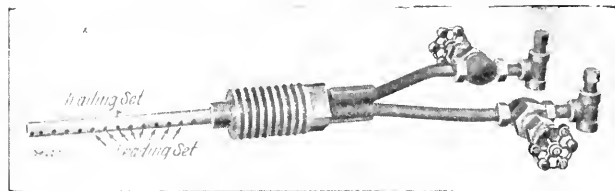
Water Flow Meter

The General Electric Company, Schenectady, N. Y., has placed on the market a water flow meter designed to measure the flow of water in mains and for other purposes. The operation of the meter depends on the principle that rate of flow is proportional to velocity. To measure this a nozzle plug is screwed into the pipe at the

the mean velocity pressure due to the flow of water. The meter, it is said, will give accurate results when measuring water delivered by reciprocating as well as centrifugal pumps, provided the pulsations are eliminated through the use of air chambers. The G. E. water flow meters are calibrated to read in gallons per minute at 39.1 deg. F.

To install the meter under normal conditions, there is no interference with the water piping, all that is necessary being to drill and tap a ½-in. hole in pipes of less than 4 in. in diameter, or a ¾-in. hole in pipes 4 in. and over in diameter. The hole should be drilled in the pipe so that the axis of the nozzle plug is in the plane of the preceding elbow. The nozzle plug must be placed in a straight run of pipe at least eight pipe diameters in length and with its axis in the plane of the preceding elbow. The meter may be located in any desired place below the nozzle plug to which it is connected by ¼-in. iron pipe.

The meter consists of two cylindrical, hollow cups filled to about half their height with mercury and joined at the bottom by a hollow tube. This arrangement of cups and connecting tube forms a "U" tube,



PIPE TO BE INSERTED IN MAIN

point where the water flow is to be measured. One set of openings in the nozzle plug, called the leading set, extends horizontally across a diameter of the water main and faces against the direction of flow. The other three openings, one opposite, the others at right angles to the leading holes, near the center of the plug, constitute the trailing set. The water impinging against the leading set of openings sets up a pressure in them which equals the static pressure, plus a pressure due to the velocity head. The pressure in the trailing set is equal to the static pressure, minus a pressure due to the velocity head. Since the leading set of openings extends approximately across a diameter of the pipe, the velocity pressure transmitted to the meter is

which is supported on and is free to move as a balance about a set of knife edges. A difference of pressure in the nozzle plug is communicated to the cups by flexible steel tubing placed inside the case. This difference of pressure causes the mercury to rise in the left-hand cup and fall the same amount in the right-hand cup until the unbalanced columns of mercury exactly balance the difference in pressure. By the displacement of the mercury, the beam carrying the cups moves downward on the left-hand side of the knife edges. This side will descend until the moment of the weights on the right side of the knife edges exactly balances the moment caused by the displacement of the mercury into the left-hand cup. The motion of the beam is multiplied by levers, and actuates the pen which moves in proportion to the amount of mercury displaced. The time element of the meter

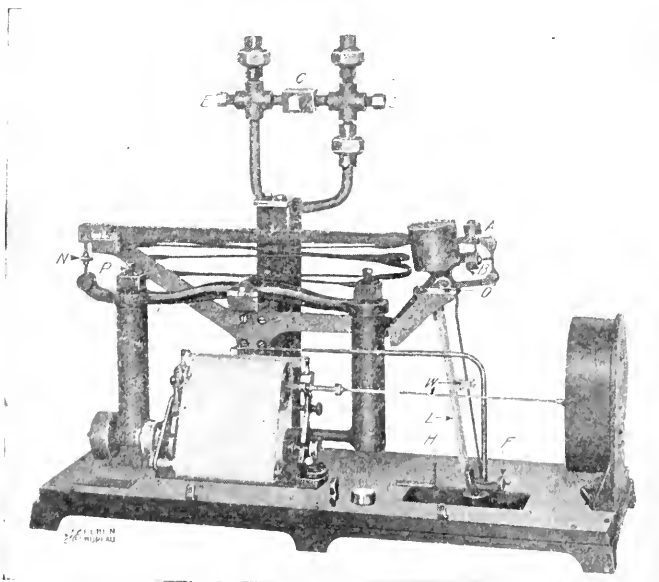
consists of an eight-day clock which drives the drum feeding the paper. The paper on which the record is made is so calibrated that the rate of flow in gallons per minute may be read at any instant or the average rate calculated for a given time. Meters are equipped with a roll device operated by a spring mechanism, and this device is of sufficient capacity to accommodate one complete roll of paper.

Duplex Inverted Mantle Street Lamp

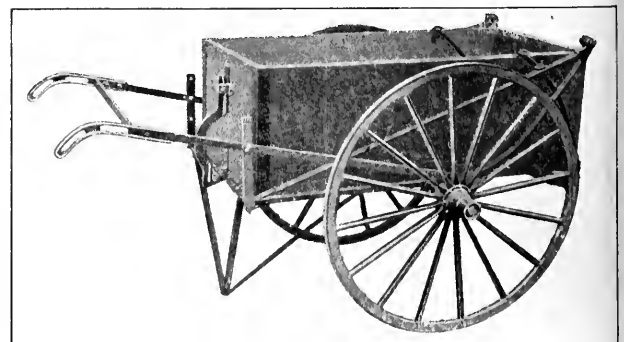
The Welsbach Street Lighting Company of America has recently perfected a new street lighting unit of increased candle-power. The candle-power is 150, which is said to be delivered with a relatively small increased gas consumption over that of the present 60-candle-power lamp, considering the greater illuminating effect produced. It consists of a burner for two inverted mantles. By the arrangement of the various parts a higher regenerative effect is produced, giving a uniform mixture of gas and air to the mantles. The result is a steady unflickering light. The natural tendency of the inverted gas flame to be affected by pressure variations and air draughts has been overcome by means of a perfected gas controller and chimney arrangement. The enclosing lantern is the Boulevard type. Owing to the high diffusive and effective distribution qualities of the light sources, the new units can be placed on the gas posts now in use without alteration of the height above the street surface.

Automatic Dumping Street Cleaning Cart

An automatic dumping cart suitable for street cleaning purposes has been placed on the market by the Baker Manufacturing Co., 337 West Madison street, Chicago, Ill. The sweeper works with the cart by his side; the body sets low enough to make shoveling easy. In small cities where the dumping place for street sweepings is not far away the cart may be pushed to the dump and unloaded, thus saving the expense of carting. The cart is heavily built, it is said, of the best materials. It weighs 200 pounds and can carry a load of 1000 pounds, although, of course, a load of sweepings of 10 cubic feet, its capacity, would not ordinarily weigh so much. The wheels are 36 in. in diameter, wood-sarvin construction, with ¾-in. spokes and rim one inch wide. The axle is of steel one inch square. The handles, framework, etc., are of steel and malleable iron. The box measures 2 ft. by 4 ft. by 1 ft. 3 in. The wood is one inch thick with corners and edges protected with steel strips. The box is hinged on the axle. The cart is dumped by a simple device.



METER AND RECORDING APPARATUS



A CONVENIENT STREET CLEANING CART

NEWS OF THE SOCIETIES

National Good Roads Association.—

The fourth national congress met at Birmingham, Ala., May 25, with representatives from fifteen States present. The floor of the Jefferson Theatre was blocked off by States, while the stage contained seats for the speakers and specially invited guests. The meeting was called to order by John W. O'Neill, president of the Jefferson County Good Roads Association and chairman of the local advisory board of the congress. Governor Emmet O'Neill made the address of welcome. He mentioned the fact that since the last convention the State of Alabama had established a Highway Commission. A large number of applications for State aid had already been received. Job Going, Birmingham, welcomed the convention in behalf of the county, Commissioner James Weatherly in behalf of the city, John W. Craft for the Alabama Good Roads Association, Judge William I. Grubb for the Jefferson County Good Roads Association, Robert W. Massey for the Chamber of Commerce, B. H. Cooper for the Board of Trade, F. P. Chaffee for the Business Men's Club, and Dr. J. E. Dedman for the Motor Club. The convention was then turned over to President Arthur C. Jackson, Chicago, who made the annual address. E. J. Watson, Commissioner of Agriculture, South Carolina, made a brief review of good roads building, tracing it back to the work of Napoleon.

The meeting endorsed a proposal on the part of the Daughters of the American Revolution, made through Mrs. A. O. Lane, for the building of a Jackson memorial highway. The route of the highway lies from the old home of Andrew Jackson in Tennessee through Huntsville, Birmingham, Tuscaloosa, Mobile and thence to New Orleans. This thoroughfare is intended to connect with the Davis-Lincoln memorial highway in Kentucky and thence with a public highway to extend to Chicago. The support of the congress was unanimously pledged the ladies in the building of memorial highways, and they were granted the privilege of naming all such roads that may ever be built.

S. W. MacCallie, State Geologist of Georgia, gave a history of Georgia road laws and the employment of convict labor.

Jesse Taylor, secretary of the Ohio Good Roads Federation, gave a description of the road system of Ohio. He spoke of the need of a road maintenance fund.

Dr. Joseph Hyde Pratt, State Geologist of North Carolina and secretary of the North Carolina Good Roads Association, spoke on State supervision of public roads.

J. C. Clair, industrial and immigration commissioner Illinois Central Railway, explained the interest of railroads in good roads, and stated that ten years ago the Illinois Central had operated a good roads train upon a similar plan to that which is now being pursued by the Southern Railway.

Logan Waller Page, Director United States Office of Public Roads, made an address on the progress of road improvement in the South. He said that 25,000 miles of road had been improved in the South between 1904 and 1909; since then the total of improved mileage had reached 42,280, or 6.67 per cent.

of all roads in the South. At the present date there is available for expenditure throughout the sixteen Southern States the sum of \$40,652,000, or \$59 per mile. Practically one-third of all funds available for expenditure on roads during 1911 are available in the sixteen States. He spoke of the different conditions prevailing in the South as affecting road construction—more rain in the winter and little or no frost.

A. G. Batchelder, New York, chairman, executive committee, American Automobile Association, speaking of automobiles and good roads, said that the association he represented would demand ultimately that all vehicles used on public roads be taxed for the maintenance of the highways, because they claim that it is unjust for automobiles alone to be discriminated against where the wear and tear of roadbeds is due to antagonistic methods of travel.

Prof. G. N. Mitchell, Alabama University, described the work of the newly created commission in Alabama, of which he is a member.

Will P. Blair, secretary National Paving Brick Manufacturers' Association, gave an illustrated lecture on brick paving on country roads.

Senator John H. Bankhead spoke of the duties of the Federal Government in road building under the Constitution, declaring that Congress has the power to establish post roads.

W. S. Keller, State Highway Engineer of Alabama, made an address on practical road construction in Alabama.

A number of other addresses were made regarding various phases of the road problem. The secretary's report showed that 1364 delegates had registered at headquarters. A plan for consolidating all national good roads associations into one organization next December was referred to a special committee, of which Senator J. H. Bankhead was made chairman. Representative Richmond P. Hobson read before the Assembly a copy of a bill which he proposes to introduce in Congress providing for a national highway survey.

New York State Conference of Mayors.—The fourth session assembled at Columbus Institute, Poughkeepsie, Friday morning, May 26, Mayor D. E. Sheehan, Binghamton, presiding. C. R. Hall, State Comptroller's office, read a paper on "State Examination of Municipal Accounting, Purposes and Results." The speaker stated that the object sought by the State Comptroller was to establish a uniform system of accounting for all municipalities if it could be done. If not, then uniform systems for each class of municipalities. The result of the work so far had been to discover little dishonesty but much laxity and inefficiency. The Comptroller examines the accounts of 57 counties, 46 cities and 446 incorporated villages. A. W. Crawford, assistant city solicitor, Philadelphia, made an address on "City Planning and Municipal Indebtedness," showing how the cost increases as the carrying out of plans is postponed. H. M. Williams, Erie Railroad, spoke of "Assessments of Railroad Properties Within City Limits." The speaker argued that structures built for the purpose of eliminating grade crossings, which were public benefits, should not be taxed. He would prefer a system of taxation based on a fixed rate on net earnings. John MacVicar, Des Moines, Ia., spoke on

"Commission Government," reviewing its history and pointing out the results where it had been tried. Richard S. Childs, secretary of the Short Ballot Organization, spoke of "Commission Government and Ballot Reform." Ernest C. Meyers, Census Bureau, Washington, spoke of the difficulties in obtaining statistical information from cities, and attributed it largely to lack of proper accounting systems in the cities. D. D. Frisbie, Speaker of the Assembly, spoke on "Restricting a City's Powers of Self-Government by the State Legislature." He said that the Legislature should refrain from charter changes dictated solely by the desire to secure petty political advantages and confine itself to such changes as experience and wisdom dictated.

A definite move was made for the formation of a permanent organization, and a proposed form of charter was read. On Saturday, the last day of the meeting, the delegates went by boat and train to the site of the Ashokan dam. Two addresses were made, "The Future of Municipal Water Supply in New York State," by Walter McCullough, State Water Supply Commissioner, and "Catskill Water Supply," by Seth Low, ex-mayor, New York City.

Next year's meeting will be held in Utica. Among the letters received from prominent persons who were unable to attend was the following from ex-President Roosevelt:

May 19, 1911.

Mayor Charles Duryee,

My Dear Sir: I sincerely regret my inability to accept your invitation to address the conference of mayors to be held at Poughkeepsie, May 25-27, 1911. I regard as exceedingly important the fact that the mayors and other municipal authorities of the cities of this State have formed an organization for the discussion of the many and important problems which they have in common. A very decided improvement in the standards of municipal administration, and in the development of sound municipal policies, should result from such discussion. Municipal government touches the lives of citizens at many points and in very important ways. Improvement in municipal administration cannot be imposed from above, but must develop first, from an enlightened and aroused public interest in municipal affairs, and second, from the development of expert officials, well and soundly informed on the diverse lines of work in municipalities.

As concerns the particular problem on which you asked me to speak—the work of a police department—I can only say that while it will always be necessary to keep a municipal force for the repression of crime, yet that we ought to do much more than is now done towards the abolition of the conditions that tend to breed crime. The provision of wholesome and sufficient opportunities for recreation for young and old, which is clearly a municipal function, is one of the things which will go far towards simplifying the problems of police administration.—I am, Very truly yours,

THEODORE ROOSEVELT.

Recreation Alliance of New York City.—The Recreation Alliance of New York City was organized May 15 at a meeting in the Metropolitan Building of representatives of practically all the recreation societies in the city. Eugene Philbin, president of the Parks and Playgrounds Association, presided. On a resolution offered by Dr. Henry Moskowitz, the representatives of the various organizations interested in recreation assembled at the meeting indorsed the bill backed by the Board of Estimate, and based upon the report made to that body by the Borough President, providing for a recreation commission, consisting of the president of the Park Board, a representative of the Board of Education and five citizens serving without pay, to be appointed by the Mayor.

American Society for Testing Materials.—The fourteenth annual meeting will be held at Hotel Traymore, Atlantic City, N. J., June 27-July 1. Among the papers to be presented are the following of general municipal interest.

Tuesday, June 27, 3 P. M.—Report of Committee A-3 on standard specifications for cast iron and finished castings; Walter Wood, chairman. Report of Committee C-4 on standard specifications and tests for clay and cement sewer pipes; Rudolph Hering, chairman. Report of Committee C-3 on standard specifications for paving and building brick; D. E. Douty, chairman.

Tuesday, June 27, 8 P. M.—Address by the president, American Society for Testing Materials. "Measured Strains on Engineering Structures," James E. Howard.

Wednesday, June 28, 10 A. M.—Report of Committee A-1 on standard specifications for steel; William R. Webster, chairman.

Wednesday, June 28, 8 P. M.—Report of Committee D-1 on preservative coatings for structural materials; S. S. Voorhees, chairman. Report of Committee A-5 on the corrosion of iron and steel; Allerton S. Cushman, chairman. "The Practical Testing of Drying and Semi-Drying Paint Oils," Henry A. Gardner.

Thursday, June 29, 10 A. M.—"Practical Tests of Sand and Gravel Proposed for Use in Concrete," Russell S. Greenman; "Some Experiments on the Incrustation and Absorption of Concrete," Abel O. Anderson; "The Determination of Stresses in a Reinforced Concrete Member Subject to Axial Load in Flexure," S. Ingberg; "The Expansion and Contraction of Concrete While Hardening," Albert T. Goldbeck; "The Properties of Magnesium Cement, Mortars and Concretes," C. Darleth, Jr., and A. C. Alvarez; "Disintegration of Concrete," Alfred H. White.

Friday, June 30, 10 A. M.—Report of Committee D-4 on standard tests for road materials; L. W. Page, chairman. "A New Consistometer for Use in Testing Bituminous Road Materials," W. W. Crosby; "Improved Instruments for the Physical Testing of Bituminous Materials," Paper III, Herbert Abraham; "A Proposed Method of Testing the Melting Point and Softening Point of Compounds," Henry W. Fisher; "Organic Residues from Soluble Bitumen Determinations," Prevost Hubbard and C. S. Reeve.

Friday, June 30, 3 P. M.—"Standard Methods for Testing Sewer Pipe and Drain Tile," A. Marsten; "A New Type of Autographic Transverse Testing Machine for Research Testing or Regular Foundry Practice," T. Y. Olsen.

Saturday, July 1, 10 A. M.—"Recent Analyses of Tests on Structural Timbers Made by the Forest Service," McGarvey Cline.

Health Officers' Association of New Jersey.—The association held its first banquet May 23 at Achtel Stetter's, with about fifty members in attendance. The toastmaster was Chester W. Wells, of Montclair, and among the speakers were Colonel George P. Olcott, Dr. A. Clark Hunt, Dr. R. B. Fitz Randolph, George W. McGuire and Dr. Richard C. Newton. An amendment to the constitution was adopted permitting any employee of a board of health who has a State license to become an active member. All passive members of State or local boards may become associate members.

Calendar of Meetings

- June 6-8.
Engineers' Society of Pennsylvania.—Annual Meeting at State College, Pa.—E. R. Dasher, Secy., P. O. Box 704, Harrisburg, Pa.
- June 6-10.
American Water Works Association.—Thirty-first Annual Convention, Powers Hotel, Rochester, N. Y.—John M. Diven, Secretary, 14 George street, Charleston, S. C.
- June 7-14.
National Conference of Charities and Correction.—Boston, Mass.—Alexander Johnson, Secretary, Ft. Wayne, Ind.
- June 7.
National Association for the Study and Prevention of Tuberculosis.—Denver, Col.—Dr. Livingston Farrand, Executive Secretary, 105 East Twenty-second street, New York City.
- June 8-10.
National Association of Comptrollers and Accounting Officers.—Annual Convention, Arlington Hotel, Washington, D. C.—George M. Rex, Secretary, 525 Industrial Trust Building, Providence, R. I.
- June 11-16.
International Association of Chiefs of Police.—Eighteenth Annual Convention, Rochester, N. Y.—Major Richard Sylvester, Superintendent of Police, Washington, D. C., President.
- June 13-18.
New York State Association of Chiefs of Police.—Annual Convention, Rochester, N. Y.
- June 13-16.
American Society of Civil Engineers.—Annual Convention, Chattanooga, Tennessee.—Charles Warren Hunt, Secretary, 220 West 57th St., New York.
- June 21-22.
National Conference of Poor Law Officials.—Boston, Mass.—Dr. Robert W. Hill, President State Board of Charities, 105 East Twenty-second street, New York City.
- June 22-24.
Intermountain Good Roads Association.—Annual Convention, Pocatello, Ida.—Caleb Tanner, State Engineer.
- June 27-July 1.
American Society for Testing Materials.—Fourteenth Annual Meeting, Hotel Traymore, Atlantic City, N. J.—Edgar Mackay, Secretary, University of Pennsylvania, Philadelphia, Pa.
- June 28-29.
South Carolina Water Works Association.—Meeting for Organization, Columbia, S. C.—W. F. Steiglitz, Temporary Secretary, Columbia, S. C.
- June 28-30.
International Association for the Prevention of Smoke.—Annual Convention, Newark, N. J.—R. C. Harris, Secretary, City Hall, Toronto, Ont.
- August 15-18.
Firemen's Association of the State of New York.—Rochester, N. Y.—Thos. Honohan, Secretary, Frankfort, N. Y.
- September 12-15.
International Association of Municipal Electricians.—Annual Convention, St. Paul, Minn.—Clarence R. George, Secretary, Houston, Tex.
- September 18-30.
International Municipal Congress and Exposition.—Chicago, Ill.—Curb M. Treab, Secretary, Great Northern Building, Chicago, Ill.
- September 18-October 1.
Fourth International Good Roads Congress.—Chicago, Ill.—J. A. Rountree, Secretary, Birmingham, Ala.
- September 19-22.
International Association of Fire Engineers.—Annual Convention, The Auditorium, Milwaukee, Wis.—James McFall, Secretary, Roanoke, Va.
- September 19-22.
American Hospital Association.—New York City. J. N. E. Brown, M.D., Secretary, Toronto General Hospital, Can.
- September 24-30.
International Congress on Tuberculosis.—Rome, Italy.—Professor Ascoli, Secretary-General, Via Lucina, Rome, Italy.
- September 26-29.
American Society of Municipal Improvements.—Grand Rapids, Mich.—A. Prescott Folwell, Secretary, 239 West Thirty-ninth street, New York City.
- October 4-6.
League of American Municipalities.—Annual Convention, Atlanta, Ga.—John MacVicar, Secretary, Des Moines, Ia.
- November 13-17.
National Municipal League.—Annual Meeting, Richmond, Va.—Clinton Rogers Woodruff, Secretary, North American Building, Philadelphia, Pa.

PERSONALS

ARDREY, HOWARD, has been appointed Chairman of the Executive Committee of the City Plan and Improvement League of Dallas, Texas.

BROWN, LEGRAND, Vice-President and Chief Engineer of the General Electric Power Company, of California, spoke recently before the Rochester Engineering Society on the hydroelectric power development of California. He described in detail and illustrated his talk by lantern slides, the proposed development, which will be one of the most important in the State.

CHALLEN, VICTOR, has been appointed a member of the Board of Police and Fire Commission of San Jose, Cal.

CRUM, EMORY C., is the new City Engineer of Frederick, Md.

FISHER, E. A., City Engineer of Rochester, N. Y., has been given charge of Exposition Park, and is authorized to lease the grounds to outside parties at his discretion.

FRASER, S. R., has been appointed Chief of Police of Tacoma, Wash., succeeding Thomas Malony.

FUERTES, J. H., Hydraulic Engineer of New York City, has been given complete charge of the construction of the new water plant at Cumberland, Md.

HASKINS, DR. THOMAS M., has been re-elected a member of the Board of Control of Wheeling, W. Va.

JOHNSON, JOSEPH, JR., has been appointed Fire Commissioner of New York City. The appointment is a promotion, as he had been Deputy Commissioner under Commissioner Rhineland Waldo, who was recently transferred from the head of the Fire Department to be Police Commissioner.

MCDONALD, R. E., hydraulic engineer of Kansas City, Mo., has been called to Green Bay, Wis., to consult with the authorities in regard to the valuation of a water plant which may be purchased.

MURDEN, CHAS. E., former Chief of the Fire Department, has been elected Street Inspector of Portsmouth, Va.

RIDGELY, RUXTON M., has been selected by Mayor Preston as a member of the Commission on City Plan of Baltimore to succeed Josias Pennington, who has been promoted to the presidency, in place of Francis K. Carey, resigned. The name of Mr. Ridgely was sent to the Second Branch of the City Council along with the promotion of Mr. Pennington. Both were unanimously confirmed.

RUMBOLD, FRANK, has been appointed Commissioner of Public Works of Tona-wanda, N. Y.

STEVENS, JOHN W., has been elected President of the Board of Water Supply of Mt. Vernon, N. Y.

TILDEN, H. O., of New York, a lecturer and agitator for better sanitation in the cities, visited Dayton last week upon his nine months' tour of the United States and Philippines in the interest of better sanitation. Mr. Tilden delivered talks in connection with Mayor Burkhart's addresses at the schools of North Dayton.

UNWIN, RAYMOND, one of the foremost architects of England, recently visited Rochester at the invitation of the Civic Improvement Committee, and delivered an illustrated talk on Town Planning.

WARREN, GEO. C., has been appointed City Comptroller of Saginaw, Mich.

WILSON, WOODROW, Governor of New Jersey, visited Seattle, Wash., during a recent trip through the West, where he delivered an address on The Commission Form of Government, before a large audience.

INDUSTRIAL NEWS

Cast Iron Pipe.—Chicago: Municipal buying has been very satisfactory and inquiries are numerous. Prices are firm. Quotations: 4-inch, \$25.50; 6 to 12-inch, \$24.50; 16-inch and up, \$24. Birmingham: Shipments are good and prices firm. Large shipments are going daily to New Orleans and to California. There is no increase in stocks. Quotations: 4 to 6-inch, \$22.50; 8 to 12-inch, \$22; over 12-inch, average, \$21. San Francisco: Movement of pipe is fairly active, many water and gas companies being in the market. New York: Market is quiet. Quotations: 6-inch, car load, \$21 to \$22.

Lead.—Demand is light. Quotations: St. Louis, 4.225c.; New York, firm at 4.375c.

Artesian Well Pumping.—The seventh annual report of the Memphis, Tenn., Water Department states that the system of segregated pumping (Wills' Pumping System), which takes the water from each well and forces it into the main, under pressure, at one operation, was given a most strenuous test of eight months constant running with such satisfactory results that an order was placed for four more units. The commission believes that this system of pumping has solved the water question for Memphis, as the saving in first cost per million gallons capacity is 75 per cent. and the cost of the water pumped much less than at either of the other pumping stations. The pumps used are made by the Hill-Tripp Pump Company, Anderson, Ind.

Hand Street Cleaners.—The Menzies Street Cleaner Company, Glens Falls, N. Y., recently shipped to the city of Macon, Ga., sixteen street cleaners. Eight machines were forwarded in a first order, and soon after a letter was received by the company stating that the machines were doing such satisfactory work that the city wished to place an order for eight more to be shipped at once.

Cement Shows.—The Cement Products Exhibition Company, 72 West Adams Street, Chicago, Ill., have announced the following dates for the New York and Chicago cement shows next year: Second Annual New York Cement Show, Madison Square Garden, Jan. 29 to Feb. 3, 1912; Fifth Annual Chicago Cement Show, Coliseum, Feb. 21 to 28, 1912.

Concrete Mixers.—To take care properly of its rapidly increasing concrete mixer business, the Standard Scale & Supply Company, Pittsburgh, Pa., manufacturer of the Eclipse concrete mixer, has found it necessary to increase the size of its large plant at Beaver Falls, Pa., by the addition of a steel fireproof building 70 by 80 feet, for which the machinery has already been purchased and installed.

Traction Engines.—The Vincennes Tractor Company, Vincennes, Ind., has been incorporated, with \$50,000 capital stock, as manufacturer of engines. The directors are F. L. Oliphant, Edward Watson, Charles Bierhaus, B. F. Nesbitt, R. M. Robinson, W. M. Alsop.

Steam Shovels.—The Orton-Steinbrenner Steam Shovel Works, Huntington, Ind., though in operation only three weeks, is already making plans to double the size of the plant. Orders are in hand sufficient to keep the factory running until January 1.

Tungsten Lamps.—A factory for the manufacture of tungsten lamps will be established by the General Electric Company at Fort Wayne, Ind. The plant will be in operation in June, and by September it is expected that it will have a capacity of 5,000 lamps per day.

Water Company Would Sell.—The Creston (Ia.) Water Works Company wants to sell its plant to the city of Creston. It has submitted to Mayor Reynolds a proposition to sell for \$100,000. The plant has never paid and is in possession of the bondholders.

Public Utility Compromise.—Litigation in the Court of Chancery lasting for three months between the Newark Water and Electric Company, Newark, Del., and the town, ended last week, when the water and light plants were turned back to the municipality. This agreement was reached out of court, largely through the active interest of Father Dougherty, who acted as arbitrator. The receiver appointed by the Court of Chancery some days ago had not qualified, in expectation of a compromise. It was the naming of this receiver which really brought about the agreement, as both sides desired to save the heavy receivership expenses.

Combination Signal System.—N. Banks Cregier, engineer of the Cregier Signal Company, Los Angeles, Cal., has submitted to the city a proposal for installing a complete fire alarm, police signal and municipal telephone system. An innovation suggested in Mr. Cregier's proposal is to install auxiliary police boxes in private houses, by which a signal may be sent automatically or a telephone conversation instantly obtained with the nearest police station. It is declared these boxes can be made quite profitable to the city at a regular yearly charge. The Fire Commission has referred the matter to the City Council with the request that the body name a special committee to confer with the commission on the subject.

Motor Fire Pump.—The Rochester Motor Fire Pump Company, Rochester, N. Y., has been incorporated with \$150,000 capital stock, the incorporators being R. S. McMahon, Leonard Fuchs, Dr. James T. McGovern, James L. Hotchkiss and A. E. Tuck. The company has acquired the rights to a patented pump. The pump, to be mounted on a fire apparatus, is said to have a capacity of over 1,000 gallons per minute.

Lighting Plants to Consolidate.—A deal has been consummated whereby the Utilities Corporation of New Jersey, owner of the Penn Central Light & Power Company, has acquired the holdings of the Hollidaysburg Electric Light & Power Company, thus bringing the lighting of the two Pennsylvania towns under the same management. A corps of engineers from the office of Dodge, Day & Zimmerman, of Philadelphia, consulting engineers of the Utilities Corporation, will be sent to this field at once and will determine the needs of Hollidaysburg, and there is no doubt but that thousands of dollars will be expended in enlarging the scope of the plant there. The same progressive spirit that has characterized the management of the Penn Central Company locally will be manifested at Hollidaysburg.

Rubber Tires.—The Toledo Tire & Repair Co., 241-3 Erie Street, Toledo, O., has secured the general distributing agency for the complete line of Firestone pneumatic, motor truck and carriage tires and rims.

Flaming Arc Lamps.—The Stave Electric Company, 27 West Twenty-seventh Street, New York City, has brought out two new types of lamps, one burning 100 hours without trimming and the other lasting from 150 to 200 hours. The general construction of these lamps is the same as their earlier type, of 10 and 17-hour lamps, and the carbons are fed by a motor. The heights of the two types are 32 and 37 inches, respectively.

Consulting Engineer.—R. Walter Creuzbaur, M. Am. Soc. C. E., has opened offices at 30 Church Street, New York City, for consulting practice in matters involving preliminary study, design, construction and operation of engineering utilities, and for references of cases in litigation requiring special knowledge of construction and interpretation of contracts. Mr. Creuzbaur has been until recently Consulting Engineer of Public Works, Brooklyn, N. Y.

Wood Paving Blocks.—A wood paving block preserving plant, according to press reports, is about to be established in Centralia, Wash. The initial cost of the factory will be \$40,000. L. R. Mason, of the Carbolineum Wood Preserving Company, Milwaukee, Wis., is the promoter of the enterprise and the process used will presumably be the Avenarius process. Local contracts are expected to give the new company a start. Waste lumber from the mills will supply a low-priced raw material.

Corrugated Metal for Intakes.—The Canton Culvert Company, Canton, O., has issued a folder in which they call attention to the new uses to which their corrugated metal culvert pipes are being put. Notable among these is the installation of an intake from a cut in the Connecticut River for the Hartford Electric Light Company, Hartford, Conn. A detailed account, with illustrations, of this installation is given. Besides this, the culvert metal is used for intakes, outlets, irrigation ditches, casings for electric wires, cables, gas mains, water pipes, collapsible forms for trestles and bridges and centering for concrete arches. The rust-resisting properties of the metal used by this company give their material special value for the purposes stated.

Lighting Merger.—As the culmination of efforts to place the electric lighting companies in several of the surrounding towns and cities under one corporation a certificate was filed in the County Recorder's office, Muncie, Ind., announcing the merger of the Muncie Electric Light Company, the Redkey Lighting Company, the Hartford City Lighting Company, the Dunkirk Lighting Company and the Eaton Electric Company. The corporation is to be known as the Muncie Electric Light Company. For several months the local electric light company has had a large force of men at work constructing lines from Muncie to all of the surrounding towns. Substations have been erected in all these towns and the current for all these towns will be furnished by the Muncie plant, which has been enlarged at an expense of several thousand dollars in the last two years.

Police Call System.—Harry E. Reed, a representative of the Gamewell Fire Alarm Company, called upon the Chief of Police and Mayor of Hazleton, Pa., last week, with a view of erecting a demonstrating model of their police call system in the police station. He was granted the permission, and as soon as the material arrives it will be placed in position.

Alternating Current Switchboard Panels.—The General Electric Company has just issued bulletin No. 4819, which is devoted to the subject of alternating current switchboard panels. The panels described are equipped with oil switches and are suitable for general use in the central stations and isolated plants. They are designed for use with one set of bus bars, to which all generators and feeders are connected by means of single-throw oil switches, and suitable provision is made for the parallel operation of generator. These panels are for use on three-phase three-wire circuits of 480 and 600 volts and 25 to 60 cycles. All of the panels are 90 inches high. The bulletin contains information, including dimension and connection diagrams, regarding three-phase generator panels, single circuit and double circuit three-phase feeder panels, generator voltage regulator panels and combination regulator and exciter panels and three-phase induction motor panels.

Switchboard Instruments.—The General Electric Company recently issued Bulletin No. 4825, which illustrates and describes a line of compact, accurate and moderate-priced instruments for use on alternating and direct-current switchboards. The bulletin contains dimension diagrams and also illustration showing the actual size of the meter scales. These illustrations will enable a prospective customer to see at a glance the ease with which readings may be made.

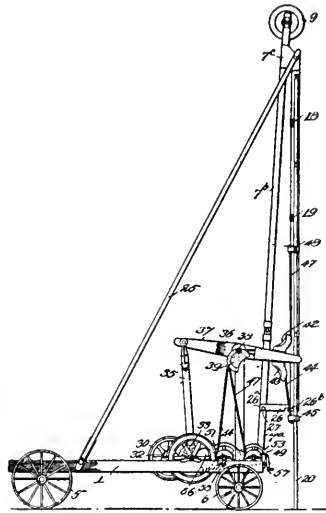
Manganese Steel.—A booklet containing an address on manganese steel by G. W. Kneisly before the National Paving Brick Manufacturers' Association has been published by the Edgar Allen-Manganese Steel Company, McCormick Building, Chicago, Ill. Manganese steel is most valuable for use where resistance to an abrasive action is required. Hence, it is extensively used for the jaw plates of rock crushers, the cutting edge of steam shovel buckets and for gearing of any sort of heavy machinery.

Concrete Bridge.—The Concrete Steel Engineering Company, Park Row Building, New York City, made the plans for the new bridge across the James River connecting Richmond, Va., with South Richmond. The bridge will be built in accordance with the Melan system, and Diamond reinforcing bars will be used. It is to have a concrete railing and a combination trolley and light pole of reinforced concrete. There will be eighteen arches, each having a span of 71 feet, with four abutments and sixteen piers. Seven of these arches cross the James River from Richmond to Mayo's Island and eleven from Mayo's Island to South Richmond. The total length of the bridge is to be 1,721 feet, with a roadway of 44 feet, and two sidewalks of eight feet each. Provision is made for water and gas mains, and three conduits of six sections each for power, police and telephone wires. The bridge is designed to carry 50-ton electric cars and will be provided with two tracks.

PATENT CLAIMS

993,882. **WELL-DRILLING DEVICE.** Ray R. Sanderson, Orrville, Ohio. Serial No. 592,470.

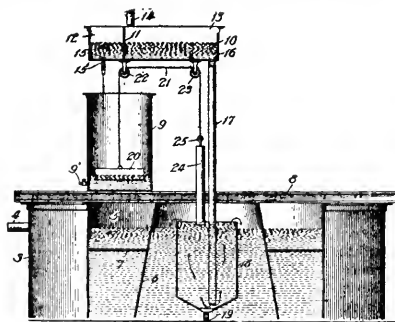
In a drilling device, a frame, a walking beam pivotally secured thereto, a mast, a guide-frame pivotally suspended from said mast, means for retaining the guide-frame



in position, a drill rod arranged to be guided by said guide-frame, and flexible connections between said drill rod and said walking beam for positively actuating the drill rod upwardly and downwardly.

993,663. **WATER-SOFTENING APPARATUS.** Francis S. Dunham, Chicago, Ill., assignor to Kennicott Water-Softener Company, a Corporation of Illinois. Serial No. 546,819.

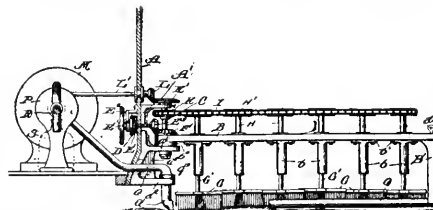
In a water-softening apparatus, means for supplying to the water to be treated therein the chemical treating-material in stick-form, comprising a tank, means for



proportioning the supply to the tank of said water, a float in the tank and mechanism for engaging the stick, connected with the float to be actuated by its rise to advance said stick, for the purpose set forth.

993,603. **STREET-SWEEPING APPARATUS.** Alva D. Jones, Louisville, Ky., assignor to American Street Cleaner Company, Louisville, Ky., a Corporation of Arizona. Serial No. 515,356. Renewed Oct. 24, 1910. Serial No. 588,900.

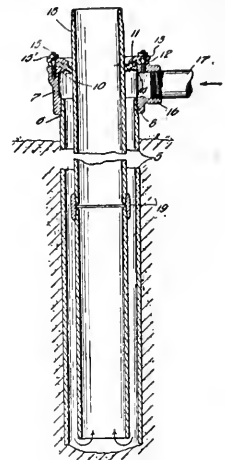
In a street sweeping machine, the combination with a vehicle, of a swinging frame hinged to said vehicle, a support for the free end of said frame, means for swinging said frame laterally, a series of rotary brushes mounted in said frame, and



having their axes substantially vertical, means for imparting vertical play to said brushes, suction pipes at each side of said brushes adapted to suck in the air and solid particles raised by said brushes, and a suction pump carried by said vehicle and connected to said suction pipes, substantially as described.

993,507. **WELL-BORING APPARATUS.** Asa G. Collins, Everett, Wash. Serial No. 523,678.

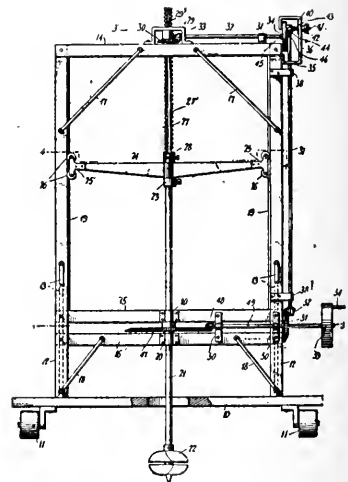
In a well boring apparatus, the combination with an inner sectional pipe member and an outer pipe member inclosing the inner member, and a pipe coupling for connecting the sections of the inner pipe member together, of a fitting detachably connected to the periphery of the outer pipe member and projecting above said outer pipe member, the inner diameter of that portion of the fitting which projects above said outer member being greater than the diameter of said pipe member, said fitting provided with a side opening and a screw-threaded socket for the reception of a water supply pipe, said fitting further pro-



vided at its upper end with an inwardly extending annular flange having a downwardly curved upper face and of a width to provide an opening of greater diameter than that of the pipe coupling, an elastic gasket seated upon said flange and of a diameter to snugly engage the periphery of the inner pipe member, a ring arranged over the coupling and provided with an inwardly-extending portion having a downwardly curved lower face engaging the upper face of the gasket, the lower face of the ring being parallel with the curved upper face of the flange, and means extending through the ring, and gasket and engaging in the top edge of the fitting for coupling the ring and gasket to a nutting.

993,903. **EARTH-AUGER.** Grover T. Stott, New Carlisle, Ohio. Serial No. 536,373.

In an earth auger, a frame, a boring bar slidably and rotatably mounted therein, a feed screw swiveled to the boring bar, a bevel gear having a threaded opening therethrough engaged on said feed screw, means to drive the boring bar, and an operative connection between said means and said bevel gear comprising a shaft operated by said means, a bracket on said



frame provided with a portion parallel to the shaft and having a slot longitudinally thereof, a friction roller splined on the shaft and provided with a circumferential groove, a clamp mounted on the slotted portion of the bracket, an arm projecting from the clamp and provided with a forked end engaging said groove, a second shaft, a second bevel gear on the second shaft meshing with the first bevel gear, and a friction disk carried on the second shaft and against which said roller bears.

THE WEEK'S CONTRACT NEWS

Relating to Municipal and Public Work—Street Improvements—Paving, Road Making, Cleaning and Sprinkling—Sewerage, Water Supply and Public Lighting—Fire Equipment and Supplies—Bridges and Concrete Work—Sanitation, Garbage and Waste Disposal—Police, Parks and Miscellaneous—Proposals and Awards.

To be of value this matter must be printed in the number immediately following its receipt, which makes it impossible for us to verify it all. Our sources of information are believed to be reliable, but we cannot guarantee the correctness of all items. Parties in charge of proposed work are requested to send us information concerning it as early as possible; also corrections of any errors discovered.

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREET IMPROVEMENTS				
Ohio	Youngstown	June 9	Paving Hillman Street and grading Myrtle ave.	City Clerk.
Ohio	Cincinnati	June 9, noon	Improving Spring Grove avenue by setting curb, paving roadway with wood blocks or bitulithic, sides with granite blocks, constructing necessary drains and inlets.	John J. Wenner, Clk. Dept. Pub. S. Board Local Improvements.
Missouri	St. Louis	June 9, 2 p.m.	Improving portions of various streets.	P. H. Connolly, Chm. Bd. Pub. Wks.
Wisconsin	Racine	June 10, 10 a.m.	Paving por. of Water street, consisting of about 2,642 sq. yds. brick paving.	Frank Snyder, County Auditor.
Minnesota	Biwabik	June 10, 8 p.m.	Constructing about 2,000 lin. ft. curb and gutter.	Harris E. Chace, Chm. Road Com.
Oklahoma	Ft. Sill	June 10	Constructing macadam roads.	Frank Snyder, County Auditor.
Massachusetts	Freetown	June 10, 8 p.m.	Constr. a section of macadam road beginning at East Freetown Ry. station and extending as far as \$3,700 will build.	Harris E. Chace, Chm. Road Com.
Ohio	Greenville	June 10, 10 a.m.	Constr. 3 county roads in all 7,169 ft.	Frank Snyder, County Auditor.
Ohio	Sandusky	June 12, 10 a.m.	Reconstructing state road beginning at corporation line of Vermillion Village running south 1,700 feet.	John Deist, County Auditor.
New York	New York	June 12	Paving, regulating, grading, curbing, flagging, etc., in various streets of Queensboro.	Lawrence Gresser, Pres. Boro. Qns.
Ohio	Cincinnati	June 12, noon	Improving portion of Peerless st. by constructing concrete steps and all necessary appurtenances.	John J. Wenner, Clk. Dept. Pub. S. City Clerk
North Dakota	E. Grand Forks	June 12	Laying about 21,000 sq. yds. of pavement, est. cost \$61,500.	John J. Wenner, Clk. Dept. Pub. S. City Clerk
Pennsylvania	Ridgeway	June 12	Constr. 2,500 cu. yds. excavation; 7,000 sq. yds. paving and 5,600 lin. ft. curb.	F. W. Ward, Boro. Engr
New York	Albany	June 12	Constr. 9.46 miles of state roads in Otsego and Chenung Cos.	State Highway Commission.
Massachusetts	Boston	June 12	Constr. walks and drains in Boston Common.	O. H. Sullivan, Supt.
Michigan	Detroit	June 12	Furn. asphalt road oil, limestone, crushed cobble and trap rock.	H. W. Busch, Secy. Dept. Parks.
Pennsylvania	Scottsdale	June 12, 7 p.m.	Paving with vit. brick or block 6,734 sq. yds. and with vit. hillside brick or block, 1,824 sq. yds., grading, curbing, etc.	R. F. Ellis, Burgess.
Ohio	Toledo	June 13, noon	Improving Post street by paving, draining, constr. retaining walls, laying sidewalks, etc.	J. R. Cowell, Dir. Pub. Service.
Minnesota	Virginia	June 13, 8 p.m.	Paving various streets.	City Clerk.
Alabama	Montgomery	June 13, noon	Paving with brick, asphalt, bitulithic or wood block various streets, also necessary curbs, gutters and storm water drains.	Robert Tait, City Treasurer.
New Jersey	Atlantic City	June 13	Constr. Schillinger or Hexagon block sidewalks in var. streets.	Rightmire, City Engr.
Ohio	Galion	June 13, noon	Paving Massachusetts and other avenues.	Ed. C. Yochem, Clk. D. Pub. Serv.
Ohio	St. Bernard	June 14, noon	Improving North Market st. by macadamizing about 3,200 ft. and paving about 5,500 ft. in East Main st. with brick.	Geo. Schroeder, City Clerk.
Ohio	St. Bernard	June 14, noon	Constructing artificial stone sidewalks on Beech St. and Spring Grove avenue.	Geo. Schroeder, City Clerk.
New Jersey	Camden	June 14, 11 a.m.	Resurfacing the Camden and Westfield Turnpike, material to be applied by the ton, consisting of about 4,065 tons asphalt concrete, 3,677 tons 1 1/2 in. stone, 3,465 cu. yds. gravel.	J. J. Albertson, County Auditor.
New Jersey	Paterson	June 14, 2 p.m.	Improving Midvale Greenwood Lake road by macadamizing, 2,000 ft. granite curbing, all necessary storm drains, inlets etc.	Wm. H. Mason, Chm. Road Com.
Alabama	Selma	June 14, noon	Laying 5,000 yds. brick paving on concrete foundation; 2,000 ft. granite curbing, all necessary storm drains, inlets etc.	Julien Smith, City Engineer.
Ohio	Canton	June 14	Paving 2 1/2 miles.	County Road Comrs.
New Jersey	Paterson	June 14	Macadamizing the Midvale Greenwood Lake road.	Wm. H. Mason, Chm. Road Comrs.
Indiana	Winamac	June 15, noon	Constructing a highway on line bet. Pulaski & Starke Counties.	Wm. E. Munchenburg, County Aud.
Tennessee	Chatanooga	June 15, 1 p.m.	Improving various streets, consisting of about 32,000 sq. yds. paving; 19,000 lin. ft. concrete curb and gutter.	E. D. Bass, Chm. Road Com.
New Jersey	Elizabeth	June 15, 8:30 p.m.	Paving various streets with brick, asphalt and trap rock, setting curbs and gutters.	N. K. Thompson, Street Comr.
Maryland	Towson	June 15	Building a section of state highway between Quarry Line & Rockland, distance about 2 miles.	E. Stanton Bosley, Secy. Co. H. C.
Ohio	Cincinnati	June 16, noon	Improving the Loveland and Madeira road; constructing culvert and approaches on Betts ave. in Springfield township.	Stanley Struble, Pres. Bd. Co. Comrs.
Ohio	Toledo	June 16, noon	Improving Kelsey ave. by paving central 30 ft. with vit. brick on concrete foundation, necessary grading, curbing, retaining walls, drainage, etc.	J. R. Cowell, Dir. Pub. Service.
Indiana	E. Germantown	June 16, 7 p.m.	Constructing cement sidewalks in various streets.	Amos E. Ehle, Town Clerk
Massachusetts	Holyoke	June 16, 2 p.m.	Furnishing paving blocks.	Oscar C. Perry, Asst. Clk. Bd. P. W.
Idaho	Pocatello	June 17, noon	Constr. macadam road between Rossfork and Gibson in Bing ham County.	J. P. Congdon, Secy. Rossford Rd. C.
New York	White Plains	June 19	Constr. a ten foot center strip of macadam asphalt in portion of Church street.	John J. Brown, Pres. Bd. Trustees.
Washington	Vancouver	June 19	Street improvements consist of paving, grading, macadamiz., etc. estimate cost \$292,780.	H. H. Lotter, City Engineer.
Indiana	Anderson	June 19	Constructing gravel roads in various townships.	Wm. T. Richards, County Auditor.
Washington	Hoquiam	June 19	Constructing the Emerson road, est. cost \$17,000.	County Commissioners.
Tennessee	Springfield	June 20, noon	Grading, ditching and macadamizing about 50 miles of public roads in Robertson County.	Jos. E. Washington, Chm. Bd. Co. C.
Ohio	Columbus	June 21	Improving various roads in Franklin Co., about 8 miles; grad. the grounds of tuberculosis camp, constr. concrete walks.	County Comrs.
New Jersey	Spotswood	June 22, 8 p.m.	Laying 2,400 ft. of concrete curbing.	Geo. W. De Voe, Boro. Clerk.
Pennsylvania	Wilkes Barre	June 22, 2 p.m.	Repairing with bituminous macadam the Kingston and Dallas Turnpike, in Kingston township.	James N. Norris, County Compt.
Ohio	Cincinnati	June 23, noon	Repairing portion of Blue Rock pike; also for oiling Colerain pike in Colerain twp. and Cleves and Bridgetown pike in Green and Miami townships.	Stanley Struble, Pres. Bd. Co. Comrs.
SEWERAGE				
Utah	Salt Lake	June 9	Constructing pipe sewers in various streets.	H. G. McMillan, Chm. Bd. Pub. Wks
Ohio	Youngstown	June 9	Constructing sewers in various streets.	City Clerk.
Kentucky	Dawson Springs	June 10 noon	Constr. sanitary and storm water sewers, consisting of about 2,640 ft. 12-in. vit. pipe sewer; 540 ft. 10-in.; 1,400 ft. 9-in.; 3,400 ft. 8-in., m.h., &c.	C. A. Niles, Mayor.
West Virginia	Huntington	June 10, 1 p.m.	Constructing sewers in various streets, size 12 to 18-in.	A. B. Maupin, City Engr.
Ontario, Can.	Steeleton	June 10, 8 p.m.	Constr. a reinforced concrete outfall sewer about 570 ft. in length and 66 inches interior diameter.	J. Robinson, Town Clerk.
New York	Fulton	June 12, 8 p.m.	Constr. 8,500 lin. ft. of 8-in. vit. pipe sewer; 4,500 lin. ft. 6-in. vit. pipe sewer; 900 lin. ft. of 10-in. vit. pipe sewer; man-holes, flush tanks, Y branches, etc.	J. A. Foster, Pres. Bd. Pub. Wks.
New York	Jamestown	June 12, 7:30 p.m.	Constr. about 30,000 lin. ft. vitrified tile sewer 30 and 24-in.	Grover E. Yerron, City Clerk.
Minnesota	Willmar	June 12	Constr. 12,316 ft. of 12 to 15-in. sanitary sewers.	J. A. Rowat, City Engineer.
Alabama	Montgomery	June 13, noon	Constr. sanitary sewer on Sayre St. and necessary inters. sewer	Robert Tait, Treasurer

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
SEWERAGE (Continued)				
Ohio	Galion	June 13, noon	Constructing about 6,000 ft. of 10 to 30-in. storm water sewers.	Ed. C. Yochem, Clk. D. Pub. Serv
Iowa	Clinton	June 13	Constructing sewers in Sewer Dist. No. 4.	R. C. Hart, City Engr.
Pennsylvania	West Chester	June 14	Constr. of outfall sewers and disposal plants.	Boro. Clerk.
New York	Binghamton	June 14, 4 p.m.	Laying vitr. pipe sewers with appurtenances and lot connections in two streets.	S. W. Murray, Clk. Bd. Cont. & Sup.
New York	Troy	June 15	Constr. about 250 ft. of 12-in. vit. pipe sewers.	James M. Riley, Secy. Bd. C. & S.
Ohio	Piqua	June 16, noon	Constructing a sanitary sewer in South Main street.	T. D. McClay, Dir. Pub. Service.
California	Oakland	June 17, 11 a.m.	Constructing main sewers together with lateral sewers in Sewer Districts 1, 2, 3 and 4.	Jas. W. Nelson, Secy. Bd. Pub. Wks.
Minnesota	Brainerd	June 19	Constructing a general sewer.	V. N. Roderick, City Clerk.
Georgia	Tolocco	June 20	Constructing a sewerage system.	D. E. Hogsed, Chm. Sewerage Com.
South Dakota	Madison	June 20	Installing a sewer. Estimated cost \$65,000.	Chas. A. Trimmer, City Engr.
South Dakota	Aberdeen	June 26	Constr. about 1,860 ft. of 18 and 8-in. pipe sew. and 5 manholes.	F. W. Raymond, Cit y Auditor.
North Carolina	Red Springs	June 27, 3 p.m.	Constr. a sewer system including 4 1/2 miles of 8 to 15-inch pipe.	A. B. Pearsall, Chm. Bd. Pub. Wks.
Maryland	Baltimore	June 28	Constr. storm water sewers in the bed of Jones' Falls, preliminary to constructing boulevard over Falls.	J. H. Preston, Mayor.
California	San Jose	July 3	Construct septic tank for County hospital.	City Clerk.
WATER SUPPLY				
Michigan	Marquette	June 9	Constr. an extension to the water works intake, consisting of about 2,230 ft. of 36-in. c. i. pipe with all appurtenances, riprap, dredging, etc.	J. P. Kern, Secy. Bd. Fire & W. C.
Wyoming	Upton	June 9	Constructing system of water works.	Geo. H. Davis, Town Clerk.
Indiana	Marion	June 9	Laying water mains in portion of D street.	City Clerk.
New York	White Plains	June 9	Furn. c. i. pipe for water mains; excavating 2,000 feet.	City Clerk.
Louisiana	Rayne	June 10	Furnishing 4, 6 and 8-inch cast iron pipe, gate valves, hydrants, etc., 5,000 lbs. of pig lead, and 300 lbs. of tarred hemp.	J. D. Hunter, Mayor.
Indiana	Richmond	June 12, 10 a.m.	Furnishing water to city for period of 25 years.	H. M. Hammond, Chm. Bd. Pub. W.
Montana	Lewiston	June 12	Trench and lay. 56,000 ft. of 4 to 12-in. water mains.	Phil. A. Chase, City Clerk.
Minnesota	Willmar	June 12	Constr. 2 purification plants and pumping stations.	J. A. Rowat, City Engr.
Michigan	Detroit	June 13	Furn. seven 72-in. gate valves, seven motor-operated floor stands and 9 hand-operated floor stands.	B. F. Guiney, Secy. Bd. Wt. Comrs.
Virginia	Richmond	June 14, 4 p.m.	Furn. 2 centrifugal pumps, piping and water meters; also two 200 H. P. electric motors, switches and wiring.	E. E. Davis, Supt. Water Dept.
Massachusetts	Williamsburg	June 15	Constr. a rubble masonry dam, 425 ft. long 40 ft. high with 2 spillways each 60 ft. long.	City Clerk.
North Carolina	Tarboro	June 15, 3 p.m.	Improving water works consisting of 500,000 gallon concrete filter plant 260,000 gallon concrete storage reservoir, auxiliary electric pumping station and 1 mile of 10 inch cast iron pipe.	W. O. Howard, Mayor.
Colorado	Colorado Spgs	June 16, 10 a.m.	Furn. and laying 63,785 ft. of cast iron pipe 4 to 16-in. and 43 tons special castings; alternate bids for 12 and 16-in. steel pipe; 143 gate valves and boxes; 53 tons pig lead, manh., etc.	H. F. Avory, Mayor.
Indiana	Evansville	June 17, 10 a.m.	Furnishing about 250 tons of c. i. pipe and spec. valves, meters.	Henry L. Heilman, Secy. Bd: W. C.
Ontario, Can.	Toronto	June 20, noon	Laying about 3,500 ft. of riveted steel pipe 6-in. in diameter in Lake Ontario.	F. S. Spence, Chm. Bd. Control.
Alabama	Gadsden	June 21	Furn. about 900 tons of water main, 20 tons of specials, 20 tons of lead, 30 valves and 26 hydrants.	M. E. Jones, Supt.
Quebec, Can.	Montreal	June 29, noon	Installing pumping machinery, blower and cranes at filtration plant.	L. N. Senecal, Secy. Bd. Comrs.
Minnesota	Minneapolis	June 30	Furnishing filter equipment and devices.	Henry N. Knott, City Clerk.
BRIDGES				
Wisconsin	Milwaukee	June 10	Constr. a bascule bridge across the Mil. river at foot of Oneida st.	H. E. Briggs, Comr. Pub. Wks.
Indiana	Indianapolis	June 12, 10 a.m.	Constr. a bridge over Fall Creek, on Capitol ave.	Albert Sahm, County Auditor.
Indiana	Scottsburg	June 13, 1 p.m.	Constr. two iron bridges and four concrete bridges.	Robt. Blunt, County Auditor.
California	Eureka	June 13, 2 p.m.	Constr. a pile trestle and fill on the road from the new Eel River bridge to Ferndale.	Geo. W. Cousin, Clk. Bd. Super.
Delaware	Wilmington	June 13, noon	Constr. a new reinforced concrete arch bridge over White Clay Creek at Roseville Mill, removing old bridge, furn. temporary bridge, constr. all retaining walls, etc.	James Wilson, County Engr.
Kansas	Leavenworth	June 14, noon	Repairing concrete culvert on Wyandotte and Leavenworth County line, also repairing Harms Bridge in Kickapoo twp.	J. A. Hall, County Clerk.
Manitoba, Can.	Wheatland	June 15	Constr. a bridge across the Saskatchewan river, near Rivers, to have 90-ft. steel span, 160 ft. roadway, steel stringers, masonry abutments.	Jas. R. Shanks, Chm. Bridge Com.
Washington	Ritzville	June 16	Constr. a 2-span steel bridge across Palouse River.	County Commissioners.
Ohio	Lima	June 20	Constructing a concrete arch bridge.	Bd. County Comrs.
Pennsylvania	Kutztown	June 20, 10 a.m.	Constr. a reinforced concrete arch bridge.	A. L. Rhoades, County Comptroller.
Iowa	Eldora	June 22	Constr. a 7-span steel bridge 30 ft. wide with concrete floor over Iowa River, at Iowa Falls.	E. L. Marriage, County Auditor.
Ohio	Cincinnati	June 23, noon	Constr. bridges, culverts and approaches on County Club road in Sycamore, Silverton and Columbia townships.	Stanley Struble, Pres. Bd. Co. Comrs.
Virginia	Rocky Mount	June 24	Constr. two bridges in Franklin County, of iron.	J. H. Ferguson, Chm. Bridge Com.
Texas	Houston	July 1	Constr. a reinforced concrete viaduct over Houston ship channel about 1,650 ft. long and 60 ft. wide.	F. L. Dormant, City Engr.
Pennsylvania	Pittsburg	July 1	Constructing one concrete arch, estimated cost \$85,000.	City Clerk.
LIGHTING AND POWER				
Minnesota	Eveleth	June 9	Installing 5 electric light standards.	City Clerk.
Virginia	Barton Heights	June 9	Installing a municipal gas plant.	Town Clerk.
Georgia	Colquitt	June 10	Improving electric light system to cost \$7,500.	P. E. Willin, Mayor.
Mississippi	Tupelo	June 10, 2 p.m.	Furn. 2 engines, two 250 KUA generators and accessories; 125 tungsten lights; 15 metallic flame lights; 60 H.P. induction motor; transformers, switchboard, etc.	D. W. Robins, Mayor.
Maryland	Fort Howard	June 12, 11:30 a.m.	Constructing electric light plant and lighting system.	T. A. Terry, Constr. O.M., U.S.A.
Sask., Can.	Prince Albert	June 26	Furn. hydraulic power and electrical power equipment.	C. O. Davidson, Secy.-Treas.
Arkansas	England	July 1	Building and operating an electric light plant under a 30-year franchise.	H. Galloway, Recorder.
FIRE EQUIPMENT				
New Jersey	Westfield	June 12, 8 p.m.	Furn. 1 comb. chem. engine and hose wagon; 1 pumping engine, capacity 700 gals. per minute.	R. F. Hohenstein, Chm. Fire Com.
Oregon	Portland	June 15	Furn. two 1-ton auto trucks with solid tires for Fire Dept.	City Auditor.
Dist. of Col.	Washington	June 15, 2 p.m.	Furn. one second size, double action steam fire engine.	Cuno H. Rudolph, Commissioner.
Dist. of Col.	Washington	June 20, 2 p.m.	Furn. 15,000 ft. 2 1/2-in. cotton covered rub. lined fire hose.	Cuno H. Rudolph, Commissioner.
New Jersey	Princeton	July 5	Furn. auto pumping engine.	E. M. Updike, Chm. F. & W. Com.
MISCELLANEOUS				
New York	New York	June 9, 2:30 p.m.	Repairing steamer "The Lowell"	Michael J. Drummond, Comr. D.P.C.
Texas	San Antonio	June 12, 10 a.m.	Remodeling the county jail, est. cost about \$50,000.	County Commissioners.
New York	Buffalo	June 13, 11 a.m.	Constructing steel and brick superstructures on Intake Pier; and two internally fired tubular boilers.	Francis G. Ward, Comr.
Rhode Island	Providence	June 14, 2:15 p.m.	Constructing tuberculosis ward at City Hospital.	City Clerk.
Arkansas	Benton	June 16	Erecting jail; separate bids for cell work.	W. H. Evans, County Comr.
Indiana	Evansville	June 19, 7 p.m.	Constr. earth work embankments surrounding filtration plant consisting of about 2,500 cu. yds.	Henry L. Heilman, Secy. Bd. W. C.
Ohio	Toledo	June 20, noon	Constructing a market house.	J. R. Cowell, Director Public Service.
Indiana	Indianapolis	June 21	Collecting and disposing of garbage.	Edw. A. Ramsay, City Clerk.
Indiana	South Bend	June 26, 10 a.m.	Furn. 50 or more voting machines.	John W. Harbou, Auditor.
Ohio	Maumee	June 26, noon	Erecting a village hall building.	Geo. V. Raab, Village Clerk.
Indiana	Muncie	July 5	Constructing a new barn at County Infirmary, 40x50 ft.	County Auditor.

STREET IMPROVEMENTS

Nashville, Ark.—City has decided to construct sidewalks.

Phoenix, Ariz.—Council is considering paving of large number of streets.—O. H. Christy, Superintendent of Streets.

New Britain, Conn.—Board of Public Works has voted to recommend to Council purchase of 5,000 gals. of light Texas oil for oiling streets.

New Castle, Del.—City has sold \$30,000 street improvement bonds to F. D. Lackey & Co.

Bradentown, Fla.—Citizens have voted 45,000 bonds for paving streets, improving water works plant and extending sewerage system.

Plant City, Fla.—Council has ordered about ten miles of brick, cement or asphalt sidewalks.

Elberton, Ga.—City will expend about 50,000 for street improvements.

Valdosta, Ga.—Lowndes County Grand jury has recommended issuance of \$200,000 road bonds.

Waycross, Ga.—Grand Jury has recommended \$250,000 bond issue for road improvements.

Chicago, Ill.—Board of Local Improvements is preparing estimates of the cost of paving Lake, Van Buren and Harrison sts.

Freeport, Ill.—Council is considering paving of Maple ave., Benton and other streets.

Fort Wayne, Ind.—City will advertise for bids for complete street repair plant, including five-ton roller, to be used in filling holes in pavements.

Indianapolis, Ind.—Board of Public Works has decided to pave Maple st.

Burlington, Ia.—Council has returned unopened bids for paving Spring st., South of Arch st. and Arch st., Fifth to Eighth ts., owing to errors in specifications.

Dubuque, Ia.—Council has adopted resolution for improvement of 4th st.

Newport, Ky.—General Council is considering improvement of 59 squares of city streets.

New Orleans, La.—Council is considering paving of Lafayette and Poydras sts. with mall granite block, and extension of sea wall at East End.

Richmond, Ind.—Board of Works has prepared preparation of plans for paving Main st.

Holyoke, Mass.—Board of Public Works has ordered macadamizing of Park and School sts.; Beech st. will also be macadamized between Hampden and Appleton sts.

Lowell, Mass.—City is about to pave Gorham, Dutton, Merrimack, Middlesex and Iken sts. and Merrimack Square.

Benton Harbor, Mich.—City Engineer Johnson has prepared plans for paving W. Main st. with brick on concrete; cost, about 36,399.

Lansing, Mich.—Council has reconsidered resolution awarding contract for construction of artificial stone sidewalk to V. D. Finnis, who has had contract for last year, and passed resolution instructing Clerk to divert for bids.

Duluth, Minn.—Grand ave. will be paved with brick.

Butte, Mont.—Park st. west of Montana and Harrison aves. below viaduct will be improved at once.

Joplin, Mo.—Bids will soon be received for paving Main st. with creosoted wood block at cost of \$39,784.—J. E. Hodgdon, City Engineer.

Newark, N. J.—Colonel E. A. Stevens, state Road Commissioner, has decided to pave plank road between Newark and Jersey City paved with both wood and granite blocks.

Woodbridge, N. J.—Bids will be readvised for macadamizing roads in Township.

Long Island City, N. Y.—Local Board has passed resolutions for paving with asphalt block on Munson st., Astoria, from Fulton to Franklin, estimated cost \$5,800, and on 1st ave., city, from Jackson ave. to Webster st., to cost \$16,000; also to regulate, grade, curb and flag Stanhope st. from Woodward to Grandview aves., and pave with granite blocks on concrete foundation from Woodward to Fairview aves., cost, 24,425.

North Tarrytown, N. Y.—Citizens have voted to pave Broadway and other streets with brick at cost of \$144,000.

Watkins, N. Y.—Village Trustees are considering paving of Franklin st.; cost, about \$32,000.

Hamlet, N. C.—Bids will be received June 7 for \$5,000 street improvement bonds.—V. E. Davis, Mayor.

Pittsboro, N. C.—Bids will be received until June 10 for \$5,000 street improvement bonds.—B. Nooe, Mayor.

Tarboro, N. C.—Citizens have voted \$25,000 for paving.—John A. Weddell, City Clerk.

Akron, O.—Council has passed \$125,000 bond ordinance for following improvements: Paving of W. Exchange, Portage Path to west corporation limits, \$35,000; Dodge ave., Payne to Exchange, \$5,800; Mills ave., Carroll to Exchange, \$6,500; Cuyahoga Falls ave., W. Tallmadge to east corporation line, \$30,900; Lake st., Main to Lakeside, \$20,000; Nebraska, Forge to Upton, Arlington from Adams to Arch, \$15,000; Arlington, Second to south corporation line, \$12,800.

Cincinnati, O.—Council has decided to improve portions of Auburn and Terrace aves.; cost of street improvements has been estimated as follows: Jonathan ave., Woodlawn ave., to west line of Harlem place, brick, \$5,826.25; McMacken st., Delaney to Joe Williams st., brick, \$3,830; Michigan ave., Observatory to Erie ave., \$5,943.25; Knowlton st., Lane st. to Crawford ave., brick, \$15,656; Carlisle ave., Central ave. to west line of Cutter st., asphalt, \$2,163.

Cincinnati, O.—County Commissioners have approved estimate for improving Sharon ave. from Glendale to Reading pike, at an estimated cost of \$16,760, and grading and macadamizing Springfield pike, from Colerain to Hamilton pike, to cost about \$13,495; plans and specifications for improvement of Lower River road at estimated cost of \$10,254, from Murry Creek covered bridge to Main ave., Addyston, have been ordered prepared, as well as for eight other road improvements.

Dresden, O.—Kliggs & Sherman Co., Toledo, have been selected by the village as engineers for proposed street improvement.

Toledo, O.—Council has decided to repave Washington st.

Independence, Ore.—Council has decided to hard-surface three streets at estimated cost of \$15,000.

Junction City, Ore.—Citizens will vote July 3 on \$17,000 bonds for street improvements.

Springfield, Ore.—Council has decided to issue \$50,000 bonds for street improvements.

Hazleton, Pa.—County Commissioners have decided to oil over 10 miles of county roads within the next month and have advertised for bids for work.

New Brighton, Pa.—Borough will expend about \$12,000 for brick paving.—H. T. Barker, Borough Engineer.

Sharpville, Pa.—Council is considering paving of every street to borough limits.

Greenville, S. C.—City will pave W. Washington st. from Academy st. to Southern Railway passenger station.

Johnson City, Tenn.—Council will pave 1½ miles of streets, including Roan st. and Watauga ave.

Memphis, Tenn.—Bids will soon be asked for paving Union ave. with asphalt, bitulithic and wood block pavement.—Geo. C. Love, Commissioner Streets, Bridges and Sewers.

Childress, Tex.—Childress County will vote on bonds for improvement of roads.

Lockhart, Tex.—Road Precinct No. 4 of Caldwell County will vote June 24 on \$25,000 bonds for macadamizing roads.

Longview, Tex.—Gregg County will soon vote on \$200,000 bonds for road macadamizing.

Naples, Tex.—Surveys are being made by J. J. White, City Engineer, Tyler, preparatory to grading streets and laying concrete walks.

Richmond, Tex.—Fort Bend County will vote June 26 on \$75,000 bonds for road construction.

Chehalis, Wash.—Lewis County Commissioners have asked for bids for another mile of hard surface road east of this city.

Kelso, Wash.—Citizens have voted \$10,000 bonds for street improvements.

Seattle, Wash.—Bids have been rejected as too high for filling Fifth ave. south; Lewis & Wiley, lowest bidders, \$6,000; cost of improving streets has been estimated as follows: paving, Dearborn st., \$85,500; concrete walks, Corliss ave., \$1,730; grading and paving E. 45th st., \$17,300; and clearing 25th ave. S. W. \$2,160.

Spokane, Wash.—City Commissioner D. C. Coats will recommend paving of 5th ave. with Hassam and brick at cost of \$15,000 and grading, curbing, sidewalk and parking of Hawthorne st. at cost of \$12,300.

Spokane, Wash.—The Washington Water Power Co. will spend more than \$25,000 in road improvements and bridges in Spokane, Lincoln and Stevens counties this summer.

Huntington, W. Va.—County has voted \$300,000 bonds for improving roads.

Tacoma, Wash.—County Commissioners have decided to advertise for bids for clearing of a right-of-way from Julius Gulch road through to Dash Point.

Green Bay, Wis.—Council is considering improvement of roads leading into city.

Superior, Wis.—Council is considering paving of Belknap st. and John ave.

Montreal, Que., Can.—City proposes to expend about \$1,000,000 in paving streets this summer; Chief Engineer Janin has also asked for \$500,000 for sidewalks and \$2,500,000 for sewers, drains, etc.

CONTRACTS AWARDED

Phoenix, Ariz.—Road work: Prescott-Flagstaff road to J. A. Treubert, Prescott; Tucson-Bisbee road to Griffith & Poeben, Tucson.

Fresno, Cal.—To Thompson Bros. for grading and curbing Mariposa ave. and constructing concrete culverts at \$10,850; to E. W. Redman for similar work on Raisin st., \$6,785.

Hermosa Beach, Cal.—To the Barber Asphalt Paving Co., Central Bldg., Los Angeles, for improving Summit ave. and cross streets; total cost, \$55,000.

Long Beach, Cal.—By Board of Public Works, to build the Seaside blvd., to T. W. Young, of Los Angeles, \$96,000.

Los Angeles, Cal.—Street improvements, Trione ave., to Fairchild-Gimmore-Milton Co., for asphalt paving, cement curbs and vit. block gutters, \$26,144; for improving Forest ave., to Geo. R. Curtis for grading, cement curb, gutters, storm sewer and vit. block gutters, \$10,775; for improving Parkview st., to Barber Asphalt Paving Co., for asphalt paving, cement curbs, vit. block gutters, \$11,981.

Chicago, Ill.—Furnishing two tandem type steam rollers, to Barber Asphalt Paving Co., Iroquois Iron Works, Tribune Bldg., \$1,600 each.

Mt. Pleasant, Ia.—To Burlington Construction Co. for paving 10,710 sq. yds. with brick, \$2.07½; excavation, 1,200 yds., 52c.; other bidders: Independence Construction Co., Davenport, \$30,000; McGuire & Stanton Construction Co., \$30,100.—W. D. Worthington, City Clerk.

Villisca, Ia.—To Burlington Construction Co., of Burlington, for paving with brick, \$1.82 per sq. yd.; to Hamilton & Schwartz Co., for curbing, 35c. per lin. ft. and 69c. per lin. ft. for curb and gutter.

Olathe, Kan.—To Dobbins-Wilson Contracting Co., to pave six miles of the Overland turnpike, \$45,535.

Wellington, Kan.—Paving 12th and Olive sts. to Eby & Ramsey, city, \$57,372; other bidders: Cleveland Trinidad Asphaltic Paving Co., Kansas City, Mo., \$61,907; Raw Paving Co., Topeka, \$62,244; Warner-Quinlan Paving Co., Wichita, \$63,119.

Covington, Ky.—Paving 5th and Madison sts with asphalt to F. J. Ruh Company.

Lexington, Ky.—Following bids for street paving have been recommended for awards: Central Construction Co. for construction of macadam streets on Woodland, Columbia, Bryan, Kentucky and Oldham aves., 80c. per sq. yd.; deduction is allowed by contractor of 10 per cent for cash; William Lutes & Co. for construction with macadam of Clay and Ash and aves., 60c. per sq. yd.; F. T. Justice & Co. for construction of concrete curbing and guttering on same street, 60c. per lin. ft. for cash.

Colfax, La.—By Police Jury of Grant Parish, to Francis T. Constant for building about 32 miles of model road from Colfax to Rochelle at a cost of \$1.778 per mile; vit. pipe will be used for culverts.

Boston, Mass.—To John McCourt & Co. for grading edgestones and sidewalks in Mendum st., between Walter and Fairview sts., \$1,274.80; other bidders: William J. Rafferty Co., \$4,423.46; West Roxbury Trap Rock Co., \$4,724.75; R. J. Young & Co., \$5,068.55; Daniel E. Lynch, \$5,786; Engineer's estimate, \$5,000; to F. S. & A. D. Gore Corporation for edgestones, gutters and crosswalks in Hutchings st., between Elm Hill and Humboldt aves., \$1,539.10; other bidders: C. W. Dolloff & Co., \$1,567.90; R. J. Young & Co., \$1,592.25; James Doherty, \$1,618.65; Daniel E. Lynch, \$1,685.80; Jeremiah J. Sullivan, \$1,720.40; William J. Rafferty Co., \$1,730; John McCourt & Co., \$1,879.20; Engineer's estimate, \$4,000; difference between the estimate and bid is caused by the city supplying gutter stones.

Carthage, Mo.—By Joplin Special Road District Commissioners for grading and graveling nearly a mile of road, including approaches at Hallwood bridge across Spring River five miles northwest of Carthage, to the Winters Construction Co., Joplin.

Hacksack, N. J.—Oiling streets, to the Pennsylvania and Delaware Oil Co., 1¼c. per sq. yd. for 350,000 sq. yds.

New Brunswick, N. J.—To Sindepost & Poor, Riegelsville, Pa., for building and construction of Franklin Park-Kingston road, \$55,297.72.

Newark, N. J.—Paving following streets with brick: To J. E. Shanley Company—Belmont ave., from Watson to Hawthorne aves., \$7,533.50; Hillside ave., Watson to Hawthorne aves., \$7,440; Hunterdon st., from Elizabeth to Farley aves., \$8,022.50; Alpine st., from Elizabeth to Farley aves., \$7,320.50; Third ave., from the canal to Roseville ave., \$12,371.50; Sixth ave., from Clifton ave. to Parker st., \$5,318; to the Standard Bitulithic Company—to pave Clifton ave., from Grafton to Verona aves.,

Mapes ave., from Elizabeth ave. to Bergen st., and Sherman ave., from Poinier st. to Pedate st., the Jersey Laying Company—to pave Vincent st., from Ferry st. to the Waverly branch of the Pennsylvania Railroad.

Brooklyn, N. Y.—To Barber Asphalt Co., for repaving with asphalt, on concrete, Thames st., \$5,870; First pl., \$9,818; Greene ave., \$35,135; Monroe st., \$1,955, and Fleet pl., \$5,156; to Uvalde Contracting Co., for repaving with asphalt, on concrete, Sneider ave., \$11,029; Nassau ave., \$1,902, and Crescent st., \$13,062; regulating and repaving with Grade 1 granite, on concrete, Wythe ave., to MacFarlane Contracting Co., \$6,883; repaving with Grade 1 granite, on concrete, Bremen and Noll sts., to John M. Fox, \$21,117; repaving that portion of Jamaica ave., between tracks and rails of the tracks, from point 20 ft. west of Hemlock st. to Borough line, etc., to Henry J. Muller, \$8,048; and regulating, grading, curbing and laying sidewalks on 63d st., 8th ave. to New Utrecht ave., to Nicola Caponi, \$19,880.

Dunkirk, N. Y.—Paving King st., to J. N. Doyle, Erie, Pa., \$23,000.

New York, N. Y.—Regulating E. 192d st., from Creston ave. to Kingsbridge road, to the Hastings Pavement Co., 25 Broad st., \$8,352; and regulating Westchester ave., Main st. to Eastern Blvd., to Watson Contracting Co., Fordham, \$61,578.

Rochester, N. Y.—Street improvements: Conkey ave., brick pavement, to Thomas Holahan, \$19,021; Itaines Park, brick and asphalt pavement, to the Julius Friedrich Co., \$24,226; Post st., asphalt pavement, to Rochester Vulcanite Pavement Co., \$8,181.50; Shafer pl., brick pavement, to F. V. Brotsch, \$3,896.50; Congress ave. cement walks, to J. Petrossi Co., \$859.50.

Rochester, N. Y.—Asphalt paving on St. Paul st., to Julius Friedrich Co., \$32,956.

Schenectady, N. Y.—Paving Bradley st. with cement concrete pavement, to T. R. Crane.

Whitesboro, N. Y.—Paving portions of four streets, to Warren Bros. Co., \$18,658 for bitulithic, including manholes and 12-in. concrete curbing.

Dayton, O.—To J. E. Conley for paving Huffman Hill, \$38,981.

Logan, O.—Building Rockbridge road, sandstone foundation, to Dadebaugh & Inboden, City, \$5,069.

New Philadelphia, O.—To Kinimel & Steinbaugh, Mineral City, for paving New Cumberland road with brick, \$2,318.

Oakley, O.—Repaving Brogher road and Madison ave., to John Snider, Norwood, \$21,000.

Zanesville, O.—Paving extension of Greenwood ave. to J. Emery & Son, \$6,251.

Oklahoma City, Okla.—Paving Geary ave., 2d to 3d, to Cleveland Trinidad Co., \$3,019.91; Western Paving Co. bid \$3,094.53; Byers ave., 3d to 4th, to Cleveland Trinidad Co., \$1,955.94; Western Paving Co. bid \$2,063.96; Agnew ave., from alley between Hickory and Exchange sts. to Central ave., Western Paving Co., only bidder, \$16,925.66; Linwood Blvd., 10th to 16th, Severns Paving Co., \$133,355.32; Swatek & Parker bid \$143,857.72; Linwood Blvd., 16th to Grand Blvd., to Severns Paving Co., \$59,951.71; Western Paving Co. also bid \$62,248.84.

Myrtle Point, Ore.—To J. J. Burns, Marshfield, for grading one mile of streets, about \$4,000.

Portland, Ore.—Paving streets in Beaumont Addition with bitulithic pavement, to Elwood Wiles, \$91,156; also contract for paving Klickitat district with bitulithic pavement, \$62,799; to Pacific Bridge Co., for filling Second st., between Arthur and Sherman sts. in South Portland, \$29,261; Belmont district will be paved with bitulithic pavement by the Pacific Bridge Co., \$53,631.

Salem, Ore.—To Warren Construction Co., Portland, to pave with bitulithic on Cottage st., \$1.85 per sq. yd.

Altoona, Pa.—Resurfacing paved streets, to Standard Bitulithic Co., New York City, \$1.35 per sq. yd.; removing old paving, 20c. per yd.

Erie, Pa.—Laying class B asphalt pavement with artificial stone curb and brick gutters on Poplar st., to John McCormick & Son, \$1.27 per yd. on pavement, 31c. per ft. on curb.

Hazleton, Pa.—Furnishing oil for oiling streets to Atlantic Refining Co.

McDonald, Pa.—To Kossler & Ma'ony, Bellaire, O., for street paving, \$41,673.43; next lowest bidder, Samuel Gamble, Carnegie, \$12,354.55.

Monessen, Pa.—Paving various streets to Hallam Construction Co., Washington, \$15,452.

New Castle, Pa.—Grading Atlantic ave. to D. E. Sullivan, \$17,818.

Philadelphia, Pa.—Grading and constructing walks, roads, walls, etc., at Valley Forge Park, to Wm. H. Doyle, Berwyn, about \$6,200.

Pittsburg, Pa.—Furnishing about 100,000 gal. of heavy asphalt road oil to Standard Oil Co.; about 100,000 gal. light asphalt oil to the Indian Refining Co.

Warren, Pa.—Building five miles of brick highway, to South Shore Construction Co., Erie, about \$80,000.

York, Pa.—Building 5,680 ft. of road in Fawn Township, to Thos. Mehan & Sons, Philadelphia, \$11,696.30.

Pierre, S. D.—Improvements on State Capitol grounds, to Taylor Construction Co., Volga, driveway and curbing, \$9,282; to R. E. Airey, of Pierre, inside walks, \$3,200; to Nemmis & Nemmis, St. Paul, Minn., lighting conduits, \$1,410; to Wm. F. Karble, Pierre, drainage and water system, \$2,300, and grading, to C. E. Pickett, Pierre, 30c. per yd.

Chehalis, Wash.—By Council, for paving contracts aggregating \$57,740, to Warren Construction Co.

Everett, Wash.—To F. K. Ffolliette for improvement of Wetmore ave., \$14,500; other bidders: H. T. Edmerson, \$14,700; Atlas Construction Co., \$15,600; J. B. Snyder & Co., \$14,953, and R. J. Barber, Seattle, \$16,286.

Kelso, Wash.—Paving with bitulithic in Improvement District No. 11 to Anderson Construction Co., Tacoma, \$76,300.

Pasco, Wash.—To Pacific Paving Co., for paving with bitulithic 25,012 sq. yds. on W. Clark, 1st and 2d sts.

Seattle, Wash.—Grading 63d ave S. W. to W. F. Manney & Co., \$35,158.

Spokane, Wash.—To Robinson & Foster, grading, curbing, parking and sidewalking Vine ct., Vine st. to North Crescent, \$1,368; estimate, \$1,530; sewer on Havermale st., Washington to Howard, \$5,598; estimate, \$6,435.

South Vancouver, B. C., Can.—To Shacht & Co., for grading from King Edward to 51st ave., \$19,734; to La Place Bros. Construction Co., for grading Main st., \$9,737.

BIDS RECEIVED

Burlington, Ia.—Paving with brick Smith st., Garfield ave. to Leebriek, and Leebriek, from Smith to Division, Burlington Construction Co., grading 45c., curbing 45c., paving \$1.80; Geo. Peterson, grading 32c., curbing 48c., paving \$1.84; Capital City Co., grading 40c., curbing 49c., paving \$1.93; Young & Buescher, grading 32c., curbing 39c., paving \$1.81; paving with brick the one block on Spring, from 3d to 4th st., Young & Buescher, grading 55c., curbing 41c., paving \$1.79; Burlington Construction Co., grading 55c., curbing 32c., paving \$1.77; Capital City Co., grading 40c., curbing 49c., paving \$1.93; paving with concrete Arch st., 8th to Central ave., and Central ave., from Arch to High, Fred Guenther, grading \$2.40, earth 40c., curbing 45c., paving \$1.57; Capital City Co., grading \$2, earth 40c., curbing 49c., paving \$1.49; Young & Buescher, grading \$1, earth 48c., curbing 42c., paving \$1.34.

Detroit, Mich.—Furnishing 50,000 or more sq. yds. of creosote block, United States Wood Preserving Co., \$1.82 per sq. yd.; furnishing 30,000 or more sq. yds. of Medina or granite block, George Mason, \$2.02½ per sq. yd.; both lowest bidders.

Grand Rapids, Mich.—Paving Fountain st., Peter Vanderveen, bitulithic concrete, \$7,126.75; Carpenter & Anderson, creosoted block, \$10,129.05; McDermott & Cooper, asphalt macadam, \$7,425.55; A. Green, asphalt macadam, \$7,656.77; Leonard C. Hilding, creosoted block, \$10,407.10; E. W. Seaman, creosoted block, \$11,126.25; E. W. Seaman, asphalt macadam, \$6,993.17; McConnell Court, paving, Leonard C. Hilding, grading and graveling, \$1,214.85; H. A. Hossie, grading and graveling, \$1,230.86; Klute & Vanderveen, grading and graveling, \$1,134.57; Clancy st. paving, Leonard C. Hilding, westrumite, \$10,129.70; E. W. Seaman, asphalt macadam, \$9,493.06; C. E. Williams, westrumite, \$9,295.70; McDermott & Cooper, asphalt macadam, \$10,093.95; A. Green, asphalt macadam, \$10,361.86; Crescent pl., paving, C. E. Williams, tar macadam, \$1,282.30; Kloote & Vanderveen, tar macadam, \$1,165.80; McDermott & Cooper, tar macadam, \$1,456.40; Humboldt st. improvement, Kloote & Vanderveen, \$6,997.53; Leonard C. Hilding, \$6,792.20; McDermott & Cooper, \$6,811.70; Martin Den Boer, \$7,092.15; Richard Pickett, \$7,696.95; Jones st. sewer, Myers & Van Overen, \$1,539.22; Martin Den Boer, \$1,043.05; John J. Ren, \$1,448.33; Peter De Witt, \$1,472.18; Vanderwee Bros., \$1,268.34; Cottage Grove ave. sewer, Vanderwee Bros., \$1,235.93; Peter De Witt, \$1,540.38; Myers & Van Overen, \$1,266.66; John J. Ren, \$1,356.33; Martin Den Boer, \$1,806.16; Water main West Leonard and Bridge sts., John J. Ren, \$362; Vanderwee Bros., \$263.70; John Power, \$267.80.

Hackensack, N. J.—Improvement of Bergen turnpike: First section begins at the State line and runs south 9,000 ft., George

M. Brewster Construction Co. was low at \$35,441; on the second section, near Allendale, Francisco Bros., \$18,620.25; H. T. Haring, Jr., \$19,622.70; George M. Brewster Construction Co., \$18,392.12; the third section was held up; on the fourth section, also near Allendale, H. T. Haring, Jr. & Co. bid \$21,560.50; Ernest Abrahams, \$22,622; George M. Brewster Construction Co., \$26,166.15; owing to some legal technicality this bid was laid over until advice of counsel could be obtained.

New Brunswick, N. J.—Construction of Franklin Park-Kingston road; bids were as follows, the first figures being for oil dressing, with heavy asphalt, and the second exclusive of oil: H. M. Scott Co., Cranbury, \$88,312.97 and \$80,722.05; Richard & Gaston, Somerville, \$65,843.92 and \$61,496; John A. Hurley, Trenton, \$73,143.76 and \$68,690.16; Russell Klockner, Trenton, \$65,826.54 and \$59,749.99; he also gave a figure on light oil, at \$60,619.62; Sindepost & Poor, Reglesville, Pa., \$67,171 and \$59,297.72.

Brooklyn, N. Y.—Regulating and repaving with asphalt on a concrete foundation Clinton st., from Baltic st. to Hamilton ave., Brooklyn Alcatraz Co., 407 Hamilton ave., lowest bidder, as follows: 13,705 sq. yds. asphalt pavt. outside railroad area, 5 years' maintenance, 86c.; 13 sq. yds. asphalt pavement within railroad area, no maintenance, 86c.; 30 sq. yds. old stone pavement relaid, 40c.; 1,905 cu. yds. concrete for pavement foundation outside railroad area, \$4.80; 3 cu. yds. concrete for pavement foundation within railroad area, \$4.80; 6,760 lin. ft. new curbs, set in concrete, 95c.; 700 lin. ft. old curb reset in concrete, 55c.; 45 noiseless covers and heads for sewer manholes, each \$12, total, \$28,319; total of other bids; Barber Asphalt Paving Co., 30 Church st., New York City, \$28,621; Cranford Co., 52 9th st., Brooklyn, \$28,966; Uvalde Contracting Co., 1 Broadway, New York City, \$31,043.

Massillon, O.—George W. Lemmon, of Wheeling, W. Va., was lowest of seven bidders for the city's street paving contracts aggregating \$27,630.

Portland, Ore.—Lowest bidders for paving E. Salmon and other streets from E. 55th to E. 58th, asphalt, Oregon Independent Paving Co., \$22,127; 2d st., from Sheridan to Arthur, macadam, Pacific Bridge Co., \$29,214; Beaumont and other streets, bitulithic, Elwood Wiles, \$91,156; Belmont and other streets, bitulithic, Pacific Bridge Co., \$53,631; Gantebein ave., from Skidmore st. to Alberta st., Hassam, Consolidated Contract Co., \$14,729; Klickitat and other streets, from E. 39th to E. 45th, bitulithic, Warren Construction Co., \$62,799; E. 26th St. from Hawthorne ave. to Belmont st., bitulithic, Warren Construction Co., \$10,537; Williams ave. and other streets from Killingsworth ave. to north line of Piedmont, asphalt, \$98,324; Woodstock ave. and other streets, grading and concrete curbs and sidewalks, Joplin & Meeks, \$12,473.

Harrisburg, Pa.—Building road in Selinsgrove Borough, H. G. Hinckle, Inc., Altoona, lowest bidder, \$13,645 for Mifflin County, limestone top with Watonsontown or No. 1 Clearfield block and concrete; lowest bidders for following roads were: 10,647 ft. road in Colley Township, E. Whalen, Towanda, \$21,930 for native stone top and bottom with concrete pipe culverts; 3,010 ft. road in Armagh Township, R. B. Taylor, Bellfonte, \$7,261 for native stone bottom Vilray limestone top and corrugated pipe culverts; 4,457 ft. road in Delaware Township, H. G. Hinckle, Inc., \$6,520 for sandstone bottom Mifflin County limestone top with corrugated pipe culverts; 13,178 ft. road in Beaver Township, J. E. Francis, Punxsutawny, \$40,495 for native stone bottom, Du Bois and Butler brick top with corrugated pipe culverts.

SEWERAGE

De Queen, Ark.—Council has approved petition looking to construction of a sewer system.

Winters, Cal.—Citizens have voted \$28,000 bonds to construct sewers.

Washington, D. C.—City will soon lay 1,000 ft. of wall sewer sewers in Brookland, 8,000 to 10,000 ft. in Tenleytown; trunk sewer, half mile in length will be laid in Cleveland Park at cost of \$10,000; plans are being made for drainage for extension of Mall.

Bradentown, Fla.—Citizens have voted \$45,000 bonds for extending sewer system and making other improvements.

Bloomington, Ill.—Board of Local Improvements has approved Engineer's estimate for sewer on Clay st., Woodland ave. and Jackson st. at \$4,736; bids will be asked at once for work.—Elmer Folsom, City Engineer.

Baltimore, Md.—Calvin W. Hendrick, Chief Engineer Sewerage Commission, American Bldg., has completed specifications for half of sewer to cover Jones

alls; will soon ask bids for construction; crk to include three reinforced concrete pbes costing \$600,000 to \$700,000; other half ill cost about same amount.

Las Cruces, N. M.—Bids will be received y Board of Trustees, July 1, 10 a. m., for 5,000 bonds for construction of sewer ssystem.

Hasbrouck Heights, N. J.—Town has appropriated \$1,000 for complete working ans and estimates of proposed sewer system.

Chapel Hill, N. C.—Bids will be received ine 15 for purchase of \$15,000 bonds for sewer system.—C. B. Griffin, City Clerk.

Cincinnati, O.—Cost of installing sewer, 16th ave., has been estimated at \$1,550, id on Marshall ave. at \$1,150; council has ecided to construct sewer on Eastern and enway ave.

Muskogee, Okla.—Dr. Alexander Potter, ew York, Consulting Engineer, has been employed to supervise construction work n the proposed storm sewer to Arkansas iver.

Baker, Ore.—Plans and estimates of cost e being prepared for construction of saniry sewers in number of streets.

Chambersburg, Pa.—Council has ordered nstruction of sewers in large number of eets.

North York, Pa.—Council has decided to nstruct storm sewer on 8th ave.

Providence, R. I.—Joint Standing ommittee on Sewers is considering construction of sewers in Elmdale ave., Gifford st. d Brenton ave.—F. W. Morse, Chairman.

Nashville, Tenn.—Council is considering ll appropriating \$311,000 for construction rnk sewers in various sections of city.

Dallas, Tex.—Bids will be asked at once r laying storm sewer on Columbia and llet avcs.

Sweetwater, Tex.—Council has granted nchise for sewerage system to M. A. y, Terrell.

Waco, Tex.—Citizens will vote June 27 \$85,000 bonds for construction of additional storm and sanitary sewers.—P. A. rman, Street Commissioner.

Spokane, Wash.—Creation of another br th Side sewer district and construction about 40 blocks of new sewer in the outh ward is recommended by Departnt of Public Works.

Tacoma, Wash.—Municipal Commission- have adopted ordinance creating Sewer istrict No. 198.

Granbrook, B. C., Can.—Citizens have ed \$100,000 bonds for a sewer system; st of the construction will be done by s' work under supervision of the John t Engineering Co., Calgary, Alta.

Huddleton, N. S., Can.—Town is conering installation of \$4,000 sewerage ssystem.—J. A. Gates, Clerk.

CONTRACTS AWARDED

hicago, Cal.—To J. W. Terrell for conuction of a sanitary sewer on 5th st., \$69,20.

Williamantic, Conn.—To Bernardo Silves-, Hartford, for 8-in. and 10-in. pipe ver, 57c. per lin. ft.; all manholes, \$28 h; rock excavation, \$3.75 per cu. yd.

Hoopston, Ill.—To Henry Rees, Quincy, construction of sanitary sewer system, \$172; work will include 10 miles of glazed ver pipe.

ary, Ind.—By Board of Public Works, to chael Byrnes, Chicago, for \$165,000 sewer olltoston district.

altimore, Md.—Building proposed lateral ers to B. F. Sweeten & Sons Co., \$64,75.

Albert Lea, Minn.—To Illstrup & Olson, neapolis, for building sewers, \$11,100; er bidders: Moeller Bros., Knierim, la., 1,937; E. T. Webster, St. Paul, \$19,315.85; J. Connolly, St. Paul, \$18,887; Omaha nstruction Co., Omaha, Neb., \$19,650; storet-Lawrence Co., Duluth, \$15,567; bs and drainage, Albert Lea Constructon Co., \$66,567.

uluth, Minn.—To E. A. Dahl for saniry sewer on East Superior st., \$3,316.

ilbert, Minn.—Building sanitary sewers. Pastore & Lawrence, Duluth, \$25,008.62; ing 14,510 lin. ft., 8-in., 5,279 ft., 10-in., 2,497 ft., 12-in. vit. pipe, 24c., 28c. and ; 12,000 cu. yds. excavation, 60c.; 4 manholes, below 6 ft., \$20; 35 over 6 ft., \$30; 8 h tanks, including flushing appliance, 29 lampholes, \$5; extra for 15 drop holes, \$5; filter plant settling tank, 25 diam., 16 ft. deep, concrete; percolating r, 54 x 100, conc. bed, 6 ft. depth shed rock; sludge bed, 20 x 30, 7 manholes, 730 ft., 12-in. pipe, 1800 cu. yds. exation and 1,300 cu. yds. crushed rock, \$35; other bidders: W. E. Kern, West luth, \$35,668 and \$11,080; J. H. Dahl, luth, \$29,739 and \$10,436; J. D. O'Connell; C. Butler, Virginia, \$28,496 and \$9,717; H. Bartlett Company, Virginia, \$29,739 \$10,436; Johnson & Equist, Superior, \$45 and \$8,647; Harding & Co., Racine,

\$29,831 and \$11,730. Kircher & Johnson, Gilbert \$26,457 and \$8,036.

Hastings, Neb.—To A. J. Van Avery, for construction of sewer laterals in districts 58, 59 and 60.

Binghamton, N. Y.—Building sewers: Main st., to George Serfina, \$99,10; Moeller st., to George Serfina, \$1,299.96; Bennett ave., to George Pignatello, \$1,660.90; Seminary ave., to Michael Barber, \$1,581.18; Vine st., to George Serfina, \$733.72; Schubert st., to George Pignatello, \$217.10; Highland ave., to George Pignatello, \$1,441.33.

Schenectady, N. Y.—Laying sanitary sewers in Baker ave., to Kautaux-Frank Co., about \$19,000.

Muskogee, Okla.—To E. P. McCormick, for building monolithic concrete sewers, \$136,021.95; to Nelson Bros., Parsons, Kan., for brick work, \$106,311.11.

Erwin, Tenn.—To R. L. Ebevins, Bristol, to build system of trunk sewers, to cost \$20,000.

Texarkana, Tex.—Installing sewers in the recently organized district No. 10, to Ockander Brothers by Commissioners of the District, J. F. Huddleston, J. H. Moffett and J. E. Conder, \$11,997.81; other bids: M. J. Nash, \$12,190; W. A. Hanna, \$12,840; J. R. Edmonds, \$12,375; two combination bids, one of \$10,191.75, submitted by Almeter & Parker, and another of \$8,640.15, submitted by Arkansas Sewer Company, were not considered by Board.

Seattle, Wash.—To Olson Construction Co., Seattle, for constructing Interbay district north trunk sewer for \$925,781; will be circular concrete sewer.

Owen Sound, Ont., Can.—To John Cross, to supply the pipe for sewer work now being done, \$1,560.—R. McDowall, Town Engineer.

Ottawa, Ont., Can.—Construction of the west end drainage scheme, to Thos. McLaughlin, \$209,158.

BIDS RECEIVED

San Diego, Cal.—Furnishing portion of pipe and fittings for the construction of municipal sewer system: Pacific Sewer Pipe Co., \$31,512; Western Metal Supply Co., \$33,396; J. S. Schirm, \$33,504; W. J. Bailey, \$33,513; A. H. Burch Co., \$33,575. The Glazed Cement Pipe Co., of San Diego, bid \$26,618 for furnishing cement pipe, but bid was rejected.

Huron, S. D.—Building sewers: Jones & Roderick, Sioux Falls, \$8,397.30; H. J. Cathroe, Omaha, Neb., \$8,178.11; Fraser & Donforth, Rochester, Minn., \$8,946.60; E. L. Dimick, Loure, Neb., \$8,841.12.

Amherst, O.—Lowest bidder for sewer system, P. S. Construction Co., Columbus; for sewage disposal plant, F. Rennieck, BeHeFontaine; total cost about \$26,000.

Portland, Ore.—Lowest bidders for constructing sewers: For northern portion of Alameda Park, Alameda Land Co., \$20,581, and Irvington Heights extension of E. 17th st. sewer, Lundstrom & Sandberg, \$13,878; also, McAleary bld. division of the King's Heights sewer, Lundstrom & Sandberg, \$13,721.

North Toronto, Ont., Can.—Building three sections of sewage installations: (a) work from southerly limits of town to Eglinton ave.; (b) from Eglinton ave. north to Victoria crescent and Glenwood ave.; (c) north from Glenwood ave. to town limits: (a), Davisville; George Crowe & Son, Trenton, \$87,000; Campbell & Latimer, Port Hope, \$106,108; John E. Connolly, Toronto, \$107,846; Thos. R. Allison & Co., Toronto, \$108,012.80; Ryan & Reilly, Philadelphia, \$118,360; (b), Eglinton; E. F. Fry, Toronto, \$53,570.80; John P. Connolly, \$63,852; the J. H. McKnight Construction Co., Ltd., \$67,628.66; Thos. R. Allison & Co., \$71,897.80; (c), Bedford Park; James Reid & Co., Brantford, \$56,157; the McKnight Construction Co., \$62,825; Lorenzo & Marshall, Dunnyville, \$65,780; Thos. R. Allison & Co., \$79,787.

WATER SUPPLY

Greensboro, Ala.—Geo. Findlay, manager of Greensboro Water and Light Co., desires addresses of manufacturers of wood tanks, capacity about 8,000 gals.

Booneville, Ark.—Booneville Oil and Gas Co. is considering sinking of artesian well and gas well.—S. J. Lowell, President.

Mena, Ark.—Winters & Dove, 810 First National Bank Bldg., Ft. Smith, have completed plans and specifications for distribution system for Water Works District No. 2; separate bids will be received for material and the construction as follows: For 750 ton c.-i. pipe and special castings, 71, 4 to 12-in. valves and 27 hydrants, and for laying approximately 40,000 ft. of 1 to 12-in. mains.

Chino, Cal.—Bids will be received until June 20 for the purchase of \$10,000 bonds for the construction of water works.—A.

L. Sonderegger, 635 Central Bldg., Los Angeles, Engineer; H. E. Griffith, City Clerk.

Morgan Hill, Col.—Citizens have voted bonds to install water works system.

Bridgeville, Del.—Council has appointed a committee to secure meters for every water spigot in town.

Bradentown, Fla.—Citizens have voted \$15,000 bonds to improve water works system and make other improvements.

Washington, Ga.—Council is considering \$5,000 bond issue to install filter at pumping station.

Chicago, Ill.—Board of Local Improvements will soon let contract for constructing water mains on number of streets.—Chas. V. Standish, Secretary.

Lostant, Ill.—Hugh M. Price, Hartford Bldg., Chicago, is preparing plans for proposed water works.

North Judson, Ind.—G. C. Morgan, Consulting Engineer, 160 Washington bldv., Chicago, Ill., is preparing plans for installation of system of water works.

Porter, Ind.—G. C. Morgan, Consulting Engineer, 160 Washington bldv., Chicago, Ill., is preparing plans for installation of water works.

Rushville, Ind.—Council has decided to dig more wells.

Shreveport, La.—National Board of Fire Underwriters has recommended installation of additional high-lift pump of at least 6,000,000-gal. capacity, additional boilers of 150 hp. and installation of additional mains.

Mars Hill, Me.—Chas. N. Taylor, of Wellesley, Mass., has been selected to design and construct water works for the Mars Hill and Blaine Water Co.; work will include about five miles of 8-in. and two miles of 6-in. pipe, with 30 hydrants and a concrete dam; material yet to be purchased.

Baltimore, Md.—Water Board has approved modified specifications for installation of pump at Mount Royal pumping station.

Rising Sun, Md.—Town Commissioners are considering construction of artesian well and standpipe.

Deerfield, Mass.—The Deerfield Fire District has voted to spend \$30,000 for water works and fire protection; concrete covered reservoir is to be built and five miles of 6 and 8-in. mains laid.—William S. Johnson, 101 Tremont st., Boston, Engineer.

Lynn, Mass.—Plans for pumping station at Montrose, to be erected for Water Department, are being prepared by Assistant Superintendent of Buildings Chas. R. Hunt.

Salem, Mass.—Plans have been completed by George P. Ashton, City Engineer, for installation of high-pressure, salt-water system for fire protection; plans include 10,000 ft. of 16-in. pipe laid in the streets and 2,000 ft. in the harbor; and fire pumps of 5,000 gal. per min. capacity, at a pressure of 200 lbs.

Benton Harbor, Mich.—Citizens will vote June 14 on \$50,000 water bonds.

Grand Rapids, Mich.—Need of better water pressure is being urged.

Wayzata, Minn.—W. D. Lovell, Consulting Engineer, Minneapolis, is preparing estimates of cost for installation of water works system and light plant.

Milan, Mo.—Citizens have voted to construct water works.

St. Charles, Mo.—Citizens have voted \$30,000 bonds for water works improvement.—J. N. Olson, Mayor.

St. Louis, Mo.—Board of Local Improvements has rejected all bids for post fire plugs, as Excelsior Tool and Machine Co., East St. Louis, Ill., lowest bidder, \$29,213.75, did not enclose certified check.

Hackensack, N. J.—National Board of Fire Underwriters has recommended installation of additional hydrants and water mains.

Kenilworth, N. J.—Borough is considering election on establishment of water plant.

Oradell, N. J.—Hackensack Water Co. will erect concrete dam across Hackensack River; cost, \$50,000.

Middleport, N. Y.—Village is considering installation of water plant.

Salem, N. Y.—Village Trustees have granted Frank A. Hill a franchise for a system of water works; water supply will be taken from Scotts' Lake, about 2 1/2 miles from village.

Cincinnati, O.—Plans and specifications are being prepared for installation of water tanks at Mount Auburn. Address Water Works Superintendent Laidlaw.

Plymouth, O.—Council is considering installation of filtration plant.—R. H. Mann, City Clerk.

Union, Ore.—Council is considering repair and extension of water system.

Glasgow, Pa.—Town is considering construction of water works system.—Henry Camp, President Council.

Somerset, Pa.—Council will issue \$15,000 bonds to equip water plant on site of new wells.

Lewisburg, Tenn.—G. C. Morgan, Consulting Engineer, 160 Washington bld., Chicago, Ill., is preparing plans for installation of system of water works.

Galveston, Tex.—Bids will be asked by City Superintendent of Electricity W. D. Masterson for installation of Corliss high-efficiency flywheel type pump with cap. of 4,000,000 gal. per day.

Olney, Tex.—Citizens have voted \$12,500 bonds for installation of water works.

Paris, Tex.—Council is considering increasing of water supply.

Rogers, Tex.—Bids will be received July 1 for \$14,000 water bonds to lay pipe line from Lake Leathrick to Little River.

Weston, Tex.—Bids are wanted by A. E. Ragsdale for deep well.

Neenah, Wis.—J. F. Icke, Engineer Madison Water Works, has made report on condition of Neenah system and recommended that pump and meters be installed and well dug.

Cordston, Alta., Can.—Citizens are considering installation of gravity water works system.

Southampton, Ont., Can.—Citizens have voted to expend \$7,500 to extend water works system.

Wilkie, Sask., Can.—Installation of water works system is being considered.

CONTRACTS AWARDED

Fort Baker, Cal.—Erecting 100,000-gal. steel water storage tank to Braun, Williams & Russell, Inc., 503 Market st., San Francisco.

Presque Isle, Me.—By Presque Isle Water Co., which is to lay about five miles of 6, 8, 12 and 14-in. c.-i. water pipe, build concrete core dam and a 1,000,000-gal. reservoir, to Chas. N. Taylor, Contracting Engineer, Wellesley, Mass., for the engineering and construction necessary; to the Standard Cast Iron Pipe and Foundry Co., to furnish the pipe; to Chapman Valve Co., valves; to R. D. Wood & Co., hydrants; to Freeman & Co., Presque Isle, cement; and to Builders' Iron Foundry, special castings.

Boston, Mass.—To Raffale Cartullo for laying water pipes in Arlington st. and other streets, \$2,369; other bidders: A. M. Cusack, \$2,477.50; Thomas Burke, \$2,572.50; Daniel E. Lynch, \$3,280; Charles J. Jacobs Co., \$3,424; Michael Russo, \$3,137.50; Hugh McNulty, \$2,543.50; R. J. Young & Co., \$2,555.50; R. P. Cushing, \$3,192.50; J. A. Costello & Co., \$2,897.50; Peter W. Hill, \$3,610; Charles M. Callahan, \$2,595; F. H. Cowin Co., \$2,651; M. De Sisto & Co., \$2,517; William J. Rafferty Co., \$3,191.50; A. De Stefano, \$2,932.50; Engineer's estimate, \$2,800.

North Mankato, Minn.—Construction of water works; two reservoirs and pump house, to J. B. Nelsen Construction Co., \$4,335; well, to Sioux City Well Co., \$3 per ft.; pipe line, valves, hydrants and sewer drain, to Pastoret-Lawrence Co., Two Harbors, Minn., 6-in., 76c., 8-in., \$1.25; 10-in., \$1.55.

Columbia, Mo.—To John W. Danforth Co., Buffalo, N. Y., for extensions to the municipal water and light plant, \$66,000.

Perth Amboy, N. J.—To the Merritt & Chapman Derrick and Wrecking Co., to lay additional 24-in. main, about 2,000 ft. in length, under the Raritan River, \$15.93 per ft.

Cortland, N. Y.—Building 1,000,000-gal. standpipe, to Sharon Boiler Works, Sharon, Pa., \$13,000 for ingot iron.

Jamestown, N. D.—To C. H. Porritt, of Fargo, for water mains, \$10,265, and for sewers, \$6,493.

Barnesville, O.—To U. S. C. I. Pipe & Foundry Co., Rookery Bldg., Chicago, Ill., for water pipe; to W. H. Patterson & Son for laying same.

Silverton, O.—Installing system of 6-in. water mains and necessary appurtenances to M. F. Quill, \$15,123.

Toledo, O.—Furnishing and installing rotary pump of 15,000,000 gals. daily capacity, gas producer and accessories of approximately 400 hp. continuous capacity, to Rathburn-Jones Co., of Toledo.

Vian, Okla.—Construction of water works from plans of E. W. Gantt, Kennedy Bldg., Ft. Smith, Ark., to the Healy Construction Co., of McAlester; total \$18,303, including tower and tank, pump pipe, buildings, etc.; 5,600 ft. 6-in. c.-i. pipe, 64c.; 1,150 ft. 8-in. c.-i. pipe, 85c.; 8,840 ft. 4-in. c.-i. pipe, 98c.; 8,700 ft. 2-in. w. galv., 31½c.

Tacoma, Wash.—To P. E. McHugh for construction of the pipe line of Green River gravity water system from the McMillan reservoir to the city by Municipal Commission, \$102,609.80.

Harrison, Ont., Can.—Water works, to Gartschore-Thomson, P. & F. Co., Hamilton, for c.-i. pipe; to Kerr Engine Co., Walkerville, for hydrants and valves; to Hunter Bridge & Boiler Co., Kincardine, for water power; to Jas. Robertson Co., Toronto, for lead; to Geo. B. Moogk, Weston, for excavation and pipe laying; to Brown & Co., Toronto, for electrical fixtures.

Saskatoon, Sask., Can.—Installation of mechanical water filtration plant, to Roberts Filter Manufacturing Co., Philadelphia, \$55,890; other bidders: Bell Filtration Co. of Canada, Toronto, \$56,950; Pittsburgh Filter Manufacturing Co., Pittsburgh, Pa., \$58,120; New York Continental Jewell Filtration Co., New York, \$56,845; Geo. H. Archibald & Co., Winnipeg; Laurie & Lamb, Montreal, \$50,575.—Geo. T. Clark, City Engineer.

South Vancouver, B. C., Can.—Supplying hydrants to municipality, to the Terminal City Iron Works.

BIDS RECEIVED

Eveleth, Minn.—Erection of foundation and in the installation of a 2,500,000-gal. water pump; Epping-Carpenter Co., Pittsburgh, Pa., \$15,721, the city to deduct \$1,679 if it desires to make the connections itself; Fred W. Prescott Co., Milwaukee, \$12,560 for pump, \$13,710 for erection of foundation and pump, \$2,750 for installation work, \$300 for additions; Norberg Manufacturing Co., Milwaukee, Norberg engine, \$15,000; Ladellaw, Dun, Gordon & Co., Milwaukee, \$11,400 for pump, \$2,750 for installation.

Long Island City, L. I., N. Y.—Furnishing and laying water mains in Academy, Amity, Bragay, Cherry, Crescent and other streets, Roswell S. Williams, lowest bidder, \$87,571, including pipe, valves, hydrants, etc.; 1,350 tons straight c.-i. pipe, \$29.50; 75 tons c.-i. special castings, \$60; 100 tons c.-i. castings, \$45; 27,500 cu. yds. earth excavation, 35c.; 3,700 lin. ft. 16-in. pipe to lay, 37c.; 6,500 lin. ft. 12-in. pipe to lay, 30c.; 38,500 lin. ft. 8-in. pipe to lay, 22c.; 2,000 lin. ft. 8-in. pipe to lay, 20c.; 32 12-in. valves to set, \$8; 160 8-in. valves to set, \$8; 150 6-in. valves to set, \$5; 50 fire hydrants, pipe drain, \$8; 75 fire hydrants, broken stone, \$8; 250 sq. yds. sheet asphalt, \$1.75; 100 sq. yds. asphalt block, \$2.50; 3,500 sq. yds. macadam pavement, 40c.; other bidders: Leo E. Kelly, \$89,182; Beaver Engineering and Construction Co., \$95,052; Franklin Contracting Co., \$99,069; Daly Bros. Co., \$87,695; Nelson & Dowling, \$78,526; R. Carter Co., \$96,035; Peace Bros., \$77,449; Wilton Construction Co., \$96,534; D. Cuzzo Co., \$89,544.

New York, N. Y.—Contract 77, for the Wakefield ave. blowoff from Hill View reservoir; T. J. and George L. Brown, 87 Hamilton pl., city, \$58,178; Keystone State Construction Co., 704-709 Penn Bldg., Philadelphia, Pa., \$63,935; King-Ganey Contracting Co., \$64,481; D. Cuzzo & Co., Park Row Bldg., city, \$65,511; Voorhees-Sullivan Construction Co., Dorothea pl., Fordham, \$69,907; Godwin Construction Co., 30 Church st., city, \$69,931; William F. Norton, 215 West 125th st., city, \$71,635; T. M. McLeod Co., 90 West st., city, \$72,859; Patrick Derry, 44 Jane st., city, \$73,121; F. N. Lewis, 263 4th ave., city, \$73,697; Silery, Nordone & Silery, Mount Vernon, N. Y., \$76,625; Phoenix Construction Co., 41 Park Row, city, \$97,764.

New Brighton, S. I., N. Y.—Laying mains in Belmont, Clarke, Henry and other streets, including valves, hydrants, etc., Jas. McAvoy, 303 E. 127th st., New York City, \$399,444; Leo E. Kelly, Brooklyn, \$332,062; Wm. F. Norton, 215 W. 125th st., New York City, \$342,694.

Galveston, Tex.—Furnishing pumps for city water works; three bids were received for installation of two centrifugal pumping units and each bidder submitted two or more propositions by reason of exchanging two turbines now used for the city electric light plant for new centrifugal pumps or allowing difference for turbines; bidders were as follows: A. M. Lockett & Co., New Orleans, \$3,275 for first proposition, \$4,250 for second proposition, \$6,100 for third and \$7,800 for fourth proposition; Randall, Lovegrove & Wyman, Houston, \$4,250 for first proposition and \$3,550 for second proposition; the Lowe Electric Co., city, \$4,317 for first proposition and \$2,517 for second proposition.

Park City, Utah.—Construction of water works plant; Lynch & Cannon Engineering Co., Salt Lake City, Utah, \$48,949; J. W. Percival, Salt Lake City, \$56,380; A. A. Clark, Salt Lake City, \$47,499 (awarded contract); McKay & Reed, Salt Lake City, \$47,800; P. J. Moran, Salt Lake City, \$57,732; Moran Construction Co., Salt Lake City, \$47,010; Wheelwright Construction Co., Ogden, Utah, \$47,144.

Ft. Myer, Va.—Water works improvements: (a) remodeling pumping station, (b) filter, (c) 2 miles of 10-in. water main from Roslyn to Ft. Myer; W. H. McCray, (a) \$2,100; Julius Wanner, (c) \$18,500; R. E. Reissau, (a) \$2,860, (c) \$21,500; General Conduit Co. (a) \$2,000, (b) \$7,200, (c) \$25,467; Jas. Nolan & Sons, (a) \$3,500, (b) \$6,375; J. W. Danforth & Co., (a) \$3,400, (b) \$5,200, (c) \$19,000; Newport Construction and Engineering Co., (a) \$3,000, (b) \$6,400, (c) \$21,775; the W. E. Burnizer Co., (c)

\$21,000; L. B. Jacobs, (c) \$17,446; F. J. Boas, (a) \$3,000, (c) \$19,280.

Tacoma, Wash.—Building final unit of Green River gravity water system; P. E. McHugh, city, lowest bidder, \$417,441; estimate was \$102,000 above that figure, being \$520,000. Other bidders: International Contract Co., of Seattle, \$489,086.50; Pacific Coast Pipe Co., of Tacoma, \$483,736.40; F. McLellan, of Seattle, \$478,944.70; Sound Construction & Engineering Co., of Tacoma, \$477,327; Butler Construction Co., of Seattle, \$466,874.70; Jahn Contracting Co., of Portland, \$463,843; Wright Contracting Co., of Tacoma, \$463,736.20; N. A. Jones and A. W. Tweeden, of Tacoma, \$464,937.50; Far-West Construction Co., \$460,432.10; Dibble-Hawthorne Co., of Tacoma, \$456,920.50; Grant Smith Co., of Spokane, \$454,626.40; C. L. Morris Construction Co., of Seattle, \$449,948.90; John Galluci and R. De Rose, of Tacoma, \$436,820.50; W. B. Slick, of Boise, Idaho, \$436,251.50.

LIGHTING AND POWER

Birmingham, Ala.—People's Gas Company has been given franchise by the Birmingham Commission; company proposes to bring natural gas to Birmingham from Fayette Fields, 82 miles away.

Decatur, Ala.—Plans are being prepared by J. B. McCrary Co., Atlanta, Ga., for municipal electric light plant; cost, about \$40,000.

Kingman, Ariz.—Kingman Gas Co. has secured options on site for erection of gas plant.

Madera, Cal.—Frederick C. Roberts has been granted franchise to lay gas mains through city streets.

New Castle, Del.—Council is considering installation of electric light plant.

Washington, D. C.—District Commissioners have abandoned scheme for lighting Pennsylvania ave. by a series of ornamental posts running down center of the street and have asked Walter C. Allen, District Electrical Engineer, to submit another plan.

Washington, Ga.—City is considering improvements to electric light plant, including power plant, estimate cost \$10,700; repair outside wiring, \$8,000; install electric pump at pumping station and build transmission line to pumping station, \$6,300.

Hope, Ida.—Northern Idaho & Montana Power Co. has been granted franchise to install power and lighting service.

Sylvan Grove, Kan.—Citizens will vote June 26 on \$25,000 bonds for electric lighting and water works.

Lake Charles, La.—Council has authorized the Mayor to advertise for bids for franchise to operate a gas plant in Lake Charles, subject to the charter provisions and specifications for installing plant adopted by Council; franchise is to run for 20 years.

Catonsville, Md.—Baltimore County Water & Electric Co. has completed arrangements for installing new arc and incandescent lights on all streets; present lights in use at Catonsville will be transferred to Highlandtown; cost about \$5,000.

Cambridge, Mass.—Council is considering advisability of establishing municipal electric lighting plant.

Newberry, Mich.—Citizens will vote on \$11,500 bonds to improve power plant.

Braham, Minn.—Village Council has granted franchise to Eastern Minnesota Power Co. to install electric light plant.

St. Paul, Minn.—Specifications are being prepared and bids will be asked at once for lighting streets of city.

Wayzata, Minn.—Consulting Engineer W. D. Lovell, Minneapolis, is preparing estimates of cost of installing light plant and water works system.

Butte, Mont.—Council has authorized the extension of curb cluster lighting system at estimated cost of \$12,000.

Libby, Mont.—Libby Water Works, Electric Light and Power Co. will soon install electric light plant.

Sheridan, Mont.—Madison Power Co., of Butte, is planning to supply electric light for this town, Alder and Laurin.

Mason, Nev.—H. W. Culbertson, Manager of Mason Water, Light & Power Company, will at once proceed with enlarging of water supply of city; work includes building of large tank on hill above town and laying of more water mains; also means change from air pressure system to gravity system.

Wolcott, N. Y.—The Public Service Commission at Albany has authorized Northern Wayne Electric Light and Power Co. to purchase Wolcott Electric Light and Power Co. for \$33,000; company is also authorized to complete construction of a pole line for transmission of electricity from substation of the Rochester and Sodus Bay Railway Co., at Sodus, to village of Red Creek, and from village of North Rose to Rose, and construction of secondary distribution systems in the villages.

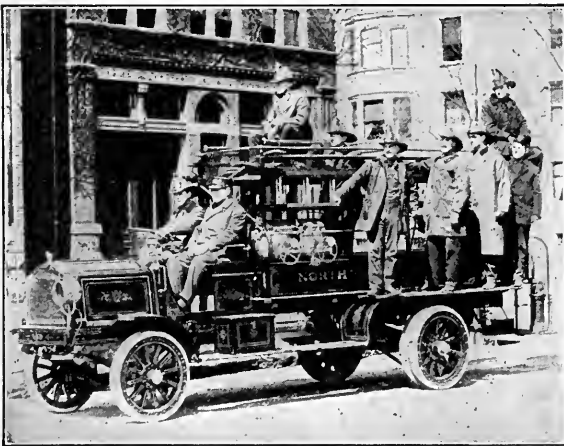
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New York City

Comanche, Okla.—Citizens have voted bids for electric plant.

Klamath Falls, Ore.—F. W. Bordman and associates, San Francisco, have been granted a 50-year franchise for gas plant in this city; construction of the plant must be begun within 60 days and system must be in operation before expiration of eight months.

Edgefield, S. C.—City will soon receive bids for construction of electric light plant. W. H. Harling, Clerk.

Chamberlain, S. D.—Newly organized company, W. Hall Trans, president, has asked for electric light franchise; contract for lighting streets expires July 1.

Petersburg, Tenn.—Charter has been granted to Petersburg Electric Light and Power Co. to establish electric light system.—A. C. Davis, Geo. McAdams, J. A. Montgomery, J. C. Melady and O. F. Gill, Incorporators.

Terrell, Tex.—Commission will at once award contract for construction of concrete powerhouse.

Castlerock, Wash.—Carl A. McClain is interested in private company contemplating erection of power plant.

Tacoma, Wash.—Municipal Commissioners have adopted ordinance authorizing asking of bids for furnishing 10,000 lbs. of weather-proof copper wire.

Spokane, Wash.—Washington Water Power Co. will expend \$30,000 in Lincoln Heights to install electric lights; line will be run direct from main station.

Mishicot, Wis.—Ira Beyer and Peter Kowler are interested in proposed construction of dam across Mishicot River to furnish power for an electric light and power plant.

Hamilton, Ont., Can.—Dominion Power & Transmission Co. is considering construction of electric line to Galt.

Montreal, Que., Can.—The Shawinigan Water & Power Co. is planning to build another power house to develop 75,000 additional hp.—Julian C. Smith, 607 Power Bldg., Chief Engineer.

Penetanguishene, Ont., Can.—City will expend \$16,500 to purchase existing power plant and \$10,500 for extensions and improvements.

CONTRACTS AWARDED

Bakersfield, Cal.—Furnishing surface condenser for San Joaquin Light & Power Co. to Braun, Williams & Russell, Inc., 503 Market st., San Francisco.

Tustin, Cal.—To Southern California Edison Co., Los Angeles, to install and operate 110 electric lights on certain streets.

Brainerd, Minn.—Northwestern Electrical Equipment Co. to furnish the equipment for electric street lighting, \$3,080; other bidders were General Electric Co. and Electrical Appliance Co.

Altoona, Pa.—By the Penn Central Light and Power Co. for trenching and other work, to the Bell-Bockel Stone Co. and to H. G. Hinkle; work will involve expenditure of \$250,000.

Richmond, Va.—To W. H. Jenks, for erecting poles for municipal lighting system in Washington Ward, \$1,200.

Tacoma, Wash.—Furnishing \$25,000 worth of long filament lamps, to Home Electric Co.

FIRE EQUIPMENT

Little Rock, Ark.—Purchase of following apparatus has been recommended: Auto combination hose wagon, first-class steamer, chief's auto, 75-ft. self-raising aerial ladder and one reserve hose wagon.

Los Angeles, Cal.—Architects Dennis & Farwell, 301 Currier Bldg., have prepared plans for erection of annex to fire engine house at 139 North Hope st.

Golden, Col.—Equipment will soon be needed for newly formed fire department.

Freeport, Ill.—Council has decided to call election on \$20,000 bond issue to purchase apparatus and erect 85,000 hose house.

Indianapolis, Ind.—City has sold \$200,000 bonds for improving fire department to Meyer & Kiser Bank and Newton Todd.

Council Bluffs, Ia.—Purchase of auto fire truck is being considered.

Shreveport, La.—National Board of Fire Underwriters has recommended installation of 600-gal. engines for Companies 1 and 5, preferably autos; auto combination hose wagon for Company No. 5 and new auto for Chief; also minor equipment.

Bangor, Me.—Council has ordered estimate of cost of erecting fire station.

Chisholm, Minn.—Purchasing Committee of Council will purchase two additional hand chemical wagons.—Thos. O'Connor, Chief.

Joplin, Mo.—Purchase of additional auto apparatus is being urged.

Libby, Mont.—Volunteer fire company has been formed.—W. S. Maguire, Chief.

Belleville, N. J.—Fire District has defeated \$8,000 appropriation for purchase of fire auto.

Hackensack, N. J.—National Board of Fire Underwriters has recommended providing of reserve hose wagon equipped with turret nozzle and carrying 1,000 ft. of hose; also purchase of minor equipment and apparatus for fire alarm system.

Wantua, N. J.—Newly organized fire company will erect engine house.

Hazleton, Pa.—Council is considering bill providing for purchase of 1,000 ft. of hose.

Pittsburg, Pa.—Mayor Wm. A. Magee has signed ordinance for purchase of 85-ft. aerial truck, three auto propelled combination chemical and hose wagons and for erection of temporary fire house in Beechview.

Williamsport, Pa.—Special committee has recommended need of hose wagons for companies 1 and 4.

Sumter, S. C.—Fire Committee, J. F. Glenn, Chairman, will secure bids on furnishing auto engines.

CONTRACTS AWARDED

Birmingham, Ala.—Furnishing nine motor-propelled combination chemical and hose fire wagons to Seagrave Co., Columbus, O.; about \$10,000.

Grand Rapids, Mich.—Furnishing two motor-driven 60-hp. chemical engines, to Michigan Hearse and Carriage Co., \$3,500 each.

New York, N. Y.—Furnishing and delivering 3,500 ft. of 3/4-in. rubber fire hose for fire-boats, Boro Manhattan, and 1,500 ft. of 3/2 in. rubber fire hose for fire-boats Brooklyn to only bidder, B. F. Goodrich Co., New York.

Syracuse, N. Y.—Installing central office fire alarm system, to Gamewell Fire Alarm Telegraph Co., \$28,875.

Utica, N. Y.—Furnishing and installing automatic repeater and switch board for fire station, to Utica Fire Alarm Co., \$1,343.

Butler, Pa.—Erecting three-story fire station, to W. S. Brandon.

Cameron, Tex.—To W. D. Bigby for erection of fire station in this city, \$3,145.

Spokane, Wash.—Furnishing 66-hp. auto for Fire Chief Harry A. Myers, to Geo. W. Merrill, local agent for the Thomas Flyer, \$3,800.

BRIDGES

Bridgeport, Conn.—Plans are nearly completed for new Island Brook culvert to be built out of special appropriation of \$3,900; bridge will be of reinforced concrete 50 ft. long, 60 ft. wide, of high beam construction; bids will soon be invited.

Dover, Del.—Levy Court of Kent County will build modern bridge of iron with a 14-ft. wood span and 16-ft. roadway over west branch of Smyrna River.

Rockford, Ill.—Plans and specifications are being prepared for construction of 125-ft. bridge, estimated at \$1,000, over Keith Creek at 6th st.—S. B. Hand, City Engineer.

Waukegan, Ill.—City Commissioners are considering erection of bridge over ravine at Genessee st.

Clio, Ia.—Engineer Hart has prepared plans for three steel bridges to be erected in the central part of county; bids on their erection will soon be asked.

Grand Rapids, Mich.—Daniel B. Luten, Indianapolis, will draw plans for new cement bridge at Leonard st.

Albert Lea, Minn.—Plans are being prepared for 80-ft. span concrete bridge and draw.—Wm. Barneck, City Engineer.

Joplin, Mo.—Joplin Road Commissioners will construct bridge on Scotland road east of Luenweg; steel framework; concrete floor; cost \$2,500.

Far Rockaway, L. I., N. Y.—Board of Estimate, New York City, has appropriated \$35,000 for construction of bridge over Norton's Creek at Atlantic ave.

Chillicothe, O.—County Commissioners have passed resolution for issue of \$37,000 bonds for construction of bridge over Paint Creek.

Johnstown, Pa.—Plans will be prepared and bids asked for repairing Conemaugh bridge.

Pittsburg, Pa.—Mayor Wm. A. Magee has signed ordinance authorizing sale of \$30,000 bonds for erection of bridge over Hoever st.

Llano, Tex.—Plans have been adopted by Commissioners' Court of Burnet and Llano Counties for erection of Colorado River bridge; cost, \$30,000.

Brigham City, Utah.—Box Elder County has voted \$200,000 bonds to build bridges and roads.

Spokane, Wash.—Washington Water Power Co. will spend more than \$25,000 in bridge and road improvements in Spokane, Lincoln and Stearns counties this summer.

Tacoma, Wash.—Municipal Commission has decided to advertise for bids for the construction of bridges over 11th st. waterways and over Puyallup River at 11th St.

Milwaukee, Wis.—Alderman Mikkelsen, Chairman Harbor Committee, has recommended erection of aerial ferry bridge, cost \$100,000, to connect Jones Island with mainland.

CONTRACTS AWARDED

Wilmington, Del.—Building bridge over west branch of the Sinyra River in Blackbird Hundred, to Frank R. Jones, \$5,000.

Goff, Ida.—Constructing bridge over Salmon River, to the Security Bridge Co., Lewiston, about \$15,000.

Indianapolis, Ind.—Building concrete bridge on State ave. over Pleasant Run, to R. F. Pickens, \$9,683.

Clinton, Ia.—Building concrete bridges in county to F. V. Clarke, city, \$5,388.52; other bidders: W. L. Steele, \$6,534.12; Godber Hansen, \$6,556.20; Link & Schnell, \$6,541.05; J. R. Kane, \$6,243.35; P. C. Donahue, \$6,250.21; Clinton Bridge Co., \$8,626.95.

Louisville, Ky.—Building bridge over Salt River at West Point for Jefferson and Hardin counties, to Capital Construction Co., \$53,600.

Louisville, Ky.—To National Concrete Construction Co., Indianapolis, for construction of two bridges over Beargrass Creek, \$11,510; other bidders were L. R. Figg & Co., \$14,447.45; the Henry Bickel Co., \$13,939.08; the L. W. Hancock Co., \$12,936.48; and H. H. Snyder, \$11,815.60.

Springfield, Mo.—Constructing concrete culvert, 222 ft. long and 12 ft. wide to A. H. Rountree, \$5.25 per cu. yd.

Ripley, Tenn.—Building eight county bridges to Jollet Bridge & Iron Co., Joliet, Ill., \$4,800.

Fort Worth, Tex.—By County Commissioners for 60-ft. concrete bridge over Marine Creek at 13th st., on the north side, to Dennis Fagan, approximately \$8,000.

Moab, Utah.—Constructing bridge over Grand River to the Midland Bridge Co., Gibraltar Bldg., Kansas City, Mo., \$43,000; other bidders were: Monarch Engineering Co., \$48,000; Patterson-Burghardt Construction Co., \$47,000; Chas. G. Sheehy, \$46,577; Empire Bridge Co., \$47,800; Central States Bridge Co., \$47,000; A. M. Blodgett Construction Co., \$46,925.

MISCELLANEOUS

Modesto, Cal.—Plans by Architect W. H. Weeks, San Francisco, have been accepted for erection of \$25,000 library.

Indianapolis, Ind.—City has sold \$110,000 city hospital bonds to syndicate composed of Fletcher American National Bank, Joseph T. Elliott & Sons, Gavin L. Payne & Co., Freed, Harrison, Miller & Adams.

Davenport, Ia.—City will spend about \$250,000 during next few years in improving river front; islands, including a fill, will make 120 acres of valuable ground; Mayor Alfred C. Mueller has named W. D. Peterson, business man; Rudolph B. Clausen, architect, and Wm. H. Kimball, civil engineer, as River Front Improvement Commission, who, with the Mayor and Commissioner of Public Works, A. M. Compton, will have full charge.

Boston, Mass.—Council has passed \$25,000 loan order for branch library in North End.

Boston, Mass.—Bids will be readvertised by Commissioner Rourke for erection of proposed ferry boat.

Groveland, Mass.—Town is to have modern playground for children; \$1,200 available.—Rev. Andrew Campbell, Chairman Committee.

Crystal Falls, Mich.—Council has decided to erect city hall and opera house; site purchased.

Chisholm, Minn.—Site will soon be purchased for erection of proposed \$25,000 Carnegie library. Prof. J. P. Vaughn is interested.

Duluth, Minn.—Douglas County Board will erect \$8,000 sanitarium at Parkland.

Fulton, Mo.—City will erect \$12,000 Carnegie library.

Brooklyn, N. Y.—Plans are being prepared for erection of disposal plants at Rockaway Beach and Ridgewood; for the former cost is estimated as follows: Incinerator, 50 tons, \$1,000 per ton; land, \$16,000; stable and 32 horses, \$25,000; section house, \$10,000; for latter: Land, \$30,000; incinerator, 100 tons, \$100,000; stable and 50 horses, \$10,000; station house, \$32,000.—A. C. Hankins, Commissioner of Street Cleaning.

Chatham, N. Y.—Municipal building, cost \$25,000, will be erected on Central Square.—Wm. H. Houseman, President Board of Trustees.

New York, N. Y.—Park Commissioner Stover will spend \$250,000 before end of the summer for development of playgrounds.

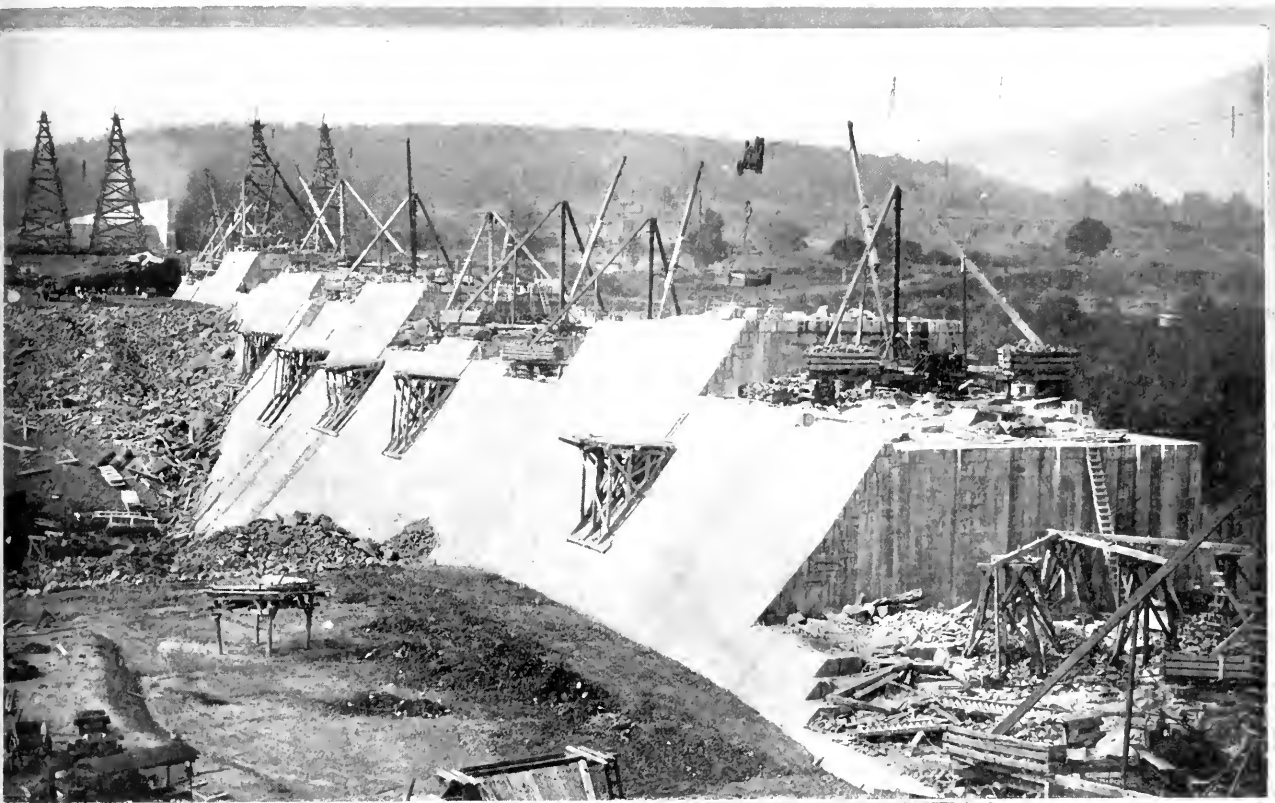
Rochester, N. Y.—Board of Contract and Supply has authorized \$20,000 expenditure for purchase and equipment of playground on Front st.

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No. 24



GENERAL VIEW OF OLIVE BRIDGE DAM UNDER CONSTRUCTION

CATSKILL WATER SUPPLY

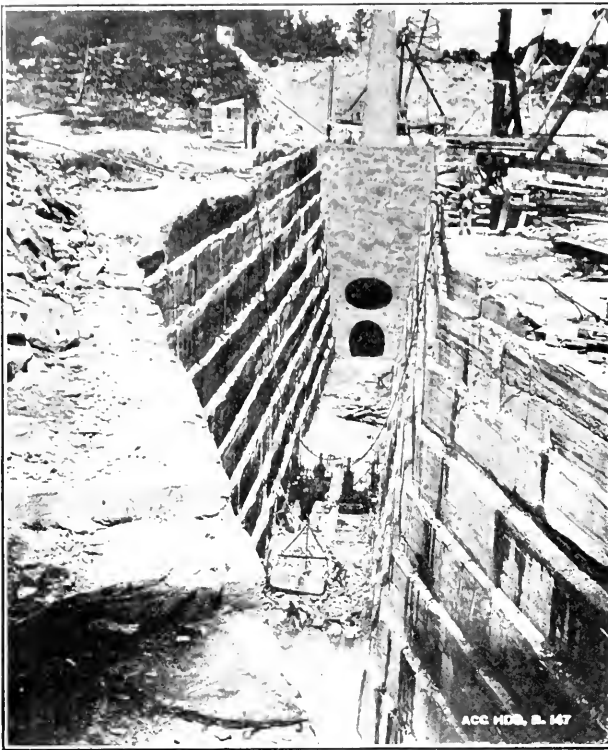
Progress Made to Date on Ashokan Reservoir and Aqueduct—Masonry Dam Will Be Completed This Year
—Expansion Joints—Tunneling Under the Hudson—Mud Seams and Caves—Handling Seepage

In our issue of January 19, 1910, we gave a general description of the new water supply for greater New York which is under construction and has for its aim the bringing to New York City of water from the Catskill watersheds 100 miles away. Work was continued during the year of 1910 even more rapidly than was called for by the contract, and, although to a considerable extent intermitted during the winter, has been under full way for several weeks.

It may be interesting to review concisely the general fea-

tures of this project, and especially of the Olive bridge dam and the Ashokan reservoir. This reservoir is the only one which it is intended to build at present, although the complete plans include the development of three other watersheds.

The reservoir is formed by the impounding of the Esopus Creek by the Olive bridge dam and several dikes. Two branches of the creek meet near the dam, and a dike about 1,100 feet long at this point divides the reservoir into two basins. The west basin has an area of 5 square miles and



PRESSURE AQUEDUCTS UNDER DIVIDING WEIR AND UPPER GATE HOUSE, ASHOKAN RESERVOIR

Built of Concrete in Rock Trench, Instead of by Tunnelling.

available storage capacity of 47,000 million gallons; the east basin has an area of 7.8 square miles and available storage capacity of 80,000 million gallons. The maximum width of the reservoir is 2.6 miles and the average width 1.1 miles. The average depth is 50 feet. The water surface in the west basin has an elevation of 590 feet above mean high tide at Sandy Hook and that of the east basin 587 feet; the dike between the east and west basins serving as a weir over which the water passes from the west to the east. The Olive bridge dam will have a total length of 4,620 feet, 1,000 feet of this being masonry. The top of the masonry dam is at elevation 610, 210 feet above the elevation of the original creek bed and 252 feet above the lowest point in the cut-off trench. The maximum width of the masonry dam at the base is 200 feet and the maximum width of the earth portion of the dam is 780 feet. In addition to the dam there are dikes having a total length of about 3 miles, a maximum height of 110 feet and a maximum width of 640 feet at the base.

Before flooding the reservoir it will be necessary to discontinue and rebuild 13 miles of track of the Ulster and Delaware Railroad. Sixty-eight miles of highways will be discontinued and 38 miles rebuilt. Seven villages will be drowned out, having a winter population of 1,900 and a summer population of about 3,000. It will also be necessary to move 35 cemeteries, most of them private, containing 2,800 bodies.

As soon as the dam is completed it will be possible to begin storing water in the reservoir, and to supply it to New York City as soon as the aqueduct is completed. Work on these has been hastened as much as seemed consistent with good construction, and it is confidently expected that the masonry dam will be completed this year, and that water will be delivered to New York City from this supply before the end of 1912. Of the 550,000 cubic yards of masonry in the dam 75 or 80 per cent. has been completed, and practically all of the face blocks have been constructed and are seasoning in the yard. The south end of the dam is practically finished and the general average of the entire dam is probably about 30 feet below its completed elevation.

The dam is constructed of concrete laid in place and con-

taining numerous boulders; molded concrete blocks being used for the upper and lower face, for one face of each expansion joint, and for the blocks around the well holes and galleries. These face blocks are molded in a yard near the work and allowed to season for at least three months before use. These are laid in advance of and kept a little higher than the mass concrete. Up to the present time about 27 per cent. of the mass concrete has been composed of boulders, which are thoroughly imbedded in the concrete and uniformly distributed.

At intervals of 84 feet there are expansion joints extending completely through the dam and from the crest to a little below the surface of the ground, every alternate joint extending entirely to rock. One face of each expansion joint is built of concrete blocks, the surface well covered with crude petroleum and the concrete of the adjoining section placed in bulk against this. In the face built of blocks are left a number of rectangular recesses having an area of about 10 by 20 feet, distributed so as to occupy possibly one-fourth of the area of the joint, with slightly beveled edges, for the purpose of bonding the two sections together. At each expansion joint there is a well hole about 12 feet in from the upper face of the dam, and 6 by 8 feet in section, extending from the level of the water surface to about elevation 440, or 170 feet below the crest and a few feet below the general surface of the ground. At the upper and lower ends of these well holes is a gallery which extends the entire length of the masonry dam, the lower one serving to receive any leakage which may enter the expansion joints and be intercepted by the well holes. The lower gallery has a slight slope from each end toward the center, at which point a branch gallery extends to the lower face of the dam, where there is a manhole giving access to this gallery, and where the seepage water may be observed. In addition to this there are placed 16 feet apart and 12 feet from the upstream face of the dam vertical holes 16 inches in diameter, to intercept any leakage into the concrete, these holes also extending to the lower gallery. Each of these holes is constructed by a pillar of blocks containing openings of the specified diameter, these blocks being made of very dry, lean concrete with the idea that, being porous, they will admit water to the drain holes. Should leakage into the well holes become excessive, it is possible that these will be filled with clay or other substance to cut off such leakage at the expansion joints.

In front of the lower face in the center of the dam is a gate chamber in which are several compartments and the gates connecting them which allow complete control of the flow from each of the basins into the conduit. The excavation for this chamber extends 60 feet into the bed rock, and this excavation has been completed and the foundation concrete has been placed and the gates are now being put into position.



ROUNDOUT SIPHON. LINED TUNNEL SHOWING QUARTER BEND TO UPTAKE SHAFT

The work on the dikes has not progressed as rapidly as that on the dam, chiefly because this was not considered so necessary. The concrete core walls are kept about 20 feet higher than the embankment. Work on the latter is carried on only during favorable weather, when the earth is not too muddy for proper compacting and when it is not subject to freezing. Consequently, little has been done on this work since last fall.

Of the aqueduct possibly the most interesting parts are the tunnels, and of these the one which has attracted the most attention is that under the Hudson River at Storm King. For several years borings were carried on; first, vertical ones at intervals across the river from shore to shore, and later inclined ones from the shore to the center of the river; the object being to locate the tunnel at a depth which would insure the whole of it being in solid rock and having above it a sufficient depth of rock to withstand by the weight of the superposed material alone the upward pressure of the water in the aqueduct. In the center of the channel a fault in the rock was found which extended approximately 1,000 feet below the surface of the river. A vertical drill hole was carried at this point to a depth of 768 feet below mean high tide, when it was thought impractical to extend it any further. Inclined drill holes were then started from each bank of the river and extended toward the center until they crossed each other. Two sets of these were driven, the upper pair crossing at a depth of about 768 feet below mean high tide. At this depth the core showed an unbroken bed of gneiss throughout. It was then decided to locate the tunnel with the soffit of the arch having an elevation of -1,100 on the east side and -1,097 on the west side, thus giving at least 330 feet, and probably 500 feet or more, of solid rock above the tunnel. The tunnel aqueduct will be circular in cross section with an inside diameter of 14 feet and will have a uniform slope, falling three feet from the west toward the east shaft. The latter shaft is carried 42 feet below the tunnel to serve as a sump for de-



TUNNEL LINING COMPLETED, AND WITH SIDE WALLS ONLY COMPLETED

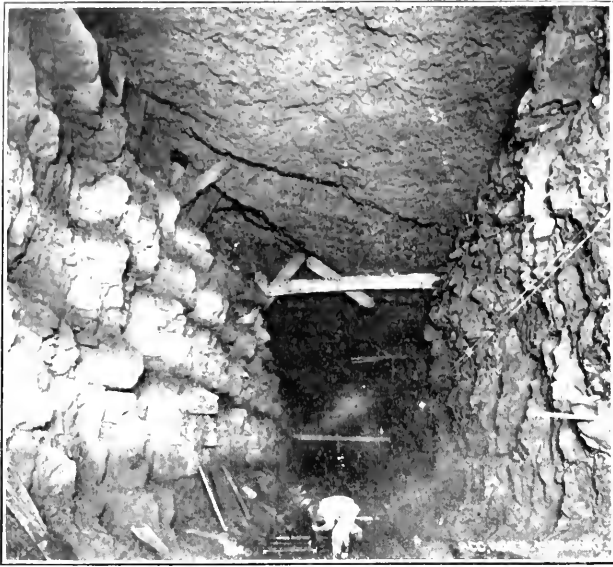
watering the tunnel should it be desired to obtain access to it. The two shafts have been completed to the depths named, this work having been done by the Board of Water Supply by day labor; and the Board has also started the tunnel from each shaft and completed 268 feet of heading from the east shaft and 150 from the west shaft. At this writing it is expected to award the contract within a very few days for completing the tunnel.

This tunnel will be lined with concrete mixed 1 : 2 : 4, rather wet, and precautions taken to give a smooth surface by greasing the forms and spading the stones back from them.

Other tunnels along the line are nearing completion, these



ROUNDOUT SIPHON. INVERT IN PLACE AND FORMS READY FOR SIDE WALL CONSTRUCTION



SHOWING FLAT WATER-WORN SURFACE OF STRATUM IN ROOF OF TUNNEL; ALSO REGULAR SEAMS IN WALL OF TUNNEL.

The Seam Beneath the Roof Bed is a Mud Seam, which Has Displaced the Rock.

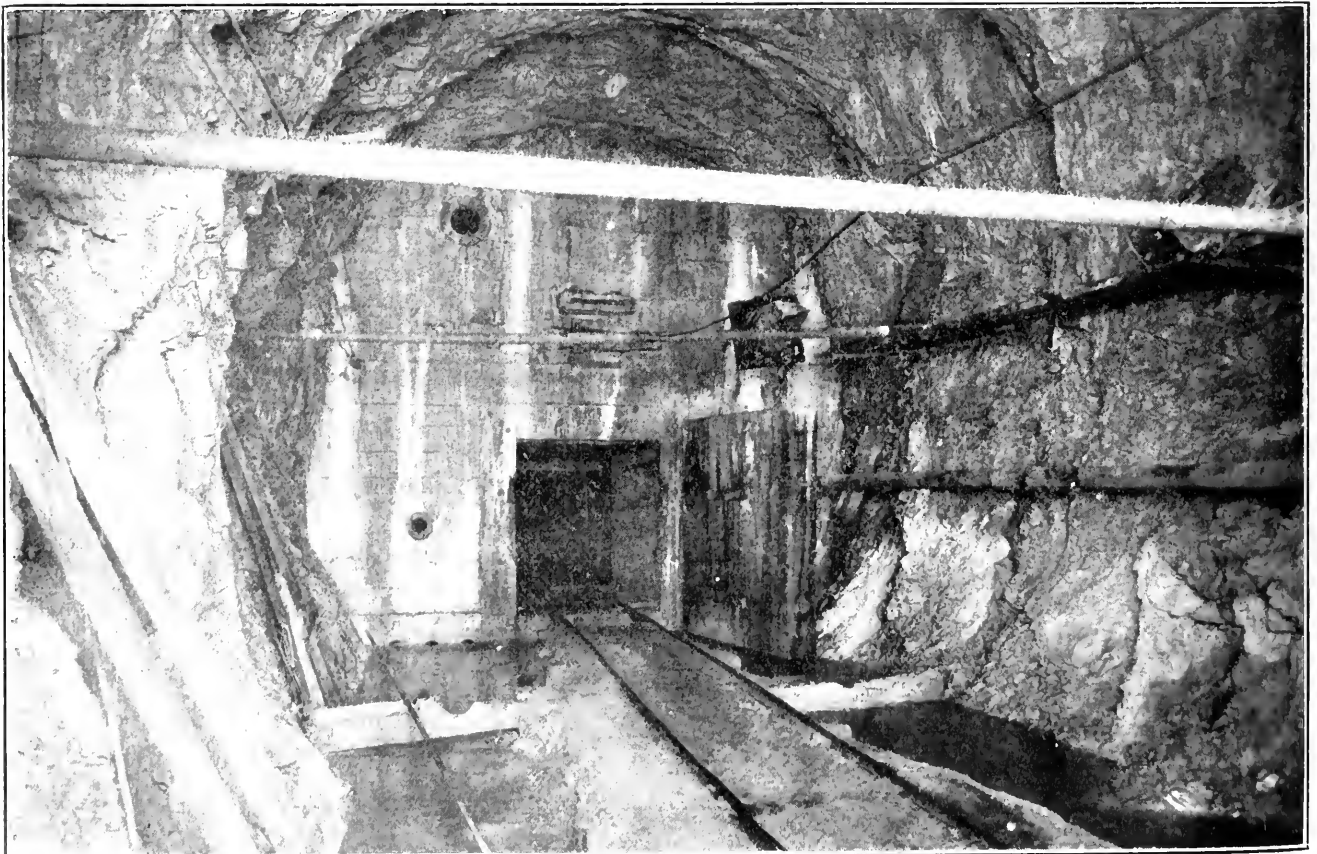
including several which follow the hydraulic gradient, known as "grade tunnels," others serving as inverted siphons, known as "pressure tunnels." A siphon tunnel under Rondout creek is about 24,000 feet long and one under the Walkill valley is about four miles long. The grade tunnels are of horseshoe section 17 feet high and 13 feet 4 inches maximum horizontal diameter. The pressure tunnels are circular, 14 feet 6 inches in diameter. Both these pressure tunnels are in rock, and as in the case of the Hudson River tunnel, are carried to such depth as to insure solid rock throughout their length. The

Rondout tunnel was carried somewhat deeper than this requirement called for in order to avoid as much as possible a stratum of grit which would be extremely difficult to bore through. This brought the tunnel over 400 feet below the surface of the ground.

The tunnels are lined with concrete, Blaw forms being used as centers in most of the work. The lining of the pressure tunnels is placed in three sections, an invert section 5 feet wide being placed first, on which, when it has set, is laid the contractor's track for carrying the forms, the concrete, etc., for completing the lining. Following this the side walls are built, and after this the arch.

One of the interesting features of this tunnel work, which is mostly in limestone, has been the seams and caves encountered. Some of the latter extend for an unknown distance at right angles to the tunnel. When these are encountered the earth found in them is removed to a distance of approximately 20 feet from the tunnel in the case of large caves which extend this far, and this space is filled with concrete. Smaller seams are cleaned out as far as practicable and likewise filled with concrete. One of the illustrations shows a rather wide seam which has been cleaned out for several feet and the remaining earth held in place by steel channel beams placed vertically and held in place by wooden struts. The concrete backing is packed against these steel channels, each wooden strut being removed as the concrete reaches it; this construction being adopted in order to leave no perishable material in the structure.

Wherever there is a seam or hole through which water seeps into the tunnel, a weep-hole is left through the concrete and a corresponding opening in the form, allowing the water to drain into the tunnel while the concrete is being placed. After the completion of the tunnel grout is forced into all these holes under a pressure of 300 pounds to the square inch to render the aqueduct perfectly tight. As it is found that the concrete in the arch section tends to settle away from the



CONCRETE BULKHEAD IN RONDOUT SIPHON. TO PREVENT FLOODING OF PUMPING AND OTHER MACHINERY AT THE BOTTOM OF SHAFT 4

MASONRY DAM CONSTRUCTION

Provision for Slight Settlement and Resulting Stresses—Increase in Unit Pressure and Reduction in Section Warranted
—American Engineers Commended

IN the presidential address of Edward Sandeman, president of the Association of Water Engineers (England), he took as his theme the construction of impounding reservoirs, and especially the construction of masonry dams. His principal thought was the importance of studying and making allowance for the effect of both compressibility of foundations and masonry and temperature changes upon the masonry, and also the unit compressive strength adopted as a maximum.

He said, in part: I hope that in the future those who are engaged in masonry dam construction will devote especial attention to the recording of the amount of settlement in the foundations, and that, if possible, some information may also be gathered relating to the compression of masonry itself due to its own weight. It has generally been considered (and one authority at least lays it down as an axiom) that for a masonry dam it is absolutely necessary to have an unyielding foundation to build upon. But while such a foundation is no doubt an ideal one, it is to be remembered that all materials are more or less compressible and that settlement must always take place to some extent in the case of the hardest rocks, the amount being, of course, exceedingly small and without doubt difficult of accurate measurement. Masonry dams built upon shale and materials of a similar character must of necessity produce a compression greater than that produced upon the harder rocks, and in these cases measurements of the amount of compression brought about by a given weight could be ascertained without much difficulty and the results recorded. It seems certain that, as the knowledge obtained from such observations accumulates, it will no longer be held that a masonry dam foundation must be an unyielding one.

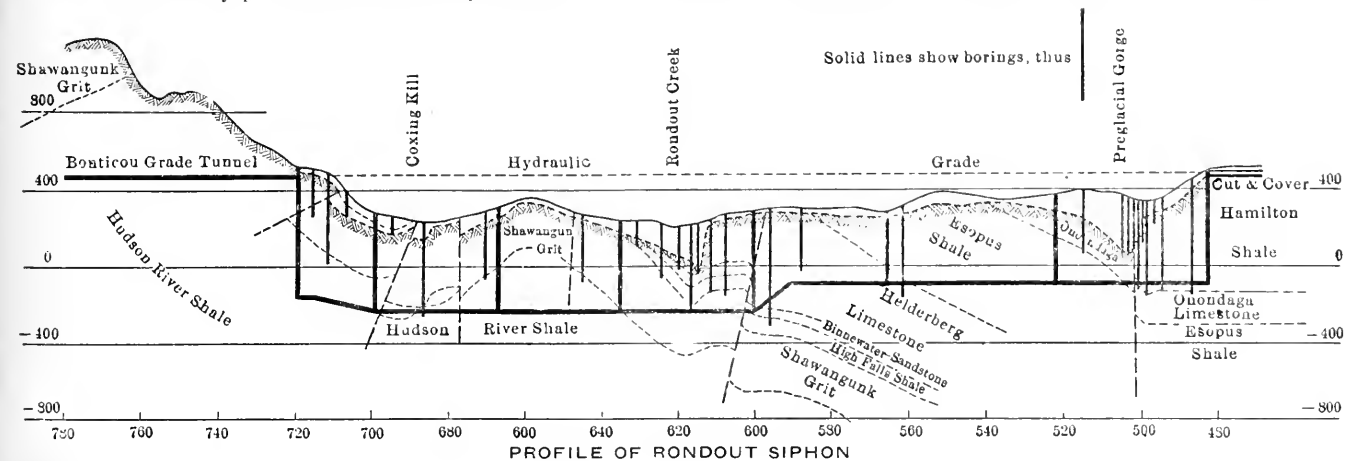
It will not infrequently occur that the various parts of the foundation of a masonry dam, even when this is bedrock, will differ slightly in compressibility, and there must consequently be some adaptation of the masonry to the unequal yielding. Moreover, the compressibility of the masonry itself will probably not be the same as that of the rock, and consequently the settlement in sections of the dam which have different heights, owing to the variation in the depths of foundations, will differ. That masonry will adapt itself to pressure is known, but the extent of its adaptability had not, as far as Mr. Sandeman knew, been ascertained or calculated. Experiments made to determine the movement of high dams when subjected to water pressure have shown slight movements, in all probably bending movements and not due to a real motion of the dam as a whole. It seemed to him probable that when concrete was subjected to a continuous strain for a long period, its continuing to set more firmly through a period of years would enable it to gradually eliminate the strain and the concrete



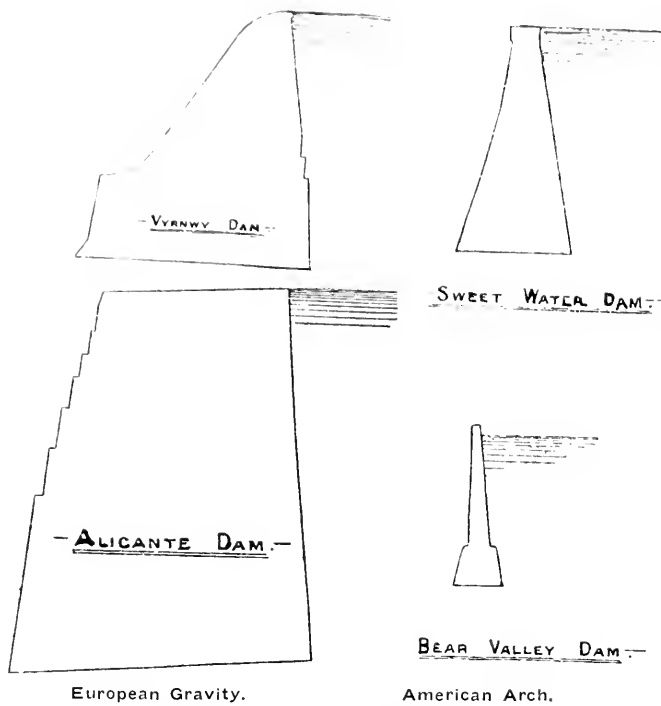
STEEL LAGGING IN MUD SEAM IN SIDE OF TUNNEL

crowns after being placed, thus leaving a cavity, similar openings or weep-holes are left at frequent intervals along the crown and dry material placed there while placing the arch concrete; and here also grout is forced in under pressure to completely fill this section of the arch and give it a firm bearing against the rock.

These seams admitted more or less water into the tunnel and the contractors were compelled to keep extensive pumping plants in the tunnels for removing this water to the surface. One of these took the precaution of building a substantial bulkhead of concrete across the tunnel just beyond his pumping plant, this being provided with heavy bronze doors which could be closed practically water tight, in order to prevent the flooding of the pumps should they break down at any time. This bulkhead is shown in one of the illustrations. As a matter of fact this pumping plant did break down and was out of commission for several days; and it is probable that this precaution saved the contractor the expense and delay of pumping out the flooded tunnel with a portable plant located in the shaft, instead of by the comparatively rapid and inexpensive work of the stationary plant which was thus protected.



PROFILE OF RONDOUT SIPHON



SOME EXTREMES IN DAM SECTIONS

would take a permanent set in its final position and thus retain its full strength.

Probably of greater magnitude than these movements and stresses due to compressibility is the movement due to variations in temperature. "It was formerly considered that temperature practically remained constant a few feet within a mass of masonry, but even in this country (England) with its moderate temperature, it has been found that 30 feet from the face of a dam there is a change between winter and summer of about 5 deg. Fahr. Close to the surface—say, within one inch—the temperatures vary as much as 70 deg. Fahr. Contraction in masonry produced by low temperature is a much more troublesome thing than expansion and one which in large masses of masonry almost invariably produces cracks of smaller or greater dimensions." Mr. Sandeman referred to observations made on the Boonton, N. J., dam, 2,150 feet long, in which the sum of all the cracks measured was $3\frac{1}{2}$ inches. He stated that if concrete were placed at a temperature of 60 deg., which was raised to 70 deg. by the chemical action, and that this fell during the winter to 40 deg. in the masonry within 10 feet from the face, this fall of 30 deg. would cause a theoretical contraction of about 2 inches in 1000 feet, which would cause a tension in the masonry of 21 tons per square foot, sufficient to cause cracks in almost any masonry. Cracks thus caused commence at the top of the dam where it is thinnest and extend downward as the cold increases with a kind of tearing action.

The same stress exerted in compression by the expansion of the masonry could be resisted without injury, and it has therefore been suggested that the masonry be laid in cold weather. But to do this would involve building in winter time only, which is an inconvenient and expensive method and liable to introduce more objectionable features due to the freezing of the mortar. Mr. C. S. Gowen, resident engineer on the Croton dam, suggested covering masonry built in the summer time with a thick coating of masonry placed in the early winter so as to prevent the development of cracks in the upper part of the masonry, and this Mr. Sandeman considered a valuable suggestion and quite practicable. That this consideration of the effects of temperature is not a heedless one is shown by the fact that nearly all masonry dams which have been constructed show sooner or later the effect of change of temperature.

In speaking of the limiting stresses in dam masonry he

referred especially to the Croton dam, in which a stress of 14 tons at the base of the downstream face and 15 tons at the base of the upstream face were used in calculating the design. "Credit is due to the American engineers for their boldness in deliberately designing a dam which, while exceeding in height any existing dam by nearly 100 feet, at the same time was calculated to resist stresses so far in advance of anything previously contemplated. French engineers had already constructed dams in which the pressures on the base reached $6\frac{1}{2}$ to 7 tons, and Rankine, in a report dated February 9, 1871, suggesting masonry dams in connection with the water supply of Bombay, had even fixed a limit as high as 20,000 pounds for the upstream base, although he limited the pressure on the downstream base to 15,625 pounds for reasons which he set out, but this great increase in the limiting pressure on the masonry is a striking feature in the design of the Croton dam and one which engineers cannot do otherwise than admire. It is possible the designers were influenced in their decision by the known fact that greater pressures than those fixed by Rankine had already been borne safely by existing masonry. The granite ashlar in the Bear Valley arched dam in California is compressed to the extent of 40 to 50 tons per square foot, and even brickwork has been known to bear as much as 26 tons. Another good reason for increasing the compression limit is to be found in the greater strength now obtained from our cementing materials. So long as the mortar binding the stones of a dam together is weak, the compressive limit must be correspondingly low, for it may be taken that the stone used is stronger than any ordinary mortar; but in these days when cement is obtainable of a uniform character and high strength, there is no longer any reason to confine the compressive stresses to figures below those employed by our friends, the American engineers."

GROSSMAN SYSTEM OF SLUDGE TREATMENT

Past failures have not discouraged those who are laboring on the problem of recovering a part, at least, of the valuable matters in sewage. One of the latest propositions is that of Dr. J. Grossman, a trial of which at Oldham, England, is said to have been very successful. The town has for years been compressing its sludge and filling low land with it, but all available land has now been filled. Dr. Grossman proposes to dispose of it as follows:

By my method the expensive and disagreeable process of filter pressing is altogether eliminated. The settled sludge passes continuously and automatically into a specially constructed drying machine, which delivers it straight into a retort in a dry state, and in which it is mixed automatically with a small quantity of sulphuric acid and subjected to the action of superheated steam. The latter carries away with it all the greasy matter contained in the sludge. This is collected in tanks, and being rich in fatty acids finds a ready sale.

The residue in the distillation retorts is discharged as a fine, dry, brownish powder, free from smell, and contains nitrogen, potash and phosphoric acid mixed up with humus-like earth, which renders it extremely valuable as a manure, being sterilized by the superheated steam. It is free from seeds, germs, or bacilli; it can be stored or used on land without creating a nuisance. The process is continuous and automatic, and thus very little manual labor is required.

The sludge dried in my drying machine is so rich in fat and other combustible matter that mixed with a little coke it can be used as fuel for drying a further quantity of the sludge, and in that case a cake of the same consistency as obtained from the filter presses at a cost of 3s. 6d. for pressing alone can be produced at a cost of 9d. per ton. It is computed that 400,000 tons of soap are used every year in this country, practically all of which finds its way into the sewage, and the recovery of fat alone from that source is sufficient to effect a considerable saving in the present mode of sludge disposal. Besides this, my method yields a cheap manure, valuable for agricultural purposes, and obviates all the nuisance and danger to health arising now from present processes of sludge disposal.

All of which seems practicable, provided the sludge can be dried at a low enough cost. But this detail has so far proved the financial obstacle to success in all similar methods of utilizing sewage solids.

WATER RATES

Scientific Calculation of Rates on Basis of Cost of Service—Service Charge and Quantity Charge—Former Regulated by Size of Service and Meter—Adequate Method of Accounting Essential

THE general superintendent of the Sewerage and Water Board of New Orleans, George G. Earl, in making over and practically re-creating the water distribution service in that city and the management of the department, following upon the completion of the filtration plant to which we have several times referred, has established a system of water rates which he believes to be based upon a logical consideration of the several factors which enter into the problem. The general theory upon which this system of rates was based was described by him in a paper before the American Water Works Association.

Practically nothing was said by him concerning the flat rates, since these rates have been nearly eliminated in that city and almost all of the services are metered. This was brought about by such a relative adjustment of the flat rates and meter rates that the average small consumer pays less than one-half as much for water under meter rates as he was paying under flat rates; and yet the reduction in consumption, or rather in waste, has been so great that the department is abundantly justified in making the lower meter rates. A logical or scientific basis for flat rates would be very difficult to evolve, and some consider that such a thing is impossible, since the very idea of flat rates is illogical and unscientific.

Mr. Earl believes that the only logical and just method of charging for water is to consider each item which enters into the cost of furnishing or supplying the water, and include in the rate a charge for each of these which is not greatly in excess of the cost of the same. The rate would be divided into two general items; first, a "service" charge which will justly differentiate between different characters of service and cover certain costs which are applicable only to the individual served; and second, a charge or charges based upon the quantity of water delivered or of service rendered. In fixing the New Orleans rates he determined as nearly as possible the first cost and essential divisions of the system; the cost of operation, maintenance and depreciation, including interest, with the essential divisions thereof; and third, the essential divisions of the consumption. A proper system of accounting in the department would permit the determination of each of these. Given these figures, he draws a distinct line between those items which should be paid by the taxpayer and those which should be paid as water rates by the consumer, maintaining that public institutions of all kinds, municipal departments and the like, should pay water rates like private consumers, even if such rates are actually paid from the tax fund. It is clearly inequitable, he maintained, for the consumer to pay for water privileges for the schools out of his water rate, since the ratio between his water rate and the sum of all the water rates may be entirely different from that between his school tax and the total of all school taxes.

For metered consumers—and he would place in this class every use of water except through fire hydrants—there would be a service charge depending upon the size and kind of meter and connection, which charge would be the average cost of reading meters of that class, collecting and accounting of water rates, inspection of connections, meters and premises, and interest charges upon, and maintenance and depreciation of, those factors which are essentially and exclusively for the individual consumers—all plus a fair profit if the plant is privately owned. When these variations in the cost of serving different consumers are thus provided for there remains the water itself to be paid for, and Mr. Earl sees no reason why one consumer should be served with this at a lower rate per unit of quantity than another, no matter how great or small his consumption, or whether the consumer be a private individual, corporation or public institution.

A rate built up in this way, based upon known or ascertainable facts and costs, is readily applicable to any conditions and permits of easy adjustment as conditions change. Such rates are easy to understand, court-proof and fool-proof. With such a system as this established the water superintendent or water company has an answer which any citizen can understand to the frequent complaint that "other cities have lower rates," accompanied by a demand that the rates in the city in question be lowered to the same basis. On the other hand it would enable a tax payer or consumer to determine in what respect the department in his own city is being operated less economically than those of other cities.

There are, of course, a number of items to be considered in making up the rates, which are not perfectly apparent at first thought. One of these is the fact that most meters under-register when the quantity of water passing through them is very small; and that this under-registration increases with the diminution of the stream. To meet this point Mr. Earl would establish a minimum rate for the water itself, which rate would be sufficient to allow for such deficiency in registration. These quantities he has fixed for New Orleans as follows: $\frac{5}{8}$ -inch meter serving not over two persons and rooms, 10,000 gallons per year; $\frac{3}{4}$ -inch meter serving not over three persons and rooms, 20,000; $\frac{1}{2}$ -inch meter serving not over four persons and rooms, 30,000; $\frac{1}{2}$ -inch meter, no limitation, 40,000 gallons. For the larger sizes there is no limitation, the quantities upon which minimum charges are based being: $\frac{3}{4}$ -inch, 50,000 gallons; 1-inch, 65,000 gallons; $1\frac{1}{2}$ -inch, 105,000 gallons; 2-inch, 145,000 gallons; 3-inch, 220,000 gallons; 4-inch, 360,000 gallons; 6-inch, 635,000 gallons; 8-inch, 970,000 gallons. For all of the no limitation rates the New Orleans fixed or service charge is 10 cents per 1000 gallons. The service charge is \$4 for the $\frac{5}{8}$ -inch meter, \$5 for $\frac{3}{4}$ -inch, \$6.50 for 1-inch, \$10.25 for $1\frac{1}{2}$ -inch, \$14.50 for 2-inch, \$22 for 3-inch, \$36 for 4-inch, \$63.50 for 6-inch and \$97 for 8-inch. To this service charge is added the quantity charge of 10 cents per 1000 gallons regardless of quantity, except that no quantity charge will be made for less than the minimum quantities named above.

The two divisions of the charge are not given on the bills because this has been found by Mr. Earl to have "an irritating effect upon the mentality of many consumers who are so used to unfair and illogical charges that they assume that any charge whatever, under a new name, is a new form of extortion." Consequently, while the rate has really been calculated scientifically, its final form as presented to the public contains no perplexing intricacies. Another advantage which he claims for this method of rate making is that it provides a way to fairly differentiate between a minimum rate and quantity and charge for a compound or detector meter used on a fire service and a disc, velocity or other non-compound meter used on an ordinary service.

Where one meter is made to serve two or more houses the water rates for which are guaranteed by one responsible owner, the cost per house or per family may be ridiculously small, and there are many cases in New Orleans where it is so. Thus a family occupying a two- or three-room house would have to pay but \$1 or \$2 per year plus their share of the \$4 meter charge, assuming that they did not consume more than 10,000 gallons in the smaller house or 20,000 gallons in the larger during the year. Mr. Earl states, however, that these low payments just as fully reimburse the board for the service rendered as do those made by the largest consumer for the service rendered to him, since the \$4 service charge covers the cost of looking after the service, reading the meter, keeping it in repair, etc., regardless of how much water passes through it.

FIRE HYDRANT RATES

Rational Method of Fixing Hydrant Rates, Based upon Cost of Service—Percentage of Cost of Distribution System Chargeable to Such Service—Cost per Capita—Value of Fire Protection

(Abstract of paper before American Water Works Association, by Leonard Metcalf, Emil Kuichling and W. C. Hawley.)

A BASIS for the determination of a reasonable or legitimate return for public hydrant or fire protection service has, so far as the writers are aware, never been outlined or passed upon judicially by our courts in such a manner as to be of general applicability. The rate established has usually been based upon one of two considerations—either that it should not exceed the average rates paid in the surrounding district or State, or perhaps in the nearest large city; or that the hydrant rental should be substantially equal to the interest charges upon the necessary investment, leaving the water rates to meet the operating, maintenance and depreciation charges and profit. Consequently the existing hydrant rentals are of little value from a theoretical standpoint in assisting to a determination of what constitutes a just and equitable rate.

This paper outlines a rational mode of determining how much income should be derived yearly from the general public fire protection service rendered through public fire hydrants. It does not consider the value of the kindred service rendered by supplying water to special fire-extinguishing apparatus in private buildings, but if the community as a unit bears the cost of the extra capacity required for fire protection, no large additional revenue from special fire protection service can be expected, especially as it requires no capacity additional to that provided for the public protection.

The authors present a table of hydrant rentals in a large percentage of the cities of the country, derived from data compiled by Messrs. Jordan and Grey, of the Indianapolis Water Company. Grouping these according to localities, the table shows that the average rate in 22 cities in the Eastern States in 1909 was \$29.38; the average of 73 cities in the Central and Southwestern States was \$45.03; the average of 24 cities in the Southern States was \$42.54; the average of 6 cities in the Western States was \$28.42; and the approximate average of the total number was \$41.05. The average of all cities except those in the Eastern States was \$43.48, approximately 50 per cent greater than for the Eastern States alone. Inquiries as to whether there had been an increase or decrease in hydrant rentals during the last 20 or 30 years did not secure very satisfactory replies, but these indicated that no substantial reduction had taken place during the past 30 years.

Special reference is made to the statements of the Railroad Commission of Wisconsin (which is practically a general public service commission), which practically expresses its opinion that the revenue derived from public fire protection service is rarely commensurate with the cost of the service. In certain of its reports it makes the following statements:

In the Appleton water works case engineers and experts estimated that the cost of constructing that plant would have been reduced by from 40 to 50 per cent if the plant so constructed had been designed only for domestic use. * * * The separation thus made shows that 54.5 per cent of the plant at Ashland is made necessary to satisfy the demands of the city. It follows that 54.5 per cent of the capacity, or fixed cost of service, should be charged to the city to cover the cost of furnishing water to schools, fountains, other public buildings, for flushing and for fires. * * * Private water consumers have borne a part of the burden which properly should be borne by the taxpayers. The entire community derives the benefit from adequate fire protection, and the cost of this protection should be pro-rated on the entire taxpaying population. * * * It requires no demonstration to show that a large part of the water plant in every town, where the city is a user, is simply held in readiness for the purpose of fire protection. It may not be called into use very often, yet the investment is there and is held in constant readiness. * * * The proportion of the investment necessary for the public service may vary somewhat, depending upon local conditions. It has been held by engineers and water works men, whose experience and study of the question make their opinions of weight, that this

proportion will but seldom, if ever, go below 50 per cent of the total cost of the plant and system.

The Wisconsin Commission decided that in the Madison City case 75 per cent of the total investment was made necessary for fire protection and other public purposes.

The writers believe that the ordinary method of charging so much per hydrant, usually with the additional provision that an additional hydrant should be ordered for every 600 feet, more or less, of extensions in the distribution system, is a less equitable one than would be the payment of a lump sum for public hydrant service, granting to the city the right to attach as many hydrants as it may desire to the water mains of the company, upon the additional payment of the actual cost of such additional hydrants and connections, and making provision for the increase of this annual payment for hydrant service upon some such basis of payment as pro rata increase in population or assessed valuation or pipe line mileage within the municipality or district served by the water works.

Reference is made to the standard recently adopted by a water company which supplies a number of municipalities, which was as follows:

ANNUAL CHARGE FOR FIRE PROTECTION SERVICE.		
Period of contract.	Per mile of distribution pipe system.	Per fire hydrant in service.
1 year	\$325	\$15
10 years	275	6
20 years	260	5

The charge for fire protection service is a combination of mileage charge and annual charge per hydrant, the latter being designed to carry the approximate maintenance and fixed charges of the hydrants.

Obviously the equitable hydrant rental lies somewhere between the cost of the service to the water company and its value to the community. Unless the value is greater than the cost there will be no demand for such service.

The reasonableness of the charge for hydrant rental may be reviewed from five points of view:

1. The cost of furnishing fire protection service.
2. The value of this service to the community, as measured by the saving in fire insurance premiums, ignoring the effect of the economic waste resulting from loss in business, income and wages, in the reconstruction period following the fire, and the loss of property that cannot be replaced.
3. The actual and desirable number of hydrants and distance between them, and the annual rental per hydrant resulting from the assumption of certain gross annual payments for fire protection service.
4. The effect upon taxes, based upon the assessed valuation of property in the municipality or district served, and different assumed annual charges for fire protection service.
5. The relative cost of different kinds of public service—police and public safety, light, and fire protection—in the community served.

COST OF FURNISHING FIRE PROTECTION

The writers do not believe that the general assumption that one-half the cost of water works is on account of fire protection service, regardless of the population and other conditions, is a safe or true one. They believe that the cost of the portion of the water works plant involved by fire protection service probably constitutes from 60 to 80 per cent of the entire cost of the physical property in the case of communities having less than 5,000 population; 20 per cent to 30 per cent in communities of 100,000 population, more or less, and perhaps 10 per cent to 20 per cent in the case of our largest cities.

A diagram is presented showing the opinions of several en-

engineers as to the amount of water required for fire protection service, in terms of the number of fire streams. Freeman presented a curve, the formula for which was worked out by Mr. Kuichling to be $Y = \frac{x}{5} + 10$, in which y is the number of fire streams and x is the number of thousands of inhabitants. Mr. Kuichling himself several years ago evolved the formula $Y = 2.8 \sqrt{X}$. Assuming each stream to discharge about 250 gallons per minute, the latter formula would give a quantity of 700 \sqrt{X} gallons per minute or \sqrt{X} million gallons per day.

The authors assume that the average per capita consumption in gallons per day may be taken to be 32 \sqrt{X} . This will make the maximum draft from the distributing system for domestic, individual and public uses other than fire hydrants, at the rate of 0.064 $X^{3/2}$ million gallons per day when the maximum rate is assumed to be twice the average, and 0.048 $X^{3/2}$ when assumed to be 1½ times the average. Therefore the maximum draft for combined fire protection service and other uses is $\sqrt{X} + 0.064 X^{3/2}$ million gallons per day when the maximum domestic rate is twice the average. The ratio between the portion of the distribution-pipe system devoted to fire protection service, and the total carrying capacity of the distribution system is

$$\frac{\sqrt{X}}{\sqrt{X} + 0.064 X^{3/2}}$$

Concerning the assumption that the capacity of the mains for domestic consumption should be twice the average, the authors admit that the actual rate of consumption may considerably exceed twice the average, but consider that this increase could still be taken care of by the mains, the friction, however, being thereby increased and the pressure head lessened. In the case of the larger communities, however, the ratio would probably not exceed or even reach two.

If it be assumed that *without* fire hydrant service a distributing pipe system must be designed for a maximum rate of twice the average domestic and industrial use, whereas *with* allowance for fire hydrant service the maximum rate for domestic and industrial uses may be taken at 1½ times the average rate, the ratio of the difference between the required carrying capacities with and without fire hydrant service to the carrying capacity with such service becomes

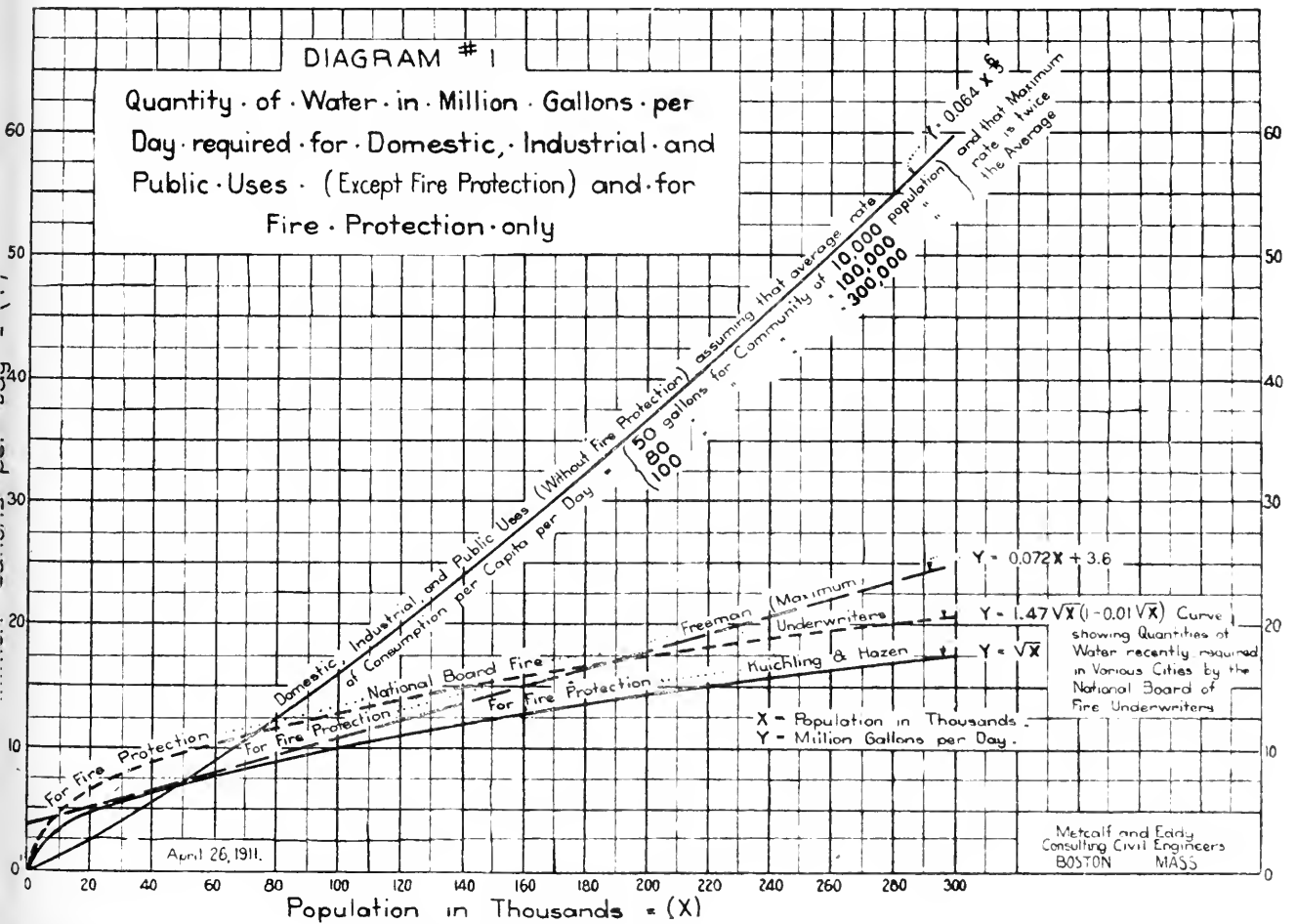
$$\frac{\sqrt{X} + 0.048 X^{3/2} - 0.064 X^{3/2}}{\sqrt{X} + 0.048 X^{3/2}} = \frac{\sqrt{X} - 0.016 X^{3/2}}{\sqrt{X} + 0.048 X^{3/2}}$$

When X becomes 367.74; that is, with a city of 367,740 population, this ratio reduces to zero; meaning that a pipe system sufficient to provide for a maximum rate of draft of twice the average draft for domestic and industrial uses is sufficient for fire protection service coincident with a maximum draft of 1½ times the average.

The authorities have assumed in this paper, as being probably of most general applicability, the conditions above described of twice the average daily rate for domestic service alone and 1½ times this average when combined with fire protection service. On this basis the percentage of the total carrying capacity of the distribution pipe system of a water works plant, which is required for furnishing fire hydrant service, would be as follows for cities of various sizes:

10,000 population	74.1%
25,000 population	58.1%
50,000 population	43.2%
100,000 population	27.1%
150,000 population	17.9%
200,000 population	11.7%
250,000 population	7.2%
300,000 population	3.7%

Under the same assumption, the ratio between the diameter of supply mains required for domestic and fire service as compared with those required for domestic service only would be



QUANTITY OF WATER REQUIRED FOR FIRE PROTECTION, AND FOR ALL OTHER USES

as follows: 10,000 population, 1.718 per cent; 25,000 population, 1.417 per cent; 50,000 population, 1.254 per cent; 100,000 population, 1.135 per cent; 150,000 population, 1.082 per cent; 200,000 population, 1.051 per cent; 250,000 population, 1.030 per cent; 300,000 population, 1.015 per cent. This means that, for instance, in a city of 100,000 population the supply main would require to have a diameter 13.5 per cent larger than if there were no provision for fire protection.

The authors give a table containing the quantity of water in gallons per minute stated by the National Board of Fire Underwriters to be desirable for each of about 125 cities. These quantities do not bear a fixed ratio to the population, since structural conditions and the extent of the high value district and of the conflagration hazard, as well as the fire department strength, have some bearing on these quantities. The authors have, however, attempted to construct a curve approximately representing the requirements of the Board of Fire Underwriters in relation to population, the equation for which is $Y = 1020 \sqrt{X} (1 - 0.01 \sqrt{X})$, in which Y equals gallons per minute and X equals population in thousands. According to this, the portion of the carrying capacity of the pipe system chargeable to fire protection service would be somewhat greater than that already given, these percentages being as follows:

10,000 population	83%
50,000 population	54%
100,000 population	37%
200,000 population	19%
300,000 population	9%

The authors believe that the minimum values in both this table and the previous one are too low, but that the curve probably indicates the general tendencies.

The authors have used their best judgment to determine the approximate percentage of the total cost of water works plants, taken as a whole, which is involved by the requirements of fire protection service, taking into consideration not only the distribution pipe system but also any additional cost involved in

the water supply and reservoir systems, pumping capacity, etc., and the limitations of the assumptions made above as to per capita consumption and fluctuations in rate of water consumption in cities of different sizes. This percentage they represent by the formula $Y = \frac{147}{X^{0.31}} - 12.1$, in which Y equals per-

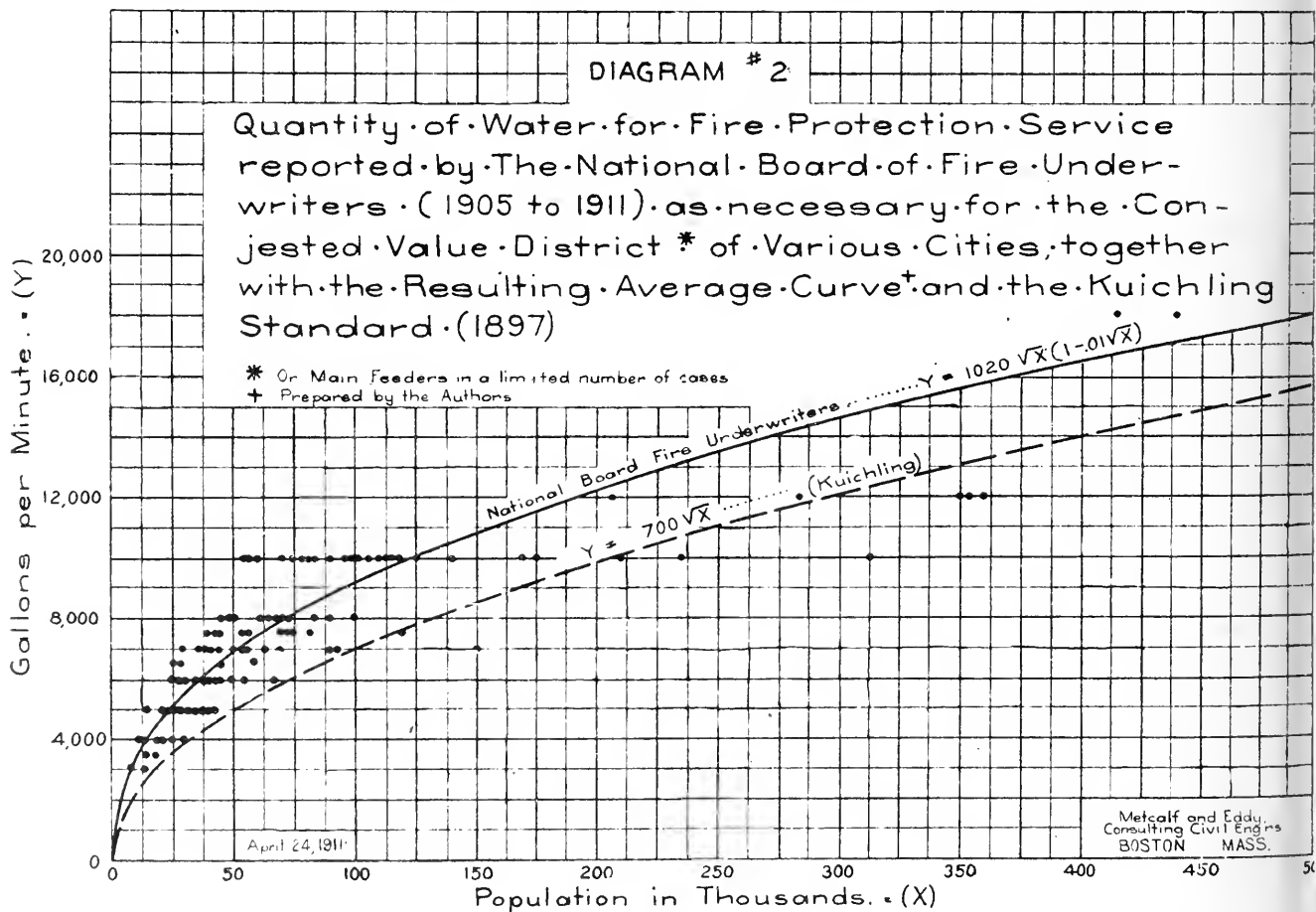
centage of total cost and X equals population in thousands.

In connection with this, as in fact with most of the formulas and figures given, they especially state that these are to be considered of comparative value only, as indicating general tendencies, realizing that substantial departure from the normal conditions assumed is to be anticipated in individual plants; so that if reliable information is desired concerning any particular plant the studies should be based upon the actual conditions existing at that plant. The equations and relations are summed up in the following table.

ESTIMATED COST OF PORTION OF WATER WORKS PLANTS, CHARGEABLE TO FIRE PROTECTION SERVICE.

Population.	Cost of Distrib. Pipe System in Percent. of Total Cost of Water Works.	Percent. of cost of Distrib. Pipe System Chargeable to Fire Protection Service under Nat'l Bd. of Fire Underwriters' Standard.	Percent. of Cost of Entire Plant Chargeable to Fire Protection Service.
		Kuichling Standard.	
5,000	72%	..	77%
10,000	68%	50.3%	60%
50,000	54%	23.8%	32%
100,000	47%	13.1%	23%
300,000	39%	1.6%	13%

The data obtainable relating to operating and maintenance charges involved in fire protection service were meager. It is believed that these charges lie between 5 and 10 per cent of the total annual operation and maintenance charges, including taxes but excluding depreciation, interest and profit allowances. Assuming a gross income for small works of 15 per



QUANTITY OF WATER CONSIDERED NECESSARY FOR FIRE PROTECTION BY NAT'L BOARD OF FIRE UNDERWRITERS

nt of their value, and assuming 10 per cent of this chargeable hydrant protection service, they obtain an annual cost of operation and maintenance equal to 1.5 per cent of the value of the property; and for large works by similar assumption obtain 5 per cent of the value. For depreciation, interest and profit allowance they assume a depreciation of one to 2 per cent; interest, 6 per cent; profit, 0 to 2 per cent, giving a total of 7 to 10 per cent of the value of the portion of the system involved by the protection service. Applying these figures or assumptions to the general range of per capita values of water works, they obtain the following table:

ESTIMATED APPROXIMATE PER CAPITA COST OF PUBLIC FIRE HYDRANT SERVICE.

Item.	Towns of		Cities of Largest Population.
	5,000 Population.	50,000 Population.	
(1)	(2)	(3)	(4)
Value per capita of water works..	\$20.00	\$30.00	\$35.00
Percentage of portion chargeable to public fire hydrant service....	77%	32%	15%
Per capita value chargeable to public fire hydrant service.....	15.40	9.60	5.25
Operation and maintenance charges, approximately 10% × 15% = 1.5% of value of entire plant, for towns; 7.5% × 12.5% = 1% for average cities; 6% × 10% = 6% for largest cities	0.30	0.28	0.21
Annual charges on public fire hydrant service, covering depreciation and interest, say 8% of Item 3	1.23	0.77	0.42
Total annual charges per capita...	\$1.53	\$1.05	\$0.63

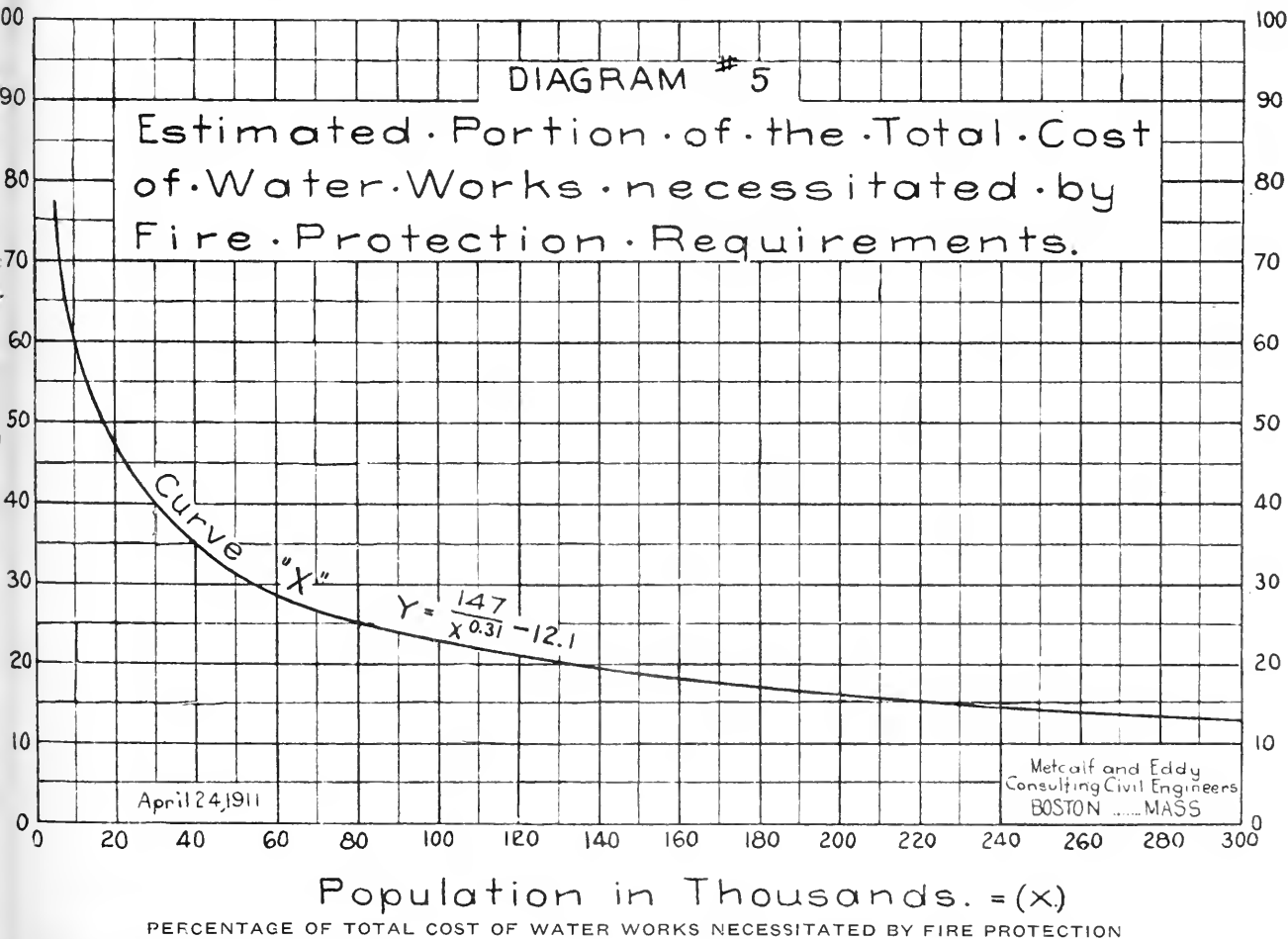
It is perhaps fair to infer, in default of more exact information, that the average cost of public fire hydrant service may be approximately \$1.00 per capita, with variation of about 40 per cent, more or less, though every plant must be examined individually, as the range of variation is obviously a large one. Water works receive an aggregate hydrant rental approaching

this amount, which is but another ground for the authors' contention that hydrant rentals rarely bear any relation to the cost of the service, usually being "traded out" as an offset to franchise and other business considerations.

Taking data contained in the census report for 1907 for population, miles of pipe and number of hydrants, and assuming a per capita cost of fire protection service of from 60 cents for the largest cities to \$1.25 for the smallest, the authors obtain an annual cost per hydrant of \$56 for cities larger than 300,000 population; \$42 for those between 100,000 and 300,000; \$58 for those between 50,000 and 100,000; \$55 for those between 30,000 and 50,000; or a general average for the country of \$55 per hydrant.

VALUE OF FIRE PROTECTION SERVICE

Concerning the value of fire protection service to the property protected and to insurance companies, the authors present a number of tables and figures obtained from fire insurance companies, the National Board of Fire Underwriters, the New York State Superintendent of Insurance and other sources. These figures include fire losses in various cities and States, fire risks, premium receipts, etc. They were advised by insurance men that the introduction of a water works system into a community effects a saving to the insured of at least 25 per cent to 33 per cent of his insurance rate, and a still greater saving to the insurance company. It is also stated that, with the stock fire insurance companies in New England, the prevailing average insurance rates in cities having a good water supply increase from one-fourth to one-third when the distance between hydrants is greater than 500 feet, and may be increased to even two or threefold upon mercantile property. Taking the figures obtained for Massachusetts, the authors find that, with a reduction in insurance rate of 20 per cent there would be a corresponding saving in insurance premiums of \$1.08 per capita of all population; while if the reduction should increase to 50 per cent the saving would correspondingly increase to \$2.70 per capita. Assuming that the actual saving to the insurance com-



families, and consequently the reduced risk, amounted to 33 per cent, there would be effected a saving of \$1.80 per capita per year by the fire protection service of a water system.

SPACING OF HYDRANTS

The system of charging for fire protection by hydrant rental or by any system based upon the number of hydrants is considered by the writers to be very unfortunate, as they believe the placing of hydrants close together should be encouraged—150 to 250 feet apart in important thickly built up districts, and 300 to 500 feet apart in residential districts. Even if the city is called upon to bear the added expense of making the installation, the saving to it in better service and in reduced length of fire hose required more than offsets the expense involved. Concerning this they quote the chief engineer of the Board of Fire Underwriters, George W. Booth, as follows:

Hydrant Spacing.—The quantity of water required for any district having been fixed upon, proper hydrant distribution may be best determined from a sketch plan of such a number of hose lines as are necessary to care for this quantity; a consideration of friction losses in hose indicates that for anything like effective service no hose line should exceed 600 feet in length if from a fire engine, nor 500 feet if direct from a hydrant, unless the hydrant pressure considerably exceeds that usually found where direct hydrant streams are depended upon. Comparatively few fire departments undertake to place more than one engine, serving an average of two hose lines, at a hydrant, or to use more than two direct hydrant streams from each hydrant. Under those conditions most high value mercantile and manufacturing districts will require at least one hydrant to each 40,000 square feet of area, and ordinary well-built-up residential districts one hydrant to each 100,000 or 120,000 square feet. As good or better distribution will be found in many of our larger cities, and in the case of mercantile districts corresponds roughly to a linear spacing of 150 feet and in residential districts of 300 feet. For each mercantile block 400 by 300 feet, center to center of streets, there should be at least three hydrants, probably located to the best advantage two at each street intersection and one intermediate hydrant on the long side of the block.

A table is given by the authors, showing the spacing of fire hydrants in 62 cities. The average distance between hydrants (number of hydrants divided into feet of mains) ranges from 290 feet in Schenectady, N. Y., to 883 at Lynn, Mass. The average of the 62 cities is 555 feet. The area served by a hydrant they consider a more valuable measure of efficiency than the linear distribution. This ordinarily ranges from about one acre per hydrant in districts of high value, to three acres, more or less, in well built up residential districts.

RECAPITULATION AND CONCLUSIONS

1. Public fire hydrant service in the United States is usually paid for upon the basis of an annual rental for each hydrant.
2. These hydrant rentals rarely bear any relation to the cost or the value of the service rendered.
3. They have heretofore usually been determined by average prices paid in the State or surrounding district, in the case of the larger communities, and by the requirement of meeting the interest charges upon the plant investment in small ones.
4. The range of hydrant rentals paid in the United States is in general from \$100 per hydrant per year to a nominal sum of \$10, more or less. The average hydrant rental is probably in the neighborhood of \$40.
5. Statistics obtained from 76 American cities supplied by water companies out of 140 circulars sent, indicate that there has been no substantial decrease in hydrant rentals in the last thirty years, the substantial reductions occurring in only about one-third of the cities from which replies were received. The data upon this subject are, however, not sufficiently complete to make general characterization safe.
6. The average number of hydrants per mile of distribution pipe system and the corresponding average amount of distribution pipe system per hydrant in 63 different cities in the United States are as follows:

	No. of Hydrants Per Mile of Distribution Pipe.	Average Amount of Distribution Pipe Per Hydrant in Feet.
Average of 63 United States cities.....	9.5	558
Desirable in heart of large cities.....	35 to 21	150 to 250
In closely built-up residential sections.....	26 to 18	200 to 300
In residential districts with houses well separated	18 to 9	300 to 600

The general tendency is to reduce the hydrant interval, and this is desirable. No hard and fast rule can, however, be laid down for the proper hydrant interval, local considerations, value of property, character of fire risks, water supply as to the size of mains and quantity and pressure of water available, danger of interruption of service, cost, etc., must control.

A better basis for the consideration of the adequacy of fire hydrant installation is perhaps to be had in a study of the area to be served by each hydrant in different parts of the city, the general range of values, under the best modern standards of service, being from one acre, in the mercantile and manufacturing districts of highest value, to three acres, more or less per hydrant in the well-built-up residential districts.

From an insurance point of view, however, the individual districts should be studied with reference to the number of fire streams which can be massed upon them effectually.

7. The additional cost of installing extra hydrants upon existing mains probably ranges from \$50 to \$150 per hydrant, the former corresponding to the outlying residential districts with unpaved streets, the latter to conditions existing in the heart of the city where the mains are large. The cost of installing hydrants at the time of building pipe lines is, of course, substantially less.

8. The cost of a modern steam fire engine of the sizes ordinarily used is \$5,000 to \$5,500. The cost per year of maintenance of a fire engine company, including the attending hose company over that of a hose company of corresponding strength, is about \$4,000, including operation, maintenance, depreciation and interest charges. The per capita annual maintenance cost is approximately \$1.50 to \$2, exclusive of the interest charges.

The fire engines have been found, recently, to deliver, under average conditions in tests, approximately 88 per cent of the rated capacity, the range in individual cases being from over 100 per cent to less than 50 per cent of the rated capacity but it is probably fair to say that under actual conditions prevailing during a large fire or conflagration, not more than 75 per cent of the above stated working capacity, or two-thirds of the rated capacity, is developed.

9. The danger from serious conflagrations, such as the Boston, Chicago, Baltimore and San Francisco fires; property and business losses resulting from them, the hazard involved in having so many services of different character, such as domestic and industrial uses, elevators, fire sprinklers, flushing devices, water motors, etc., upon the same main from which the fire hydrants draft their supply, and greater danger of interruption in service for changes in, and repairs upon them; the construction of buildings covering great areas and reaching to great heights, requiring very heavy water pressures; and relatively greater cost of maintaining steam fire engines to do the same work, have led to the introduction of independent high pressure fire protection systems in our largest American cities, having one or more independent sources of water supply readily available at very short notice, in very large quantities and under pressures up to 200 or 300 pounds per square inch.

10. Hydrant rentals, or the demand for public fire protection service, may well be examined from five points of view:

- a. The cost of the service.
- b. The value of the service.
- c. The number of hydrants per mile of pipe and the distance between them and area served.
- d. The rate of taxation corresponding to the amount paid for public hydrant service.
- e. The relative cost of other forms of public service, such as lighting and police.

11. The cost of the portion of the water works plant involved by fire hydrant service probably constitutes from 10 to 80 per cent of the entire cost of the physical property in the case of communities having less than 5,000 population, and to 30 per cent in communities of 100,000 population more or less, and to 20 per cent more or less in the case of our largest cities.

The approximate annual cost of fire hydrant service is estimated at \$1 per capita, with variations of 40 per cent more or less in different communities, being perhaps from 60 to 75 cents in our largest cities, \$1 in average cities, \$1.25 to \$1.75 in our small well-served towns and cities.

These per capita costs of fire hydrant service amount to about \$55 per hydrant, based upon present practice as to number of hydrants per thousand of population, ranging from 11 to 23 in cities of from 300,000 population to 30,000 population, and per mile of pipe ranging from 10.6 to 12.1 in cities of the type first stated.

12. Data as to the value of fire protection service are very meagre. It is believed that a reduction in insurance premiums from 25 to 50 per cent results with the introduction of a good water works system, and that the actual saving is much greater, as based upon the returns made by the Insurance Commissioners in the State of Massachusetts.

The saving probably ranges from \$1.35 to \$3, as follows:

Rate of Reduction in Insurance	The Corresponding Saving in Insurance Premiums Per Capita Annually May Be Approximately.
20%	\$1.08
25%	1.35
33%	1.80
50%	2.70

13. The cost of public fire protection service is generally much smaller than that of police and public safety, and public lighting service.

14. The most common method for paying for public fire hydrant service in the United States seems to be by annual rental per hydrant, coupled with the requirement that one additional hydrant shall be ordered in the case of extension of the pipe system, for every 600 feet more or less of such extension.

15. Improvement is suggested along the following lines. It is provided that:

- a. At stated intervals, of say ten years or more, the annual cost of hydrant or fire protection service as then rendered, including in such cost operation and maintenance charges incurred by fire hydrant service, and depreciation, interest and profit allowances upon the value of that portion of the water works property necessitated by, or chargeable to it, shall be determined. In the latter, allowance for the so-called intangible values should probably be included in many, if not in all cases. This work should be done by an expert, or board of experts in water works practice, acting in a purely judicial capacity regardless of the method of appointment.
- b. Additional hydrants may be placed upon the existing water mains, subject to the approval of the water company, or other competent authority, provided an annual rental be paid for each such additional hydrant, which rental will cover the agreed estimated maintenance and depreciation costs, and interest charges involved by the estimated average cost (or varying cost upon a sliding scale covering different conditions, such as size of main, character of excavation, street service, etc.) of making such installation.
- c. The basic amount paid for hydrant rental be increased annually, to cover extensions of pipe systems made during the year (upon which extensions hydrants may be placed at an agreed interval of spacing) pro rata in the relation of the extension to the length of the pipe system at the time of the review of the hydrant rental question, or in the ratio of the relative assessed valuation of property as of those dates, or in the ratio of the population as of those dates, if the latter can be accurately determined, which is not usually the case. If additional hydrants be desired in excess of the agreed number per mile of pipe on extensions, they can be installed upon the basis outlined above in (b).

In this manner it should be possible to adjust the

hydrant rental annually, without serious issue, and the community will more nearly bear its share of the burden, divided between the public and private and industrial consumers than under the present method.

16. The offsetting of taxes, or franchise, by free or reduced cost of hydrant service, is believed to be undesirable. If the community sees fit to make a charge against franchise or other intangible property, it should be made quite independently of the hydrant rental, or fire protection service payment. The company and the city are both entitled to know just what burden they have to meet, and to be placed in a position to seek legal redress, in case of injustice or inequitable proceedings. The desirability or undesirability of franchise tax is not touched upon herein; the question is not here at issue.

17. In conclusion, the writers desire to call particular attention to the admirable reports which have been published by the National Board of Fire Underwriters upon the water works and fire departments of the leading cities of the United States, in which are contained not only many significant and valuable facts, but suggestions of importance to the designer of water works systems.

WATER WASTE SURVEY IN MEMPHIS

Census Taken by Service Districts—District Consumption Registered Continuously for a Week by Pitometer—Sources of Leakage

LATE in the year 1909 the chairman of the Board of Water Commissioners of the Water Department of Memphis, Tenn., recommended that a study be made of the waste and other losses of water which were believed to be taking place, with a view to their prevention; and it was decided to carry on such an investigation with the use of the pitometer. Population statistics were gathered during the winter and actual measurements begun in April, under the direction of the Engineering Department.

The section of the city in which the investigations were conducted and the outline of the different districts is shown on the "Progress Chart." The method employed is what is known as the Deacon System, which has long been used abroad, and in detail is as follows:

When the area to be investigated is defined a complete list of all the connections, metered and unmetered, in the district is obtained from the records kept by the department. The amount of water passing through each meter is obtained from the Meter Department, and from the census taken by this division the number of persons supplied by each connection is obtained. From these data the average per capita metered consumption is computed.

While the record for the district is being compiled all the valves in the district are inspected and those not in good condition reported to the Street Department for repairs.

When this preliminary work is finished the valves along the boundary of the district are closed; a pitometer is installed on the supply main feeding the district and the water consumed by the district is measured for a period of about seven days. From this test the average daily consumption and the consumption during the night, when the use of water is low, are determined.

If the amount of water consumed is abnormal the district is subdivided and the consumption of each subdivision measured. The subdivisions showing abnormal rates are selected and tested as follows:

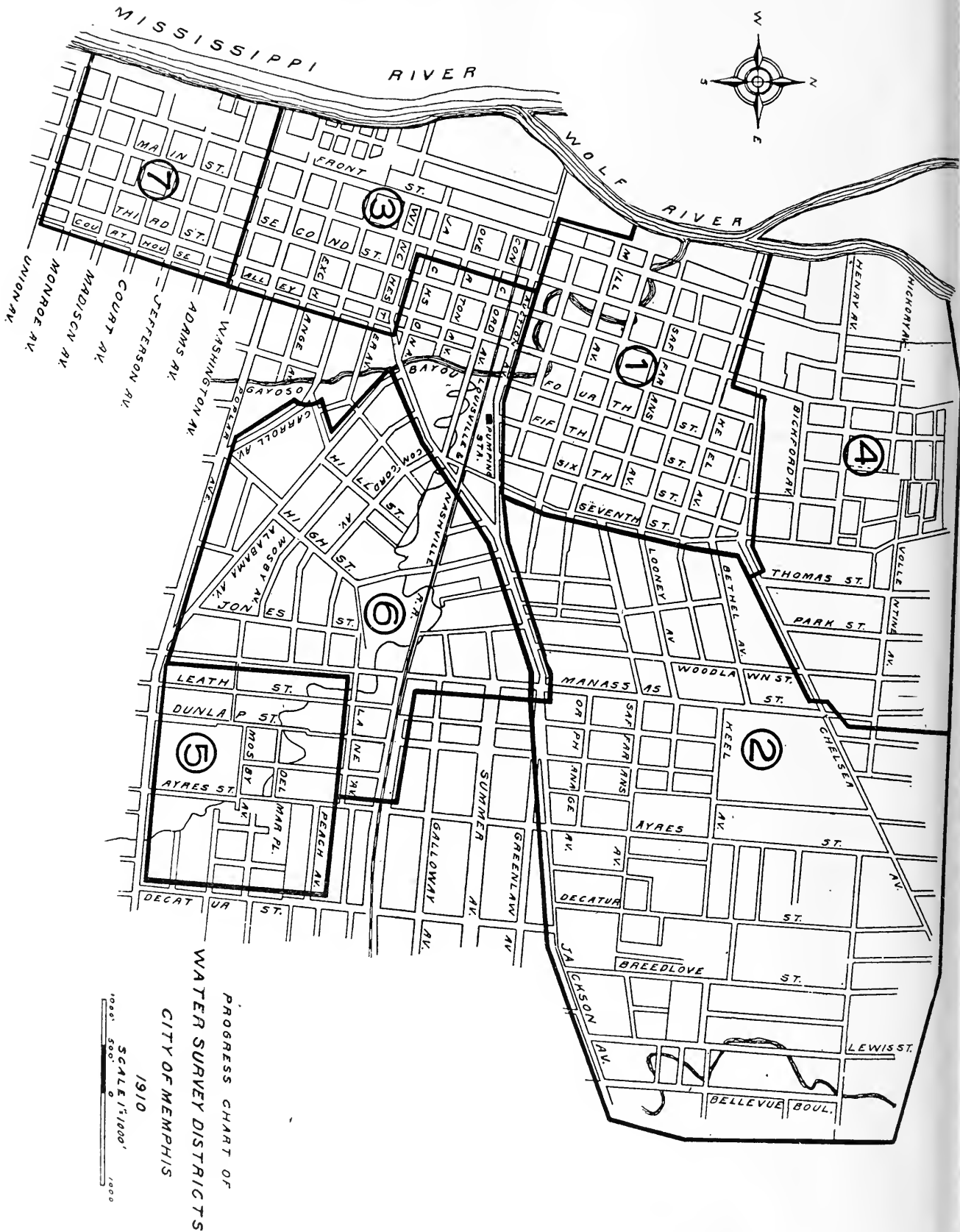
A pitometer is put in operation on a supply main feeding the sub-district, with the boundary valves closed. The area is then narrowed down in successive steps by closing the interior valves and opening the boundary valves. In this manner sections are cut off until the smallest division is reached. As each section is cut off a simultaneous drop in the flow is indicated by the pitometer. The drop or amount of decrease in

the flow is the volume of water used by the portion cut off. By this means the unaccounted-for consumption is located between valves. These tests are made between the hours of 1 and 5 a. m., for at that time the consumption is at a minimum and the rate of flow usually nearly constant.

The sections using the unaccounted-for amount are inspected by testing out each connection with the water phone. This

enables the inspector to detect any leaks, whether in fixtures or in the service pipe below the surface. He is also, very often, able to detect leaks in the main in the vicinity of the connection being inspected.

Where leaks are found within property lines the owners are given notice to make repairs. Other leaks located are reported to the Street Department. After repairs are made the sub-



PORTION OF MEMPHIS, TENN., COVERED BY PITOMETER SURVEY

district is again tested at night, and if the unaccounted for consumption is still large enough to justify it, the main is uncovered in different places until the source of waste is located.

After each sub-district is tested in this manner and all leaks that can be located are repaired, the consumption of the entire district is again measured for a period of several days to determine the amount of water saved.

The principal sources of leakage found may be briefly described as follows:

- Wrought iron supply pipes.
- Service pipes.
- House fixtures.
- Fire hydrants.
- Flush tanks.

It was apparent soon after the beginning of the work of inspection that the sewer flush tanks were, in almost every instance, wasting water, some more than others. After the inspection of the first six districts the department decided to have all the tanks in the city inspected at once, and employed men for that purpose, under the direction of the secretary of the department. Up to this time 67 flush tanks have been inspected by the pitometer division, of which nine were found discontinued and the remaining 58 wasting 106,000 gallons per day, an average of 1827 gallons per day per tank. If the remaining 307 operating tanks in the city are wasting water at the same rate, repairing them would make a saving of 561,000 gallons per day.

While the inspection of these tanks was not made by the pitometer division, the necessity for it was shown by previous inspection made by this division.

The mains were found in good condition, all the leaks located in them being joint leaks. In most cases these leaks were caused by the jarring of street cars.

A summary of the work done by the pitometer division during the year is as follows: 1170 acres were covered, in which were 34.9 miles of mains and 4132 connections. The total supply to this section was 2,526,500 gallons per day, of which 818,684 gallons were metered. In this area there were found 116 leaks on private property, 44 leaky supply pipes, 7 leaks in mains, 13 leaking valves, 21 leaking fire hydrants and 35 leaking sewer flush tanks. Stop boxes to the number of 317 were found more or less filled with dirt and were cleaned out. Seventy-four flush tanks were inspected and, as stated, nearly one-half of these were found leaking. The total reduction in consumption effected was 404,000 gallons per day, or 16 per cent of the original consumption.

The amount charged against the pitometer work was \$4251.82, which included cost of tools and the expenses of gathering the census statistics, of which there are enough on hand for the present year's work also. Valuing the water at \$40 per million gallons, the amount saved for the year was nearly \$6000, or approximately \$1700 more than the cost of the work; and a considerable percentage of the saving will extend over a number of years.

THE RED WATER PLAGUE

Effort to Determine Cause of Rust in Water Drawn from Faucets—Effect of Alum Treatment—Galvanic Action—Action on Iron Increased by Heat and Pressure—Remedies Suggested

(Abstract of a paper before the American Water Works Association, by Geo. C. Whipple.)

ACCORDING to the modern and now generally accepted theory the corrosion of iron by water and the formation of iron rust requires, first, the presence of hydrogen ions in the water, and, second, the presence of dissolved oxygen. Hydrogen ions are electrically charged atoms of hydrogen. All acids form them by dissociation. Whenever they are present in solution that solution possesses acid properties. They attack the metallic iron, which is dissolved in a ferrous condition. The oxygen dissolved in the water then oxidizes this ferrous iron and iron rust is formed. Under certain conditions this precipitates at once. Under other conditions it apparently exists in a colloidal state, with its particles electrically charged, and precipitates only when this electrical charge is neutralized. Very little is known about this phenomenon. Certain substances tend to prevent the precipitation of colloids. Thus, peaty organic matter tends to prevent the precipitation of iron.

Iron has a natural tendency to dissolve in water, as the hydrogen ion is always present in some degree. Pure water, therefore, by its dissociation into hydrogen ions and hydroxyl ions tends to act as a weak acid. Iron will be dissolved and rust will form if oxygen is present. Whatever increases the number of hydrogen ions in water increases its corrosive power. Acids do this to a marked degree. Whatever decreases the hydrogen ions reduces the corrosive power. Alkalis do this.

A further conception of the phenomenon of iron rusting is that often referred to as "the electrolytic theory of corrosion." According to this theory a sort of battery action takes place in the water and a current of electricity is set up between the metallic iron at one spot and some other metal or some impurity in the iron at some other neighboring spot. This action demands that the water be to some extent a conductor of electricity—that is, it must contain electrically charged ions—and the higher the conductivity the greater will be the current. The result of this action is that the hydrogen ions give up their charge of electricity to the iron, which goes into solution, while gaseous hydrogen collects on the surface of the metal. As this gaseous hydrogen is a non-conductor, the iron becomes

covered with a film of hydrogen, or is polarized, so that after a time the action tends to cease. Whatever removes the hydrogen from the metal depolarizes it and causes the action to continue. The presence of oxygen in water does this, as it unites with the hydrogen to form water. A circulation of water containing oxygen, whether brought about by mechanical agitation or by thermal currents also tends to remove the hydrogen. Oxygen, therefore, aids the corrosion of iron in two ways, by depolarizing it and by oxidizing the iron that goes into solution.

The presence of other metals also affects the corrosion of iron by increasing the difference of potential, and therefore the strength of the electrical currents. This is termed galvanic action. The metals act differently in regard to the direction of the electrical currents between them and iron. Some cause the positive current to flow toward the iron and some away from it—that is, some hasten the corrosion of iron and some retard it.

The common metals are arranged in the following order of what is called the potential series: Aluminum, manganese, zinc, iron, nickel, tin, lead, hydrogen, copper. Each metal tends to protect the other metals in the series below it from going into solution, but in doing so it itself tends to dissolve. Thus, zinc protects iron. On the other hand, copper acts in an opposite way, and increases the solution of iron. With two metals present, whatever increases the electrical conductivity of the water increases the corrosion of one metal or the other. Substances that when dissolved in water carry a charge of electricity and thus increase its conductivity are termed electrolytes. A typical example of this is sodium chloride. Electrolysis is an important element in various water-works problems, as the members of this association well know.

CLASSIFICATION OF WATERS

The water supplies with which the "red water plague" has been observed may be classified as follows:

Class 1.—Very soft ground waters.

Class 2.—Waters in which the chlorides or the free carbonic acid are high as compared with the alkalinity.

Class 3.—Very soft surface waters which are relatively high in color and contain peaty, organic matter and free carbonic acid.

Class 4.—Relatively soft waters, especially high-colored waters, with which sulphate of alumina is used as a coagulant, but which are not overdosed so far as the alkalinity is concerned.

Class 5.—Waters overdosed with sulphate of alumina so as to render them acid.

Class 6.—Waters containing originally excessive amounts of iron.

Soft Ground Waters.

Some of the ground water supplies on Long Island are troubled with rusty hot water. These waters are invariably soft. In some cases the chlorine is rather high, varying from 10 to 25 parts per million. The dissolved carbonic acid is also high and dissolved oxygen is present. Other waters on Long Island taken from neighboring wells and similar in character, except that the hardness is high, may cause little or no rusty water. In some oxygen is lacking.

The water supply of Far Rockaway is a ground water, aerated and filtered through a sand filter to remove the iron. The process is extremely successful and the filtered water rarely contains more than 0.1 part per million of iron; often none. The chlorine in the water is generally about 7.0 parts per million. The hardness varies from 12 to 15 and the alkalinity from 7 to 12 parts per million. The amount of carbonic acid in the filtered water is presumably low on account of the aeration. A number of instances of rusty hot water have occurred with this supply.

The ground water supply of Garden City, L. I., is somewhat troubled with rusty water. At the Garden City Hotel the marble bowls in the toilet room are at times stained beneath the hot-water faucets, no stains being found, however, under the cold-water faucets. On May 23, 1910, samples of hot water and cold water collected at this hotel were analyzed by Milville C. Whipple, with the following results:

	Parts per Million.	
	Cold water.	Hot water.
Temperature	80° F.	102° F.
Color	0	9.0
Chlorine	11.5	12.0
Hardness	27.0	27.0
Alkalinity	5.5	.....
Carbonic acid	28.0	29.0
Dissolved oxygen	9.34	8.02
Nitrates	2.90	2.80
Iron	0.20	0.30

For purposes of comparison, the following analyses of samples of water collected Oct. 29, 1909, at Flatbush, L. I., also supplied with ground water, are given below. This supply gives no trouble from rusty hot water.

	Parts per Million.	
	Cold water.	Hot water.
Turbidity	0	0
Color	0	10.0
Chlorine	22.5	23.5
Hardness	146.0	146.0
Alkalinity	94.0	94.0
Free carbonic acid	12.0	8.5
Dissolved oxygen	5.6	3.7
Nitrates	5.5	5.5
Iron	0.2	1.1

It will be seen that this water contains more chlorine but somewhat less dissolved oxygen and carbonic acid than the Garden City water. The water is hard. It will be noticed that the amount of iron in the hot water was about five times as large as that in the cold water and was much larger than was found in the hot water at Garden City, yet the Flatbush water does not give any precipitation of iron rust when the water is heated. This may be due to the protective action of the carbonates producing the high alkalinity.

Waters in Which the Chlorides are High but the Carbonates Low.

Many waters of this class exist along the East Atlantic Coast. As an example, the water supply of a village a few miles north of Camden may be referred to. An analysis of this water, made on April 18, 1905, showed that the chlorine was high but that the carbonates were low. The water as taken from the wells contained an insignificant amount of iron, but the water in the houses was at times more or less rusty.

The water supply of Oswego, N. Y., is taken from the Oswego River. It is very hard and very saline, as the river drains the Syracuse salt-deposit region. Although the river water contained comparatively little iron, the tap water was often very rusty, both hot and cold. This rusty condition of the cold water as well as the hot water seems to be somewhat characteristic of this class of supplies and serves to separate them from the soft waters in which the corrosion is found chiefly with the hot water. Water supplies of beach hotels, being located near the seacoast, are not infrequently affected in this way.

Soft Colored Waters.

It is a well-known fact that soft surface waters corrode the metals used for service pipes. This matter has long received attention in connection with the subject of lead poisoning. The soft, peaty water supplies obtained from the English moorlands act on lead pipe, sometimes to a serious extent. In a number of English cities, such as Birmingham, Sheffield and elsewhere, lime is added to the water to prevent injury to the public health from lead poisoning and to avoid the inconveniences attending the corrosion of other metals.

In a recent paper presented to the Institute of Civil Engineers of Ireland, by W. Kays-Parry, an account is given of the corrosive effects of the Vartry supply of Dublin. The author says:

We all know by experience that since the Vartry water was introduced into Dublin it has become necessary to discard both iron boilers and iron pipe for hot-water supply, owing to the destructive action of the water on the iron. A galvanized-iron cylinder in which hot water is stored is very soon perforated, and for this reason copper cylinders are now almost always used.

This action it is claimed by Dr. Adeney is "due to the presence of minute quantities of peaty matter which undergoes slow fermentation with the formation of carbonic acid as well as small quantities of nitric acid."

In 1900 Clark and Forbes, chemists of the Massachusetts State Board of Health, published a report on the corrosion of service pipes in which the effect of dissolved carbonic acid was found to be of controlling importance. The action was found especially severe when the carbonic acid was high and the water soft.

In many New England cities supplied with soft surface water experience has led to a very general use of brass and lead pipe for hot-water service, and iron pipes have been avoided. Occasionally in recent years trouble has been experienced where galvanized-iron or steel pipes have been substituted. This has been the case in Springfield, Mass., where rusty water troubles have occurred to an increasing extent during the last few years.

Conversely, it is also a fact that in localities where the public water supplies are hard galvanized-iron and steel pipes have been satisfactorily used for hot-water supplies instead of brass. This is true of London, where the water supply is hard, whereas in the cities of Middle England, where the water supplies are softer, such pipe is avoided.

Soft Waters Treated with Alum, but Not Overdosed.

It is to the waters of this class especially that the attention of engineers has been drawn during the last few years, not only because of the seriousness of the rusty water troubles that have occurred, but because, as a result of them, there has been growing up a prejudice against the use of alum as a

coagulant. It should be said at the outset that such an inference should not be too hastily drawn, but judgment should be reserved until the matter has been considered broadly in all its aspects.

One of the instances with which the writer is most familiar is that of the red water plague at Watertown, N. Y., which has occurred since the introduction of a mechanical filter in 1905. The supply of this city is taken from the Black River. The water is an especially difficult one to treat, partly because of its high color, partly because it contains organic matter resulting from the pollution of the river by the wastes of pulp mills and partly because of its relatively low and variable alkalinity. On account of the high color and the fluctuations in the amount of organic matter and alkalinity that suddenly occur without warning, it is necessary to apply rather large amounts of sulphate of alumina. The following figures will serve to give an idea of the character of the water treated and the amount of alum that has been used:

AVERAGE COLOR AND ALKALINITY OF THE RAW AND FILTERED WATER AT WATERTOWN, N. Y., AND THE QUANTITY OF ALUM USED

Year.	Color.		Alkalinity.		Quantity of alum used, grains per gallon.
	Raw water.	Filtered water.	Raw water.	Filtered water.	
1905.....	69	10	39	19	2.97
1906.....	62	9	39	22	2.00
1907.....	69	6	28	12	2.53
1908.....	65	7	31	14	2.34
1909.....	67	8	30	12	2.23
1910.....	70	12	28	10	2.30

TYPICAL ANALYSIS OF WATERTOWN WATER

	Parts per Million.	
	Raw water.	Filtered water.
Turbidity	5	0
Color	78	4
Nitrogen as albuminoid ammonia..	0.204	0.126
Nitrogen as free ammonia.....	0.036	0.018
Nitrogen as nitrites	0.004	0.003
Nitrogen as nitrates	0.150	0.120
Oxygen consumed, 5 min.....	13.00	6.40
Total hardness	37.50	39.00
Alkalinity	33.00	15.00
Incrustants	4.50	24.00
Chlorine	0.50	0.50
Iron	1.10	0.30

Not long after the filter was put into service complaints arose throughout the city that many of the copper-lined water-socket tanks were giving out through corrosion. This appeared to be due in part to a slightly increased conductivity of the water resulting from the alum treatment, but also to the fact that the filtered water was much clearer than the raw river water that has been previously used, so that the tanks, instead of being covered with a thick layer of slime, as they had been, were cleaner and there was greater exposure of the metal to the circulating water, a condition favoring corrosion through galvanic action. At the same time it was also found that the hot water in many of the houses was becoming rusty—so much so that in various instances the water was too dirty to be used for bathing. This was not generally true throughout the city, but was noticed more in some places than in others, being especially troublesome in some houses of recent construction. A study of the matter at this time showed that the water from the filter as it left the plant contained from 0.05 to 0.2 parts per million of iron and that the cold water in the city contained 0.15 to 0.35. Such an increase in the amount of iron in water passing through the city mains is not an unusual one.

Further evidence that the corrosion of the city mains was not serious was obtained by flushing various hydrants throughout the city. The amount of rusty water drawn at such times was found to be not much greater than that normally observed.

When samples of hot water were compared with samples of cold water, however, it was found that in almost every case the hot water was more highly colored and contained more iron than the cold water. Thus, in May, 1908, hot-water samples

were found to have colors between 50 and 300, while, at the same time, the water as it left the filter plant and as it flowed from the cold-water taps had a color of less than 5. In some instances the iron came from the hot-water faucets as flakes of rust that would settle in a tumbler and cause a thick, reddish deposit on the bottom.

The red water plague was particularly severe during the winter of 1907-1908 at a time when the amount of alum used was rather large and when the alkalinity of the filtered water was low. It should be noted here that the application of the alum to the water at the Watertown filter is watched with great care. The plant is in charge of a chemist and samples of raw and filtered water are collected and analyzed four times each day, and have been ever since the plant was started. These analyses show that the filtered water has always been alkaline to methyl orange or erythrosens. At times, when the alkalinity of the raw water has been low, it has been necessary to use soda ash in order to provide alkalinity for the decomposition of the alum.

These same rusty hot-water phenomena have been observed in many other places besides Watertown. The water supply obtained from the Passaic River at Little Falls and supplied to Paterson, Passaic, Montclair and other places has been the cause of more or less trouble of this character. Here also the water is relatively soft and somewhat colored and is filtered through a mechanical filter, using alum as the coagulant. At Burlington, Vt., some complaints have been made of rusty hot water. The supply is taken from Lake Champlain and filtered through a mechanical filter, using alum as the coagulant. At Charleston, S. C., the red-water plague has existed for a number of years and frequently has been serious. The supply is taken from a shallow storage reservoir on Goose Creek and filtered through a mechanical filter. The water is soft and lime is used as well as alum. Here the red-water plague is said to have existed even before the use of alum.

A more recent instance of the red-water plague is that which occurred at Springfield, Mass., in the spring of 1910. This trouble is said to have begun several years before this, when the supply of the city was taken from the Ludlow reservoir. It became somewhat more serious after the new supply from the Little River was put in service. This water passes through a sand filter before being delivered to the city. At times the raw water is rather high colored and, in order to reduce this, alum is used at times in connection with the filter. The water is extremely soft. Alum was applied to the water in small quantities between April 30 and May 18, 1910, and soda ash was applied between May 6 and May 15. Between May 18 and July 15 no coagulants were applied. During this time, even when no chemicals were being used, the rusty water troubles became serious and a detailed study of the matter was made by the Chief Engineer of the Waterworks Department, Mr. Elbert E. Lochridge, and the writer.

It was found that the trouble was worst in certain apartment houses of recent construction, although a slight trouble was general throughout the city. The color of the hot water in apartment houses varied all the way from 50 to 400, whereas the color of the cold water at the same time ranged from 25 to 45. The hot water also contained large amounts of rust sediment which, on analysis, was found to be composed almost entirely of oxide of iron. Iron was also present in solution or as a colloid. This caused red stains of iron rust on white porcelain basins and in many cases made the water practically useless for all domestic purposes. It caused pipes to become choked and in one case is said to have resulted in the bursting of a boiler.

The boilers used were generally made of cast iron, although in the case of one or two large installations steel boilers were found. The tanks were sometimes galvanized iron or steel, sometimes made of steel blackened on the outside and apparently with no protective coat on the inside. Their capacities varied from 100 to 500 gallons. In practically every case where trouble was observed the water passed through one of these unprotected steel tanks.

It was found that the rusty water troubles were associated with the steel tanks and galvanized pipes of poor quality, and an investigation was made to ascertain the character of the inside of some of the galvanized piping used in Springfield. Samples were obtained from various plumbers and dealers, from the stock of pipe in the water-works yard, and from pipes used in other cities. These samples were sawn asunder so as to expose the interior. The results, taken as a whole, showed extremely bad conditions. Scarcely a single specimen of a perfect pipe was obtained. In some cases there were large areas of the interior of the pipe entirely uncoated with zinc, and where the steel was exposed and coated with rust others were spotted with pieces of mill scale embedded in the zinc coating; others were rough from the presence of dross from the spelter bath; sometimes a line was found along the seam where the coating had not adhered to the pipe, possibly on account of the failure of the acid to remove the mill scale during process of galvanizing. In several pipes where the coating was good, so far as the eye could see, microscopical and chemical tests showed the presence of pinholes where rusting might occur. In some instances a poor coating of zinc on the inside was accompanied by a poor appearance of the outside coating, but the sample as a whole showed that it was not always possible to tell the nature of the inside pipe from the appearance of the outside. A number of samples of galvanized-iron pipe obtained from different dealers and plumbers, from the water department stock and elsewhere were carefully examined both on the outside and inside, the specimens being sawn in two for that purpose. The physical appearance of the coating was first recorded, after which the specimens were examined with the microscope and tested for porosity by means of Walker's test and by the use of ferro-cyanide.

Walker's test was made as follows: The raw edges of the iron and bare spots were first coated with asphalt in order to protect them and then the specimens were placed in a solution of boiling caustic potash. If any iron remained exposed and in contact with the zinc, bubbles of hydrogen gas were generated and could be easily seen with the eye. In the case of many specimens this test was not necessary, as the bare, uncoated spots could be easily detected without it, but in other specimens, which to the eye appeared to be thoroughly coated, this test revealed the presence of pinholes. These might become foci of corrosion, and the beginning of tubercle formation. As corrosion proceeded such tiny bare spots would increase in size until finally a large area was exposed. No specimen was examined that did not show at least one or two such pinholes. The character of the coating on the outside did not always indicate the character of the coating on the inside; that is to say, a good exterior did not necessarily mean a good interior. A bad exterior, however, was invariably accompanied by a bad interior.

Water Overdosed with Alum.

It sometimes happens with mechanical filter plants that more alum is used than can be decomposed by the alkalinity naturally present in the water. When this occurs the filtered water becomes acid and its corrosive powers are greatly increased. Such waters are liable to be the cause of the rusting of iron and steel pipes, tanks, etc., with both cold and hot water. Instances of this kind have not infrequently come to the attention of the writer. One of these was at Athol, Mass., where the supply was taken from a small reservoir and was treated with alum and filtered through a pressure filter before passing to the city. On account of irregular application of the chemical the filtered water was intermittently acid.

Other and very common instances of this overdosing have occurred in New York City and elsewhere, in connection with the use of small house filters where alum is used as a coagulant. These filters are widely used by hotels and apartment houses of the better class. They are commonly provided with a device for applying alum to the water before filtration. Usually the alum control is very imperfect at best and very poorly looked after, and the result is that the water is not infrequently overcharged with alum.

In order to correct any misapprehension in regard to mechanical filtration, it should be stated that mechanical filters with alum used as a coagulant have been in service for many years in many cities of this country, without being the cause of any red-water plague. But where this is the case the waters are relatively hard and the filtered water has a considerable residual alkalinity. The writer has corresponded with many engineers and chemists in various cities where mechanical filters have been used, and the dividing line between those which have caused trouble and those which have not appeared to be sharply drawn according to the hardness of the water; that is to say, the use of alum with hard water causes no trouble, whereas the use of alum with soft waters may cause serious trouble.

Water Naturally Charged With Iron.

Many public water supplies contain excessive amounts of iron and with these rusty water is common, both cold and hot. At Far Rockaway, N. Y.; Red Bank, N. J.; Superior, Wis.; Reading, Mass., and elsewhere filter plants have been constructed for removing iron. Methods of deferrization have been well described by Weston (Trans. A. S. C. E., Vol. 64, September, 1909).

SEASONAL OCCURRENCE

It is difficult to state any particular time of the year when the red water troubles are at their maximum, but, generally speaking, so far as the observation of the writer has gone, the fall and winter months are the worst. This appears to be due in part to the fact that during the winter the hot water is maintained at a higher temperature and for more hours in the day than during the summer, when it is not uncommon to allow the range fire to go out at night. In winter also surface waters contain more dissolved oxygen. Another, and perhaps a more important cause, is the fact that organic matter freshly dissolved in water appears to be more corrosive than organic matter that has passed through various stages of fermentation. The seasonal distribution of coloring matter in water differs in different localities. An increase in color usually occurs during the late fall and early winter, after the leaves have fallen. The maximum color, however, is more commonly observed during the months of May and June, after the spring rains have caused the swamp lands to discharge their waters. In some instances it is said that the hot water is more rusty at the time of this maximum color of the early summer. In other cases, the winter maximum of color, caused by freshly dissolved organic matter, gives rise to the worst conditions.

LOCALIZATION OF RED-WATER TROUBLES

Wherever the red-water plague has been observed a most conspicuous phenomenon has been that the rusty hot water has not been general throughout the city, but has differed greatly in different houses. Often many houses are practically exempt, while neighboring houses may be seriously affected. This was conspicuously true in one instance in Springfield, Mass., where there were two apartment houses on the same street taking water from the same mains under identically the same conditions and with the plumbing arranged in substantially the same way. In one of these apartment houses no trouble was experienced, while in the other the conditions were very bad. The only noticeable difference between these two buildings appeared to be in the character of the material used for the construction of the heaters, tanks and piping used for the hot water services.

If one were to generalize, it may be said that it has usually been found that houses recently built have suffered more severely than older houses; that houses in which brass pipe and copper boilers have been used have suffered little or none at all; that houses in which galvanized wrought iron or steel pipe have been used have been the ones affected and those in which the piping has been apparently of poor quality have suffered the worst. The troubles have been somewhat more marked in buildings where the circulating pressure system is used than in those where the tank system is used, but exceptions have been found, as, for instance, in tall buildings. In short, the

physical conditions that appear to favor the formation of iron rust in hot water are higher pressure, higher temperatures and greater circulation.

In any particular house, differences are noticed in different parts. The water supplied to the lower floors of high buildings is often slightly more discolored than the water supplied to the upper floors, but this difference is not always noticed. When pipes are examined the greatest amount of rust is found where the circulation of the water is most rapid. More is found in horizontal than in vertical pipes. Sometimes the pipes between the heater and the storage tank are very nearly, if not completely, choked with rust. Here the circulation is naturally very rapid.

TEMPORARY RUSTINESS

It is a matter of common occurrence to find the first water drawn from a hot-water faucet to be somewhat rusty, the water afterwards running clear. This may happen even in places where there is no general red-water problem. It is especially likely to happen when the water contains such electrolytes as sodium chloride. It is due to galvanic action between different metals. Thus, where brass faucets have been attached to steel pipes the writer has found the first tumblerful of water drawn to be rusty and the water afterward drawn to be clear. This temporary rustiness is often a conspicuous phenomenon where gas heaters are employed and is apparently due to the use of different metals in places where the temperature of the water is high.

SULPHATE OF ALUMINA

Carbonic acid dissolved in water increases the hydrogen ions present and therefore its corrosive properties. This acid is present in nearly all water, being high in swampy waters and many well waters. It is not driven off by heat when the water is under the pressure existing in city mains. When present in combination with the carbonates of alkaline earths it does not appear to be as corrosive as in soft waters. The effect of organic acids in the corrosion of iron is little understood, although it is generally considered that swampy waters owe their corrosive properties in part to such acids.

When sulphate of alumina is added to water that contains calcium carbonate there are formed aluminum hydrate, calcium sulphate and carbonic acid gas. The increase in the amount of free carbonic acid amounts to 6.8 parts per million for each grain per gallon of alum, assuming the original alkalinity to be in the form of bi-carbonate. Practically the reduction in alkalinity is somewhat less than the theoretical. Fuller believed this to be due to the absorption of a certain amount of sulphate of alumina by clay carried in suspension. The writer has found it to be the case with colored waters and especially with soft colored waters, and it has been found to occur with waters that have been filtered and he suggests that probably some of the alum unites chemically with the organic matter.

It is possible that where the amount of alkalinity in the raw water is very low, the alum reaction does not go to completion, but a certain small amount of aluminum sulphate remains in the water. Conductivity experiments made by Melville C. Whipple have shown that whereas the conductivity of hard water is carried by a very small amount when alum is added, the conductivity of a relatively soft water is sufficiently increased by the addition of the same amount of alum.

Under ideal conditions all of the alum added to the water before filtration is decomposed and takes the form of aluminum hydrate, which is removed by the filter, although if this is not working properly some of the hydrate may appear in the effluent. If the alum reaction should not be complete, but if a small amount of basic sulphate should be formed, it is possible that this might remain as such dissolved in the filtered water. If there is a chemical combination between the aluminum sulphate and the organic matter, it is possible that this compound might pass through the filter either in the form of a colorless solution or as a colloid. In the case of an over-

dosed water, aluminum sulphate itself is present in the filtered water.

If the filtered water should contain basic aluminum sulphate it is reasonable to believe that heating it would tend to complete the reaction so that aluminum hydrate would be precipitated in the hot water. If the filtered water contained aluminum sulphate in combination with organic matter, heating might decompose it and this also would tend to throw down the aluminum hydrate in the hot water. In this connection it is worthy of note that in Watertown analyses of the deposits in the hot-water pipes have shown considerable quantities of aluminum, sometimes as high as 7 per cent.

These changes in the basic sulphates and combinations of alum with organic matter would naturally tend to increase the hydrogen ions and therefore the corrosive properties of the water.

Experiments have shown that when alum is so added to waters the alkalinity of the filtered water is reduced to 5 or 8 parts per million, the filtered water, after long boiling, has an acid reaction when tested with the phenolphthalein indicator, whereas the reduction is alkaline if the residual alkalinity of filtered water as shown by the ordinary methyl orange or erythrosene test is kept higher than 5 or 8 parts per million. Many experiments along this line have been made by the writer and the results are shown in Fig. 1.

From a smooth curve drawn through these results it would appear that when the alkalinity of the filtered water falls below six parts per million the water will commonly have an acid reaction with phenolphthalein after boiling. This acidity of the hot water is apparently not due to carbonic acid.

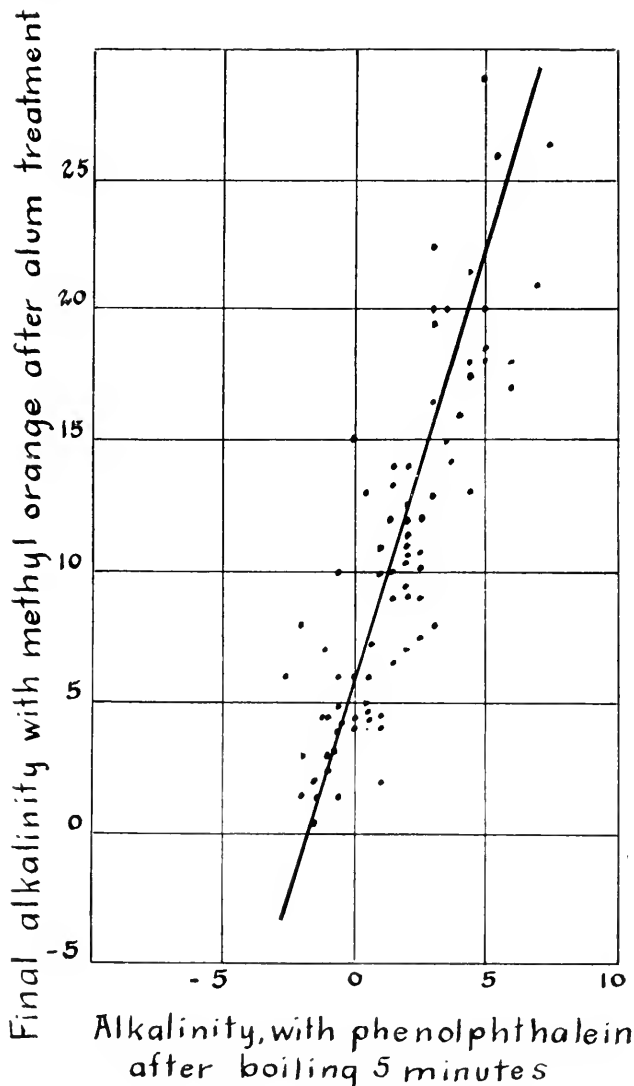


FIG. 1.—TESTS OF ALUM-TREATED WATERS

In a series of experiments made to determine the relative corrosive effects of alum-treated waters in which the residual alkalinity varied, it was found that when the residual alkalinity fell much below to parts per million the corrosive effect of the water on iron increased materially.

When waters that contain calcium carbonate are boiled a dissociation takes place, with the formation of the hydroxyl ion. These tend to neutralize the hydrogen ions and thus prevent corrosion.

Whatever may be the explanation, and the chemistry of the subject is by no means clear, the fact appears to be well established that as a result of the application of sulphate of alumina to soft, colored waters a corrosive property is imparted that acts when the water is heated, but that is insignificant as long as the water remains cold.

The theory of corrosion and rusting requires not only the presence of the hydrogen ion, but the presence of oxygen. It has been well proved that where the hydrogen ion is present the rusting of iron is proportionate to the concentration of the oxygen. The greater the amount of oxygen, therefore, the greater the rusting. Generally speaking, hot water contains more than enough oxygen to oxidize the iron dissolved and it is probable that the increased corrosion attending increased amounts of dissolved oxygen is due to its action as a depolarizer.

Surface waters used for public supplies usually contain oxygen up to their saturation point. The solubility of oxygen decreases as the temperature rises. Near the freezing point water will hold in solution about twice as much oxygen as at

summer temperatures. The solubility decreases according to a regular curve and at the boiling point becomes nil.

The solubility of oxygen is also affected by pressure and increases directly with it. Water under a pressure of two atmospheres will hold twice as much oxygen as water under a pressure of one atmosphere. The solubility of oxygen in water at different temperatures and pressures is shown in Fig. 2. When water saturated with oxygen is heated, the pressure remaining the same, oxygen gas is liberated. This is also true of the dissolved nitrogen. Experiments made in this country and also in Germany have shown that heating water increases electrolytic action between dissimilar metals in contact with such water.

Some ground waters contain little dissolved oxygen and these waters do not seriously rust pipes.

Experience has shown that the more rapid the circulation of water through a hot-water system, the greater is the rusting of the pipes, since it prevents the accumulation of hydrogen on the iron surface, that is, prevents polarization. Corrosion is also increased by the exposing of fresh surfaces due to the mechanical removal of the rust already formed. The increasing tendency to use the circulating system of hot-water distribution in houses may in part explain why the rust problem is more serious now than formerly. The circulating pipes between the heaters and boilers often become completely choked with rust when the rest of the system is much less affected.

It has been found in several cities that water in which lime has been used either for softening or in connection with copers contains normal carbonates, and acts on the zinc coatings of pipes, dissolving the zinc and exposing the iron to the water. Such water will even remove zinc from alloys, and meters and other fixtures have suffered in consequence. These waters do not corrode iron, but if, after pipes have had their zinc removed the water should change in character and no longer contain an excess of hydroxyl ions, corrosion would probably become serious.

Iron fully protected with zinc would apparently not be subject to corrosion and the red-water evil. In Springfield it was apparent that the worst red-water conditions existed in the buildings of cheaper construction where unprotected steel tanks were used. Examination of some of the pipes which were completely choked with iron rust showed them to be made of steel very badly galvanized. Experiments on the relative corrosion of wrought iron and steel pipes have been inconclusive, but so far as practical experience goes it appears that the best results are obtained by using the best grades of wrought iron. However, the better grades of steel pipe are probably more satisfactory than the poorer grades of wrought iron. But probably the most important thing is the thoroughness of galvanizing.

For the best protection pure zinc should be used, and not an alloy. It should be of sufficient thickness and applied so as to thoroughly cover the pipe at all points. If the mill scale is not properly cleaned from the pipe; if the acid used in pickling is not thoroughly washed off; if the temperatures of pipe and zinc are not right; if the zinc bath is used too long, so that dross accumulates in the dipping tank; and if other precautions are not taken the galvanized coating will not be satisfactory. In the course of inspection of many pipes taken from buildings and found in the shops of plumbers it has been often noticed that the galvanized coating is very imperfect. Unfortunately minute openings in the zinc coating are apt to be present even when the galvanizing is carried on in the best possible manner.

REMEDIES

If the above-mentioned theories of corrosion are correct, the logical methods to be used for preventing rusty hot water would be along the lines of reducing the hydrogen ions in the water or increasing the hydroxyl ions, getting rid of the dissolved oxygen, reducing the pressure, temperature and circulation, and using pipes of good quality selected with refer-

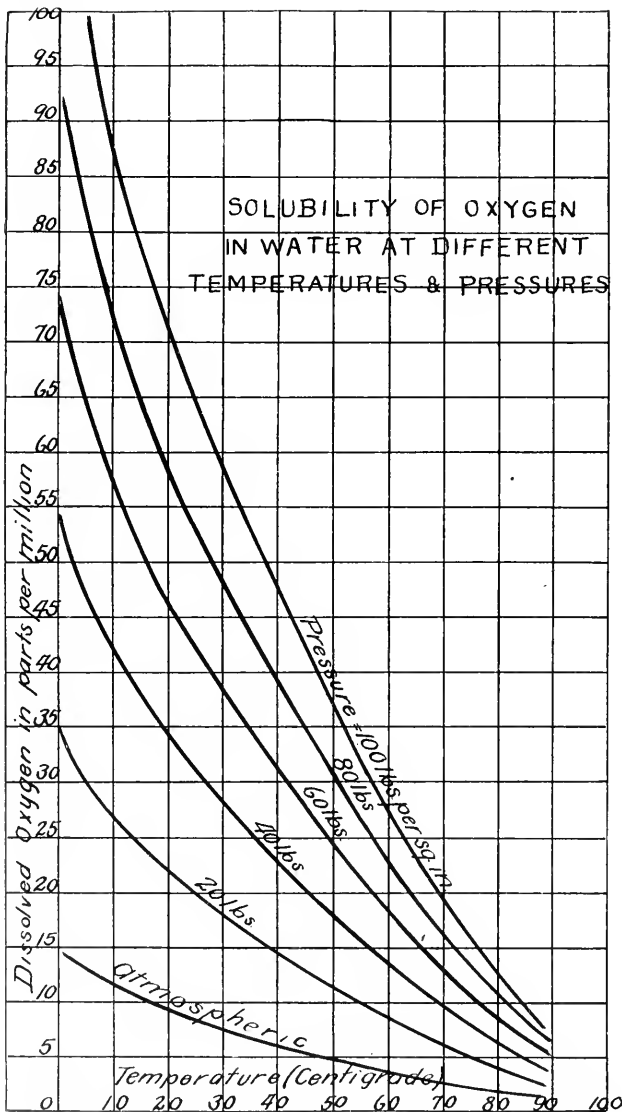


FIG. 2.—SOLUBILITY OF OXYGEN AT DIFFERENT TEMPERATURES

ence to the nature of the water. Practice can follow theory to a certain extent.

There seems to be no doubt that the most effective method of avoiding rusty hot water is to use brass or some metal other than iron or steel for the hot-water pipes and boilers. This increases the expense of the installation, but with very soft waters it is advisable. If brass is used it should be properly alloyed and well annealed, proper fittings also should be used.

If wrought-iron or steel pipes are used they should be of the best quality and should be well protected by a galvanized coating of pure zinc applied by the dipping method. Experience appears to indicate that wrought-iron pipes of the best grade resist corrosion better than steel pipes, but so many exceptions have been found to this that it cannot be considered as definitely established. Poor grades of both steel and iron pipe are to be avoided. A vigorous reform should be instituted in the manufacture and methods of branding and sale of smaller sized pipe for use with hot water.

In domestic hot-water supplies it is not feasible to prevent circulation of the water in the pipes, nor is this desirable, as the circulating system possesses a number of distinct advantages. The pressure of the hot water must depend chiefly upon practical physical conditions, but in designing a system where red-water troubles are feared, low pressure should be favored. There seems to be no doubt that in many cases the temperature of the hot-water supply is maintained higher than is necessary for domestic uses, and in such cases the red-water plague could be materially alleviated if means were taken to prevent excessive heating.

Neither is it feasible nor desirable to remove the dissolved oxygen from a public water supply as has been recommended for the Coolgardie supply in Australia. It is sometimes done in the case of water used for boiler purposes and the results are said to be beneficial. There is no reason why it could not be done for hot-water installations in large buildings, as in apartments, hotels and office buildings, where large numbers of taps are supplied from a common source. By first heating the water to a rather high degree, say 80 degrees to 90 degrees Centigrade, and then carrying it to an open tank at the top of its building a large amount of the dissolved oxygen would be liberated and its corrosive power materially diminished. A more complete removal might be obtained by the use of a closed storage tank with a partial vacuum.

The most effective method of preventing rusty hot water, next to the avoidance of iron and steel pipe, is to reduce the hydrogen ions in the hot water to a minimum or, what amounts to the same thing, to increase the relative number of hydroxyl ions. This practically amounts to saying that the public water supply should not be too soft. Experience seems to indicate that the alkalinity should be at least 10 or 15 parts per million. The higher the alkalinity the less danger of rusty hot water. But it must be remembered that the hardness of water is in itself objectionable and that when it is more than 15 or 25 parts per million it begins to have a noticeable effect on the use of soap.

Public water supplies high in organic matter and low in alkalinity may be advantageously hardened by the addition of a small quantity of lime, say 10 or 15 parts per million. This practice has long been common in England.

The use of alum with soft, colored waters should be avoided as far as possible, but if it is employed lime (or soda) should be used with the alum in order to prevent the alkalinity from falling too low. But here again is a difficulty, for when deeply stained waters are decolorized with alum it is found that the additional use of lime and soda prevents to some extent the satisfactory decolorization of the water. In such cases considerable care must be used in adjusting the chemicals, and in the present state of the art it is not always possible to obtain entirely satisfactory results. The problem of color removal for soft waters has not yet been satisfactorily solved.

With hard waters practically no precautions are necessary to

be taken, as the hardness itself seems to be sufficient to prevent rusty water troubles.

Finally, it is evident that the problem of rusty hot water is a complicated one. Its solution demands the united efforts of water works engineers, plumbers and pipe manufacturers. Economy to the householder demands that the quality of a public water supply be considered not alone from the hygienic standpoint, but from its possible influence on pipes and fixtures, and that, on the other hand, the materials used for distributing the water be chosen with reference to the inherent qualities of the naturally available supply. Plumbing regulations should be drawn with this in mind. But all these precautions will be of no avail if pipes of satisfactory quality cannot be obtained and recognized by the ordinary dealer and plumber. To this end two things are necessary, properly drawn specifications and a simple method of branding.

ILLINOIS WATER SURVEY

A BILL has just been signed by the Governor of Illinois adding to the duties of the State Water Survey an inspection of the water sheds of all of the municipal supplies of the state, making such field studies and collecting such samples as are necessary; also "To analyze and test samples and to make any investigations to the end that a pure and adequate public water supply for domestic and manufacturing purposes may be maintained in each municipality; to make sanitary analysis free of charge of samples of water from municipal water supplies or from private wells collected according to the direction of the State Water Survey; and to report the result of such examination to the Board of Health, Superintendent of Water Works, or other officer or officers of the water department of the city, village or incorporated town, or to citizens by whom the samples, respectively, were collected." The bill provides for an annual appropriation of \$15,000 for the salaries of the assistants and employees and for the expenses of this work. The Survey is directed to publish an annual report and such special reports as may be necessary. The University of Illinois was practically constituted the State Water Survey when it was originally established, Professor Edward Bartow being the director of the Survey.

MULTIPLE FILTRATION

In a paper read last month before the Association of Water Engineers of England, Walter Clemence referred to the increasing number of slow sand filtration plants in which the water receives as preliminary treatment either clarification in settling tanks or storage reservoirs, or precipitation with coagulants. Each of these methods is expensive, the coagulant is liable to cause clogging of the filter, as are also algae and other micro-organisms which form in many of the storage reservoirs or basins used as settling tanks. Reference is made to the London water supply, of which Dr. Houston states that at certain times the life of the filter beds treating stored water is reduced to a few days only, because of the large quantities of algae growing therein.

In place of precipitation, coagulation or storage Mr. Clemence advocates multiple filtration. The principle of this, he states, is founded on the idea that the formation of a film or schmutzdecke, either natural or artificial, on the surface of the filtering medium is neither necessary nor desirable. In this multiple filtration the coarse prefilters are so operated that chemical purification and bacterial reduction are effected to such a degree that no schmutzdecke is formed on the final filter. Meantime the water is exposed to the air in fountains or cascades in passing from one filter to the other and the aeration thus effected results in a partial replacing of the dissolved oxygen which had been lost in passing through the preliminary filters.

He suggests that should this absence of the film from the final, finest grained filter result in lowered efficiency of bacterial removal, sterilization by hypochlorite, ozone, ultra-violet rays or other modern methods might be necessary or at least advisable.

WATER WORKS NOTES

The superintendent of the Bradford, Pa., water department, S. D. Hefner, reports that on Jan. 1, 1911, a satisfactory reduction in their fire insurance rates was made by the fire insurance companies on all properties in the city, in accordance with an agreement with the underwriters made some time ago. This agreement was that if the city would erect a good and substantial pumping plant within the city limits and maintain it ready for instant use at all times as an auxiliary to the gravity system, the insurance rates would be lowered. A reduction has accordingly been made of from 25 to 50 per cent. in the insurance rates.

The same city also reports that the use of fire hydrants by sprinkling carts continues to be a nuisance of the worst kind "not only to the water department but to the public generally as well, by stirring up the sediment in the mains and thereby causing roily water." There are a number of most serious objections to the use of fire hydrants by sprinkling carts, but we do not remember having heard this one before. If the mains are so filled with sediment as this report would apparently indicate it seems to us that the department should blow off all the fire hydrants at frequent intervals, whenever there is sufficient water to render this expedient and thus remove the real cause of the roily water.

Summerville, Mass., had on Dec. 31, 1910, 12,149 service connections and 5,810 meters. Water Commissioner Frank E. Merrill in his annual report states that, although \$4,632.73 was spent during the year in installing meters, almost the whole of this amount was saved in the reduction of waste for that year alone. In this case the saving in consumption is an actual saving in dollars and cents and one which can be exactly computed, since the city obtains its supply from the Metropolitan system and pays the State commission by meter for the water consumed.

Of the 5,810 meters, 228, or about 4 per cent. of the entire installation, were found out of order during the year and repairs to the same made in the department repair shop. The defects found are classified as follows: Broken disks, 38; defective registers, 15; defective gear trains, 47; freezing, 46; hot water, 5; dirt, sedimentation and similar obstructions, 42; miscellaneous defects in gears, spindles, screens, etc., inside the meters, 23; noisy meters, 12.

Probably owing to a considerable extent to the introduction of a new water supply under a somewhat higher pressure than the old, the city of Springfield, Mass., suffered from a considerable number of leaks during the year 1910. Altogether there were 76 leaks in the mains, an average of 0.41 per mile of main pipe in use. Two of these were somewhat unusual. In March a 24-inch by 8-inch reducer blew out, causing a flooding of cellars in the vicinity, breaking a 12-inch gas main and a street railway wire duct, filling the gas mains and wire ducts with water and sand and doing much other damage. Fortunately, a number of teams and automobiles were immediately available and the necessary gates were closed in less than half an hour. The peculiar feature was that the reducer which was blown off could not be found and Superintendent Alfred E. Martin reports his belief that it evidently had sunk into the quicksand which is found quite generally in that vicinity, having entirely disappeared from sight before the hole was cleared of water. Fortunately, another was found at Hartford which could be obtained at once and was got on the ground so quickly that the repairs were completed the next day.

Another serious break occurred on the afternoon of July 4, a hole about 6 inches in diameter being blown out of the side of an 8-inch cement-lined main, forcing a stream of water out of the ground at an angle of about 45 degrees and completely deluging a dwelling house on the south side of the street, injuring the house badly and ruining much of the furniture and clothing of the tenants. The house was literally bombarded with trap rock and sand, all the front windows were broken, clapboards and shingles were torn off and the front room floors were covered to a depth of 3 to 4 inches with sand and gravel.

PUBLIC WORKS NOTES OF READING, PA.

In his report for the year 1910, city engineer Edmond B. Ulrich, of Reading, Pa., calls attention to the inconvenience of having the fiscal year begin on April 1st, with the new appropriations taking effect at the same time; since, although they take effect then, there is no actual money available for expenditure before the middle of June or the first of July. "In making this statement recognition is taken of the fact that there is always some money left from the previous year through unexpended appropriation and accumulations of some amount in different general funds. This lack of money for a period of nearly three months is a serious set back to all our construction work especially on highways, as it thus leaves but about 5½ months before the opening of the next winter, and all our construction and repair work must be done in this time. . . . Where laws relative to the beginning of the fiscal year and the collection of taxes are not beneficial to conditions as they exist, such laws should be amended to be made so."

STREET OBSTRUCTION BY BUILDING MATERIAL

The piling of building material directly upon paved streets is considered a nuisance by the city engineer, and he recommends legislation requiring that proper receptacles be constructed in which all building materials should be kept until used, or excavated and worthless material stored until carted away. "The object is to prevent the disagreeable sight of sand, loam, plaster, stone chips, wood and other materials being scattered over the square through various causes—by wheels of teams, water flowing in gutters, wind or rain, and also to avoid the additional wear of the pavement due to the grinding action of the wheels of each wagon as it goes over the scattered material."

SIDEWALK GUTTERS

The method in vogue in Reading, of conducting storm and waste water over the sidewalk surface by means of shallow gutters from building to curb line is considered objectionable and it is recommended that it should be prohibited as being both unsanitary, unsightly and dangerous to pedestrians, especially in winter. All water which it is necessary to carry from the building to the gutter should, it is believed, be carried through pipe drains placed under the sidewalk.

STREET CLEANING

A contract has been let by the city for cleaning the paved streets for a term of years ending June 6, 1911. On March 2, 1910, however, the contractor abandoned his contract without previous warning. On the following day the city, having decided to complete the term of the contract with its own forces, ordered the necessary equipment and on March 4 had 15 men at work sweeping the dirt into piles near the curb lines of the streets, to be later carted away in wagons. This was adopted as a temporary expedient only until the arrival of the carts, shovels, brooms and other equipment. When these had arrived each cleaner, who has been assigned to one of the 24 districts, was equipped with a broom, shovel, scraper (if there were asphalt streets in his section), either three or four cans and a can carrier, to which was added a pick during winter months.

The cans were made from No. 18 steel sheets and were 19 inches in diameter at top, 15¼ inches at the bottom and 23 inches deep, each can holding 3 cubic feet of sweepings. These cans are filled in succession and then placed at a designated spot in each district, from which points they are removed by the street cleaning wagons, of which there are three. The brooms employed were 20-inch bass and lasted an average of 48 days. The shovels lasted an average of 4½ months. The cost during the ten months of operation was \$7.88 per square for cleaning and 43 cents for flushing, or a total of \$8.31. The contract price had been \$7.59. The total amounts expended for cleaning during the ten months were as follows: Foreman, \$807; labor, \$9,720.29; teams, \$3,151.36, and for flushing labor, \$399.70, and for flushing cart, \$207.13. The regular cleaning force consisted of one foreman, 24 district cleaners and three teams.

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JUNE 14, 1911.

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Water Works Rate Making

There would seem to be some significance in the fact that two of the most important papers delivered before the American Water Works Association last week dealt with the subjects of rates for water and for fire protection. Mr. Earl makes a plea for water rates established upon a foundation of facts and reason rather than an unsystematic and irrational set of rates based upon guess work and an estimate of what the consumers will pay, as has in the past been the more common plan. Similarly Messrs. Metcalf, Kuichling and Hawley have developed a method of fixing hydrant rentals which is based upon the cost to the water department or company of the fire protection furnished, rather than a comparison with rates in other cities or the plan of exchanging it for a franchise or other considerations offered by a municipality in which neither party has any idea as to which is more favored by the exchange.

Several members of the Association took exception to Mr.

Earl's idea of charging a uniform rate for water consumed, regardless of the amount taken by the consumer; maintaining that large consumers should receive special rates or discounts, as is common in the mercantile world. In this we believe that the objectors were influenced by their familiarity with previous methods rather than by reason. Large purchasers of merchandise of any kind are usually favored because the cost of securing the order, of entering the item upon the books, of collection, etc., is little greater for a large order than for a small one, and in general because the fixed charges are nearly the same for each order regardless of its size; with the additional reason that in many cases the cost of carrying and delivery are less per unit for large quantities than for small. There is in addition the idea in many cases that the amount of profit involved is so large that rather than lose it all the seller would reduce the unit profit. In the case of water supply, once having placed the connection and meter, the unit cost is no less for furnishing large quantities of water than for furnishing small, aside from the cost of maintaining the meter and connection in order, keeping the books and collecting the bills. Mr. Earl's method provides that these items of variable cost just referred to should be charged to the consumer at their actual cost plus a reasonable percentage of profit; and in these variables we find the parallel to the additional discount offered to large purchasers of other classes of merchandise.

There remains the argument in favor of sliding rates for the water consumed item that, if large consumers are not favored they may construct a water system of their own, or locate in some other city; and there is perhaps some reason for this in certain cases. If, however, the rates are established according to Mr. Earl's method, the rebate or discount to large consumers could not be very considerable unless the water were furnished at an actual loss. There is the counter-argument, which is especially applicable to municipal supplies, that the smallest consumers are generally the least wealthy ones and that consequently they should have the advantage of as low rates as any.

There is an additional reason frequently urged for municipal supplies, that low water rates will invite manufacturing plants to the city, or that high rates will drive out those already there; and that the presence of these establishments is of considerable value to the city. This is perfectly true, but a reduction in rates made for this reason becomes in effect a bonus offered to the company, just as some cities offer free land or no taxes. To conceal this bonus under the guise of low rates is to retain the unscientific and indefinite methods which it is the very purpose of the new methods of rate making to eliminate. If it is desired to offer such bonus, let it be done openly, the water department being credited with the regular rate and the difference being made up by a credit from the public treasury or payment by the local Board of Trade or whatever organization stands sponsor for the bonuses of other kinds offered.

The authors of the papers on fire hydrant rates state near the beginning of their paper that rates should lie somewhere between the cost of supplying the service and the value of such service to those who benefit by it. They outline a method for determining with more or less accuracy, the cost of the service and give some figures indicating the value of such service. However, in the rates suggested by them they do not appear to have taken any account of the latter. It is possible that we have not fully apprehended their idea, and that what they had in mind was that the charge should be based upon the cost, but that it should not be greater than the service rendered; and if it is greater than the value of such service, then either the cost of rendering the service should be reduced, the value of the service should be increased, or there should be no effort to render the service at all. This appears to us to be the proper basis; and the authors have apparently shown that the service rendered by fire protection is considerably greater than the cost, and have therefore justified the continuation of such service.

The authors of both papers have called attention to one important matter—the necessity for keeping such cost records by water departments and companies that it will be possible

to determine the itemized cost of each service, and pro-rate all expenses to the proper items of service rendered. Without such systematic book-keeping, combined with an accurate knowledge and careful interpretation of the various elements of cost, it will not be possible to establish rational rates for either water consumption or fire protection. Such systems of book-keeping have been urged by us for some time past, as have also the general methods of rate making so excellently developed by the authors of these papers; and we are glad to see evidences of a more general acceptance of these ideas.

Esthetic and Commercial Characteristics

The abstract of Mr. Whipple's paper in this issue calls attention to one of the characteristics of a water supply which is not directly connected with its effect upon the health of consumers, and incidentally illustrates the proposition that water works superintendents and engineers are expected by the consumers to consider what are sometimes called the esthetic features of the supply and those which affect its usefulness for commercial purposes. During the past few years so much attention has been paid to the treatment of water with the sole or chief purpose of rendering it safe, that many appear to have lost sight of the fact that consumers are entitled to have due consideration paid to their natural desires for a clear and colorless water, one which is not so hard as to require an extravagant use of soap or cause incrustations in boilers and cooking utensils, and for absence of other mineral substances, acids or alkalis which would cause a destruction of pipes and plumbing, the "red water evil," or affect the taste or odor to a perceptible degree. If one or more of these objectionable features are found to be introduced by the use of alum hypochlorite, or other agents used in water purification, then some remedy for this should be found or substitutes for these processes adopted. A great argument in favor of slow sand filtration is that there appear to be few, if any, offsetting objections to its use; and for the same reason it would appear that ozone would be a most desirable sterilizing agent if some method for utilizing it could be discovered which is physically and commercially practical.

STERILIZING BY ULTRA-VIOLET RAYS

CONSIDERABLE has appeared in the European and English papers during the past year concerning a new method of sterilizing water by the use of ultra-violet rays; but the practicability, both physical and financial, of the method seems as yet to be so far from commending it for use in actual service that little has been said about it in this country except as a matter of scientific interest rather than of engineering. In a paper before the Association of Water Engineers of England Max de Recklinghausen described experiments conducted by him at Sorbonne University, in which water containing *B. coli* was sterilized by a 220-volt, three-ampere silica lamp, sterilization being obtained within one second at a distance of 10 centimeters, within 4 seconds at 20 centimeters, within 15 seconds at 40 centimeters and within 30 seconds at 60 centimeters. Temperature was found to have little effect upon the speed of sterilization, even including the freezing point.

Experiments with various classes of micro-organisms showed that they varied in their sensitiveness to the action of the rays. Destruction was found to take place in the following times at a uniform distance. *Staphylococcus*, 5 to 10 seconds; cholera, 10 to 15; *coli*, 15 to 20; typhoid, 10 to 20; dysentery, 10 to 20; pneumonia, 20 to 30; *subtilis*, 30 to 60; tetanus, 20 to 60. Glass was found to be practically an absorbent of the ultra-violet rays and therefore must not be interposed between the rays and water.

In the city of Marseilles water previously clarified by multiple filtration is said to have been treated with ultra-violet rays with some measure of success.

From the above it would appear that water which is to be sterilized must remain within 20 centimeters (about 8 inches) of the lamp for at least 4 seconds, or within 4 inches of the lamp for at least one second, and that glass must not be interposed between the lamp and the water. This would apparently

require either very low velocities or a great number of sources of ultra-violet rays placed within 2 or 3 inches of each other throughout the channel through which the water to be sterilized is to be passed.

Concerning the cost of this method it is stated by Dr. Rideal that slow sand filtration would cost about \$10.40 per 1,000,000 gallons, rapid sand filtration about \$11.60, ozone \$16.40, and ultra-violet rays \$125 to \$175.

STANDARDS OF PURITY

THE vice-president of the Society of Engineers of England, H. C. H. Shenton, in a paper read before that society last month concerning standards of purity for water supplies expressed ideas which would not be endorsed by most American engineers. One of these is an assumption that chemists and bacteriologists have attempted to fix, and are to be criticised if they do not fix, standards of purity to be adopted by Boards of Health and water works officials, and to which engineers must attain in their works and processes for the purification of water. Add to this assumption the additional one that it is the duty of the engineer to bring all potable water supplies to whatever theoretical standard may be set up, regardless of what the difficulties and expenses may be, and we find Mr. Shenton proposing a basis of conduct for the water works engineer which would not be subscribed to by many engineers or even experts in pure science in this country.

Mr. Shenton devotes a considerable part of his paper to references to conflicting views held by engineers and others concerning the reliability of the *coli* test as indicating the safety or the reverse of a water supply, with a side glance at the possibility of there being water-borne bacteria other than cholera and typhoid bacilli which are more or less inimical to the health of human beings. Dr. Thresh he refers to as being "evidently of the opinion that water may contain many harmful organisms besides the typhoid or cholera bacillus, and that it is quite probable that impure water is to blame for many minor illnesses, owing to the presence of organisms as yet undetected or undefined." Such a conclusion has already been reached in this country and has formed the subject of several articles and papers during the past year or two. This, of course, does not reflect in any way upon the *coli* test, but merely indicates that such test is not altogether sufficient and that in time there will probably be discovered other hostile bacteria or pathogenic matter in water than are yet recognized.

Concerning the *coli* test he quoted Dr. Dibdin as saying, "To condemn a water which shows no sign of contamination other than a few *B. coli communis* and gives negative results to all tests for other objectionable bacteria, and also fails to respond to the most delicate chemical and microscopical tests for those substances which are known to be present in sewage polluted waters; a water, in fact, which exhibits all the characteristics of an exceedingly pure water, except for the presence of the aforesaid few *B. coli*—to condemn such a water is rash in the extreme."

As an illustration of the minimizing of the importance of *coli*, reference is made to John R. Downs, physiologist to the United States government, who found the water supply from certain water sheds to contain *coli* although these water sheds had been completely depopulated, the roads diverted from them and pollution prevented by police inspection. In this case Mr. Downs had attributed the presence of *coli* to birds and small animals on the water shed and concluded that their presence was not necessarily an indication of dangerous conditions; although in some samples *coli* were found present in one-half c.c. Mr. Shenton also quotes a number of authorities who have expressed their belief in the value of the *coli* test, and seems to consider the two classes of statements and opinions contradictory, expressing himself as follows:

In the face of the evidence given above as to the danger indicated by the presence of *coli*, it is begging the question to assume that any water is safe when *coli* are found in it in such large numbers (as found by Mr. Downs). In one case we have Professor Starkey demonstrating that water which

could not be found to contain coli in a sample of less than 100 c.c. actually produced disease, and in the other we have Mr. Downs ready to ignore their presence in one-half a c.c., merely because he has no reason to believe that the water is polluted. Surely, if such views are to be accepted as correct, not only does the coli standard become absolutely useless, but the work of the chemist and of the bacteriologist becomes useless also; all that is required is a person possessing common sense to look around and see that the water is not grossly polluted. . . . Until some standard for all cases is fixed the position of the scientist at the present time practically amounts to this: Tell me the source from which the water comes and show me whether it is polluted or not and whether it has produced diseases or not, and I will then adapt my standard to suit the requirements of the sample in question. If I do not see any obvious causes for pollution I will allow you to have coli in one-half a c.c.; but if I think that there is any risk of pollution I will demand the absolute absence of coli from 100 c.c., or from 1000 c.c., for that matter.

Mr. Shenton states that his object in writing this paper was to "attempt to bring home to the chemist and bacteriologist the impossibility under present conditions of agreeing upon any standard, conformation with which should prove that water is incapable of producing diseases in a greater or less degree. What they can do, and what they ought to do, is to fix a standard which should prove that the water is free from given definite organisms believed to be harmful. Thus, if absence of coli were insisted upon, one might be reasonably sure that typhoid germs were absent; but according to the statements of the scientists quoted above, absence of coli does not necessarily prove the absence of certain other organisms, more or less indefinite at present, which they believe to be harmful in a minor degree. With regard to coli, typhoid, and other well defined water-borne disease germs, there is no such difficulty. If the scientist believes that they should be excluded, he should say so in no uncertain manner. If the scientist will fix his standard we, as engineers, are prepared to make any water conform to that standard."

Concerning the pollution of streams he states:

Although it is possible to purify water to any required degree, this does not afford the slightest excuse for acquiescing in the pollution of water supplies. Here, again, it rests with the medical authorities and with the chemist and bacteriologist to insist strictly and uniformly upon the prevention of pollution. If they will do so we, as engineers, are quite prepared to make all sewers, house connections and house drains as water tight as we make our water mains. We are prepared to do away with every soakage pit or cess pit in the country; we are prepared to purify all sewage discharged at outfall sewers up to any degree of chemical or bacterial purity required.

We cannot agree in any way with the attitude assumed by Mr. Shenton nor with most of the hypotheses upon which he has evidently based his discussion. By stating that the scientist should adopt a standard of purity which the engineer must live up to, he seems to assume that the engineer is not a scientist, and that he should himself have nothing to say about the adoption of the standard. This is by no means the conception of the duties and responsibilities of an engineer which are held in this country. On the other hand he seems to assume that it is possible for the engineer to reach perfection in both the construction of sewers and sewage works and in the purification of water. Theoretically this may be possible, but the engineering profession in this country certainly does not consider itself "quite prepared" to bring about such ideal conditions; and it is absolutely certain that it would not receive from municipal and other authorities the enormous financial backing requisite.

More important than this, however, are his remarks concerning the coli test, since they seem calculated to belittle the importance of this, and in fact, to assert that because an absolute and incontrovertible standard has not been fixed it seems useless to live up to such lights as we have. There would probably be no question by either Mr. Shenton, his "scientists" or engineers that the best test to make of water supplies would be one for the typhoid bacillus, the cholera bacillus, and the several other pathogenic bacteria, and other harmful matters, if there be any, and judge the water accordingly. Unfor-

tunately it has been found impossible to test for typhoid bacteria, both because of the limitations of our knowledge and because of the comparative infrequency of these even in sewage polluted waters. As to the other harmful organisms which may exist in the water, we have not even learned to identify these or to be positive that they exist at all. It therefore appears that such direct test as seems desirable is, in the present stage of our knowledge of bacteriology, impossible of attainment. It has, however, been found that all sewage teems with B. coli, and the detection of these has of recent years been made comparatively easy and certain. Unfortunately B. coli are voided from the intestines of many other animals besides human beings, and consequently the presence of them is not a sure indication of sewage pollution. Consequently, although the presence of quantities of B. coli should cast grave suspicions on the water, if, as in the case reported by Mr. Downs, investigation of the water shed shows that it is impossible that any such quantities of B. coli, if indeed any at all, could have been contributed by human beings, this evidence may be taken as even more positive and determining than the presence of the B. coli.

Even were the test for typhoid bacilli possible and certain, it would still be extremely undesirable to rely upon them, but something similar to the coli test would still be necessary. The reason for this is that it would be quite possible that the sewage of a certain town would not, for months at a time, contain a single typhoid bacillus, owing to the absence of cases of that disease in the city. And yet, with the occurring of a case of this disease such bacteria would probably be present in considerable quantities. Even daily tests of the water receiving this sewage, however, might not reveal this danger until there had possibly been several hours' flow of the typhoid-contaminated sewage. Therefore the standard test should be one which indicates the presence of sewage rather than merely the presence of typhoid bacteria.

The apparent effort of Mr. Shenton to belittle the coli test or else to reflect upon the sincerity or courage of their convictions of the engineers who believe in it, seems to us to be very unfortunate and one whose cause we cannot understand. The coli test has been and is of great value in determining whether there is ground for suspecting sewage pollution in a water supply; and it serves to give warning of any considerable change in conditions as to such pollution. It is not absolute nor infallible in its determinations; but neither are the judgments of any of the experts in engineering, medicine or other applied sciences in which we are compelled to place dependence. Neither engineers nor bacteriologists believe or claim that this test is all which is desired, but it is the best which science has yet to offer. To refuse to use it because it is not perfect would be childish; but to adopt it implicitly and close one's eyes to other tests and indications which may either confirm or refute this is to be criminally blind to the known facts of the case.

As to the readiness of engineers to live rigidly up to standards of theoretical perfection or even the desirability that they should do so, we believe there is little question among practical men. When mankind eats only sterilized food, breathes only air from which has been removed all dangerous dust, with its possible burden of tuberculosis germs and others, when every case of communicable disease is immediately isolated, when all flies and mosquitoes have been exterminated and many other more important sanitary reforms have been effected, then there will undoubtedly be included with these the removal of all danger due to the pollution of streams with sewage or to the existence in water supplies of the last faint trace of such pollution. But the preservation of life is not more important than living; and if all man's energies, resources and expenditures are to be devoted to the preservation of life he will, we fear, feel by that time that the life has ceased to be worth preserving. There is a reasonable limit to all things, even to the measures which should be taken for the preservation of life and health.

NEWS OF THE MUNICIPALITIES

Current Subjects of General Interest, Under Consideration by City Councils and Department Heads—Streets, Water Works, Lighting and Sanitary Matters—Fire and Police Items—Government and Finance

ROADS AND PAVEMENTS

Test Will Be Made of Paving Demand

Milwaukee, Wis.—A test suit to determine whether the city can force the Milwaukee Electric Railway & Light Company to lay new pavements between rails and one foot on each side, when a different pavement than that in use is desired, may be the result of action which will be recommended to the Council as an outcome of a meeting of the Committee on Streets and Alleys. On recommendation of Assistant City Attorney Williams, the committee decided to report for adoption a resolution compelling the street car company to pave its right of way on Twenty-seventh street, from Vliet street to North avenue, with bituminous material. According to J. G. Simmons, of the railway company, the action will be tested. Mr. Williams informed the committee that in his opinion the city had the right to compel the company to use any kind of pavement desired on this street under the 1900 franchise. Superintendent Simmons said that if the object was to have the company replace its cedar blocks there would be no dispute, as the company was willing to comply with such a request, for the reason that the street was now paved with this material. He further stated that the requirement to have traction companies pay for pavements was a legacy of the "horse and mule car" days, when the pavements were damaged considerably, but that now, as far as the companies were concerned, no pavement was necessary. He cited the practice in many cities, where the streets are sufficiently wide, of having grass between rails.

Cart System Will Be Used on County Pikes

Knoxville, Tenn.—The cart system of taking care of the roads in Knox county will first be tried upon the Tazewell and Jacksboro pikes, according to the action of the Knox County Road Commission at a recent meeting. If it works successfully, it will be placed on other pikes.

Delegation Views Atlantic City Paving

Long Branch, N. J.—A delegation of City Councilmen and other city officials and a committee of the Board of Trade visited Atlantic City recently for the purpose of inspecting streets and street paving. The visiting delegation was entertained by Atlantic City officials, particularly those identified with the engineering and street department. The visitors were conducted over a number of streets of bitulithic construction. One street in particular, now in course of construction, appealed most favorably to the visitors, as it could be seen in its various forms of completion. After ascertaining how the bitulithic pavement is laid, the committee was taken in automobiles to the paving company's plant, where the preparation and mixing of the material were fully explained. Streets that had been laid for several years were gone over. They were found to be even and unbroken, and appeared in the best of condition. The streets of Atlantic City have brick gutters, and this adds to the appearance as well as the durability of the construction.

Meet to Discuss Grade Crossings.

Dayton, Ohio.—A meeting of the special committee on grade crossings of the Chamber of Commerce with the representatives of the several railroads entering Dayton was held recently. City Engineer Cellarius told the body that the proposed improvement would cost about \$6,000,000, and would take about six years to complete. He also stated that should the improvement cause any change in the alignment of the different roads that it could not be forced. He said that according to statutes 63 per cent of the cost was to be borne by the railroads and the remainder by the city. Engineer Cellarius also said that a river having a rise and fall of from 15 to 20 feet would have to be considered in the proposal. According to those who attended the meeting the matter will be pushed from now on.

An Improvised Pressure Oil Sprinkler

Waterbury, Conn.—Superintendent of Streets Benjamin Chatfield and his assistants have converted an ordinary sprinkling wagon into a pressure distributor. An air pump is located at the back of the wagon, the power to operate it being taken from one of the rear wheels and transmitted to the pump by a series of chains and sprockets. There is a safety valve set to blow at 40 pounds and the pump may be thrown out of gear by a clutch. A hand pump at the top



Courtesy Waterbury Republican

PRESSURE OIL SPRINKLER USED IN WATERBURY

of the cart is used to transfer the oil from the supply wagon into the sprinkler. A strip of road either six or three feet wide may be oiled at one time. It is roughly estimated that two miles of road may be oiled in a day. A trough is let down below the sprinklers when crossing walks. A measuring device shows the amount of oil in the wagon, so that the proper amounts may be charged to each job. Three horses are used to draw the wagon.

Oiling Streets on Huge Scale

Yonkers, N. Y.—In the last two weeks three giant tanks of oil, each with a capacity of 6,000 gallons, have been received here, to spread on the macadam roads and all has been used up. Never in the history of Yonkers has oil been used for this purpose to such an extent, and the cost of flushing the streets will, therefore, be an item, in the expense of running the Department of Public Works, of unprecedented proportions. The reason for this situation is the abandonment of using water for sprinkling, in accordance with the recommendation of the Joint Water Committee, who considered that move would greatly conserve the city water supply. All the macadamized streets in the city are being oiled under the direction of Mr. William A. Coyle, who has looked after this branch of the work of the Department of Public Works since its inception, four years ago.

Property Owners Must Pay for Pavements

Spokane, Wash.—The proposition that the general fund of the city assist abutting property owners in paving streets to the city limits to connect up with county roads is frowned on by Commissioner of Finance Robert Fairley. Strong opposition by other city officials is advanced against the plan, which was a suggestion of City Engineer Morton McCarty recently at the chamber of commerce. It is practically certain, from indications at the city hall, that no such plan will be adopted by the City Commissioners, owing to the state of the general fund and the dangerous precedent which would be set.

SEWERAGE AND SANITATION

Plans Sewer Conference

Montclair, N. J.—Mayor Hinck, who is the leader in the movement to establish an independent sewage disposal system for the municipalities of Montclair, Orange, East Orange, Glen Ridge and Bloomfield, which have demurred at signing the agreement for the \$12,000,000 trunk sewer planned by the Passaic Valley Sewerage Commission, has announced his intention of calling a conference of the mayors, councils and boards of health of all the municipalities of this section of New Jersey, at which the project which he has in mind will be thoroughly discussed. Mayor Hinck believes that when the independent sewage disposal system is explained the opposition which has developed against the scheme in Bloomfield and Belleville will be removed. The authorities of Bloomfield and Belleville each have taken official action protesting against the proposed disposal plant being in either of those municipalities. The town of Montclair has acquired about sixty acres of land in Bloomfield and Belleville, on which it is proposed to establish a disposal plant, which, according to Mayor Hinck, may be operated without causing a nuisance to the communities in which it is situated. It is declared Mr. Hinck has opposed the participation of Montclair in the joint trunk sewer project because he says the method of assessment of cost, which is by ratables, is inequitable and unfair to this municipality.

Health Officer Orders Clean-up

Bay City, Mich.—Unscreened doors admitting swarms of germ-carrying flies and other evidences of absolute disregard of ordinary sanitary precautions which he promptly branded a menace to the public health were found by Dr. Edwin Goodwin, health officer, in an inspection last week of several business places. He had called at the places only a few days before with sweeping orders to improve conditions at once. Evidently, they did not anticipate such an early return, for little had been done toward carrying out his instructions. The health officer has declared war on unsanitary ice-cream makers, dairymen and butchers, and will make a rigid inspection as often as possible. Some places he already has visited several times because the proprietors are slow to remedy unsanitary conditions. All, however, have indicated a willingness to clean up and stay clean.

Open Sewers Menace Health

Racine, Wis.—Action is to be taken immediately by the local Board of Health to remedy unsanitary conditions existing in Root River, where the current at the present time is not sufficient to carry off the sewerage, thus menacing the health of people living in the vicinity. It is possible that the State Board of Health will also take action in the matter. The river is exceedingly low at the present time, bounding not over 14 inches near Sixth street bridge. The reason for the decreased depth is not known, but is thought to be the lowering of Lake Michigan and the consequent training of the rivers by the Illinois Drainage Canal. It has been suggested as a remedy that a flushing sewer be built, similar to the one which the City of Milwaukee now operates, in order to keep the channel free from contamination. Action will also most likely be taken by the Health Board in regard to other sewers which are not built properly.

Sewage Disposal Plant Inspected

Washington, Pa.—Twenty-two members of the city councils of McKeesport, headed by Mayor H. L. Arthur, recently visited Washington for the purpose of inspecting Washington's up-to-date \$100,000 sewage disposal plant at Arden. The party of McKeesporters were taken in charge by some of the Washington officials and conveyed to the disposal plant. They put in a greater part of the afternoon there, and then after seeing as much of Washington as possible returned to the Tube City. McKeesport is confronted with a somewhat serious problem in the disposal of its sewage. At present the sewage is dumped into the Monongahela River, but this practice must be stopped, according to an edict of the State Health Department.

WATER SUPPLY

Artesian Wells Are Proposed for Washington, D. C.

Washington, D. C.—If a movement just inaugurated by the Federation of Citizens' Associations materializes the District Commissioners may ask Congress for an appropriation with which to dig a number of artesian wells in the District. President William McK. Clayton, of the Federation, says that the matter has been put up to the Commissioners and that the Engineering Department of the District government is now preparing a report on it. "The Federation believes," said President Clayton, "that artesian wells, located at certain points in the city, would accomplish a great deal of good, not only in providing cool water for poor families who cannot afford to buy ice, but in keeping many persons out of saloons." President Clayton said that a number of citizens and representatives of the clergy had assured the federation of their interest in the plan, and that as soon as a definite reply has been received from the Commissioners an effort will be made to bring strong pressure to bear to have the matter favorably acted upon.

Water Company Earns \$40,651.75

Louisville, Ky.—The condensed statement of the operation of the Louisville Water Company during the month of April, signed by Auditor John S. Morris and General Bookkeeper R. H. Gardner, shows an expense of \$4,730.16 for cleaning the basin and repairing the division wall, making the total expense during the month about \$4,000 more than the expense during April, 1910. During April the total income was over \$66,000 and the net earnings \$40,651.75, or \$1,216.33 less than in April, 1910. But for the extraordinary expense due to repairing the basin the net earnings in April, 1911, would have showed a large increase over the earnings of a year before. The statement shows that 263 employees were paid \$14,569.32 during the month and that the list of permanent employees numbers 133. Two private line connections were made, two gates put in old lines and 10,468 feet of pipe laid.

Underground Lake Found in Huntsville

Huntsville, Ala.—A large underground lake from which the Huntsville spring derives its water has been discovered under the public square and extending back an unknown distance, according to Engineer Nathan Buchanan, who has been making excavations for the city. It is the intention of the city to have the lake explored, if possible, with a view of ascertaining from which direction the water comes. The water is still and deep and is seen as far back under a ledge of rock as light can penetrate. Operations are being carried on under the city with the purpose of locating the main stream that supplies the spring and tracing it out beyond the city limits. This is believed to be entirely feasible.

Double Main Water System for Fire Safety Proposed

Dayton, O.—To use the old canal basin, with the hydraulic and its various other tributaries as the basis of a double main water system for fire service, is part of a novel and interesting plan for the city's fire safety which Councilman Charles Roehm, of the Ninth ward, is working out. The Councilman's suggestions, very timely in the light of the present water predicament in Dayton, are being discussed with considerable interest about the municipal offices. Councilman Roehm's scheme was designed when the N. C. R. Company recently published an illustrated pamphlet in the interest of abandoning the canal. Councilman Roehm's plan, in brief, is to use the canal as a main conduit with tributaries and branches connecting reservoirs at various parts of the city for water with which to fight fires. The Councilman's plans would not prohibit the parking of the property throughout the city as the conduits would need but a small portion of the park space. The fact that the canal winds through the very most congested portion of the city adds much to the feasibility of Councilman Roehm's plan. Fire experts and fire insurance companies have repeatedly pointed out the necessity of double mains in Dayton and the fool-hardiness of using drinking water mains for fire fighting.

Plenty of Water for Ogden People.

Ogden, Utah.—Work on the Cold Water canyon conduit has progressed so far as to permit the final closing of the pipe line, the last juncture being made at a point on the Farr property, near the lime kiln. None of the pipe joints have been covered as yet, the excavation between lengths having been left open until each length and joint can be thoroughly tested for leaks. These tests will be made at once, after which the water will be turned in from both the old line up Ogden canyon above the confluence of Cold Water creek, and the new line up Cold Water canyon, in order that that portion of the old line between the last point mentioned and the reservoir may be thoroughly overhauled and repaired. When this has been completed the city will be provided with two separate systems, each of which may be used individually and the water from either turned into one or both. At the top of the hill near the sanitarium, both lines converge into a three-foot line, which continues to the reservoir. The old reservoir No. 1 has been re-excavated and its banks remodelled and the work of concreting it throughout will commence soon. About 2,000 barrels of cement will be used and it will require about four weeks to place it in first-class condition. The capacity will be 7,000,000 gallons, which, with 13,000,000 gallons in the new reservoir No. 2 will furnish the city with a storage of 20,000,000 gallons of water. Both reservoirs will be kept practically full for protection against fire, yet with the new system of valves and connections either may be used while the other is being cleaned or repaired. An automatic overflow has been installed which will convey the surplus water back into Ogden river.

Water Works to Charge Less

Toledo, Ohio.—Property owners will save \$7000 per year as a result of a reduction for improvements in the Water Works Department announced by Service Director Cowell. In the past the department has been receiving \$12 for making a tap in a water main and in the future the price will be reduced to \$10. Director Cowell says that about 1500 taps were made in a year, which means \$3000 less to the property owners on this item alone. The city has been charging \$9 for water meters, which meant a profit, and this price will be reduced to \$7 per meter, which is the cost price to the city. Director Cowell says that no charge will be made for water connection improvements between the water main and the curb line, which the property owners have been forced to pay for in the past.

Water Company Cleans Dry Wells With Steam Pressure

Hutchinson, Kan.—Artificial geysers are made daily in Hutchinson now. The demonstrations are the result of the work of the water company to clean out some of the dry wells just west of their plant on West Sherman street. The wells are seventy feet deep and the clay had caked and refused to let the water through. It was decided to blow the wells with steam. The wells are six inches in diameter and the steam is put down in a two-inch pipe under a 200-pound pressure. Being so far down it is able to form a strong head under the water and when the power overcomes the pressure it shoots water, mud and rocks into the air to the height of seventy feet or more, while the explosion sounds like a dynamite blast. The water company is having good success with the system and will soon have the wells in running order.

Filtration Plant Is Praised by Russian Mayor

Philadelphia, Pa.—Asserting that the fame of the Torresdale filtration plant had spread throughout Europe and that he came here to inspect it to gain ideas for a similar plant to be built in Russia, at a cost of a million dollars, Ivan Begerow, Mayor of St. Petersburg, spent more than half a day in this city, afterward leaving for Pittsburgh. Traveling incognito, the Mayor, regarded as one of the most progressive Russians in the Czar's lands, was enthusiastic over the vast equipment at Torresdale and the facilities for purifying water in such quantities. "I have visited all the larger cities of Europe," he said, through an interpreter, Frederick H. Florinsky, a secretary, "and none of their filtration plants can compare with that of Philadelphia.

United States Government Experts Will Test Water Pipes

Erie, Pa.—Experts of the United States Government Bureau of Standards are coming to this city to make tests of the local water mains to determine the extent of the action of electrolysis in the pipes. Burton McCollum of Washington has arrived in the city to take up his work, and he will soon have a force of men with him. It is expected that the active work will commence about July 1, when a survey of all water pipes will be made. The experts come to Erie at the expense of the government and they will be given all possible assistance by the local Water Board.

Plan to Instal Meters to Prevent Waste

Muskogee, Okla.—The question of placing water meters on every house receiving the service has become a live issue in city hall quarters and Commissioner Fleming has issued orders that all new taps placed must be ordered. The action of the council in deciding to comply with the recommendation of Mr. Fleming in this respect and the action of the Commercial Club in endorsing it were more or less discussed and many business men called at the water department and talked the matter over with the commissioner. In cold figures it appears that the waste of water each year runs to about a hundred thousand dollars. In his statistics, Mr. Fleming points out that 3,500,000 gallons per day for four thousand services is a heavy toll for the money paid.

City Seeks Water Supply

Talladega, Ala.—The city is quietly looking around for a source of additional water supply. The water at present piped to consumers is from a bold limestone spring in the center of the city. But limestone water is objectionable to many and it is liable to cake in boilers and machinery. Besides this the continued growth of the city will eventually demand more water than the present source can supply. Several tentative propositions are pending. One of them is to dig an immense well or reservoir north of the city where freestone water abounds and pipe freestone water from this source. Another proposition is to run the water from Talladega creek at or near Cragdale.

STREET LIGHTING AND POWER

Town in Darkness

New Castle, Del.—New Castle owes the Delaware Water Improvement Company about \$10,000 for light and water. Some days ago a conference was held and City Treasurer Manlove was instructed to pay the company \$1,500 on account. The company refused to accept the cash and ordered the electric lights to be cut out. As a consequence the streets were in darkness.

Mayor Will Push Cheaper Gas Rates

Baltimore, Md.—Declaring his intention of proceeding as rapidly as possible with the city's attempt to get cheaper gas rates, Mayor Preston states that he would consider a compromise offer from the Consolidated Gas, Electric Light & Power Company only with the advice and counsel of his proposed advisory board of citizens and the Board of Estimates. For the present it is the intention of the Mayor to proceed with such investigations incident and preparatory to a regular hearing on the question before the Public Service Commission, and any proposition which the company might find agreeable as a compromise would have to originate with the Company.

Give Prize for City Light Design

Columbus, O.—J. William Thomas, a member of the firm of Howell & Thomas, architects, was awarded the \$50 prize offered by the retail merchants for the most appropriate design for a cluster light standard for the new system of lighting that is to be installed throughout the business section of the city, and for which the City Council has already made an appropriation. Mr. Thomas' design is built on the lines of a Greek cross. Four stems, starting from the base, gradually decrease in size, until the brackets which bear the lights are reached. Honorable mention was given to four others.

FIRE AND POLICE

New Fire Net Gives Satisfaction

Schenectady, N. Y.—The new fire life net, constructed by Captain Alberts, of the Hose Depot on North College street, has been given its first practical test in the rear of the Central Fire Station in the presence of Mayor Durlea, Commissioner McDonald, and Chief Yates. Bags of sand, weighing 130 pounds, were thrown from various heights and caught with ease in the new net. A feature of the net is that it can be built for about \$17, whereas the ordinary net costs from \$75 upwards. All who witnessed the demonstration were well pleased.

Birmingham to Have Twenty-four Motor Fire Engines

Birmingham, Ala.—With the placing of an order for nine Seagrave combination hose and chemical wagons, and the making of arrangements for nine more to be ordered a few months later, Birmingham promises to take the lead among American cities in the adoption of motor fire apparatus. The city already has in commission three Sea-



Courtesy Birmingham Age-Herald.

TYPE OF COMBINATION WAGON ADOPTED FOR BIRMINGHAM

grave wagons similar to those ordered, two Webb machines and one auto fire engine. President Culpepper Exum, of the Board of Commissioners, figures that the efficiency of the Fire Department will be increased 40 per cent. and its running expenses reduced \$30,000 a year. The illustration shows one of the combination wagons in front of the old City Hall at Woodlawn, a suburb recently annexed to Birmingham.

Chief's \$3 Investment Brings Home \$5,000 Prize

Dallastown, Pa.—An investment of \$3 in a book of chances on an up-to-date hook and ladder truck taken by Leo Hollinger, chief engineer of the Rescue Fire Company, of Dallastown, at the Altoona Firemen's Convention, has won the \$5,000 prize.

Visit Neighboring City to See Test of Auto Truck

Paterson, N. J.—Commissioner Milson, of the Board of Public Works, and Fire Chief John Stagg, both of this city, were among the guests at the trial of the new auto truck in Passaic, and they were as pleased as the Passaic people with the manner in which the machine worked, inasmuch as a truck of the Paterson Department is to be converted in a similar manner. The machine was given the hardest kind of a test, in that it was driven over a 14 per cent. grade which was muddy after the rain of the preceding day.

Auto Engine Tested

Wilmington, Del.—For two and three-quarter hours the Red Streak of the Water Witch Fire Company was put through a test which caused the firemen present to wonder how the engine stood it, and at the finish, they almost shouted as W. M. Johnson, representing the National Board of Fire Underwriters, of No. 135 William street, New York, announced that it was the finest test of a like sized apparatus he ever held.

GOVERNMENT AND FINANCE

Reform Councils for Two Cities

Harrisburg, Pa.—The bill to provide small councils for the second-class cities of Pittsburg and Scranton was approved by Governor Tener. Under the terms of the bill, which was agreed to in the form of a conference committee report on the last day of the Legislature, the Councils of the two cities are ripped out of office and for Pittsburg there is provided a Council of nine, to be paid \$6,500 a year each, and for Scranton five, to be paid \$2,500 a year each. Governor Tener has appointed nine anti-Magee residents of Pittsburg to serve as members of the single Council of that city, as provided by the second-class city act. The Councilmen will serve until the first Monday of next January, their successors to be chosen at the November election. It is said that some members of the old Council in the city of Scranton will protest against the enactment on the ground that it is unconstitutional, and the matter may go to the Supreme Court.

Could Protect Funds of City by Publicity

Baltimore, Md.—It is advocated that a system of periodical financial statements by the city would protect its funds. Recently an employee of the city was charged with embezzling \$67,000. If the City Register, like the State Treasurer, was required to publish monthly statements of the amount of city cash on hand in each of the depository banks this could not have been possible. Monthly statements by the city as to the amount it claimed to have in each bank would naturally have been watched closely by the banks. If at any time in the period of two or three years during which the defalcations had occurred the city had claimed more cash in one bank than was actually on deposit, the bank would naturally have raised an objection. An objection would have started an investigation, and the thieving would have been stopped long before it was.

Commission Government Elections

Norwich, Conn.—By a majority of 387 the electorate turned down the commission form of government. Norwich is the first city in the State where the proposition has been put to a vote.

Mobile, Ala.—By a majority of 829 out of a total vote of 3,612 the city of Mobile adopted the commission form of government.

Kingsville, Tex.—In the election on the proposition of incorporating the city under a commission form of government, with Charles H. Flato for Mayor and Ben T. Laws and E. F. Wier for Commissioners, the proposition was defeated by two votes, the vote standing 125 for and 127 against.

Missoula, Mont.—By a majority of 279 votes the Des Moines commission form of government was adopted.

Ordinance Provides for Equitable Basis in Assessments

Spokane, Wash.—A new basis for the assessment of the cost of public improvements against the property benefited is provided for in a proposed ordinance drawn by the city legal department. The measure is based on the new State law which went into effect June 8. Instead of dividing the property 150 feet back from the street into three zones 50 feet each wide, as at present, for assessment purposes, the new law divides it into five zones or 30 feet each. At present the three 50-foot zones pay, respectively, 50, 30 and 20 per cent of the cost of the improvement. Under the new law the five zones will pay, respectively, 45, 25, 20, 10 and 5 per cent of the cost. This arrangement of assessment makes the strip of property fronting on the street to be improved and the property farthest away from the street pay less, while the property in between pays more than at present. The proposed ordinance provides, also, for the day labor system of doing improvement work, although bids by contractors on all jobs are required, whether the improvement is to be by day labor or not, to be decided after the bids are in. An important provision is the one requiring that the City Engineer's estimate shall be the basis for making up the assessment roll in cases where day labor is employed, thus allowing the assessment roll to be made up and passed before the work is completed.

STREET CLEANING AND REFUSE DISPOSAL

Would Clean City at Less Expense

Butte, Mont.—In the programme of economy in the Health and Street Departments that the present administration will attempt to inaugurate, municipal ownership of the city teams is to be a feature. A statement has recently been prepared by the City Clerk and submitted to the Mayor, showing that the cost of a team to the city is \$3.50 per day. Under the proposition of municipal ownership it is said the teams can be maintained for \$1 a day or less. The initial cost, that is, the cost of purchasing the teams and providing a stable for them, also is estimated. It is planned to purchase something like 25 teams. A more progressive and advanced plan now under advisement is that of furnishing the Fire Department with auto propelled equipment and using the fire horses in connection with the work on the streets and alleys. The assistance of the street car company has been asked. The more progressive plan contemplates a central point in the city to which all garbage and refuse gathered in the streets and alleys may be hauled and the hauling of this refuse to the city dumping grounds or crematory in ore cars, operated in the early hours of morning over the street railroad. The plan is not only feasible but will effect a saving of one-half over the plan in vogue.

Will Try New Idea in Street Cleaning.

Altoona, Pa.—Determined to make the forces and means at his command as effective as possible in keeping the streets of the city clean during summer Superintendent of Highways W. H. Fields has put in service half a dozen service patrol carts with cans, which will be used in the hand sweeping about the city. Accompanying each cart will be three cans, making 18 in all. One of the sources of complaint heretofore in connection with the street cleaning operations has arisen from the fact that the dirt has been swept on piles against the curb, where it has afterward been gathered up by the wagons and hauled away. In the mean time several hours were likely to elapse during which the dirt was apt to be blown about by the wind, causing much annoyance. Under the new system the men operating the carts will sweep until the can is full, and then it will be set to one side and another can used, the wagon in the mean time making the rounds and gathering up the cans. The cans are 24 in. high and will hold about two bushels.

Garbage Dump Making Trouble.

Williamsport, Pa.—For the fourth time within two weeks No. 2 Engine Company has been called to the garbage dump west of the Citizens' Electric Company. The frequent calling out of the company will probably result in the matter being taken up by Councils at the next meeting. City Solicitor Cummings was summoned to the dump and looked the place over thoroughly. Every time that the dump has broken into flames Jonas M. Fisher of the Citizens' Electric Company has asked that the engine and men be sent down and they have always responded. When they were busy with other work he would threaten to sue the city if they did not come. Chief Stryker is incensed over the matter. He says that the engine uses thousands of gallons of water and that even this will do no good, as the fire will soon break out again. The only thing to do, according to the chief, is to let the fire burn until it burns itself out, setting a watchman to guard it day and night. The flames are smouldering many feet under ground and cannot be reached by the hose. The chief is of the opinion that should there be many more calls of a similar nature the reservoirs will undergo a serious drain, and if there should be a drought the city may suffer.

Refuse to Pay For Cleanup

Greenfield, Ind.—A few weeks ago during a cleanup day in this city the mayor and street commissioner employed several men and teams to dispose of the rubbish and the commissioner's orders amounting to about \$50 were cashed for different persons by local merchants, who later presented the bills to the council, which allowed them. The clerk and treasurer refuse to issue or pay the warrants, contending they are illegal, although the city attorney has given a different opinion. They were advised by the state board of accounts that there is no fund from which to draw these bills and that they would be personally liable.

RAPID TRANSIT

Plans to Tax Street Cars

Topeka, Kan.—The taxing of street cars and all pole lines in Topeka is embodied in an ordinance now being drawn up by the city commissioners. It is planned to tax every street car in the city at \$25 each. The poles owned by the telephone, telegraph and electric light companies will be taxed at about 50 cents each. These figures have not been settled, but they seem to be the figures now chosen by city officials. The revenue from the street railway is proposed in order that the city might receive some sort of a tax from this company. The original franchise gives the city of Topeka nothing from the Topeka Railway Company for the operation of their lines in this city. It is figured by some of the commissioners that a tax of \$25 a car will be a means of gaining a revenue. The law provides that the city shall receive a certain per cent of the gross earnings, but nothing has been turned over to the treasury since the franchise was accepted many years ago.

Will Electrify Line on Getting Franchise

Salt Lake, Utah.—Plans are on foot to electrify the Salt-air line as soon as the City Council grants a franchise to come down Main street. Under the new arrangement, instead of discharging 2,500 passengers all at once at the West Second South street depot, 200 can be brought back from the lake at a time on interurban cars, and there will be no congestion in transferring to the city cars at various points along South Main street.

City Ownership of Street Railway Will Be Submitted to Vote

Detroit, Mich.—Again Detroit is to wrestle with the municipal ownership of street railways question. Right in the midst of the hot summer Mayor Thompson has announced that he wants the question submitted to the people this fall. A majority of the aldermen are with him on the proposition, and the question of the city buying the D. U. R. would undoubtedly be placed on the ballots at a special election, if it were not for the fact that legal steps will be taken to prevent such action by the city officials. Under the original home rule act, passed by the Legislature of 1909, petitions were circulated for the submission of the questions and the required number of names secured. But a suit was started by property owners to prevent the question going to the people and it was successful, the Supreme Court holding that no charter could be amended piecemeal under the home rule act until after there had been a general revision by a charter convention. At least that seemed to be the opinion of the Court, although a dozen interpretations were read into the decision. Corporation Counsel Hally contended that the defect in the home rule act could be cured by amendment, and he succeeded in securing the amendment he wished at the last session of the Legislature. But while the Legislature was doing that it also fixed up the act so that it will be almost impossible for the people to secure the submission of amendments by initiatory petitions, the law now compelling the securing of 25 per cent of the registered vote signed at the polls. But Mr. Hally contends that the aldermen may submit any question to the people at any time. Therefore the steps for the submission are now being taken in the Council. But the gentlemen who successfully fought the submission of municipal ownership before insist that no amendment to the home rule bill was sufficient to enable piecemeal charter amending and they are prepared to go into court and fight the proposition over again.

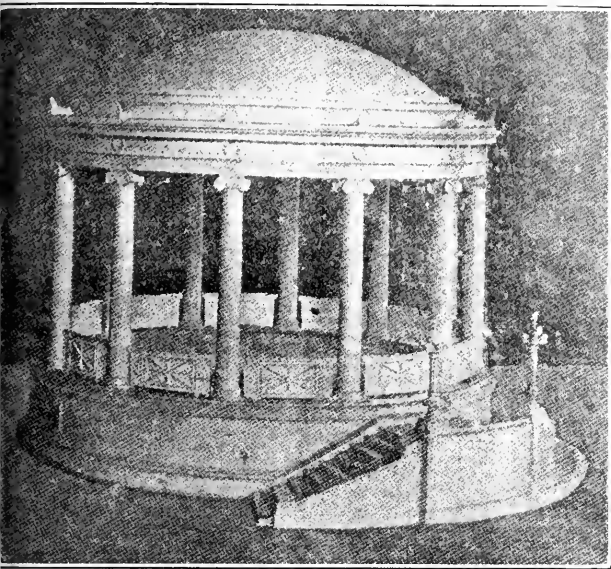
Electric Road to Accommodate Commuters

San Francisco, Cal.—It has been announced that preparations are being made for an electric road running between San Mateo and San Francisco, and that the plans would undoubtedly materialize, providing the proper sentiment was found to exist relative of a right-of-way through the cities of San Mateo and Hillsboro. The necessary capital has been secured for the undertaking, and it is proposed to establish express train service and grant commuters' rates. Those behind the project feel confident that there will be little difficulty in securing the desired right of way. This is a line that has been long desired by the residents of San Mateo.

MISCELLANEOUS

Band Stand for a Boston Park.

Boston, Mass.—A miniature model in plaster of the marble band stand that will be erected on Boston Common as a memorial to the city's benefactor, George F. Parkman, is on exhibition in Mayor Fitzgerald's office and has met with general approval. The stand will be built several hundred feet southwest of the existing structure, near Flagstaff hill, and the board of health has promised to take down the convenience station there and build another underground. The stand and pavement around it will cover about 3,000 square feet. The superstructure will be of pink marble and



MEMORIAL BAND STAND FOR BOSTON COMMON

the base of granite. The ceiling and floor will be inlaid with marble and there will be 12 perforated pillars of bronze. The architects, Derby, Robinson & Shepard, who won in the competition, have wrought in the spirit of the early Roman style, that of plain, chaste and delicate outlines, without a trace of modern ornamentation. The City Council appropriated \$50,000 from the Parkman fund several months ago for the band stand and other improvements for the Common. The stand will cost about \$25,000.

Playground Commission

Schenectady, N. Y.—Mayor Charles C. Duryee has decided to appoint a committee of five prominent citizens to investigate the subject of municipal playgrounds and report to him upon the advisability of working out a comprehensive plan for the establishment of such playgrounds and the enactment of the legislation necessary to establish them. The appointments will be made shortly.

Will Push Harbor Development of Chicago

Chicago, Ill.—Chicago harbor development has been stimulated following action by the Council when a resolution was adopted by unanimous vote directing the Harbor Committee to proceed without delay to draft an ordinance. Ald. Charles M. Foell, Republican, who has been pushing the harbor proposition for years, offered the resolution, which called attention to the enabling legislation obtained at Springfield for an absolute municipal ownership and controlled harbor. The tonnage of the port of Chicago proper has been declining annually for the last ten years or more, while that of all the other principal ports on the great lakes has been rapidly increasing. The Chicago Harbor Commission after a thorough and exhaustive study of the leading American and European ports, pointed out Chicago's inadequate and neglected harbor facilities as one of the principal causes of this decline, and recommended the immediate construction of piers extending into Lake Michigan as an indispensable means of rehabilitating the lake commerce.

Many Cities Plan Exhibits for Big Municipal Congress

Chicago, Ill.—Plans for the International Municipal Congress and Exposition, which will be held in Chicago next September, received a big boost last week when nearly sixty cities accepted invitations to participate in the big event and send exhibitions. The cities epitomize the enthusiasm and co-operation which is being shown in the congress. Controller William A. Prendergast, of New York, will contribute an address on municipal financial systems. His acceptance of the invitation has been received.

Prizes for Well Kept Lawns.

Cincinnati, O.—For several years the Hyde Park Business Club has arranged a contest and awarded prizes for the best kept lawns. This has induced individual effort and has resulted in producing many beautiful lawns. This year the sphere of influence is to be extended. Individual contests will be dropped and instead the unit to be considered will be a whole square, including both sides of the street between the nearest intersecting streets.

Mayors Will Gather to Honor Spokane's Executive

Tacoma, Wash.—Mayor W. W. Seymour is arranging for a gathering of the chief executives of all the cities west of the Cascades and a number of those east of the mountains at Seattle in June, in honor of Mayor Hindley of Spokane. The senior class of the University of Washington has chosen Mayor Hindley to preach the baccalaureate sermon, he having been a Congregational minister before entering political life last spring. Recently Mayor Seymour of Tacoma and Mayor George W. Dilling of Seattle decided that it would be a graceful compliment to the Spokane executive for a number of the mayors of Washington cities to attend.

Municipal Baseball Park is Proposed

Taunton, Mass.—Councilman Joseph L. Anthony is fostering a plan for a municipal baseball park for the use of schoolboy teams. Mr. Anthony put the plan before several of his brother members at City Hall after a meeting a day or two ago, and declared that if there was no law that stood in the way it would be a good investment. It would not be necessary to buy a lot, but as the councilman thinks, a place could be secured at a reasonable cost for the high school team on the days when they have the games and for the juvenile school organization at other times, the dates to be secured by application to the superintendent of schools or whoever might be designated in charge.

City Improvement Plans Exhibited

Albany, N. Y.—Drawings of the plan of Architect Marcus T. Reynolds, chairman of the Albany 1916 committee on river front improvement, have been placed in the office of William B. Jones, of the Chamber of Commerce, for inspection. President McKinney is expected to name a special committee of three within a few days to study the plans and report on them. The executive committee of the Albany 1916 movement, for which the plans were prepared, will also pass on them and report to the general committee. A new feature of the plans is the suggestion made for the acquisition of the block bounded by Broadway, Steuben, Columbia and James streets as a traffic square and trolley terminal. A circular plaza is provided for at the foot of State street, about which the trolley cars will circle. This will include the site bounded by State street, Broadway, Quay street and Hudson avenue. A system of concrete docks is proposed in the basin from Maiden lane to the steamboat square, with covered sheds and freight facilities. As these facilities are needed they can be extended southward. A sewage disposal plant is provided for to receive the sewage from the northern section of the city at the north end of the basin. This plant is to be covered by a little park. An ornamental lighthouse is provided for at each end of recreation pier. The south end of the present pier is to be cut away and a larger entrance made to the basin at the foot of Maiden lane for the entrance of the Troy boats. A system of lateral docks is provided for in the basin from Maiden lane south to the steamboat square, with covered sheds and freight facilities. A platform is to extend from the foot of State street to the recreation pier, curving to the north and run parallel to the Maiden lane bridge.

Bonds for Playgrounds

Columbus, O.—Columbus and other cities that take pride in their playgrounds and civic centers can rejoice over the action of the Governor in signing the bill legalizing bond issues for playground purposes and for recreation centers. The bill corrects an omission in the law by allowing councils to issue bonds for the above purposes. In Columbus the recreation bureau has been crippled for funds owing to the legal defect and has been compelled to postpone the opening of many of the summer playgrounds, bath houses and various civic centers. Money will be now available.

Children's Court Plan is Approved

Richmond, Va.—As a substitute for an ordinance referred providing for holding a special term of the Police Court in the afternoon twice a week for the trial of juvenile offenders, the Council Committee on Ordinance, Charter and Reform has recommended an ordinance strongly recommended by the Juvenile Protective Association and several other societies, which conforms to State laws recently enacted with regard to delinquent children. The first clause provides for the appointment of a special probation officer, preferably a woman, though the ordinance does not so state, the salary being placed at \$1,200. The second clause provides that the judge of the Hustings Court may designate three police officers for special service as probation officers in carrying out the work outlined, this power having already been given to the judge of the Hustings Court by State law. The third clause provides that in order that no child under seventeen years of age, when arrested for any offense, shall be confined in jail previous to trial, the Finance Committee is empowered to enter into a contract on a per diem basis, for the detention and care of such children, previous to trial, with some approved home of detention or charitable society having such powers under its charter. The fourth clause provides that the Police Justice of the city of Richmond shall hold a special session of his court every day at noon, whenever necessary, for the hearing of juvenile and non-support cases.

Deep Channel Plans Ready

Philadelphia, Pa.—Plans and specifications for the 35-foot channel from Philadelphia to the sea, the United States engineers announce, have been completed and proposals for starting the work on the Tinicum and New Castle Ranges will be opened soon, by Major Herbert Deakye, United States engineer in charge of the deeper water improvements on the Delaware river and bay. The 35-foot channel project will insure deeper water and enough to float vessels of all sizes bound to and from Philadelphia's ports necessary for the increasing commerce.

Museum Buys Vinton Canvas

Boston, Mass.—Frederick P. Vinton's "Gray Landscape," painted in France several years ago and before he had practically abandoned his landscape work to devote himself to portraiture, has been purchased by the Boston Museum of Fine Arts. This is one of the first paintings to be bought with the fund of \$200,000 set aside for the purchase of pictures when Jean Guiffrey came over from the Louvre Museum to take charge of the department.

Experiments to Be Made in Planting Foreign Trees

Crowley, La.—The Rice Experiment Station has received fifty varieties of trees and shrubs, some of which are for ornamental purposes and others fruit-bearing trees, from the Department of Agriculture. They have been set out at the station with the object of ascertaining their adaptability to the soil and climate of the gulf coast. The Department of Agriculture will distribute samples of such of the trees and shrubs as are found suitable to this climate and soil.

No Rubber Stamps For Councilmen

Spokane, Wash.—The city commissioners have concurred in Commissioner Fassett's recommendation that the rubber stamp and pencil be abolished by city officials for signing papers which become a matter of record. Commissioner Coates is granted a special dispensation in being allowed to have his chief clerk sign the commissioner's name with a rubber stamp, by certifying it with his own name underneath.

Weed Campaign Ordered by Law

Spokane, Wash.—County officials, with assistance of the prosecuting attorney, will try to do away with the weed nuisance. After June 9 it will be a misdemeanor, punishable by a fine or imprisonment, for a property owner to allow noxious weeds to grow upon his property. Under the old law, which is still in force, the road overseer of each township is required to notify property owners to cut down and destroy the weeds growing on their property, such as Russian thistle, tumble weeds, "Jim Hill" mustard, cockle burrs and other weeds which may be detrimental to the agricultural interests. Upon the failure of the property owner to comply with the notice, the overseer is required to destroy the weeds himself and send a bill to the property owner. Upon failure of the property owner to pay the bill within 30 days, the overseer may present his claim for labor to the county commissioners, whereupon the claim is paid and taxed against the property, to be collected with taxes for the ensuing year. It also is a misdemeanor for the road overseer to fail, neglect, or refuse to enforce the law.

Concrete Foundation of Bridge Floats

Kansas City, Kan.—West Kansas avenue is carried across the Kaw River on a typical long span steel highway bridge, supported on steel caissons filled with concrete. Two of these steel caissons at a point well above flood waters began recently to swell in an unaccountable manner, until finally a sheet in one cylinder burst open. This was at first attributed to the action of severe frost, but it was soon observed that the contents of this cylinder was disintegrating with the jar of traffic on the bridge and gradually falling out of the rent in the steel sheets and floating away like pumice stone on the surface of the river. When a cavity of about 10 cubic feet was made in this way the authorities took steps to repair the piers. At the same time they started an investigation of this floating concrete, which is still in progress. While awaiting a full report it is interesting to note that on the bank of this river, not 500 feet from this bridge, is a large factory engaged in making a soap which floats, and its discharge sewer flows out almost under the bridge and at certain stages of the water deposits a white limelike sludge along the banks, which is often piled knee deep. A sample of this peculiar material was sent to the MUNICIPAL JOURNAL by Benjamin Brooks. The material is light, easily friable and somewhat resembles pumice stone and has few properties in common with ordinary concrete. A small piece thrown in water will float for a minute or two, gives out bubbles of air and finally sinks.

City Appropriates Money for Park Fetes

Rochester, N. Y.—Money for the water carnival in Genesee Valley Park on July 12, during the Shriners' convention, and for the big musical festival in Seneca Park in August, was appropriated by the Park Board at the regular monthly meeting. The sum set aside for the musical festival was \$1,500 and \$1,300 was the amount appropriated for the water carnival.

Mayor Favors Tax League and Investigation

Tacoma, Wash.—The proposition to organize a tax league and appoint a committee to investigate tax conditions of the city has been indorsed by Mayor Seymour. His indorsement of the plan was given to a committee from the Central Improvement League, which started the movement for the organization of a tax league. The committee asked Mayor Seymour to appoint at once a committee of five to investigate the city's taxes, budgets, levies and general taxation methods and make a report on its investigation. The Mayor was adverse to appointing such a committee at once. It would be difficult to find men willing to serve on such a committee without compensation, he said, and suggested that before a committee be appointed to begin the exhaustive work necessary to start investigating the city's books and taxation records that a fund be raised for payment of the investigating committee members. The Mayor also asked that other representative bodies and organizations be interested in the plan before requesting that he appoint the committee to investigate general taxation conditions in the city.

LEGAL NEWS

A Summary and Notes of Recent Decisions—Rulings of Interest to Municipalities

Defective Street—Injury—Sufficiency of Notice

City and County of Denver vs. Perkins.—A notice of injury to a traveler sufficiently designated the place in the street where she was injured as being on a named street, between two other streets, "where the sidewalk intersects the alley and where a curbing was being put in," and was not insufficient for not stating the particular side of the street.—Supreme Court of Colorado, 114 P. R., 484.

Extension of Water Mains—Indemnity

Town of Claremont vs. Rand et al.—An instrument reciting that the signers thereof agree to guarantee the 8 per cent. required by a town to extend a water main, executed after the town authorized the extension if the people along the line guaranteed 8 per cent. on the expense of extension guarantees an annual rental of 8 per cent. on the expenses of the extension. An action in assumpsit on the instrument against the signers thereof to recover the difference between the annual rental and the 8 per cent. of the cost of the extension is an adequate remedy and the town may not sue in equity.—Supreme Court of New Hampshire, 79 A. R., 689.

Water Company's Contract—Changing Rates

City of Independence v. Independence Waterworks Co.—A water company's charter constitutes a contract between the company and the city served which the city cannot alter without the company's consent. Where rates charged by a water company can be changed only by agreement between the company and the city, the company will be restrained from charging an increased rate agreed to by the city on condition that no meter rental charge be made, where the company refuses to abide such condition.—Kansas City Court of Appeals, 135 S. W. R., 956.

Private Fire Alarm Company—City Wires

Foy vs. City of New York et al.—The fire commissioner of the city of New York, in the absence of statute prohibiting it, has power to permit the Manhattan Fire Alarm Company in the discharge of its business to connect its wires with the city fire alarm telegraph system, so as to communicate an alarm of fire directly to fire headquarters, instead of compelling notice to be given by pulling the signal in the fire alarm box in the usual way, thus saving time, this not being the loaning or granting of property by the city to a private corporation.—New York Supreme Court, 129 N. Y. S., 72.

Mandatory Ministerial Duties

Mayor and Councilmen of City of Pawhuska vs. Pawhuska Oil & Gas Company et al.—The Constitution providing that after a franchise has been voted to be granted by a majority of the qualified electors voting thereon the same shall be granted by the proper authorities at the next regular meeting of the legislative body of the municipality, imposes upon the Mayor and Councilmen a mandatory ministerial duty. The writ of mandamus is available to require the performance of such duty.—Supreme Court of Oklahoma, 115 P. R., 353.

Municipal Contracts—Labor Laws

Ewen v. Thompson-Starrett Co. et al.—That the portion of a contract for the erection of a building for a city which provides for the furnishing of the stone work is sublet does not affect the question whether the work on the stone, which is done in another state, is subject to Labor Law regulating the wages to be paid workmen on public works or materials to be used in connection therewith. Labor Law, providing that workmen on public works or material used in connection therewith shall be paid the wages prevailing in the locality within the state where the public work in its completed form is to be situated, does not apply to work done out of the state on the material.—New York Supreme Court, 128 N. Y. S., 595.

Public Improvements—Bonds—Injunction

Clouse et al. vs. City of San Diego et al.—San Diego City Charter provides that the Common Council shall determine the necessity for public improvements and that where the ordinary revenues are insufficient bonds may be issued, the proceedings for which shall be in accordance with the general laws relating to municipal bonded debts, but the charter is silent as to how money so raised shall be spent. Held that in the silence of the charter, the expenditure of the money was not a "municipal affair" within constitution, providing that city charters shall be controlled by general laws, "except in municipal affairs," so that the general law followed as to the mode of issuing the bonds for the improvement. Laws 1901, was controlling, which forbids spending such funds, except on competitive bidding.

In an action by taxpayers to enjoin the making of public improvements for which city bonds had been sold otherwise than by contract, let by competition, an answer which charges that plaintiffs were contractors acting in collusion in order that some of them might obtain contracts for the proposed work and profit thereby, but which wholly fails to plead any facts showing collusion, is bad on demurrer.

The mere fact that a method of paying for municipal work which is contrary to the statute might be expensive and wasteful and might preclude responsible contractors from securing it gives a citizen of the municipality a sufficient standing to maintain an action for an injunction to prevent the illegal expenditure.—Supreme Court of California, 114 P. R., 573.

Streets—Extent of Dedication

Provident Trust Co. vs. City of Spokane.—A deed of dedication of a town plat recited that the grantors dedicated as public highways "the streets as marked and described on the foregoing plat," reserving "the strip of land twenty feet in width marked 'R. R.' for railway purposes," etc. Such strip occupied the space between two streets, both named and definitely marked on the plat as being a certain width each; the boundaries of the intervening strip being also definitely marked and its width being also shown on the plat. It appeared that in grading one of the streets the city did not enter on the strip, but constructed a retaining wall along the line thereof. Held, that the strip was not dedicated as part of the streets. An intention to dedicate will not be presumed, but must clearly appear. If the meaning of an instrument is doubtful, the practical construction given it by the parties will be accepted by the courts.—Supreme Court of Washington, 114 P. R., 1030.

Opening Surface of Streets—License Fee

City of Buffalo vs. Stevenson.—Buffalo ordinances providing that before any permits for the opening of a pavement shall be granted the applicant shall pay to the city treasurer \$5 for every such opening, to be credited to the street repair fund, and that any person who opens any street or alley without permission, or who shall fail to comply with any of the provisions of this section, shall forfeit and pay a penalty of \$10, is not in violation of constitution prohibiting the taking of private property for public use without just compensation, for the streets are within the control of the municipality.—New York Supreme Court, 129 N. Y. S., 125.

Boundaries—Extension—Procedure

McBee vs. Town of Springfield et al.—Since by Constitution as amended June 4, 1906, cities and towns are authorized to provide the manner of exercising the initiative and referendum powers in municipal legislation, except that not more than 10 per cent. of the legal voters may be required to order the referendum nor more than 15 per cent. to propose any measure by the initiative, which section is self-executing, no enabling act being required to put it into operation, the general law requiring cities and towns to provide by ordinance or charter the manner of exercising such powers is advisory only, and where the Town Council adopted the manner prescribed by Laws 1893, requiring a petition for change of boundaries to be signed by not less than 20 per cent. of the qualified electors, and submitted the question to the voters as provided by such section, this was a reasonable exercise of the power.—Supreme Court of Oregon, 774 P. R., 637.

EXHIBITS AT AMERICAN WATER WORKS CONVENTION

The exhibits made in connection with the 31st annual convention of the American Water Works Association, June 6-10, were displayed in the corridors and adjoining rooms of the Powers Hotel. The main corridor is perhaps 60 feet long and 20 feet wide. On both sides of this were tables on which the various devices were shown. The main corridor leads into an office or lobby perhaps 60 feet square. On two of the sides of this were arranged the exhibitors' tables and in two large rooms opening from the lobby besides. The unusual publicity given the exhibits had its advantages and disadvantages. Many people passing by the hotel were attracted by the show, so that in a way it had a popular feature and presumably accomplished some of the ends of a municipal budget exhibit. The many tables, covered with water meters of all sizes and descriptions, must have brought the matter of water conservation forcibly to the minds of many people who had hitherto given it little thought. Notwithstanding the publicity there was ample time and room for members of the association to study the devices they were interested in without serious interruption.

Water Meters

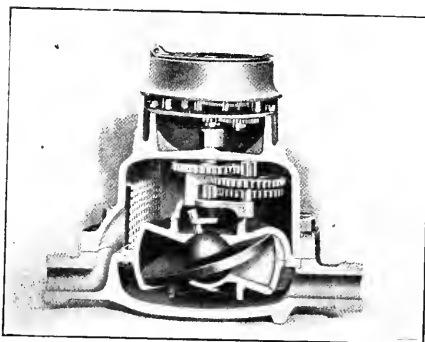
Water meters were the appliances most in evidence; perhaps the tables holding them occupied a third of the total floor space. Altogether, eleven meter manufacturers were represented. The total number of exhibitors of all devices was 53. In this account are not included the Pitometer and Venturi meter, although they, too, may be used for individual installations. The importance of the meter question was indicated also by the number of meter accessories, such as meter boxes, meter seals and meter testing machines. All sizes of meters from smallest to largest were shown. Complete meters were shown and meters taken apart showing the working mechanisms. In other instances the casing was cut away, showing sectional views. Photographs, diagrams and reading matter were also used to explain the strong points of each. The fact that the meters were not new in design—the writer only noticed one that was actually new—did not prevent them from being objects of considerable interest to the members of the association. In fact, there seemed to be a strong desire to learn details of design and construction of different meters, with a view to consideration of questions

of comparative accuracy and cost of maintenance.

Reproductions and brief descriptions of many of the meters shown follow.

Disc Meters.—A disc meter is a meter in which a hard rubber disc nutating in a chamber receives a definite quantity of water between the disc and the bottom of the chamber. This unit of water as the disc nutates is passed on around as chamber and out at an orifice near the point where the water enters. Nearly all house meters are disc meters.

The Badger meter is made by the Badger Meter Manufacturing Company, Milwaukee, Wis. One of the chief merits claimed for this meter is the frost bottom, which consists of a plate of soft gray cast iron, thoroughly galvanized and rust proof, with a low breaking strength of 600 pounds. In case the meter should be frozen the ice breaks the bottom plate, thus relieving all strain before the pressure has reached a point where it is dangerous to the interior parts. The bottom plate can be renewed at a cost of a few cents. The frost bottom is held firmly



BUFFALO

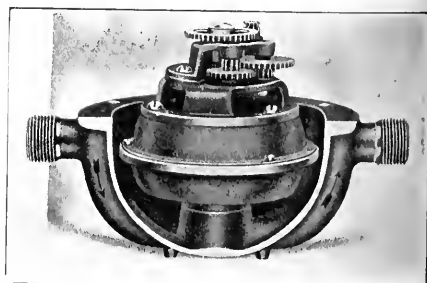
in place by means of four strong toggle bolts, which, when removed, expose the bottom of the measuring or disc chamber. All parts of the meter, except the bottom, are constructed of hard tough bronze. The intermediate train gears, pinion gears and pinion rods are of phosphor bronze.

The Buffalo Meter Co., Buffalo, N. Y., exhibited their American and Niagara meters. The measuring chamber of these meters is made of the best bronze and cast and machined in halves. It rests upon a seat formed in the base, and upon opening the meter at the bolted flanges may be at once removed. It may be slightly rotated upon its seat so as to cover more or less of the outlet in the base and thus regulate the meter for unusual water pressures. The disc is made of hard rubber nearly as light as water. No reinforcements or extra parts are used to increase its weight, but the requisite strength is secured by making the central ball large, to provide ample bearing surface and by making the flat web thick. The intermediate gearing is accessible on removing the outer casing. The gears turn on long phosphor bronze pins, mounted with the driver and disc control upon a simple removable plate. Each gear is composed of a large driven gear and a small driving pinion; the pinion is fluted, pressed into the fluted hole of the gear and riveted, so they will not come apart nor the pinion turn in the gear. The tooth faces are broad and the gear circumferences large. Two kinds of indicators are in general use—the

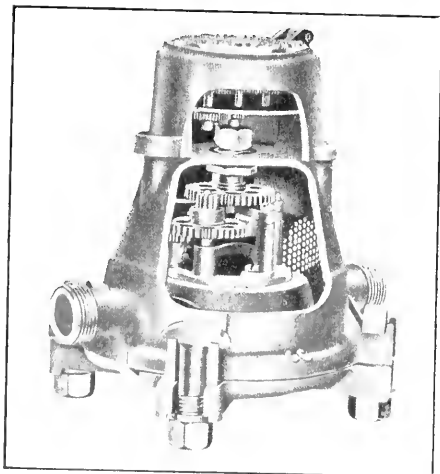
Standard, which has a continuously moving mechanism, and the straight reading, which has an intermittent mechanism. Both kinds are accurately made and positive in their action. The entire outside casing of the Niagara meter is made of a fine grade of cast iron carefully galvanized. This is the only feature that distinguishes the New Niagara from the American, as all other parts are alike.

The Gamon Meter Co., Newark, N. J., exhibited their Watch Dog meter. In this meter the area of the measuring chamber has been increased until for one cubic foot of water passed the piston makes only 235 revolutions. The measuring chamber is machined with great care and the piston disc is fitted with great accuracy, some of the clearances being only one five-hundredth of an inch. The disc has a roller thrust bearing holding it in position with the least friction. The joint formed between the pedestal in the lower casing and the disc chamber hub is an ordinary metal joint, screwed into a 3/4-inch pipe tap thread, the land around the top of the thread being about one-quarter of an inch. This small area, to be made water-tight in connection with a double bottom in the disc chamber, renders it absolutely impossible to cramp the piston at any time. To assemble or take the disc chamber out it is simply necessary to use a screwdriver as a lever and unscrew or tighten the joint. The chamber is circumferentially free from the casing, allowing a free passage for water. The strainer fits tightly over the pedestal and against the wall of the casing, having an effective area of over twenty-six times the area of the pipe, heavy particles falling by gravity to the bottom of the containing case. The gear train has all the bearings bushed with hard vulcanized rubber and has a reduction of 168 to 1. The stuffing box is internal and kept in place by the pressure by a hard rubber plug ground into a bronze bearing. The higher the pressure the tighter the joint. The flange bolts within the casing. The joint is formed have a device which distributes the pull upon four points instead of under the head of the screw only, thus avoiding springing.

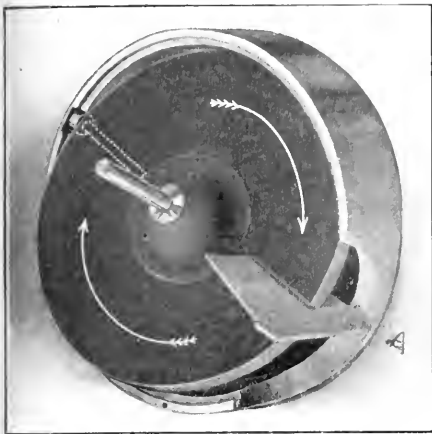
The Neptune Meter Company, New York, exhibited their Trident meter. If one characteristic feature of this old and well-known meter were to be picked out it would be the friction roller bearing which resists the circular thrust of the disc-piston. That is, in order to prevent the revolution of the disc which interferes with the regularity of the nutations, the disc is held in position by a pin located opposite the ports. This pin is provided with a roller which moves in a groove in the disc casing. By avoiding friction the accuracy of registration is increased. This roller device adds to the



GAMON



BADGER

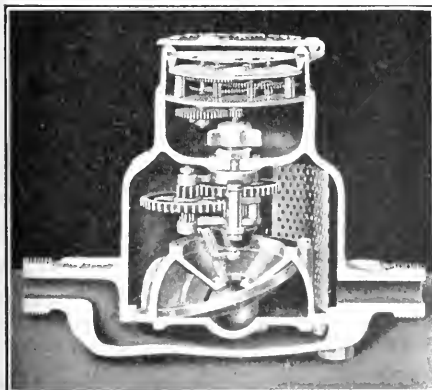


DISC OF TRIDENT

life of the disc-piston, which, in the Trident, is said never to break. The gear train consists of heavy bronze castings accurately machined. The driving pinion spindle revolves in a long hard-rubber bushing. The meter is provided with a device which prevents damage from freezing; a light casting cheaply replaced breaks and relieves the pressure.

The Pittsburgh Meter Company, East Pittsburgh, Pa., exhibited the Keystone disc meter. The illustration shows the D. C. type, which is now made with all bronze outer cases. Formerly these meters were made with galvanized iron upper cases. In other respects the meters are the same and all parts interchangeable. The intermediate gear construction is considered by this company as the most vital part of the meter. In the Keystone the shafts are held in accurately-made journals, while the weight of each element is carried by the sharp pivot resting on the step surface, with only a point contact. The first pinion and wheel of the train have a larger pitch and also a greater face than the second and third wheels, in order to take up the increased wear due to the higher speed at which the first wheel operates. The measuring chamber is supported in the lower case by lugs, and is held in position, without the aid of screws or bolts, by the upper case bearing on a shoulder cut in these lugs. When the upper section is removed, the measuring chamber can be immediately taken out without any annoyance of removing screws, etc.

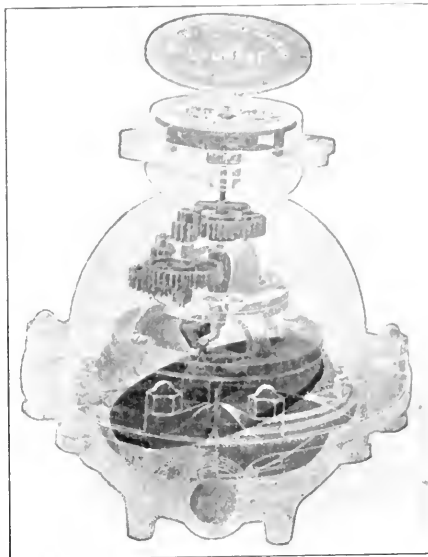
The Standard Water Meter Company exhibited a disc meter; but as their leader is a current meter of rather remarkable construction which adapts it for small services such as are usually provided with disc meters, no description is given of their disc meter.



HERSEY

The Thompson Meter Company, Brooklyn, N. Y., exhibited their Lambert disc meter. The phantom view herewith reproduced gives an excellent idea of the construction. The measuring chamber of the Lambert is large, tending to reduce friction and wear. The internal gear train consists of four gears and four pinions. The gears and pinions are made with very heavy teeth cut by special machinery, all wheels being 5/16 of an inch thick at the toothed portion or periphery, cast of semi-hard bronze composition. The four pinions are made of hardest grade phosphor bronze. The central axis or pivots of the gear are made of hardest wire-drawn phosphor bronze journaled freely at both ends in composition bearings of from 5/16 to 7/16 of an inch deep.

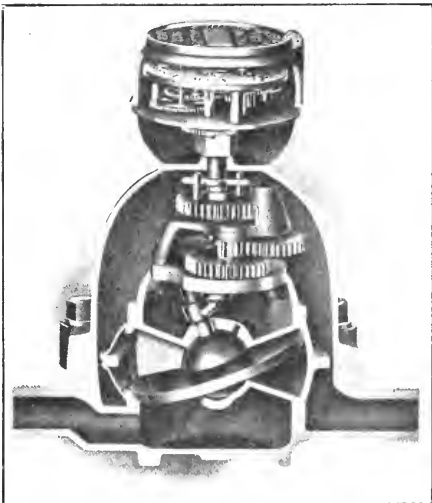
The Union Water Meter Company, Worcester, Mass., exhibited their King disc meter. In this meter all internal moving parts are assembled in a single working unit, readily accessible for inspection without removing the meter from the service pipe. The bearings of moving parts are of generous proportions and are protected from the entrance of abrasive material. The measuring chamber is large. Inlet and outlet spuds are low, thus allowing water to drain from



LAMBERT

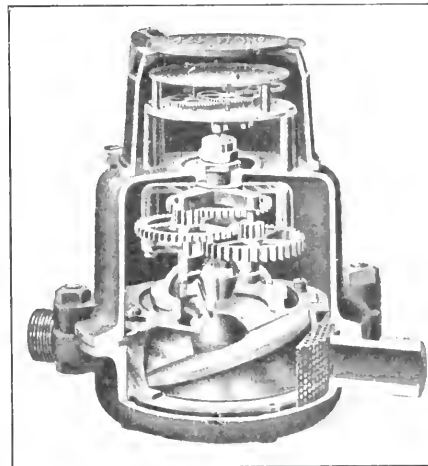
and outlet connections of the King are brought into vertical alignment, while the mechanism remains in its normal position. A vertical setting is thus obtained without sacrificing either sensibility or durability. The only point of difference between this meter and the regular horizontal model is in the lower section of the casing, and an interchange of the two styles may be easily made.

Henry R. Worthington, New York, exhibited the Worthington disc meter. One feature of this meter is an opening in the bottom casting, under the ball bearing of the disc, which provides egress to the settling basin in the bottom for any fine silt or sand carried by the water. The top outside casing is made of galvanized iron or brass. The bottom casting of the smaller sizes, carrying the inlet and outlet spuds, are usually made of composition, and the main body or bottom castings of the larger sizes of iron, galvanized. In all sizes the pipe openings are on the lower casting. The company makes a specialty of furnishing meters of special composition to resist the chemical action of waters carrying elements which attack ordinary brass compositions containing zinc. The intermediate train of gearing is securely anchored upon the disc chamber. The first spindle which carries the driving pawl has a long bearing in the bottom plate and also in the top plate. Both of these bearings have bushings made of fine quality of rubber. This spindle carries a large, heavy, hard

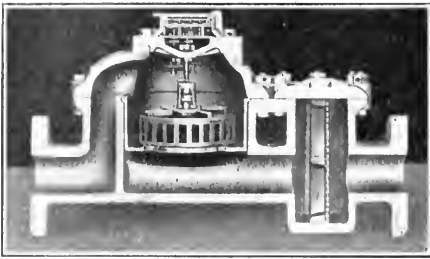


KEYSTONE

the meter to a point where damage from freezing is impossible. The spuds being a part of the lower section of the casing it is not necessary to disturb pipe connections in opening the meter for examination. The manufacturers of this meter contend that the breaking of meter discs is generally caused by unequal pressures within the chamber resulting from improper proportioning of ports. They argue that the disc of the King, unhampered by the added weight of reinforcements, has the lightness and activity necessary to respond to small flows of water, while under large draughts it is not subject to damaging stresses set up by its own action. The disc control is effected by a single hard rubber roll mounted on the disc spindle, coating with a stationary cone. The gear train, composed of accurate, machine-cut hard-rubber gears and bronze pinions, presents antifricition and long-wearing qualities. As hard rubber is of nearly the same specific gravity as water the weight of the gears is inappreciable. A modification of the ordinary meter is the King vertical, which is made to be set in a vertical pipe. This makes the plumber's bill for setting low and it is easy to read the index. By a simple arrangement of water passages the inlet



KING



HERSEY CURRENT

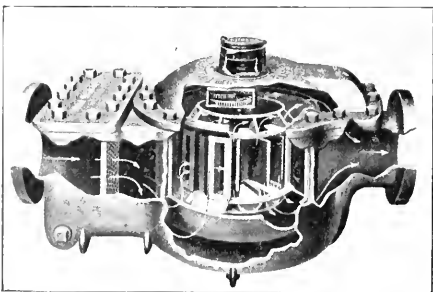
phosphor bronze pinion, which engages with the first gear. This first gear, being the fastest running, is made with an extra wide face. The gear has the No. 2 pinion pressed in and the spindle is then pressed in the pinion, making the three parts as one. Gear No. 2 has the same long bearings in the top and bottom plates. No. 3 gear is rubber bushed and is journaled on a boss on the top of the upper plate. Openings in the web of this gear permit of the entrance of the prongs of the intermediate pawl.

Current Meters.—Current Meters are variously described as current, velocity or inferential type. In this class the volume of water passing is inferentially ascertained by recording the number of revolutions of a reaction wheel or propeller which is arranged to be revolved by flowing water at a speed proportional to the velocity of the flow. Current meters are generally used for measuring large volumes of water.

The only new meter exhibited which has not actually been placed on the market is a current meter made by the Gamon Meter Company, Newark, N. J. This meter has a single set of propellers in the place of the two sets usually employed. A complete description of this meter will be given in the MUNICIPAL JOURNAL at some later date.

The Hersey Manufacturing Co., South Boston, Mass., exhibited their Torrent meter. In this meter the piston is the only moving part in the measuring chamber and is in the form of a horizontal wheel with curved vanes made of vulcanized rubber. The measuring chamber in which the wheel revolves is of bronze composition with phosphor bronze spindle and vulcanized rubber renewable bearings and bronze screws. The intermediate train which communicates the motion of the piston to the register is made of bronze throughout, with phosphor bronze spindles and screws and vulcanized rubber bearings. All working parts are held in a substantial outer case from which they are easily removable. All sizes are provided with strainers or fish traps forming part of the external case which are accessible for cleaning without disturbing the working parts of the meter.

The Neptune Meter Company, New York City, exhibited their Trident-Crest water meter. The essential features of

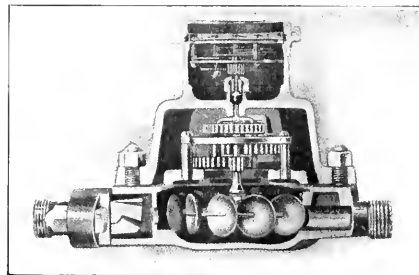


EUREKA CURRENT

the Trident-Crest water meter are the vertical position of the axis, and the mounting thereon of two propellers having helical blades formed on their edges—one a right hand spiral and the other a left hand spiral—which cause the inflowing stream to divide and flow to both the propellers in equal volume and at equal velocities. After the two streams have passed through the spaces formed by the helical blades, causing the propellers to revolve, they meet in equal volume and at equal velocity, head on, react upon themselves, radiate in all directions, and pass out at a right angle to the line of impact, through the ports of the circumferential casing to the large receiving chamber of the main casing, and thence on to the outlet spud.

The Trident-Compound meter, shown in the illustration, is a combination of a 6-inch current meter and a small disc meter. Small volumes of water go through the disc meter. Larger volumes raise a valve, shutting the disc meter out of circuit and passing all the water through the current meter.

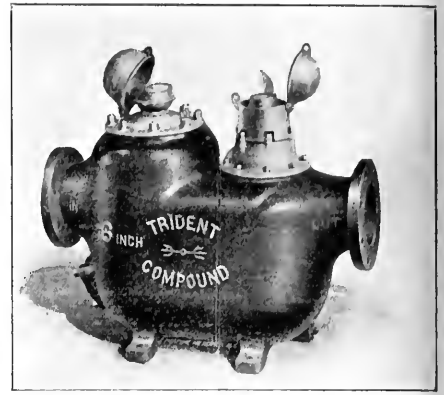
The Pittsburg Meter Company, East Pittsburg, Pa., exhibited their Eureka meter. The sectional view here reproduced shows by means of arrows the route taken by the water. The inflowing stream first passes through a strainer placed at the inlet end of the lower outer casing, is then conducted to the compartment surrounding the measuring chamber through ports located diametric-



SAPPHIRE

ally opposite each other, and enters the measuring chamber through tangential ports equally spaced around the walls of the chamber. The contact of the water upon the vanes of the wheel made of hard rubber rotates it in a horizontal plane at a speed which is proportional to the velocity of the water. A suitable crank on the top of the piston communicates the motion of the piston to the intermediate train, which in turn transmits it through a stuffing box to the registering device located on top of the meter. After its contact with the vanes of the wing wheel or piston, the inflowing water is equally divided into streams which pass out of the measuring chamber through the outlet ports in its top and bottom plates, to a common outlet in the lower outer casing. The intermediate train of gears is of the same stepped-bearing construction already described in the Keystone meter.

The Standard Water Co., New York City, exhibited their Sapphire meter. Although this is a current meter, it is made in small sizes and competes with disc meters for house services. The general outlines of the small size Sapphire are similar to those of an ordinary disc meter. In the place of the disc, however, is a device consisting of a series of cups, a cup plate and a spindle which rests on a jewel bearing. The plate and cups revolve in a casing. The water as it enters the meter from the port impinges against

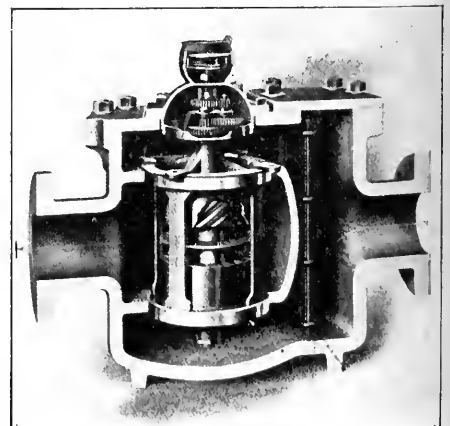


TRIDENT COMPOUND

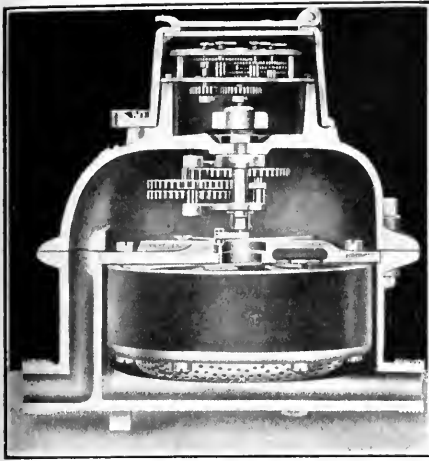
the cups and starts them in rotation, the motion being transmitted and recorded in the usual way. In order to make the meter sensitive even to very small currents there is a lip at the inlet port of the meter which drops when not in use and closes the inlet. Even so slight a hydraulic pressure as a quarter of a pound six inches head, lifts it. The effect of this device is to confine a small inflowing current to a definite area so that as it strikes the discs they will revolve. Hot water flowing back from a boiler will not injure this device as it will a rubber disc. The bodies of these meters up to and including 3-inch size are made of bronze.

The Union Water Meter Company, Worcester, Mass., exhibited their Nilo meter. This meter has a hard-rubber piston, in two sections, the upper having right and lower left hand helical vanes, the two halves being separated by a deflector plate insuring discharge of equal volumes of water from upper and lower halves of piston. The vanes are encased in a rubber shell. Interior of piston is chambered in which is placed a buoyant material which relieves weight of bronze shaft and pistons on step bearing. As vanes of piston are inclosed by the integrally revolving shells no water can pass through meter without actually passing through piston. Intermediate gearing has bronze pinions and spur gears of a specially compounded non-corrosive material, very nearly as light as water, hard, durable and fully guaranteed. Gearing is protected from possible accumulation of rust by the bronze dome, on which rests register and case. Inlet chamber of meter is provided with a screen of the bar type.

Henry R. Worthington exhibited the Worthington Turbine meter, which is a development of the turbine pump. The water enters the casing through a side



NILO CURRENT



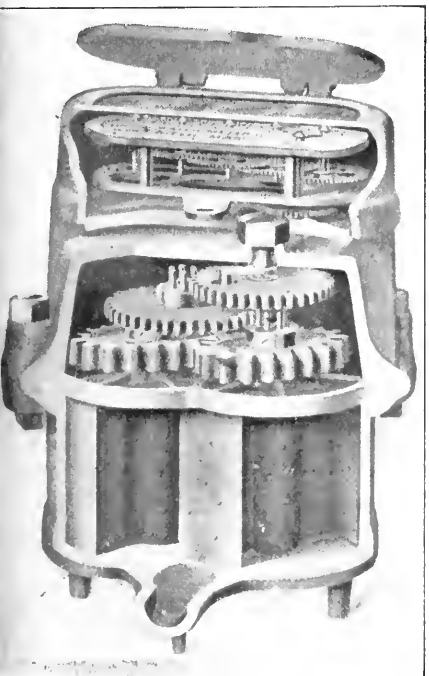
HERSEY DISPLACEMENT

strainer; the column then divides, flowing to both sides of a double wheel. The wheel is surrounded by a chamber of the volute pattern.

Displacement Meters.—Displacement meters are rotary meters which measure the water in compartments in a piston revolving in a measuring chamber.

The Hersey Mfg. Co., South Boston, Mass., exhibited their rotary meter, which is a positive displacement meter. The piston is the only moving part in the measuring chamber and is in the form of a six-toothed gear, made of vulcanized rubber. The measuring chamber is made of vulcanized rubber and bronze composition. The intermediate train is made of bronze throughout, with phosphor bronze spindles and screws and vulcanized rubber bearings. These meters are made in sizes from $\frac{3}{8}$ to 2 inches.

The Union Water Meter Company, Worcester, Mass., exhibited their rotary piston meter, varying in size from $\frac{5}{8}$ to 12 inches. The meter derives its name from its fundamental principle: the rotation of two pistons on vertical axes. These pistons, mutually controlled in their respective chambers by means of elliptical gears, constitute the entire meas-



UNION METER CO.

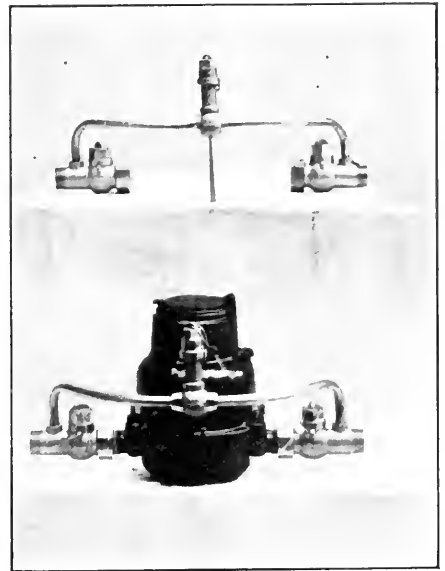
uring mechanism of the meter. A simple gear train transmits their motion to the register. The construction of the rotary meter allows practically uninterrupted flow of water, and the action of the pistons being continuous and positive, accurate measurement with a minimum of retardation is insured. No wear takes place in the measuring chambers, consequently they retain their original dimensions, and the accuracy of the meter remains unimpaired during long periods of service.

Water Meter Attachment and Protector

The H. B. Van Order Attachment and Water Meter Protector Co., Ithaca, New York, exhibited a number of rubber disks taken from water meters that had been distorted by the action of hot water. This is an accident which may occur particularly when the meter is located close to a boiler either in a power plant or even in a residence when the boiler becomes overheated. The protector not only prevents hot water from entering the meter but prevents anyone from reversing the meter and thus virtually stealing water. The illustration shows the attachment separately and as attached to a meter—in this case a Trident. There are three check valves, one on each side of the meter between it and the meter and the other in the middle of the bypass. The check valve on the boiler side of the meter prevents water from returning through the meter. The check in the bypass will allow back flow of water if the pressure is sufficient. If the meter is reversed the check normally on the side towards the main prevents water from passing through to the consumers' fixtures.

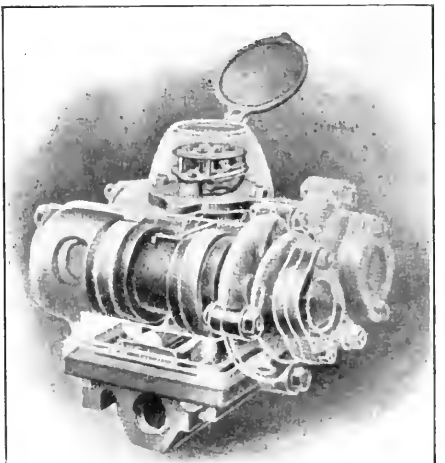
Exhibits at American Water Works Association Convention

- ALLYNE BRASS FOUNDRY Co., Detroit, Mich.—Corcoran lead pipe couplings.
- AMERICAN ASPHALTUM & RUBBER Co., Chicago, Ill.—Samples of asphaltum, showing its remarkable flexibility and rubber-like qualities. Photographs and printed matter showing waterproofed reservoirs and methods of construction. Pipe dip.
- BADGER METER MFG. Co.—Water meters.
- L. M. BOOTH Co., Chicago, Ill.—Photographs and literature explaining the Booth water softener.
- JAMES BOYD & BRO., Inc., Philadelphia, Pa.—Rotary valve seats.
- BUILDERS IRON FOUNDRY, Providence, R. I.—Venturi tubes and meters. Model installation for measuring boiler feed water.
- BUFFALO METER Co., Buffalo, N. Y.—Water meters.
- CENTRAL FOUNDRY Co., New York, N. Y.—Universal pipe, a cast-iron pipe made in short lengths with machined joints.
- H. W. CLARK Co., Mattoon, Ill.—Meter boxes.
- COLUMBIAN IRON WORKS, Chattanooga, Tenn.—Meter boxes, valve boxes.
- EAST JERSEY PIPE Co., New York, N. Y.—Section of bar lock pipe.
- EASTERN MFG. Co., Elmira, N. Y.—Samples of wood stave pipe, sections showing method of construction.
- FAIRBANKS Co., New York, N. Y.—Fire hydrants.
- FORD METER BOX Co., Wabash, Ind.—Sectional view of meter box.
- GAMON METER Co., Newark, N. J.—Water meters.
- GLAUBER BRASS MFG. Co., Cleveland, O.—Goosenecks, brass stop cocks, corporation cocks, etc.



WATER METER PROTECTOR

- GOULDS MFG. Co., Seneca Falls, N. Y.—Two single-stage centrifugal pumps.
- HAYS MFG. Co., Erie, Pa.—Payne's patent tapping machines. Hays Fire extension service boxes.
- HERSEY MFG. Co., South Boston, Mass.—Water meters.
- INTERNATIONAL STEAM PUMP Co.—Water meters.
- INTERNATIONAL SEAL & KNOT PROTECTOR Co., New York, N. Y.—Device for sealing meters with a wire and seal to prevent tampering with the dials.
- JENKINS BROS., New York, N. Y.—Valves, automatic, equalizing, stop and check valves.
- KENNEDY VALVE MFG. Co., Elmira, N. Y.—Gate valves.
- LEADITE Co., Philadelphia, Pa.—Composition for jointing cast-iron pipes.
- LEAD LINED IRON PIPE Co., Wakefield, Mass.—Sections of lead lined pipe, special fittings, couplings, etc.
- L. J. LOWE, Clarksville, Tenn.—Lowe automatic self-locking meter box.
- MODERN IRON WORKS, Quincy, Ill.—Snow quick repair stop box cover, wireless pipe locator.
- H. MUELLER MFG. Co., Decatur, Ill.—Three sizes of tapping machines, water meter testing machines, portable lead furnace, valve box, brass fittings, kit of tools, Mueller's sprinkler and flushing hydrant for obtaining water for flushing streets. The box is level with the surface of sidewalk or pavement, presenting no unsightly



WORTHINGTON

obstruction to traffic. This company reports great interest in its meter testing machine, two orders for them having been actually placed. The machine has a device by which very large meters may be tested. All water passing through the meter is actually weighed.

MUNICIPAL JOURNAL, New York, N. Y.—Magazines.

NATIONAL WATER MAIN CLEANING Co., New York—Sample of incrustated pipe. Physical objects removed from pipes. The company gave a demonstration of water main cleaning at a convenient point during the convention.

NEPTUNE METER Co., New York, N. Y. Water meters.

NEW YORK CONTINENTAL JEWELL FILTRATION Co., New York, N. Y.—Photographs and literature describing different types of rapid mechanical filters and machinery for the chlorination of water.

PENNSYLVANIA SALT MFG. Co., Philadelphia, Pa.—Sample of chloride of lime. Drums in which chemicals are shipped.

PITOMETER Co., New York, N. Y.—Model pitometer installation for recording flow of water in mains. New prism attachment increasing accuracy of readings. Literature explaining operation and results.

PITTSBURG FILTER MFG. Co., Pittsburg, Pa.—Photographs and literature.

PITTSBURG METER Co., East Pittsburg, Pa.—Water meters.

RENSSELAER MFG. Co., Troy, N. Y.—Corey solid stream frostproof fire hydrant, with casing cut away to show working parts. The valve is in the horizontal pipe leading to the hydrant and is controlled by a toggle joint. Rensselaer gate valves.

ROSS VALVE Co., Oakwood avenue, Troy, N. Y.—Regulating valves for steam, water and air. Large valves for street mains. Ross water engine.

A. P. SMITH MFG. Co., Newark, N. J.—Gate valves, tapping apparatus, hydrants, water meter testing machine.

G. H. SNELL, Attleboro, Mass.—Easy-on pipe couplings and tees.

SIMPLEX VALVE & METER Co., Philadelphia, Pa.—Water measuring devices.

STANDARD ASPHALT & RUBBER Co.—Sample of asphalt showing rubber-like consistency. Samples of waterproofing materials. Photographs and literature showing waterproofing of reservoirs. Pamphlet describing the 72-inch steel pipe line of the Brooklyn water supply lined with Sarco pipe dip. Pamphlet showing waterproofing of bridges.

STANDARD WATER METER Co., New York, N. Y.—Water meters.

THOMPSON METER Co., Brooklyn, N. Y.—Water meters.

UNION WATER METER Co., Worcester, Mass.—Water meters.

H. B. VAN ORDER WATER METER ATTACHMENT & PROTECTOR Co., Ithaca, N. Y.—Device for protecting meters from damage by back flow of hot water.

WATER WORKS EQUIPMENT Co., New York, N. Y.—Tapping machines, tapping sleeve and valve, corporation stop cocks, stop and waste and inverted key cocks, extension service boxes, emergency sleeves, Star pipe jointer, pipe cutters, gasoline lead furnace. The company gave a demonstration of its portable contractors' gasoline pumping outfit at a convenient point near the hotel. The members of the association who witnessed the test were favorably impressed with the capacity and portability of the machine.

A. WYKOFF & SONS Co., Elmira, N. Y.—Wykoff patent steam pipe covering. This pipe consists of layers of tin, asbestos, wood, corrugated paper, wood and asphaltum covering.

MUNICIPAL APPLIANCES

Vertical Thrust Multiple Stage Deep Well Pump

The accompanying illustration shows an installation of four Hill-Tripp vertical thrust, multiple stage deep well pumps at Chicago Heights, Ill., made by the Hill-Tripp Pump Company, Anderson, Ind. The installation is interesting because it is claimed that a world's record for deep well pumping was established here. The inside diameter of the well casing was 12 inches, the lift was 72 feet and the gallons pumped per minute was 2,780.

The action of the Hill-Tripp pump is similar to that of the propeller of a boat except that the water is moved forward instead of the propeller, and, with this

have no bosses, set screws, balance weights or obstructions on the inside. They are placed from three to four feet apart on shaft sections of nine and ten feet. Thus, if ten-foot sections are used, and the shaft is dropped 60 feet in the well there would be 18 impellers along the shaft. Deflectors are placed at proper intervals to retard the whirling of the water. Bands surrounding each impeller are held in place by connections that allow the largest possible diameter of impeller. A slight water space is left between band and impeller to prevent metal contact. No other bearings are required down in the well, all being hung from the head above. The speed of revolution varies for different conditions and sizes from 800 to



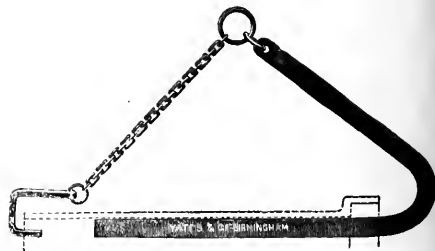
DEEP-WELL PUMPING PLANT, CHICAGO HEIGHTS, ILL.

device, in an upward course. A system of impellers are located at proper intervals along a vertical shaft extending down in the well to the proper depth. This shaft, with impellers, being revolved rapidly by means of a drive head at top of well with proper ball or roller thrust and lateral bearings to insure the minimum of friction wear and power. These drive heads are built for either vertical or horizontal belt drive or for direct attachment of electric motor, steam turbine or engine. In the Chicago Heights plant the vertical head drive with electric motor attached was used. The motor is provided with a thrust bearing to carry the weight of armature while head is fitted with ball thrust bearing to carry the weight of impellers, shaft and water. An improved oiling device is provided to keep the bearings submerged. The head is self-contained and heavy enough to absorb vibration and torsional strain. The sections of shaftings are connected with bronze screw couplings, the shaft revolving in the direction that draws them tight. Impellers can be made of iron or bronze, according to the nature of the water pumped. They are turned true and made of the proper pitch to insure the best lifting capacity and run in rings or bands of suitable dimensions arranged so as to utilize the largest diameter possible in the well, no moving parts coming in contact with the well casing. All parts in the well can be put in or taken out from the top of the ground through the base plate, and no pit or open shaft is needed. The impellers are turned true on the outer surface and

1,600 revolutions per minute. For a 12-inch well the head weighs 3,000 lbs., speed is from 800 to 1,000 revolutions per minute, rated capacity from 1,000 to 1,500 gallons for lifts of from 25 to 150 feet, and the horsepower required from 25 to 150.

Pipe Lowering Appliance

A handy device for lowering sewer pipe in a trench and aiding in the jointing process is made by John Yates & Company, Limited, Aston, Birmingham, England. It is generally used in connection with a small derrick, and is claimed to result in the saving of the labor of one man, besides decreasing the ordinary loss from the heating of pipes. The device is simply a band of iron, bent to an acute angle, and a clamp attached to a chain. The chain and one end of the iron band are attached to a ring, to which the line from the derrick is attached.



GRAPPLE FOR LOWERING PIPE

NEWS OF THE SOCIETIES

American Water Works Association.

—The annual meeting of one of the largest American societies whose field is a branch of municipal work gives rise to the query, "What is the function of the society and what was the meeting for?" Other societies, many of them, exist in this and other countries whose membership is made up of men engaged in municipal and engineering work. There is a difference, however, between American societies and those of foreign countries. This arises from the differences in administration of government. In England the Board of Trade exercises some supervision over city affairs. In Germany government control of city affairs is much greater than in England. In both cases, and in other countries, cities are kept in touch with each other by the publication of statistics, data for which the government has ample power to obtain, and by the control of expenditures, at least those requiring bond issues. In America in recent years cities are to some extent kept in touch with each other by a more or less efficient Census Bureau, a bureau hampered in its work for lack of authority. A few states in recent years, through accounting departments, have attempted to supply the deficiency which, it is generally felt, exists.

As having a bearing on this question, it is worth noting that many of our prominent educators, college professors and others who are looked on as leaders of thought return from trips to Europe, or the periods spent there as exchange professors, imbued with the idea that a strong central government, one that, among other duties, should exercise more control over city governments, is the great desideratum for this country. If they would study what is going on among municipal societies they would see how the need for closer association of municipalities is being efficiently supplied by technical societies, such as the American Water Works Association. At the Rochester convention delegates from all over the country, from Washington to Florida, and from Maine to Texas, met and discussed, under a guarantee of absolute freedom of speech, the most important problems regarding which there are differences of opinion, or any other problem regarding a detail, however small, which any member chose to bring up. The threshing over of these questions in such an assembly may develop in our water works department a degree of efficiency which even the power of a strong central government could not bring about, for there are dangers in bureaucracy, and authority is prone to suppress initiative.

That many of the delegates at the convention were conscious of the semi-governmental character of the society was apparent in the course of a discussion of the relations between water works departments, insurance companies and the city. Some members favored government supervision over these relations. But the question of freedom of speech in the society was promptly defended when a motion was made which was in effect in part a criticism of a fellow member who called in question the fairness of insurance interests in dealing with municipalities regarding the supply of water for fire protection. On the whole, it would seem as if the American system of initiative in management

would be promoted by the growth in influence of such associations as the American Water Works. It is to be hoped that, though the Rochester meeting was the most largely attended ever held, that the 1912 convention, at Louisville, Ky., will be still larger.

The thirty-first annual convention was formally opened in the banquet room of the Powers Hotel, Rochester, N. Y., Tuesday, June 6, by President John W. Alvord, Chicago, Ill. Mayor Edgerton welcomed the association, reminding it that Rochester took pardonable pride in its water works system, both as to the quality of its water and the equipment that delivers the un-failing supply. President Alvord replied. Secretary-Treasurer John M. Diven, Charleston, S. C., read his report, indicating that the society is in a flourishing condition, financially and in point of membership, substantial gains having been made during the past year. President Alvord, in his annual address, touched on many phases of the general subject of intimate interest to his audience.

At the afternoon session considerable time was given to receiving various committee reports. The reports from the Committee on Electrolysis, which was presented by Chairman D. H. Maury, consulting engineer, Peoria, Ill., was of much interest, dealing as it did with one of the vexed problems of maintenance of water mains.

Theodore A. Leisen, of Louisville, Ky., chairman of the special Committee on a National Bureau or Department of Health, presented the report of that body. Considerable significance is attached to the work of the committee by reason of the possibility that Congress will create such a bureau. The committee was appointed at the association meeting a year ago to stimulate in so far as practicable such action by Congress. No active effort will be made at the present special session, but it is planned to prosecute the plan with the opening of the regular session.

Two papers were presented at the afternoon session. Thomas McMillan, of Milwaukee, discussed at considerable length "Pumping Station Management." Illustrations were drawn from the experience which Mr. McMillan had gained in his home city.

George Houston, of Kalamazoo, Mich., presented the live topic, "Fire Line Meters, a Comparison of Efficiency." The subject is in a way chronic, coming up as it does periodically for consideration. On one side are arrayed the interests representative of waterworks systems in general, who, with much show of reason, hold that all water should be metered in order to provide a reliable check against abuse.

In as formidable a line-up are the insurance interests, which insist that installation of meters in lines designed to give special fire protection through sprinkling systems and other apparatus in large industrial plants impedes the force of water, reducing the efficiency of the apparatus. The insurance men conclude that reduced protection should find its equivalent in higher insurance rates. That there is much to be said on each side was indicated by Mr. Houston's paper and the discussion that it aroused.

With the close of the afternoon session at 5 o'clock the men of the association were the guests of the Bartholomay Brewing Company for two hours.

At the evening session Leonard Metcalf, of Boston, presented a paper on subject, "Some Fundamental Considerations in the Determination of a Reasonable Return for Public Hydrant Service," which had been prepared collaborated by Mr. Metcalf, Emil Kuickling and W. C. Harvey. The discussion was illustrated with lantern slide charts. D. H. Maury, of Peoria, Ill., gave an illustrated lecture on the Panama canal.

During the progress of the evening session the women of the convention were entertained at cards in one of the hotel parlors.

The session of Wednesday forenoon was taken up with discussion of the previous day's papers, particularly that of Leonard Metcalf, on reasonable returns for public hydrant service. The relations between the city, the water works department and fire insurance companies were discussed by many members in the light of their own experience. General dissatisfaction seemed to exist with the insurance companies for alleged failures to make reductions in rates that were expected in return for water works improvements. However, it was admitted that little was known about insurance affairs and profits, and it was admitted that insurance losses had been very large in recent years. The case of Newark, N. J., was cited, where a high-pressure fire pipe line had been established with a view to reduced rates. When the work was completed insurance rates generally were raised, and those in the newly protected district reduced from the new rate to just what they were before.

The election of officers and selection of the city for the next convention followed. The following officers were elected: Alexander Milne, president; Dow R. Gwinn, first vice-president; Robert J. Thomas, second vice-president; John A. Affleck, third vice-president; John M. Diven, secretary-treasurer. Finance Committee—H. E. Keeler, chairman; Leonard Metcalf and Charles R. Henderson, Executive Committee—Alexander Milne, Dow R. Gwinn, H. E. Keeler, Leonard Metcalf, Robert J. Thomas, John A. Affleck, George G. Earl, Charles R. Henderson, John M. Diven, Theodore Leisner and John W. Alvord.

Louisville, Ky., was chosen for the meeting place for 1912 by a large majority, with Minneapolis second.

The afternoon session was given to the reading of papers, that of J. Chalkley Hatton, Wilmington, Del., on Wood Stave Pipe, answering a number of questions in the question box. The author took a very favorable view of the adaptability of wood stave pipe for water mains in matters of economy in construction, durability and serviceability in the matter of conveying water without serious leakage. He was asked whether the pipe would not rot at high places in the lines and replied that air valves installed at such points would, in his opinion, overcome the difficulty.

In the evening the members were the guests of the Water Works Manufacturers Association who had charge of the exhibit of water works appliances in the corridors of the hotel. Special trolley cars were in waiting near the hotel. On the way a stop was made at the pumping station of the Rochester & Lake Ontario Water Company. The final stop was made at Manitou Beach, where a fish dinner was served. After dinner the party was taken to Ontario Beach Park,

which is the popular resort of Rochester.

Thursday sessions were given to the reading of papers. George G. Earl, New Orleans, explained the system of metering all water services that had been adopted in connection with the inauguration of the new water rates. He explained the basis of rates was arrived at with the end in view of charging all persons alike for water consumed. Charles A. Hague explained the uses of compressed air in water works construction. Papers by Alexander Milne and W. A. McFarland were read by title. A paper by George C. Whipple on hot water problems, which is abstracted at length on another page was presented. C. C. Brown read a paper on the keeping of water works records. Two papers were read which had a bearing on the same general subject, the purification of water. Dr. J. L. Leal explained the theory and practice of the disinfection of water by the use of hypochlorite of lime, and gave instances of its use where typhoid fever epidemics had been stopped. D. D. Jackson presented a paper explaining the physical, chemical, bacteriological and microscopical methods of examining water. Lantern slides were exhibited showing some of the larger organisms existing in water easily removable by mechanical means and bacteria and amoebae visible under the high powers of the microscope. He mentioned those that were and those that were not killed by weak solutions of hypochlorite of lime.

In the evening the city of Rochester provided an entertainment for the members. The largest band in the world gave a concert in the Park Area, and special trolley cars were provided for taking the guests to and from the park.

The Friday forenoon session was given to the reading of papers. In the afternoon, by invitation of the Water Works Manufacturers' Association, the members attended a matinee in Lyceum Theater.

National Association of Comptrollers and Accounting Officers.—The convention was called to order at the Arlington Hotel, June 9, by Alonzo Tweedale, auditor of the District of Columbia, who is president of the association. An address of welcome was made by H. B. F. MacFarland, former Commissioner of the District of Columbia.

The proposition of Herman A. Metz, former controller of the city of New York, to provide a fund of \$10,000 a year, for three years, "to make available to American municipalities the best principles and practice worked out in municipal accounting and reporting," was announced by President Tweedale in his address to the convention. Mr. Metz had written to Mr. Tweedale on the subject.

"Mr. Metz clearly shows in his letter," said Mr. Tweedale, "the great desirability of uniformity in accounting methods throughout the larger cities of the United States, and in a practical way makes possible the accomplishment of that work in which he has been so vitally interested. In my reply I stated to Mr. Metz that in my opinion no other action that had been taken up to that time would be of such great and lasting benefit, and that the result of his endeavor carried to completion would be the saving of millions of dollars annually to the taxpayers in the United States.

"I cannot close without inviting at-

tention to a severe loss suffered by the association during the last year. I refer to the death of our fellow-worker, Frederick W. Carey, city auditor and assessor of Sacramento, Cal., a man whom we all knew and learned to love."

Representative Otto Lobeck, who was elected to the present Congress while controller of the city of Omaha, Neb., and a member of the association, made a brief speech, in which he greeted his former associates, wishing that all of them were in Congress to inculcate principles of proper accounting into the national government's methods. He referred to municipalities as the greatest and most powerful corporations on earth.

The following officers were elected: Edmund D. Fisher, deputy controller of New York City, president; Vice-presidents, S. M. Wilhite, Louisville, Ky.; E. Stetson Griffing, New Rochelle, N. Y.; A. B. Frost, Chelsea, Mass.; A. M. Heston, Atlantic City; J. S. Culpepper, Norfolk, Va.; Dan C. Smith, Jr., Houston, Tex.; J. J. Crowder, Peoria, Ill.; W. H. Farnham, St. Paul, Minn.; L. D. Evarts, Milwaukee, Wis.; A. B. Pfouts, Denver, Col.; E. E. Phelps, Pittsburg; W. H. Deharity, Indianapolis, and Dr. Le Grand Powers of the census bureau; secretary, George M. Rex, Providence, R. I.; treasurer, W. S. McCormick, Duluth, Minn. At the second day's session Buffalo was chosen for the 1912 convention.

Aside from the addresses the feature of the meeting was the adoption of a resolution offered by Milton R. Palmer, deputy controller of Detroit, condemning a policy of some newspapers which give percentage of money to officials furnishing city advertising.

Saturday E. D. Fisher delivered the opening address and he chose as his topic "Standardization" and told how the board of estimate and apportionment of New York City by the appointment of a commission has been able to economize and save the city thousands of dollars.

Dr. Le Grand Powers, chief statistician of the census bureau, made an address at the banquet at the Arlington. He urged state supervision of city accounts, saying that such supervision would tend to make more uniform the systems of accounting in American cities.

The statistician also declared that public accounting is as a rule superior to methods in vogue among private institutions.

Another address that attracted attention was then made by Edmund D. Fisher, deputy controller of New York City, who told of a new system of borrowing for his city. In order not to flood the bond market, New York City will in the future sell most of its bonds in Europe.

Duncan MacInnes, of New York, W. S. McCormick, of Duluth, Minn.; Representative C. O. Lobeck, of Omaha, Neb., a former president of the association, and Alonzo Tweedale, auditor of the District of Columbia, made brief addresses.

In the afternoon President Taft greeted the delegates. The reception took place in the east room of the White House, and before shaking each visitor by the hand Mr. Taft made a brief speech praising the character of the management of public moneys by men in the employ of the federal and state governments. Alonzo Tweedale introduced each delegate to the Presi-

dent and briefly responded to the chief executive's remarks.

The feature of the morning's session of the convention at the Arlington was an extended dissertation by Dr. Frederick A. Cleveland on the "Financial Statements of Municipalities." Dr. Cleveland is chairman of the President's commission on economy and efficiency. The five members of this commission were present to hear the address.

Dr. Cleveland, after pointing out the good and bad points in accounting systems in various cities, made special reference to the balance sheet contained in the last annual report of the controller of Philadelphia. He used the statement as a model, and showed how the government and the public could see at a glance the exact financial condition of the city.

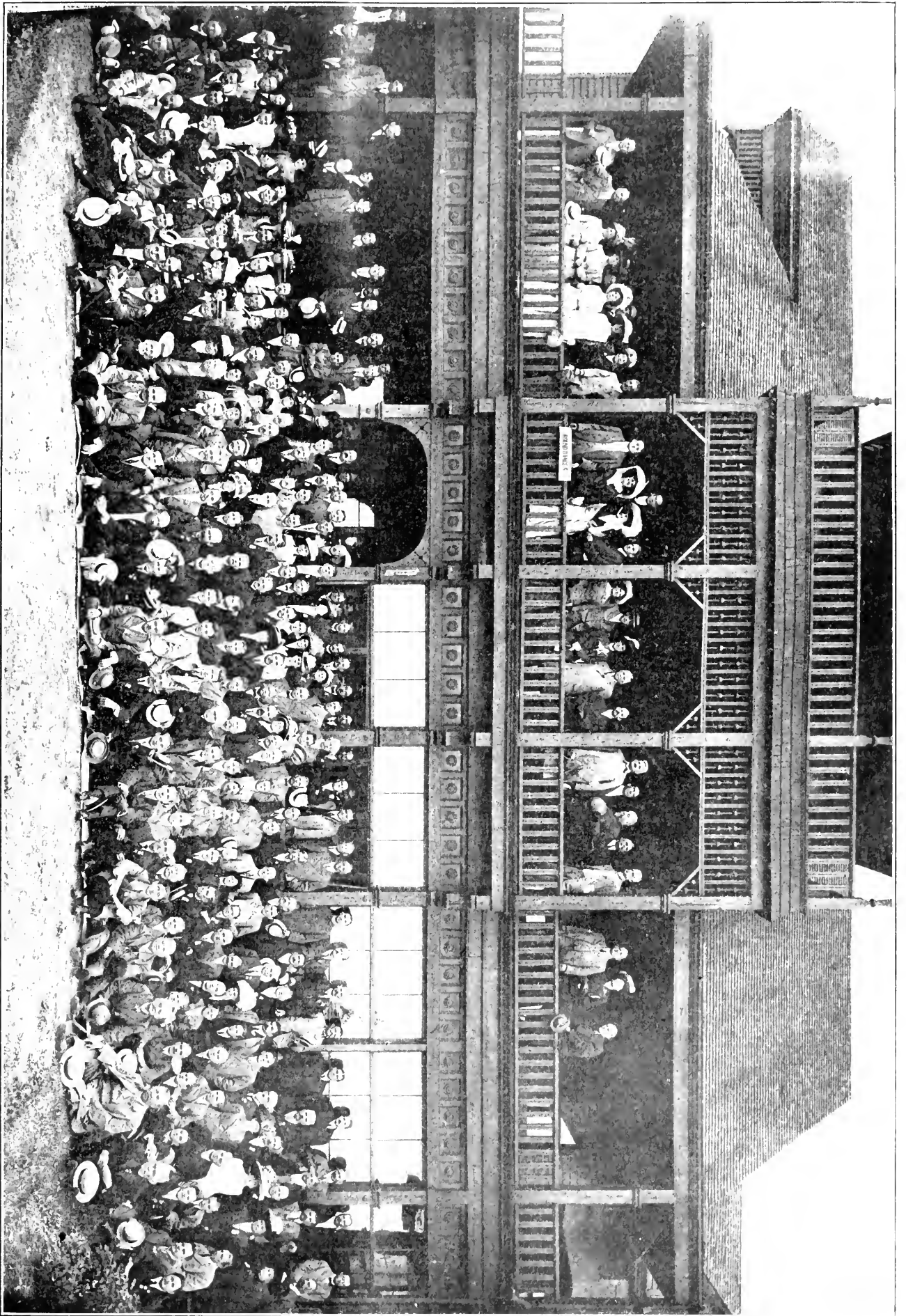
Representative Sweet, of Michigan, was the first speaker in the morning, and he was followed by Howard C. Beck, of Detroit, who took as his topic "The Capital Account of a City." He asserted that the capital account of a city should be the value of all of the property of the city in excess of its liabilities.

Representative Swager Sherley, of Kentucky, won liberal applause when he closed his address at the first day's session by urging a modern system of municipal and governmental budget making which would enable a plain citizen to gain a tangible idea of just what the expenses of the government are in comparison with expenses in other cities.

Dr. Le Grand Powers, chief statistician of the census bureau, was another speaker at the session. He declared that certain cities were issuing bonds without presenting statistics to show that proceeds of former bond issues had been disposed of in a wise manner. As an example he said: "Take the case of a city which issues bonds for a period of fifty years, and with the proceeds lays pavements which last only for eight or ten years. The same city will turn and issue more bonds with which to relay the pavement, and thus piles up debt on debt, with the probability of becoming bankrupt in the future."

Connecticut State Fire Chiefs.—The semi-annual session of the Connecticut Fire Chiefs' Club was held in Bridgeport June 5 with 25 members present. The session was called to order at 11 o'clock in the parlors of the Atlantic Hotel with former Chief A. C. Hendricks, of New Haven, presiding as president. He was given an ovation. Over 80 years old, he still takes an active interest in the work of the organization and gave some interesting reminiscences of the work. He is the first and only president the organization has had. The day marked the first time in several months that he has attended any social or business sessions.

The programme was entirely informal with no special speakers or set arrangements. The discussion was general and comprised remarks on the topic "Fire Prevention of More Importance Than Fire Extinguishment." Bridgeport's fire commissioners were the guests of the organization. Dinner was served at 2 o'clock and afterwards there was an informal inspection of Bridgeport's fire fighting facilities. During the forenoon session there was an alarm from Box 16 and the visitors were given an opportunity to note the Bridgeport apparatus in practical work.



DELEGATES AND GUESTS ATTENDING AMERICAN WATER WORKS ASSOCIATION

Photograph taken at Portland, Oregon, June 7, 1911.

PERSONALS

American Chemical Society.—J. W. Films, superintendent of filtration, Cincinnati water works, read a paper before the Cincinnati section, May 10, on "Sewage Disposal of Cincinnati and Vicinity." He advocated the establishment of a Cincinnati sanitary district, which would include all of the immediate territory on both side of the river, for the purpose of disposing of the sewage on scientific principles.

Louisiana Engineering Society.—J. F. Coleman, New Orleans, presented a paper, May 8, at the monthly meeting of the society on "The Engineer's Problems of Land Reclamation." J. C. Haugh presided.

Albany, N. Y., City Planning Association.—The first act of the new board of governors was to direct the executive committee to prepare an ordinance for introduction in the City Council for the appointment of an expert city planner to be in the employ of the city. The association is composed of representatives of other city organizations.

Union of Canadian Municipalities.—Secretary W. D. Lighthall has announced that the eleventh annual convention will be held in the City Hall, Quebec, by invitation of Mayor Drouin, on August 29-31. The following are among the topics that will be discussed: "Town Planning and Embellishment," "Special Functions of a Provincial Capital," "Conservation of Water and Water Powers," "Country Roads," "Railway Terminals and Crossings," "Street Railway Freight Carriers," "Pure Food in Cities" and "Fire Protection."

Calendar of Meetings

June 11-16.

International Association of Chiefs of Police.—Eighteenth Annual Convention, Rochester, N. Y.—Major Richard Sylvester, Superintendent of Police, Washington, D. C., President.

June 13-18.

New York State Association of Chiefs of Police.—Annual Convention, Rochester, N. Y.

June 13-16.

American Society of Civil Engineers.—Annual Convention, Chattanooga, Tennessee.—Charles Warren Hunt, Secretary, 220 West 57th St., New York.

June 21-22.

National Conference of Poor Law Officials.—Boston, Mass.—Dr. Robert W. Hill, President State Board of Charities, 105 East Twenty-second street, New York City.

June 22-24.

Intermountain Good Roads Association.—Annual Convention, Pocatello, Ida.—Caleb Tanner, State Engineer.

June 27-July 1.

American Society for Testing Materials.—Fourteenth Annual Meeting, Hotel Traymore, Atlantic City, N. J.—Edgar Mackay, Secretary, University of Pennsylvania, Philadelphia, Pa.

June 28-29.

South Carolina Water Works Association.—Meeting for Organization, Columbia, S. C.—W. F. Steiglitz, Temporary Secretary, Columbia, S. C.

June 28-30.

International Association for the Prevention of Smoke.—Annual Convention, Newark, N. J.—R. C. Harris, Secretary, City Hall, Toronto, Ont.

August 15-18.

Firemen's Association of the State of New York.—Rochester, N. Y.—Thos. Honohan, Secretary, Frankfort, N. Y.

September 12-15.

International Association of Municipal Electricians.—Annual Convention, St. Paul, Minn.—Clarence R. George, Secretary, Houston, Tex.

September 18-30.

International Municipal Congress and Exposition.—Chicago, Ill.—Curb M. Treab, Secretary, Great Northern Building, Chicago, Ill.

September 18-October 1.

Fourth International Good Roads Congress.—Chicago, Ill.—J. A. Rountree, Secretary, Birmingham, Ala.

BIGELOW, E. M., of Pittsburg, Pa., the new State Highways Commissioner, will supervise the construction of the 7,000 miles of improved roadways provided for in the Sproul bill and will have full charge of the Governor's improved roads plan, which is one of the most comprehensive that any State ever has mapped out. J. W. Hunter, who has been at the head of the road department, probably will become Mr. Bigelow's first assistant.

BIRMINGHAM, EUGENE, has resigned as Superintendent of Police of Bridgeport, Conn.

DOCKWEILER, J. H., water expert of Oakland, Cal., has been engaged by the City Council to render an expert report on the water situation there for rate-fixing purposes. The council has been working on the question of the water rate for the past two months, and confronted by an array of facts and figures submitted by the People's Water Company, has called upon Dockweiler to analyze them for the consideration of the council.

EMMART, WM. M., chairman of the committee on city planning of the City-Wide Congress, of Baltimore, made a plea for a city beautiful as well as a city useful in an address recently before the North Carolina Society.

EPSTEIN, JACOB, is the first to accept the invitation Mayor Preston of Baltimore extended to a number of prominent business men, asking them to serve as members of his advisory commission.

FARLEY PHILIP P., President of the Jamaica Bay Improvement Commission, has been appointed Deputy Fire Commissioner of New York City. Mr. Farley was the Democratic candidate for State Engineer and Surveyor in 1908.

FORREST, C. M., an asphalt expert from Albany, spent several days in Binghamton, N. Y., recently, inspecting the various roads treated with asphaltic oil during the past two years. Mr. Forrest on his return to Albany made reports and recommendations to the State Highway Commission as the result of his inspections.

FUERTE, JAMES H., sailed from New York on May 31 for Para, Brazil, where he will make a report on the sewerage of that city. He will return to New York about the middle of July. A few years ago Mr. Fuertes was a member of the commission of engineers, including his father, the late Estevan A. Fuertes, and Dr. Rudolph Hering, which prepared plans and made a report on the sanitation of the city and port of Santos, Brazil.

GOODWIN, DR. EDWIN, the new Health Officer of Bay City, Mich., after a month of preparation, including a two weeks' post-graduate course "brushing up" on bacteriology and microscopic work at Ann Arbor at his own expense, has started in a sanitary inspection of Bay City such as the town has never before enjoyed. He expects to be busy a couple of months as he will review the sanitary conditions surrounding all meat markets, dairies and milk depots, restaurants, grocery stores, ice cream plants, slaughter houses, bakeries, candy stores and a number of places where other articles of food are made. His procedure will be novel in that he has secured the free services of several men who are experts in their various lines of business.

HAMILTON, JOSEPH W., has been appointed City Engineer of Pasco, Wash. He enters the service of the city from the United States Reclamation Service, where he has been engaged on the Sunnyside project. He is a graduate of the University of Virginia and was formerly City Engineer of St. Paul, Va.

HARPER, E. F., has been appointed City Engineer of East St. Louis, Ill. Mr. E. W. Rodenberg has been appointed Assistant Engineer in charge of outlet sewer, and Mr. James F. Parr, Assistant Engineer, in charge of streets.

HUGHT, LESLIE, has been appointed Superintendent of Fire Alarm at Binghamton, N. Y.

HERBERT, H. W., has been chosen by the Water Commission of Camden, N. J., as chief of the Water Department to fill the unexpired term of Robert Hollingsworth, deceased.

HOWARD, DR. HARRISON W., is the new Mayor of Wilmington, Dela.

HIRZEL, ALFRED J., has been appointed City Engineer of Wilmington, Del.

HUNT, A. M., has been appointed consulting engineer for the construction of the Geary Street municipal railway, of San Francisco, by the Board of Public Works. He has been engaged for a number of years past in hydro-electric power development and with public service companies in the west coast cities. He was connected with the work of conversion of the Los Angeles railways from cable to electric power.

HALL, ROBERT, who for the past ten years has held the position of manager of the Corpus Christi water supply department, has resigned the position to assume charge of the interests of F. Z. Bishop at the new city of Bishop, Texas.

JONES, WILLIS S., has been appointed City Engineer of Pomona, Cal.

MANN, G. W., remains as City Engineer of Reno, Nev., under the new administration.

MARTIN KINGSLEY, of New York, handed his resignation as Bridge Commissioner to Mayor Gaynor. He gives up the position to accept one as head of the Foundation Company, a concern whose specialty is the constructing of foundations for buildings.

MIXON, C. M., has been elected mayor of Amite City, La.

MOORER, H. B., is the new mayor of Henning, Tenn.

MOTT, FRANK K., was re-elected mayor of Oakland, Cal.

O'MEARA, STEPHEN, has been appointed Police Commissioner of Boston, Mass.

PEYTON, E. A., was reappointed Superintendent of Water and Sewers by Mayor Burton of Chickasha, Okla., Mr. Peyton has been in charge of the plant for the past six years.

RUSHLIGHT, A. G., has been elected Mayor of Portland, Ore.

SAMUEL, GEORGE F., has been appointed Engineer of Track Elevation for the city of Chicago. He has been engaged in municipal work since his graduation from the University of Michigan in 1885, and first became connected with the city of Chicago in 1888, as Assistant Engineer in the Bureau of Streets. Since then he has been in charge of construction on the water works tunnels and in charge of pumping stations. In 1910 he became Assistant City Engineer.

SHIRLEY, MAJ. JOSEPH W., Chief Engineer of the Topographical Survey, has been appointed by the Mayor as the city's representative on all work being done by the State Roads Commission within the city limits. Upon Major Shirley will devolve the responsibility for any delays which any of the municipal departments might occasion with the good roads work.

SLOAN, JOSEPH E., has been appointed Fire Chief of Newark, N. J.

VAN AMBURGH, CHARLES, has been reappointed Superintendent of Highways of Broome County, N. Y., with headquarters at Binghamton.

WEBB, DR. DE WITT, is the new Mayor of St. Augustine, Fla.

INDUSTRIAL NEWS

Cast Iron Pipe.—Chicago: The leading pipe interest is busy filling orders placed in the spring. Although prices are firm, an advance is not expected. Quotations: 4-inch, \$25.50; 6 to 12 inch, 24.50; 16-inch and up, \$24. Birmingham: The rate of production continues below normal and in no case has stock accumulated to any appreciable extent. Quotations are considered nominal as follows: 4 to 6 inch, \$22.50; 8 to 12 inch, 22; over 12 inch, average, \$21. New York: The general market continues very quiet. Quotations: 6-inch, cast pipe, \$21 to \$22.

Lead.—Prices are somewhat firmer, but demand is light. Quotations: New York, 4.375c.; St. Louis, \$4.225c.

New Life Net.—A test of a new life net was recently made in Schenectady, N. Y., by Fire Chief Henry R. Yates, Commissioner of Public Safety James J. McDonald, Captain Sanford Alberts, designer and maker of the net, and William Hansen, chief rigger at the works of the General Electric Company. Bags of sand weighing 130 pounds, thrown from second and third story windows, were caught without injury to the net. The net will be used by one of the local companies. It is stated that the nets can be made for \$17.

Test of Paving Brick.—The Henry S. Pachman Engineering Co., Philadelphia, Pa., have reported on a series of tests made for the Augusta Vitriified Block Company of paving brick made at their Harlem, Ga., plant. The losses by abrasion of different lots tested were as follows: 22.06; 22 and 20.2.

Gives Asphalt for Highway.—The Pittsburg-Salt Lake Oil Co., Salt Lake, Utah, has sent a communication to the Commercial Club offering to give sufficient crude asphalt from its Sunnyside deposits to surface a road 40 miles long from Salt Lake through Davis County. The estimated quantity needed is 60,000 tons.

Trinidad Asphalt Oil.—The tanker *Predentia*, loaded with 3,800 tons of crude oil for Perth Amboy, N. J., is the first shipment of oil from Trinidad. Her boats are to be used, and shipments every ten days are expected. Oil can be discharged into steamer tanks at the rate of 2,400 barrels per hour through 10-inch mains extending from the land tanks and reservoirs along the 1,700-foot pier. The oil refinery at La Brea is now in operation. Many tanks have been constructed to care for the products. The works have a daily capacity of treating 3,000 to 3,500 barrels of crude oil.

Show Engine.—The auto fire engine contracted for from the American-Lorraine Fire Engine Co., Elmira, N. Y., by the city of Waterbury, Conn., will be exhibited at the convention of International Association of Fire Engineers, Milwaukee, Wis., September 19-22. The engine is the first of this special kind to be built by the company.

Concrete Paving.—R. S. Blome and Co., Chicago, Ill., has notified the city of Spokane, Wash., that it will be held responsible for payment of a royalty to the company for the paving of Division Street between Sprague and Fourth Avenue. The sum of \$3,150.20 is demanded, which amounts to 35 cents per square yard on 8,872 square yards of pavement. The street has just been paved with concrete by John Fife.

Carbolineum.—C. S. McKinney Company, 50 Church Street, New York City, who are the owners and sole selling agents of three carbolineum wood-preserving companies, issue a pamphlet explaining that all carbolineum is not alike. Their highest grade is called Cop'R-oil, another grade Bincre, and ordinary cheaper grades have no special names. It should not be assumed that the low grades are unsuitable for some purposes. The Cop'R-oil carbolineum is a heavy oil of coal tar having a high boiling point with powerful antiseptic chemicals added. The following description and definition of carbolineum appeared in McGraw's Electrical Dictionary for Buyers (1909):

CARBOLINEUM. This name covers a multitude of different compounds made in different ways by different manufacturers. The better class of manufacturers and chemists seek to confine the name to compounds containing the products of the destructive distillation of coal tar, which distill over at the higher temperatures, and are known as "heavy oils" in contradistinction to "light oils or creosote oils." These heavy oils, freed from substances which are solid at low temperatures, such as naphthalene, are powerful and persistent antiseptics in themselves alone, but they are improved by the addition of other antiseptics, such as zinc chloride and the copper salts. It is easy to doctor up low grade oils until they look and smell right, though valueless as wood preservatives, hence Carbolineum should be subjected to rigid chemical tests, or purchased from reliable dealers, who are competent to select and test the products which they sell. There is no proprietorship in either the name "Carbolineum" or the method of manufacturing it, and all brands of Carbolineum are "genuine," though some may be worthless. Carbolineum is the name given to a modification of Bethel's process of preserving wood, patented in England in 1838 and introduced into Germany by Bröner in 1816, and it has been extensively used since that time in all parts of the world, as an efficient and a comparatively cheap wood preservative, convenient to apply at the place of use by unskilled labor.

Fire Extinguishing Compound.—In the presence of Deputy Fire Chief Thomas Lally, New York Fire Department, and several experts who are making a study of scientific fire fighting, officials of the Standard Oil Company fought a blaze with chemicals and within a minute subdued flaming oil, such as has, on many occasions, caused much damage in the large plant in Kent avenue, Williamsburg. Four times men set fire to oil and gasoline, which for the purposes of experiment had been placed in a small isolated tank, and each of these promising fires was extinguished quickly by the introduction into the tank of aluminum sulphate, bicarbonate of soda and licorice.

The new system comprises, in addition to the necessary fire pump, two tanks of a combined capacity of 38,000 pounds of chemicals. There is a small quantity of water in the tanks for the purpose of dissolving the chemicals. One of the tanks is used for a solution of aluminum sulphate and licorice in the proportion of 18,000 pounds of aluminum to 8,000 pounds of licorice. In the other tank there are 12,000 pounds of bicarbonate of soda.

The two solutions are mingled as they are forced through the pipes and as they reach the tank in which the fire has started they swell into a yeast like froth, spread across the surface of the burning liquid, separate the liquid from the air and put out the fire.

Modern Municipal Illumination.—With this caption the Flour City Ornamental Iron Works, Minneapolis, Minn., has issued its new de luxe edition of its Lamp Standard Department. The shape of the brochure, long and narrow, is suited to the proper display of the different styles of standards of classical designs made by the company. A list of a few cities having large installations of Corinthian standards is given; they are Atlanta, Ga.; Duluth, Minn.; Minneapolis, Minn.; Jacksonville, Fla.; Fort Dodge, Ia.; Milwaukee, Wis.; Oklahoma City, Okla.; Winnipeg, Canada. As indicating the high character finish which has been done by the Flour City Company, it may be mentioned that all of the ornamental standards on Federal buildings throughout the country are of their manufacture.

One of their devices used in connection with police call systems is worth mentioning, because the lights commonly used for calling officers are far from ornamental. On certain standards, in the place of the iron bulb or acorn forming part of the ornamentation of each bracket, a colored globe is substituted. This is not out of harmony with the design and answers the purpose perfectly.

The brochure illustrates two Corinthian, two Capital and two Egyptian designs. Indicating the substantial character of the construction is a photograph of the Nicollet Avenue fire of last winter, when the standards were uninjured, although the buildings on the opposite side of the street were damaged.

Imhoff Royalty.—In the course of a discussion regarding the relative merits of an Imhoff system of sewage disposal and a trunk sewer for the city of Passaic, N. J., the fact was brought out that the royalty charged by the Imhoff company would be \$400 for each 10,000 of population served.

Contracting Firms Merged.—The McCartin Contracting Company and the Southern Asphalt and Contracting Company, both of Birmingham, Ala., have combined their capital and interests and the name of the latter will be retained. The capital of the new company will be \$50,000. Officers have been elected as follows: Eugene Fies, president; J. R. Copeland, vice-president; John McCartin, vice-president; John Donaldson, vice-president, and John Crawford, secretary. The new organization starts out with \$200,000 work on hand. It is the intention of the company to bid on work in all the Southern cities.

Garbage Plant.—Citizens of Bridgeport complain that the odors from the new garbage plant are very similar to those from the old one. Commissioner Whitcomb, who has visited the plant, says that there is no accumulation of garbage in the pit to speak of, and he thinks the odors are created by gases generated during the process of reduction.

Mechanical Filtration Plant.—The mechanical filtration plant at Cohoes, N. Y., built by the New York Continental Jewel Filtration Company, has been finished and placed in operation. It will be operated several months before it is finally accepted by the city.

Portable Pumping Plants.—Commissioner Edwards of the New York Street Cleaning Department is looking up the subject of portable gasoline pumping plants to be used for pumping river water into street flushing machines. A pumping capacity of about 300 gallons a minute is desired. The scarcity of Croton water, as well as the question of economy, is the cause of the innovation.

Inspecting Asphalt Pavements.—Francis P. Smith, of Dow and Smith, chemical engineers, recently looked over 30 miles of Syracuse pavement in company with Mayor Schoeneck, Commissioner of Public Works F. M. Westcott, Deputy City Engineer Isaac Schwartz and Superintendent G. H. Beebe of the Bureau of Water. They also visited the asphalt mixing plant of the Warner-Quinlan Company in Fulton Street. Mr. Smith returned to New York well supplied with samples of pavement for analysis and report.

Information Bureau.—The Salvador government now maintains an information bureau to report upon the orders which the various departments of the government may consider placing abroad or in the home market. Manufacturers interested should send catalogues and prices addressed to the Oficina de Informacion, Ministerio de Agricultura, San Salvador.

Auto Engine.—A Webb auto fire engine has recently been installed in the Vailsburg section of Newark, N. J. Under Acting Chief Sloan a test was made. The apparatus was sent six-tenths of a mile and the men laid six lengths of hose in two minutes and fifty-four seconds after the call was sounded.

Auto Combination Apparatus Tested.—An auto combination hose and chemical wagon built for the Sanford, N. Y., fire department by the American La France Company was recently tested. The auto is 48 horsepower, with eight cylinders, though 72 horsepower is developed under speed. Hills were climbed at speeds varying from 20 to 46 miles an hour. Mayor Ellison, Fire Commissioners Amey and Cole, Fire Chief McCarthy, several of the city's Aldermen and others to the number of 11, rode on the truck during the demonstration.

Municipal Lighting Plants.—When the Chamber of Commerce of Manette, Ga., recently made an investigation of municipal ownership of lighting and water plants, it found that of the 89 municipally owned lighting plants in Georgia, 51 had been built by J. B. McCrary Company, Atlanta, Ga.; of the 107 municipally owned water works, 33 were built by the same company. Joseph M. McCrary, president of the company, is an engineer. Altogether 300 municipal plants have been built by this company. The company has a bond department which assists the towns in disposing of their securities.

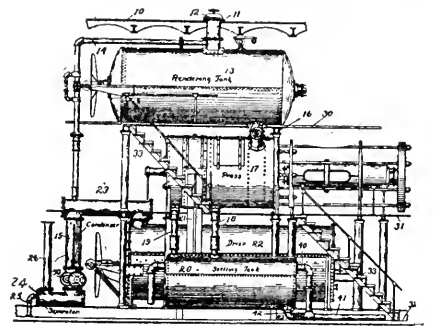
Trinidad Maltha.—Dr. Albert Sommer, recently connected with the Texas Company, will take charge of a new department of the Barber Asphalt Paving Company. Dr. Sommer received the degree of Doctor Ingenieur, Dresden University, in 1903. Later he was assistant in the chemical laboratory of Prof. Walter Hempel, Dresden University, whose specialty is technical organic chemistry. In 1910 Dr. Sommer was lecturer on Petroleum and Its Products, School of Marine Engineering, United States Naval Academy, Annapolis.

Dr. Sommer is already actively engaged in the enormous amount of development work undertaken immediately upon the discovery of the Trinidad maltha in the neighborhood of the asphalt lake. He describes this discovery as the "mother substance" of Trinidad asphalt and one that, having no exact counterpart among the malthas heretofore known to the asphalt industry, is destined to play an important part in the future progress of street paving and road building.

PATENT CLAIMS

994,047. **SYSTEM OF APPARATUS FOR TREATING GARBAGE.** Frederick G. Wiselogel, Indianapolis, Ind., assignor to United States Construction and Utilization Company, Rochester, N. Y., a Corporation of New York. Serial No. 451,106.

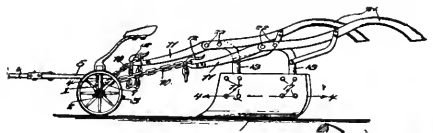
In a refuse reduction plant, the combination of a receiving floor, a pair of rendering tanks arranged beneath said floor and having receiving portions in said floor, a press arranged beneath the rendering tanks, independent connections between each rendering tank and press, a drier arranged beneath the press, a connection between the pulp discharge of said press and the drier, a settling tank also arranged beneath the press, a connection between the



liquid discharge of the press and the settling tank, a valved draining discharge leading from said settling tank at its lowest point, an overflow passage leading from an upper portion of the settling tank, a condenser, a connection between said condenser and the rendering tanks and drier, a vacuum pump connected with said condenser so as to maintain a vacuum within the drier and rendering tanks, and a separator connected with the discharge side of said pump, and having a liquid discharge pipe and a gas discharge pipe, all combined and arranged as set forth.

993,487. **ROAD-SCRAPER.** Jacob Williamson, Ava, Ill. Serial No. 590,938.

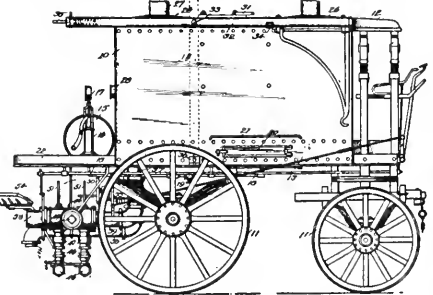
In a road grading machine, a pair of scraper beams capable of being changed in position, one in advance of the other, and provided with downwardly extending cylindrical portions at their rear, a scraper con-



ected between the beams and provided with tubular members in which the downwardly extending portions of the beams are swiveled, in order to permit a swiveled action between the beams and the scraper when the beams are changed in position relative to one another.

993,618. **APPARATUS FOR TREATING ROADS.** Henry K. Potter, Boston, Mass., assignor to Studebaker Brothers Manufacturing Company, South Bend, Ind., a Corporation. Serial No. 588,337.

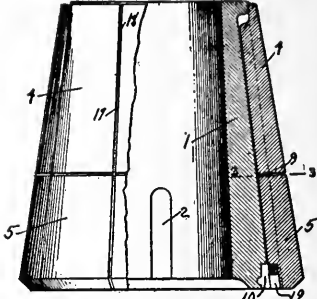
The combination with a vehicle running gear, of a tank mounted thereon, a fire box under the tank, T-rails on the running



gear, said rails having their webs upstanding, and the side walls of the tank being extended to form the side walls of the fire box, and secured to said upstanding webs on the outside thereof, the bottom of the fire box being secured to the inner horizontal flanges of the T-rails, and a spraying device connected to the tank.

993,783. **CRUSHER-HEAD.** Volney W. Mason, Jr., New York, N. Y., assignor to Edgar Allen American Manganese Steel Company, Augusta, Me., a Corporation of Maine. Serial No. 588,157.

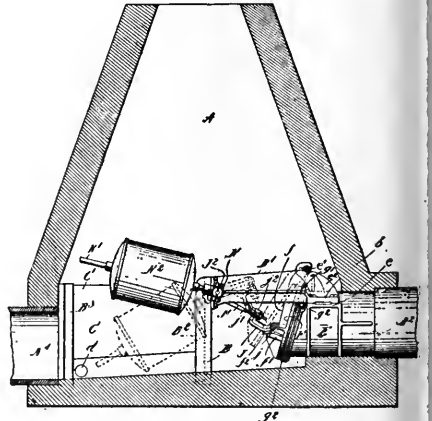
In a crusher head, a core having a series of vertically extending grooves; a series of circumferentially arranged segments spaced apart from one another and occupying the upper portion of the exterior surface of said core, and having each a rib adapted to enter one of the grooves aforesaid and to co-operate therewith to



hold the segments in place upon the core; a second series of circumferentially arranged segments spaced apart from one another and occupying the lower portion of the exterior surface of said core, and having each a rib similar to the ribs of said first mentioned segments; and means interposed between adjacent ends of aligned segments of said two series of segments whereby they are spaced apart from one another.

993,587. **REGULATOR - VALVE FOR SEWERS.** Charles H. Dodd and Richard J. McNulty, Boston, Mass. Serial No. 521,665.

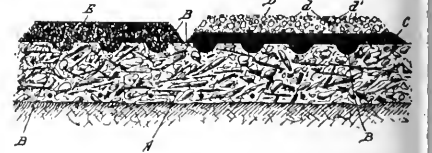
The regulator valve above described, comprising a nozzle, a gate, and means for supporting said gate comprising two arms mounted on said nozzle, each arm being slotted, a hinge rod adjustably mounted



in said slots to form a hinge for said gate whereby said gate may be adjusted on an axis transverse to the length of said nozzle, as well as toward and from said nozzle in combination with means for operating said gate.

994,092. **CONCRETE ROADWAY.** Edward M. Chadbourne, San Francisco, Cal. Serial No. 615,134.

The method of pavement construction which consists in providing an aggregate composed of a mixture of wear resistant stone of such size as to have a large percentage of voids and sand or equivalent having a smaller percentage of voids, the interstices in the sand being of such size as to exert capillary attraction on a limpid



but normally non-fluid asphaltic binder, then heating the mixture of stone and sand and filling the interstices therein from the bottom capillary action, with a normally non-fluid asphaltic binder rendered limpid by the heat of the mixture of stone and sand, whereby a homogeneous layer is produced having no excess of either binder or aggregate.

THE WEEK'S CONTRACT NEWS

Relating to Municipal and Public Work—Street Improvements—Paving, Road Making, Cleaning and Sprinkling—Sewerage, Water Supply and Public Lighting—Fire Equipment and Supplies—Bridges and Concrete Work—Sanitation, Garbage and Waste Disposal—Police, Parks and Miscellaneous—Proposals and Awards.

To be of value this matter must be printed in the number immediately following its receipt, which makes it impossible for us to verify it all. Our sources of information are believed to be reliable, but we cannot guarantee the correctness of all items. Parties in charge of proposed work are requested to send us information concerning it as early as possible; also corrections of any errors discovered.

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREET IMPROVEMENTS				
Ohio	Cincinnati	June 16, noon	Improving the Loveland and Madeira road; constructing culvert and approaches on Betts ave. in Springfield township.	Stanley Struble, Pres. Bd. Co. Comrs.
Ohio	Toledo	June 16, noon	Improving Kelsey ave. by paving central 30 ft. with vitr. brick on concrete foundation, necessary grading, curbing, retaining walls, drainage, etc.	J. R. Cowell, Dir. Pub. Service. Amos E. Ehle, Town Clerk.
Indiana	E. Germantown	June 16, 7 p.m.	Constructing cement sidewalks in various streets.	Oscar C. Ferry, Asst. Clk. Bd. P. W. Board Pub. Works.
Massachusetts	Holyoke	June 16, 2 p.m.	Furnishing paving blocks.	Board Affairs.
Massachusetts	Springfield	June 16	Paving about 5,200 sq. yds., three streets.	Timothy Dasey, Mayor.
West Virginia	Bluefield	June 16, 7:30 p.m.	Macadamizing Princeton ave. with water-bound macadam.	J. M. Nicholson, Boro. Clerk.
New York	Little Falls	June 16	Paving and curbing various streets.	C. F. Redmon, Turnpike Supervisor.
Pennsylvania	Derry	June 16	Paving with vit. brick about 9,650 sq. yds.; 4,850 lin. ft. combined curb and gutter.	S. A. Arnold, Clerk. Geo. Johnson, Clerk.
Kentucky	Paris	June 17	Constr. 2 1/2 miles of new turnpike, ten miles west of Paris.	J. P. Congdon, Secy. Rossford Rd. C.
Ohio	Canfield	June 17, noon	Grading and paving with brick on furnace slag foundation 948 lin. ft. of Broad street. Estimated cost \$6,232.26.	Francis G. Ward, Commissioner.
Ohio	Hamler	June 17, noon	Grading, curbing and paving Belton street.	Wm. Barneck, City Engr.
Ohio	Pocattelo	June 17, noon	Constr. macadam road between Rossfork and Gilson in Bingham County.	John J. Brown, Pres. Bd. Trustees.
New York	Buffalo	June 17, 11 a.m.	Furn. paving stone, curbing, sand, gravel, crushed stone and bit. dressing for mac. roads for fiscal year 1911-12.	H. H. Lotter, City Engineer.
Minnesota	Albert Lea	June 19, 5 p.m.	Paving with creosoted wood, vit. brick, mineral rubber, bitu. sandstone or concrete 32,280 sq. yds.	Wm. T. Richards, County Auditor.
New York	White Plains	June 19	Constr. a ten foot center strip of macadam asphalt in portion of Church street.	County Commissioners.
Washington	Vancouver	June 19	Street improvements, consist. of paving, grading, macadamiz., etc., estimate cost \$292,780.	Jas. C. Holland, City Clerk.
Indiana	Anderson	June 19	Constructing gravel roads in various townships.	John M. Murch, County Auditor.
Washington	Hoquiam	June 19	Constructing the Emerson road, est. cost \$17,000.	R. Milton Ford, Village Clerk.
Montana	Havre	June 19, 8 p.m.	Constructing concrete walks and curbs.	John T. Geary, City Clerk.
Texas	Galveston	June 19, 11 a.m.	Grading, rebuilding culverts and resurfacing county road from Virginia Point to Texas City Junction.	John E. Potter, President.
Michigan	Highland Park	June 19, 7:30 p.m.	Paving various streets with creosote block, asphalt block, cedar block and reinforced concrete.	Ed. Minton, Town Clerk.
New York	Yonkers	June 19	Regulating and grading Nepperhan ave. and setting flagging.	Wm. T. Easton, City Clerk.
Pennsylvania	Derry	June 19, 8 p.m.	Excavating, grading and paving with vit. brick right of way of Westmoreland County R. R. Co. on North Chestnut street.	Geo. Warriner, Chm. Bd. Selectman.
Pennsylvania	Media	June 19, noon	Resurfacing portion of Monroe st. about 3,100 ft. in length.	George T. Bouton, Clk. Bd. St. Com.
Michigan	Dowagiac	June 19	Grading High st. and paving with 6-in. concrete surfaced with bitumen; combined curb and gutter.	E. D. Fouse, City Clerk.
Massachusetts	Palmer	June 19	Rebuilding and resurf. Main st. in the village of Bondville.	J. S. Hanlon, City Clerk.
New Jersey	Jersey City	June 19, 2 p.m.	Repeating Ninth street and improving Enos place.	Frank M. Kerr, Chief State Engr.
Georgia	Newnan	June 19, 8 p.m.	Laying 22,000 sq. yds. smooth pavement.	H. E. Devlin, City Engineer.
New York	Auburn	June 20, 8 p.m.	Bldg. subways and vitrified brick pavement on State street.	Jos. E. Washington, Chm. Bd. Co. C.
Louisiana	New Orleans	June 20, noon	Bldg. highways from North st. to Bayou Sara road, Baton Rouge and from Mansfield to Logansport.	Stanley Struble, Pres. Bd. Co. Comrs.
Kansas	Newton	June 20, 10 a.m.	Paving 5,000 sq. yds. with brick asphalt filler.	Geo. W. De Voe, Boro. Clerk.
Tennessee	Springfield	June 20, noon	Grading, ditching and macadamizing about 50 miles of public roads in Robertson County.	James N. Norris, County Compt.
Ohio	Columbus	June 21	Improving various roads in Franklin Co., about 8 miles; grad. the grounds of tuberculosis camp, constr. concrete walks.	Stanley Struble, Pres. Bd. Co. Comrs.
New Jersey	Spotswood	June 22, 8 p.m.	Laying 2,400 ft. of concrete curbing.	C. P. Rudolph, Chm. Commissioners.
Pennsylvania	Wilkes Barre	June 22, 2 p.m.	Repairing with bituminous macadam the Kingston and Dallas Turnpike, in Kingston township.	Jas. T. MacMurray, City Clerk.
Ohio	Cincinnati	June 23, noon	Repairing portion of Blue Rock pike; also for oiling Colerain pike in Colerain twp. and Cleves and Bridgetown pike in Green and Miami townships.	H. E. Wells, County Clerk.
Dist. of Col.	Washington	June 23, 2 p.m.	Laying gutters and bituminous macadam pavement and setting curb on various streets.	State Highway Com.
New Jersey	Plainfield	June 26, 8 p.m.	Paving about 40,000 sq. yds. with plain and bituminous.	Bd. Superv. Wise County.
Nebraska	Lincoln	June 27	Paving portions of roads Nos. 667 and 1225, 9,564 sq. yds. Class "C" and "G"; 10,760 lin. ft. artificial stone curb.	John Scott, Clk. Bd. Co. Comrs.
Virginia	Norfolk	June 28	Constructing new highways in Wise county.	J. D. Miller, Chm. Co. Comrs.
Tennessee	Wise Ct. House	June 28, 11 a.m.	Constructing about 81 miles of county highway.	Stanley Struble, Pres. Bd. Co. Comrs.
Ohio	Columbus	June 28	Furnishing and applying 10,489 gals. surface treatment on Harrisburg Pike; 15,739 gals. on Sunbury Pike and 13,630 gals. on National Road.	A. B. Maupin, City Engr.
Pennsylvania	Greensburg	June 29, 11 a.m.	Construction and permanent improvement of four county roads about 68,348 feet.	
Ohio	Cincinnati	June 30, noon	Treating with tar Hillside ave. and Warsaw pike; oiling Springfield pike in Springfield township.	
West Virginia	Huntington	July 6, 1 p.m.	Paving various streets with vit. brick, asphalt, bitulithic, tarry or asphalt block.	
SEWERAGE				
Ohio	Piqua	June 16, noon	Constructing a sanitary sewer in South Main street.	T. D. McClay, Dir. Pub. Service.
Missouri	St. Louis	June 16	Building Sewer Harlem Creek District No. 7.	Maxim Reber, Pres. Bd. Pub. Imp.
Ohio	Niles	June 16, noon	Constr. sanitary sewers in Williams, Smith, Mechanic and Chestnut sts. necessary manholes, house connections, etc.	J. E. Tregaskis, Clk. Bd. Control.
Ohio	Canfield	June 17, noon	Constructing storm water sewer in portion of Broad street.	S. A. Arnold, Clerk.
California	Oakland	June 17, 11 a.m.	Constructing main sewers together with lateral sewers in Sewer Districts 1, 2, 3 and 4.	Jas. W. Nelson, Secy. Bd. Pub. Wks.
Minnesota	Brainerd	June 19	Constructing a general sewer.	V. N. Roderick, City Clerk.
New York	Long Island City	June 19, 11 a.m.	Reconstructing Harris ave. sewer; bldg. sewers in Jackson and other avenues.	Lawrence Gresser, Boro. Pres.
New Jersey	Roosevelt	June 19	Constructing sanitary sewers.	Borough Clerk.
Georgia	Toccoe	June 20	Constructing a sewerage system.	D. E. Hogsed, Chm. Sewerage Com.
South Dakota	Madison	June 20	Installing a sewer. Estimated cost \$65,000.	Chas. A. Trimmer, City Engr.
Wisconsin	Janesville	June 21, 2 p.m.	Bldg. sewers in Districts 3, 4, 11, 15 and 16.	John C. Nichols, Chm. Str. Asses. C.
Ohio	Dayton	June 21, noon	Constructing storm water sewers in various streets.	J. C. Ely, Dir. Pub. Service.
Massachusetts	Attleboro	June 21, 3 p.m.	Laying c. i. and vit. pipe sewers; building brick manholes, etc.	J. J. Van Valkenburgh, Engineer.
Wisconsin	Wausau	June 22	Constr. 2,300 ft. of 5-ft. reinforced concrete sewers and 1,000 ft. vit. pipe sewer.	B. C. Gowan, City Engr.
South Dakota	Aberdeen	June 26	Constr. about 1,860 ft. of 18 and 8-in. pipe sew. and 5 manholes.	F. W. Raymond, City Auditor.
North Carolina	Red Springs	June 27, 3 p.m.	Constr. a sewer system including 4 1/2 miles of 8 to 15-inch pipe.	A. B. Pearsall, Chm. Bd. Pub. Wks.

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
SEWERAGE (Continued)				
Minnesota	Morris	June 27, 8 p.m.	Constr. 3,232 ft. of 8-in. sewer, 4-in. tile drain, manholes, flush tank, etc.	C. B. Burpee, City Clerk.
New York	Hempstead	June 27, noon	Bldg. about 122,930 lin. ft. 8 to 20 in. vit. pipe, about 2,000 lin. ft. 8 to 18-in. cast iron pipe, about 115,300 cu. yds. excavation, 3,000 vert. ft. concrete manholes, 113 flush tanks, 445 man-hole covers, 18,000 lin. ft. 6-in. vit. pipe for house service, two pumping plants and one disposal plant.	M. O. Hedges, Clk. Vil. Bd.
Maryland	Baltimore	June 28	Constr. storm water sewers in the bed of Jones' Falls, preliminary to constructing boulevard over Falls.	J. H. Preston, Mayor.
New York	Hudson	June 29, 6 p.m.	Constr. 10-in. vit. tile sewer on Green street.	M. J. O'Hara, City Engineer.
California	San Jose	July 3	Construct septic tank for County hospital.	City Clerk.
South Dakota	Madison	July 6, 8 p.m.	Bldg. sewer system about 31,465 lin. ft. 6 to 18 in. vit. pipe.	George H. Waskey, Mayor.
WATER SUPPLY				
Colorado	Colorado Spgs.	June 16, 10 a.m.	Furn. and laying 63,785 ft. of cast iron pipe 4 to 16-in., and 43 tons special castings; alternate bids for 12 and 16-in. steel pipe; 143 gate valves and boxes; 53 tons pig lead, manh., etc.	H. F. Ivory, Mayor. Henry L. Heilman, Secy. Bd. W. C.
Indiana	Evansville	June 17, 10 a.m.	Furnishing about 250 tons of c. i. pipe and spec. valves, meters.	E. E. Bellamy, City Clerk.
Kansas	Cherryvale	June 19, noon	Bldg. water purification plant, storage reservoir, etc.	
Ontario, Can.	Toronto	June 20, noon	Laying about 3,500 ft. of riveted steel pipe 6-in. in diameter in Lake Ontario.	F. S. Spence, Chm. Bd. Control.
Alabama	Gadsden	June 21	Furn. about 900 tons of water main, 20 tons of specials, 20 tons of lead, 30 valves and 26 hydrants.	M. E. Jones, Supt.
New York	New York	June 21, 2 p.m.	Furnishing and driving test wells in Kings, Queens and Nassau counties; hauling and setting fire hydrants, etc.	H. S. Thompson, Comr. Water. Sup
Vermont	Ft. Ethan Allen	June 21, 10 a.m.	Building addition to pump house, installing electrically driven pumping machinery; building concrete reservoir; remodeling electric lighting system.	R. J. Fleming, Capt. 10th Cav. Qm
Indiana	Hammond	June 21, 10 a.m.	Furnishing 6,400 feet 36-in. standard c. i. water pipe and 4,950 feet 16-in. c. i. water pipe.	A. R. Ebert, Chm. Bd. Pub. Wks. Geo. B. Thorn, Secy. Cross. Wt. Co
New Jersey	Crosswicks	June 22	Constr. a system of water works.	
Texas	Galveston	June 22, noon	Furn. compound Corliss fly-wheel pump of 4,000,000 gals per day capacity, including piping, valves, foundations, etc.	W. D. Masterson, City Supt. of Elec
Arkansas	Mena	June 23	Constr. new distribution system for water works Dist. No. 2; separate bids for material and construction; 780 tons c. i. pipe and special castings; about 40,000 ft. of 4 to 12-in. mains	John Thompson, Chm. Bd. Imp. F. H. Schoaff, Village Clerk.
Ohio	Euclid	June 26, noon	Laying 6-in. water mains in four avenues.	J. J. Jones, City Clerk.
New Jersey	Bridgeton	June 27	Constructing complete pumping station and water filtration works, machinery, pumps, fillers, etc.	Albert Scott, Pres. Ken. St. Bd. Cor
Kentucky	Frankfort	June 27, 11 a.m.	Constr. pipe line to Lakeland, consisting of 7,360 ft. 16-in. pipe, 21,680 ft. 12-in. pipe, 10,690 ft. 8-in. pipe.	L. N. Senecal, Secy. Bd. Comrs. Henry N. Knott, City Clerk.
Quebec, Can.	Montreal	June 29, noon	Installing pumping machinery, blower and cranes at filtration plant.	John Wilson, City Engineer. H. H. Canfield, City Clerk.
Minnesota	Minneapolis	June 30	Furnishing filter equipment and devices.	
Ontario, Can.	Ft. William	July 1	Selling equipment of municipal pumping and electrical generating plant, suitable for town of 5,000 inhabitants.	
Ohio	Cleveland Hghts.	July 5, noon	Building 10-in. water main in Cedar Roads.	
BRIDGES				
Washington	Ritzville	June 16	Constr. a 2-span steel bridge across Palouse River.	County Commissioners.
Ohio	Cincinnati	June 16, noon	Building bridge on Dunlap Creek road, Colerain township.	Fred Dreihls, Clk. Co. Comrs.
Pennsylvania	Sunbury	June 16, noon	Building bridge, Spurnheim street, Shamokin.	E. W. Young, Ch. Clk. Co. Comrs.
Maine	Mars Hill	June 17	Bldg. rein. conc. bridge, 66 ft. span, 24 ft. roadway.	W. M. Denman, Spring., Mass., C. E
Indiana	South Bend	June 19, 11 a.m.	Taking down old bridge and re-erecting an iron truss bridge in Penn township.	John W. Harbou, County Auditor. Bd. County Comrs.
Ohio	Lima	June 20	Constructing a concrete arch bridge.	A. L. Rhoades, County Comptroller
Pennsylvania	Kutztown	June 20, 10 a.m.	Constr. a reinforced concrete arch bridge.	E. L. Marriage, County Auditor. Board Co. Comrs.
Iowa	Eldora	June 22	Constr. a 7-span steel bridge 30 ft. wide with concrete floor over Iowa River, at Iowa Falls.	
Ohio	Brooksville	June 22, 10 a.m.	Building superstructure bridge No. 239, Clay township.	J. O. Donovan, Clk. Bd. Co. Comrs
Ohio	Dayton	June 22, 10 a.m.	Constr. superstructure on Bridge No. 239 over Wolf Creek in Clay township, including removal and purchase of old structure.	Stanley Struble, Pres. Bd. Co. Comr
Ohio	Cincinnati	June 23, noon	Constr. bridges, culverts and approaches on County Club road in Sycamore, Silverton and Columbia townships.	J. H. Ferguson, Chm. Bridge Com.
Virginia	Rocky Mount	June 24	Constr. two bridges in Franklin County, of iron.	
Washington	Tacoma	June 26, noon	Constr. new bridges on 11th st. Separate bids on (1) substructure; (2) entire bridge except steel work, electrical and other machinery; (3) Furn. metal work, electrical equipment; (4) Erecting superstructure; (5) Constr. bridge complete, removing old bridges constr. temporary bridge.	City Clerk.
Texas	Houston	July 1	Constr. a reinforced concrete viaduct over Houston ship channel about 1,650 ft. long and 60 ft. wide.	F. L. Dormant, City Engr. City Clerk.
Pennsylvania	Pittsburg	July 1	Constructing one concrete arch, estimated cost \$85,000.	
Ohio	Cincinnati	July 7, noon	Constr. concrete bridge at intersection of German and Compton roads in Springfield township.	Stanley Struble, Pres. Bd. Co. Comr
LIGHTING AND POWER				
Sask., Can.	Prince Albert	June 26	Furn. hydraulic power and electrical power equipment.	C. O. Davidson, Secy.-Treas.
Arkansas	England	July 1	Building and operating an electric light plant under a 30-year franchise.	H. Galloway, Recorder.
Australia	Brisbane	Jan. 30, noon	Designs, supply and erection at Mount Crosby Pumping Station of alternatively one, two and three complete units consisting of power generating pumps and plants, etc.	Geo. Johnston, Albert St., S.&W.B
FIRE EQUIPMENT				
Dist. of Col.	Washington	June 20, 2 p.m.	Furn. 15,000 ft. 2½-in. cotton covered rub. lined fire hose.	Cuno H. Rudolph, Commissioner
New Jersey	Princeton	July 5	Furn. auto pumping engine.	E. M. Updike, Chm. F. & W. Com.
MISCELLANEOUS				
Arkansas	Benton	June 16	Erecting jail; separate bids for cell work.	W. H. Evans, County Comr.
Manitoba, Can.	Winnipeg	June 16	Erecting an incinerator.	M. Peterson, Secy. Bd. Control.
Indiana	Evansville	June 19, 7 p.m.	Constr. earth work embankments surrounding filtration plant consisting of about 2,500 cu. yds.	Henry L. Heilman, Secy. Bd. W. C
New Jersey	Perth Amboy	June 19, 8:30 p.m.	Building fire house for Liberty Ladder Company.	Wilbur LaRoe, City Clerk.
Ohio	Toledo	June 23, 2 p.m.	Constructing a market house.	J. R. Cowell, Director Public Servi
Georgia	Macon	June 20	Constr. a new jail.	County Commissioners.
New York	N. Brighton, S.L.	June 20	Constr. building, destructor foundations, chimney base, connecting flues, dust pockets, ventilating ducts and adjuncts for the Clifton Refuse Destructor.	Geo. Cromwell, Boro. President.
California	Oakland	June 21, 11 a.m.	Collecting and disposing of garbage and refuse.	James W. Nelson, Secy. Bd. P. Wk
Indiana	Indianapolis	June 21	Collecting and disposing of garbage.	Edw. A. Ramsay, City Clerk.
Massachusetts	Holyoke	June 23, 2 p.m.	Constructing shelter for public playground.	Oscar C. Perry, Assistant Clerk.
Indiana	South Bend	June 26, 10 a.m.	Furn. 50 or more voting machines.	John W. Harbou, Auditor.
Ohio	Maumee	June 26, noon	Erecting a village hall building.	Geo. V. Raab, Village Clerk.
New Jersey	Paterson	June 28	Collecting and disposing of garbage and refuse for term of 5 years from July 1.	T. S. Standeven, City Clerk. John Wilson, City Engineer. County Auditor.
Ontario, Can.	Ft. William	June 30, 5 p.m.	Constructing a reinforced concrete subway.	
Indiana	Muncie	July 5	Constructing a new barn at County Infirmary, 40x50 ft.	

STREET IMPROVEMENTS

Andalusia, Ala.—Board of Revenue has asked for bids for construction of additional 10 miles of good road.

Richmond, Cal.—Bissell ave., 1 1/4 miles, will be paved with asphalt; cost about \$50,000; plans by City Engineer Chapman.

Willows, Cal.—Glenn County is considering \$200,000 bond issue for roads and ridges.

Bridgeport, Conn.—Mayor Buckingham has recommended extension of Broad st. and wider approach to Stratford ave. ridge.

Jacksonville, Fla.—Estimates will be prepared of cost of paving Ionia and Clay sts. with vit. brick.

Dalton, Ga.—Catoosa County has decided to build road to connect with government line at Ringgold.

Indianapolis, Ind.—Board of Public Works has adopted resolutions for improving eight streets.

Jacksonville, Ind.—Board Public Works has decided to pave Meridian st.

Portland, Ind.—Jay County Commissioners have rejected all three bids submitted for construction of proposed O. S. Buckingham stone road in Bearcreek township.

Princeton, Ind.—Gibson County Commissioners will soon let contract for constructing 3 gravel roads in Wabash Township at cost of \$21,000.

Louisville, Ky.—Three miles of modern metal built and drained road will be constructed on Bardstown road through village of Fern Creek by the Fiscal Court of Jefferson County.

Plaquemine, La.—Police Jury is considering building of gravel road on Bayou, laquemine to Indian Village; distance, 9 mi.

Chicopee, Mass.—City will expend \$25,000 on permanent street improvement work.

Detroit, Mich.—Council has passed resolutions providing for the resurfacing of arned, Madison, 24th and Beaubien sts., lark and Warren aves.; cost about \$11,970.

Houghton, Mich.—Village Council has authorized expenditure of \$1,500 to macadamize West Sheldon st.

St. Paul, Minn.—Repaving of 5th st. is being considered; either creosoted wood blocks, cost \$20,564.70, or sandstone, \$22,26.70, will be used.

Jackson, Miss.—Council has decided to spend \$85,000 on street improvements.

Butte, Mont.—Improvement of West Park st. is being urged.

St. Louis, Mo.—Bids will soon be asked by Commissioner of East Fourth St. District for paving East Fourth st. with creosote block or asphalt.—Claude Ringo, secretary.

Hastings, Neb.—Extension of First st. paving is being considered by Council.

Bayonne, N. J.—Council has passed resolution for asphaltting of Ave. C.; is also considering improvement of five streets.

Millville, N. J.—Council has decided to pave High st. with small gravel stones.

Rahway, N. J.—Council has decided to pave Main st. with asphalt paving brick or corks.—Chas. H. Lambert, City Clerk.

Trenton, N. J.—Bids will be asked for pairing North Broad st. with Filberne; Council has decided to pave Highland ave. with high grade asphalt and is considering paving of Ward Alley with onolith concrete.

Albany, N. Y.—Council has passed ordinance for repaving Livingston ave. and lack road and improving of Buchanan

East Syracuse, N. Y.—Village Board, rough Superintendent I. W. Allen, is planning to resurface or fill practically every street in this village during season; acadam will laid on two blocks in Center st., one block in Upton st. and two corks in McCool ave.

Mount Vernon, N. Y.—City has issued 8,000 bonds for street improvements.

Niagara Falls, N. Y.—City Engineer F. S. Arkhurst has been instructed by Board of Public Works to estimate cost of paving th st. from Niagara st. to Ferry ave., and th st. from Ontario ave. to Portage road, and permanent sidewalks in 13th st. from Niagara st. to Ferry ave.

Oswego, N. Y.—Superintendent of Highways E. A. Howard has received notice from State Highway Commission that plans have been drawn for the improvement of Fruit Valley Southwest Oswego road, and that bids will soon be asked; road will be built this summer.

Rochester, N. Y.—Bids have been received and new proposals will be asked for paving Mt. Hope ave. cement walks.

Walden, N. Y.—Bids received for constructing 1 1/2 miles of concrete sidewalk have been rejected; work will be done by village; estimated cost 12c. per sq. ft.

Asheville, N. C.—City is considering paving of Magnolia ave. from Cumberland to

N. Main st. with bitulithic.—J. E. Rankin, Mayor.

Wilmington, N. C.—New Hanover County has voted \$50,000 bonds for road and bridge improvements and construction.—D. McEachern, Chairman County Commissioners.

Bryan, O.—Council has decided to pave East High st. with brick as soon as bonds can be sold and other preliminaries completed.

Cincinnati, O.—Cost of improving Turrill st. with brick has been estimated at \$13,927.50 and Moore st. with asphalt at \$2,172.75; Council has decided to improve Ella st. by paving with brick and setting with limestone curbs at cost of \$2,137, and macadamizing Herschel ave. with tar binder, cement combined curb and gutters at cost of \$8,338.75.

Cincinnati, O.—County Commissioners have decided plans and specifications to be prepared for improving Lower River road at a cost of \$10,254 and reported favorably on improving Sharon ave. and macadamizing of Springfield pike at a cost of \$20,000.

Cleveland, O.—Bids will be received June 19, noon, for \$15,000 street opening and \$15,000 grade crossing bonds.—H. L. Davis, City Treasurer.

Dayton, O.—Montgomery County Commissioners will expend about \$35,000 on state and county roads in vicinity of this city.

Tulsa, Okla.—City Commissioner Yeager and City Engineer Huges have recommended eighty blocks of paving at total cost of about \$300,000.

McKeesport, Pa.—Repaving of Fifth ave. and Walnut st. is being considered.

Washington, Pa.—Improvement of 21 miles of road has been authorized by County Commissioners, highway to be built from bond issue of \$500,000.

Wellsboro, Pa.—Citizens have voted \$49,500 bonds to extend brick pavement.

Columbus, S. C.—Washington st. between Assembly and Sumpter sts. will be paved with wooden blocks.

Belton, Tex.—Precincts 4 and 5 of Bell County will vote July 1 on \$350,000 bonds for road improvements.

Teague, Tex.—Citizens will vote June 29 on \$30,000 bonds for street improvements.—J. H. King, Mayor.

Alexandria, Va.—Improvement of streets and sidewalks at cost of \$100,000 is being considered.

Seattle, Wash.—Cost of grading Lane st. has been estimated at \$152,475.

Spokane, Wash.—City Commission has decided to resurface Northwest boulevard; bids will be asked on various kinds of paving.

Green Bay, Wis.—Council has taken preliminary steps for proposed improvement of streets.

CONTRACTS AWARDED

Gadsden, Ala.—Building sidewalks on 3d st., to C. O. Duncan, \$5,999.10.

Little Rock, Ark.—By City to E. J. Wederstrom for paving in Water-Cross Paving District.

Longbeach, Cal.—Constructing the seaside walk and bulkhead to F. W. Young, Los Angeles, \$95,000.

Los Angeles, Cal.—To Walter Overell for improving Michelterena st., \$3.90 per lin. ft., grading and graveling, 35c. per lin. ft. cement curb, 15c. per sq. ft. cement gutter, 334 sq. ft. vitr. block gutter, aggregate \$12,980.03.

Oakland, Cal.—Sidewalking Shafter ave. and other avenues, to Oakland Paving Co.

Pasadena, Cal.—Grading, graveling, etc., Washington st., between Hill and Lake sts., to J. E. Haddock, at \$10,800; paving with asphalt macadam South El Molino ave., between Colorado and California sts., to James M. Montgomery, \$27,136.

Pomona, Cal.—Street work on Texas st., to Louis Ferrill; grading and oiling, per lin. ft., \$1.80; curbing, per lin. ft., 30c.; sidewalk, per sq. ft., 10c.

Bridgeport, Conn.—Paving State st. for its entire length, from Broad street to its westerly terminus, with wood blocks, to the Farber Asphalt Company to furnish the blocks, \$1.80 per sq. yd., and to Van Keuran & Son, Jersey City, for laying pavement, \$1.25 per sq. yd.

Thompsonville, Conn.—By Selectmen for macadamizing of Pearl and South sts., to Amos D. Bridge Sons, inc.; contract calls for about 11,000 yds., 97c. sq. yd.

Peoria, Ill.—Paving North Orange st. with brick, to J. S. Allen Co., \$7,110.

Brazil, Ind.—To Jas. McGuire & Sons, city, \$2,418, and to L. W. Gibbens & Son, Saline City, \$1,200, for building roads.

Des Moines, Ia.—Paving 35th st., to Bryant McLaughlin Paving Co., Des Moines, \$1.89 per sq. yd.

Fort Dodge, Ia.—Paving 7,500 yds. with concrete to Schweppe & Co. of the St. James Tile & Manufacturing Co., \$1.58 1/2 per yd.

Harlan, Ia.—Laying 13,600 sq. yds. concrete pavement to G. Mancini, \$1.18; other bidders: C. H. Atkins, \$16,665; J. A. Beebe, \$16,679; McMahon & Son, \$16,768; Luna Construction Co., \$18,711; to C. N. Atkinson for 1,250 sq. yds., \$1.29; other bidders: McMahon, \$2,802; G. Mancini, \$2,324; Luna Construction Co., \$2,401; reselling, \$1,885 lin. ft. curbing and gutter to Luna Construction Co., 30c.; 1,429 lin. ft. new curb, 30c.; 565 lin. ft. curb to C. N. Atkinson, 37c.; 770 lin. ft. new curb, 25c.; totals of bids: Luna Construction Co., \$2,475; W. R. Garland & Co., \$2,617; McMahon & Son, \$4,138; G. Mancini, \$2,791; C. H. Atkinson, \$2,616.

Lexington, Ky.—To Carey & Reed, for paving Vine st. with street asphalt, \$1.25 per sq. yd.

Lexington, Ky.—By Fiscal Court of Fayette County, to the Home Construction Co. for oiling reconstructed county roads.

Frederick, Md.—Paving South Market and East and West Patrick sts., to United Paving Co., Atlantic City, N. J., \$19,393.

Boston, Mass.—Building highway in Barnstable to E. J. Rourke, Abington, \$10,219; other bidders: M. R. Cavanaugh & Bros., \$11,014; Frank Williams, city, \$11,860 and Thos. Whalen & Co., Wollaston, \$12,114.

Bourne, Mass.—To M. J. Denauet & Co., 999 Chelmsford st., Lowell, for building 1 1/2 miles of State highways, \$8,529.

Groveland, Mass.—Building oil gravel road through School st., to Jas. E. Watkins, Amesbury.

Duluth, Minn.—Paving 10th ave. East with asphalt to P. McDonnell, \$6,713.50.

Kansas City, Mo.—Building 6 miles of rock road between Overland Park and this city, to Dobbins-Wilson Contracting Co., \$45,535.

St. Louis, Mo.—To Parker Washington Co., Taylor and Duncan aves. by the Board of Local Improvement for 19 street improvement contracts, \$45,948; work includes reconstructing street with wood blocks as follows: Taking up old paving, 85c.; granite curb, 83c.; marginal curb, 10c.; wood block, \$2.54; macadam, 1c.

Tilton, N. H.—Grading and surfacing with native stone about 3,500 ft. to Lane Constr. Co., Meriden, Conn.

Cape May, N. J.—To Lemuel Miller, city, for proposed 6-mile road as connecting link of Ocean Boulevard, \$23,751.62; foreign gravel.

Hackensack, N. J.—Road improvements: Franklin Turnpike, 3 sections, with asphalt concrete to G. M. Brewster Constr. Co., Hackensack, \$18,392; from New York State linesoutherly, distance of 9,362 ft., to same, \$35,741; from north line of Allendale to north line of Hohokus, to Geo. F. Brackett, Ridgewood, \$49,274, and for macadamizing road from Saddle River to Park Ridge, to E. Abrahams, Hackensack, \$22,962.

Newark, N. J.—To Ludwig Batt, South Orange, to lay two miles Bermudez asphalt macadam pavement on South Orange ave., South Orange, 97c. per sq. yd.; 3-in. coating on Washington ave., Belleville, 85c. per sq. yd.; to Osborn & Marcellis, Upper Montclair, for resurfacing Springfield ave., 2-in. amesite on one side and 2-in. on other, \$1.19 and 95c. per sq. yd.; resurfacing Bloomfield ave., Caldwell, to Bamberger & Chapman, city; 2-in. amesite, 95c. per sq. yd.

Dunkirk, N. Y.—Paving King st., to J. N. Doyle, Erie, Pa., \$23,000.

Lockport, N. Y.—Cement walk, curb and gutter on LeVan ave., to Contractors C. N. Stainthorpe & Co., \$1,839; other bidders: C. N. Whitore Co., at \$2,710; N. I. France, \$2,879.90; Harry E. Whitney, \$1,974.90, and John Irwin at \$2,670.

Schenectady, N. Y.—To Schenectady Contracting Co. for paving with sheet asphalt, in Huron st. to Henry W. Golden for curbing, laying sidewalks and grading portion of Van Vranken ave.; to John L. Nolan for repaving with granite block a portion of Veeder ave.

Utica, N. Y.—Extension of traffic way on Boulevard from Elm to Mohawk st., to Harry W. Roberts & Co., fluxed Bermudez asphalt, bituminous binder, \$18,940.47.

Yonkers, N. Y.—To Thomas Grady for regulating, grading and otherwise improving Alexander st., Ashburton ave. to the south line of Wells ave., \$25,500, for granite block.

Ashtabula, O.—Paving Market and Hubbard sts., to Thos. Fitzgerald, about \$30,000.

Bucyrus, O.—To Mallory Bros. for building new Winchester road, \$5,308; Bucyrus-Marion road, \$3,511 and Milmore-Marion road, \$2,615.

Canton, O.—To John Wilson, Alliance, for paving with brick 1 mile of Lexington road, \$17,608 and 1 mile of Harrisburg road, \$18,119.

Celina, O.—Road construction to E. & G. Alexander, Mestemaker Pike, \$1,197 and Hemmelgarn Pike, \$5,985, both to be built of screening gravel; to Fishbaugh & Karch,

Chickasaw Pike, \$21,000, road to be built of stone, to Edmett & Engler, Guggenbiller road, \$16,000, gravel.

Cincinnati, O.—To the Joe Grandison Construction Co. for change of route and improvement of Crookshank road, Summit, \$14,386.

Columbus, O.—Paving Summit st., 11th ave. to Mock road, to G. W. Patterson, \$63,000.

Lima, O.—Paving West Elm st. by the Board of Control, to Murray & Jameson, \$14,044; bituminous macadam will be used.

Perrysburg, O.—Paving 2d st. from Hickory to Pine, to T. J. Mulligan, Lima, \$38,335 for Wassell block with cement filler; George B. Campe, Toledo, has been engaged as engineer to look after work.

Wellington, O.—Paving with block paving S. Main and E. Main sts. from plans of Ohio Eng. Co., Elyria, to Lee & Driggs at \$23,991 and \$10,108, respectively; detail bid on S. Main st. is as follows: Excavation, 6,500 cu. yd., 30c.; drain, 3-in., 7,465 lin. ft., 3c.; concrete curb, 7,465 lin. ft., 34c.; split curb, 7,465 lin. ft., 40c.; machine dressed curb, 7,465 lin. ft., 49c.; concrete foundation, 12,700 sq. yd., 48c.; or slag foundation, 12,700 sq. yd., 39c.; or limestone foundation, 12,700 sq. yd., 39c.; paving block, 12,700 sq. yd., 94c., 96c., or 98c., according to different makes; inlets, 12, ea., \$13; 12-in. sewer, 1,000 lin. ft., 40c.; 10-in. sewer, 500 lin. ft., 30c.; 8-in. sewer, 27c.; tar filler, 3c., and headers, 254 lin. ft., 36c.

Grants Pass, Ore.—To the Warren Construction Co. for laying 10,000 sq. yds. of bitulithic pavement.

Beaver Falls, Pa.—Paving number of streets to George B. Clifford, \$24,585; other bidders: Hunter & Hammon, \$25,350; A. V. Prunnett, \$26,329.70; and R. C. McQuiston & Co., \$31,020.70.

Olyphant, Pa.—Paving 1 mile of streets to R. C. Ruthven, \$24,283; other bidders: Stephen Flanagan & Son, \$24,837; R. P. McHugh & Co., \$24,555; Scranton Paving Co., \$24,283.

Reading, Pa.—To Fehr & O'Rourke, city, to lay brick in 6th st., \$11,969.90.

Wellsboro, Pa.—Constructing 9,162 lin. ft. of road extending from Kelsey Creek over West ave. to the Delmar Township line, distance 4,747 lin. ft., and from Main st., over Tioga st., to Delmar Township line, distance 4,415 lin. ft., to E. Whalen, Towanda, \$34,869; other bidders: H. G. Hinkle, Altoona, \$43,985; A. E. Francis, Punxsutawney, \$37,393; Stucker, Wellsboro, \$35,143; John Bradley, Corning, \$31,741.

Nashville, Tenn.—To J. G. Laubheimer, for construction of granitoid curbing and sidewalks on portions of several new streets, 12½c. for sidewalk and 30c. for curbing.

Dallas, Tex.—To Risley Bros. for furnishing Jacksboro rock at 65c. per long ton.

Chehalis, Wash.—To Warren Construction Co. to pave streets with bitulithic; cost about \$57,740.

Everett, Wash.—Paving South Colby ave., to Atlas Construction Co., city, \$50,500.

Seattle, Wash.—Grading and curbing 25th ave., N. W., to J. H. Cullen & Co., \$18,910.50; other bidders: W. F. Manney & Co., \$19,664; N. McKimmon, \$20,709; A. Peterson & Co., \$25,086.50; Agassiz & Hadley, \$24,387.50; R. J. Barter, \$21,339.50.

Tacoma, Wash.—Paving Carr, N. 30th, N. 9th and Starr sts. with sandstone and asphalt, and other streets in Local Improvement Dist. No. 434, to Keasel Constr. Co., \$59,471.

Superior, Wis.—Building cement walks in the Third Ward, eight blocks, to Swan Holmquist, 63½c. per lin. ft. and 75c. per cu. yd. for filling; Fourth Ward contract, about five blocks of walk, to Bergman & Anderson, 58½c. per ft.; Eighth Ward, two contracts, to Ed. Johnson, 58 9-10c. and 59c. per ft.

BIDS RECEIVED

Stockton, Cal.—Grading and paving of county roads: Hogan road, F. C. McIntire, \$28,355; M. B. White, \$28,278.20; W. J. O'Brien, \$23,681.66; McDonald & Jenkins, \$25,993.55; West Side road, W. J. O'Brien, \$28,850; Cotton Bros., \$31,900.

Washington, D. C.—Furnishing Portland cement during the fiscal year ending June 30, 1912: (a) 45,000 bbls. Portland cement f. o. b. 14th and D sts. S. W., (b) alternate proposal, 30,000 bbls. Portland cement f. o. b. 14th and D sts. S. W.; Alpha Portland Cement Co., Easton, Pa., (a) \$1.61 per bbl., (b) \$1.61; National Mortar Co., Washington, D. C., (a) \$1.08, (b) \$1.08; Security Cement Co., Baltimore, Md., (a) 98c., (b) 98c.; Atlas Portland Cement Co., New York, (a) \$1.21, (b) \$1.21; Columbia Granite & Dredging Co., city, (a) \$1.70, (b) \$1.70; Rosslyn Supply Co., Rosslyn, Va., (a) \$1.49, (b) \$1.49.

Herkimer, N. Y.—Paving South Washington st. from Eastern ave. intersection to Smith st., Warren Bros. bitulithic, 5-

inch concrete foundation, \$2.20 per sq. yd., sewer curbing 90c.; D. P. Strobel and B. Manion, Corning, metropolitan black brick \$2.20 per sq. yd., curbing 60c.; Frank M. Johnston, Corning, Mack-Shawwide brick \$2.20 per sq. yd., curbing 50c.; 5-in. concrete foundation was provided for in both of the latter bids; bids totaled: Warren Bros., \$5,961.20; Frank M. Johnston, \$6,243.30; Strobel & Manion, \$6,051.96.

New York, N. Y.—Paving Bronx and Pelham Parkway, from Southern Boulevard to Butler st. road; Barber Asphalt Paving Co., 30 Church st., \$17,035; Thomas M. Hart, 2356 Lyon ave., \$13,233; Sicilian Asphalt Paving Co., 41 Park Row, \$16,883; Uvalde Contracting Co., 1 Broadway, \$17,492—(arence L. Hill, Clerk of Park Board.

Dayton, O.—Low bidders upon recent letting of street improvement contracts: Troy, from Leo to Valley, J. O. Shoup, limestone \$37,588, berea \$37,698, cement \$37,518; Lexington ave., from Broadway to Deal ave., J. E. Conley, limestone \$29,310, berea \$28,977, cement \$28,520.

Perrysburg, O.—Paving 2d st.: brick, Garrigan Bros., Toledo, \$38,335; M. F. O'Sullivan, Toledo, \$40,569.60; A. A. Reilly, Toledo, \$41,204.76; E. E. McKinney, Toledo, \$44,872.80; D. J. Mulligan, Lima, \$35,538.68; Hennessy & Bro., Piqua, \$37,820.80; T. S. Saxton Co., Richmond, Ind., \$37,820.80; W. W. Hatch, Detroit, \$29,092.62; sheet asphalt, C. Marsman, Grand Rapids, Mich., \$41,667; asphalt block paving, Asphalt Block Paving Co., Toledo, \$40,064.

Butler, Pa.—Paving First st. and Brugh ave.: Norman J. Boyer on 1st st., excavation 35c., paving \$1.12 to \$1.30, pitch filling 15c., sand filling 2c., cement curb 18-in. curb 60c., 24-in. cement curb 70c., stone curb 52c., resetting stone curb 50c., repaving \$1 per sq. yd.; Brugh ave., excavating 30c., paving \$1.20 to \$1.27, repaving \$1; 18-in. cement curb 57c., 24-in. cement curb 70c., pitch filling 13c., sand filling 2c.; Tony Morelli, 1st st., excavating 29c., paving \$1.10, repaving \$1, pitch filling 15c., sand filling 2c., cement curb 56c. and 65c., stone curb 48c., resetting curb 30c.; Brugh ave., excavating 29c., \$1.13 to \$1.35 for paving, \$1 for repaving, cement curb 56c. to 65c., stone curb 48c., resetting stone curb 30c., pitch filling 15c., sand filling 2c.; John Mazza, 1st st., excavating 37c., paving \$1.15 to \$1.37, pitch filling 15c., sand filling 2c., cement curb 58c. to 73c., stone curb 50c.; Brugh ave., 37c. for excavating, \$1.17 to \$1.39 for paving, 58c. to 75c. for cement curb and 50c. for stone curb.

Knoxville, Tenn.—Street improvements: Barber Asphalt Co., asphalt paving 6 in. base, \$1.88 per sq. yd.; excavation, 57c.; solid rock, \$3, and \$1.78 on 5 in. base; R. S. Blome Co., granitoid paving on all districts, \$1.88 sq. yd.; excavation, 47c.; Cretosot Wood Block Paving Co., \$2.54 on 5 in. base and \$2.66 on 6 in. base; excavation, 53c.; Graves-Matthews Paving Co. of Birmingham bid only on Central st., brick paving, pitcher filler, 5 in. base, \$2.18, 6 in. base, \$2.24; excavation, 70c.; Mann Construction Co., of Knoxville, on same grade of brick as the Birmingham firm, pitch filler, 5 in. base, \$2.17 per sq. yd., 6 in. base, \$2.22; macadam with tar or oil binder, \$1.16 per sq. yd.; excavation, 61c.

SEWERAGE

Lindsay, Cal.—Citizens will vote June 28 on \$75,000 bonds for acquisition of outfall sewer system.

Athens, Ga.—Citizens will vote July 11 on \$200,000 bonds to erect jail and court house.

Barnesville, Ga.—Surveys are being made by M. B. McCrary & Co., Atlanta, preparatory to extending sewer system.

Thomaston, Ga.—Bids will be received June 15 for \$45,000 sewerage and water works bonds.—R. E. Rushlin, City Clerk.

Crawfordsville, Ind.—Plans are being prepared by E. R. Warbritton for the construction of about 700 lin. ft. of 8-in. sewer in Market st.—F. B. Robinson, Clerk, Board Public Works.

Council Bluffs, Ia.—Council has decided to construct 10 miles sewer on McPherson ave.—C. J. Duff, City Clerk.

Mulvane, Kan.—Plans have been prepared for construction of sewer system; estimated cost, \$8,000.

Winchester, Ky.—Council has decided to ask for bids for installing sewerage disposal plant.

Morgan City, La.—K. A. Kramer, Magnolia, Miss., will make survey for sewerage and water works system; cost about \$60,000.

Lynn, Mass.—Council has ordered construction of public sewer on Michigan ave.

Malden, Mass.—Street and Water Commission intends this summer to build large section of sewer in section east of Suffolk Square.

St. Paul, Minn.—Board of Public Works has rejected all bids for construction of Goodrich ave. sewer.

Trenton, N. J.—Council has decided to construct sewer in Wayne ave.

Albany, N. Y.—Council has passed ordinance for building sewer in Livingston ave. and Black road.

Union, N. Y.—Board of Sewer Commissioners has adopted plans for proposed Morgan st. sewer.

Port Chester, N. Y.—Question of sewer disposal plant will be considered by Committee of 12 citizens appointed by the President, to confer with committee having matter in hand.

Edenton, N. C.—W. J. Berryman, Secretary, sewerage committee, desires correspondence with engineers on sewer construction.

Cincinnati, O.—Council is considering construction of sewers in three streets.

Dayton, O.—Board of Control has decided to reject bids for construction of sewers in vicinity of Bolander ave.

Grants Pass, Ore.—Council is considering plan submitted by City Engineer F. E. Hobson to construct two large reinforced concrete conduits for drainage and sanitary sewer purposes along natural channels of Gilbert Creek on the west, and Skunk Creek on east side of the city, which will serve entire city as sewer mains leading to Rogue River; estimated cost \$150,000.

Grants Pass, Ore.—Bids will be received about July 15 for construction of a 24-in. concrete drainage sewer.—F. C. Hobson, City Engineer.

Lebanon, Pa.—Council has approved specifications for proposed house sewer system as designed by City Engineer Crowell, also specifications for sewage disposal plant as prepared by Engineer Jas. H. Fuertes, of New York.

Ligonier, Pa.—Borough Council has passed a resolution to build sewage disposal plant and pumping station; plans have been prepared by F. H. Shaw, of Lancaster, and bids will be taken in the near future.—I. F. Brant, Clerk.

Reading, Pa.—Council is considering building of storm sewers on Spring and Maple sts.

Mount Pleasant, Tex.—Citizens have voted \$16,000 bonds to install sewerage system; plans will be prepared at once.

Salt Lake City, Utah.—Construction of the proposed sewer outlet canal from the present outlet of the gravity sewer on the sewer farm to the waters of Great Salt Lake has been authorized by Council and Board of Public Works instructed to call for bids on the canal at once; estimated cost, \$18,000.

Petersburg, Va.—Council is considering extension and improvement of sewerage system.

Ronceverte, W. Va.—Citizens have voted \$16,000 bonds to extend sewer and water works systems.

Reedsburg, Wis.—All bids opened May 17 for construction of trunk sewers along Franklin st. sewer district have been rejected; proposed work consists of 1,650 lin. ft. 20-in. pipe, 1,200 lin. ft. 27-in. pipe, 1,410 lin. ft. 18-in. pipe; the trenches varying from 8 to 20 ft. in depth, with 10 manholes and 22 catch-basins.

Cannington, Ont., Can.—Plans are being prepared for drainage system; cost \$3,000.—Cavana & Watson, Oullia, Engineer.

CONTRACTS AWARDED

Frederick, Md.—To Bond & Bates, Baltimore, to construct one section of storm sewers, including catch basins and manholes, \$4,892.12.—E. C. Crum, City Engineer.

Malden, Mass.—Furnishing quantity of sewer pipe, to D. W. Lewis & Co.

St. Paul, Minn.—Sewer contracts: Eaton ave., from Indiana to Fairfield, to P. J. Ryan, \$327; St. Clair st., from Mcalester to Snelling, to Christ Johnson, \$1,486; Hathaway st., from 7th to Adrian, to C. A. Nelson, \$1,210; Front st., from Western ave. to Mackubin st., to P. J. Ryan, \$1,555; Jessie st., from Whiteall to York st., to O'Neill & Preston, \$1,029.

St. Joseph, Mo.—Constructing 5th ave. main sewer to D. B. Kelly, about \$7,000.

Perth Amboy, N. J.—Laying sewers in Jeffries and Johnstone sts., to Martin Hansen, \$2,080.

Fargo, N. D.—Building sewer on 15th st. North, to Gilbert W. Haggart, \$1.28 per lin. ft., \$57 for manholes and \$59 for catch basins.

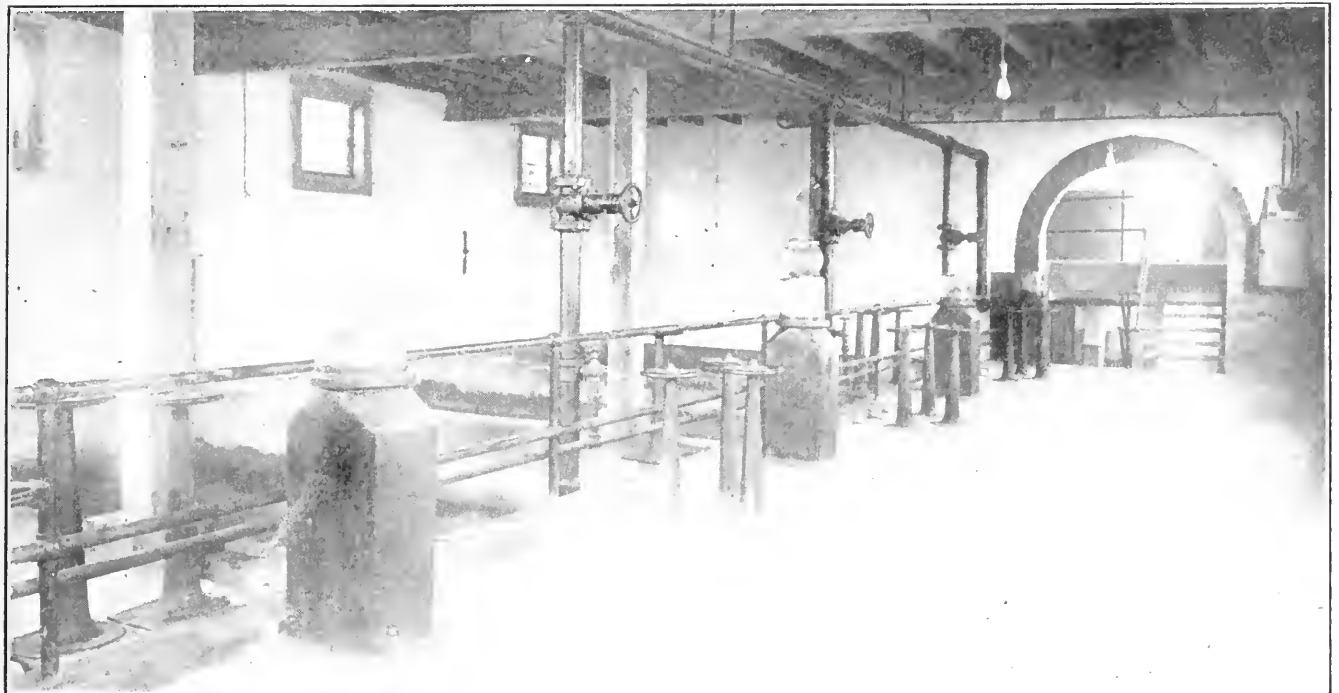
Chester, Pa.—Building sewers, to Pritchard & Oliver, Crosby st.: 15 in. terra cotta, \$1.23; Y's, 75c.; manholes, \$39; rock, \$4.50; Edwards st., etc., 8 in. terra cotta, 90c.; Y's, 50c.; manholes, \$39; rock, \$4.50; Engle st., 15 in. terra cotta, \$1.24; 8 in. terra cotta, 92c.; 15 in. Y, 75c.; 8 in. Y, 50c.; manholes, \$39; rock, \$4.75; Concord ave., 8 in. terra cotta, 46c.; Y, 50c.; manholes, \$39; rock, \$4.75; to John Hanna's Sons: Esrey st., 8 in. terra cotta, 92c.; Y, 50c.; manholes, \$39; rock, \$4.75; 15th st., 15 in. terra cotta \$1.25; 8 in., 92c.; 15 in. Y, 75c.; 8 in. Y, 50c.; manholes, \$39; rock, \$4.75.

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OPERATING FLOOR, GRAND FORKS FILTERS

GRAND FORKS RAPID SAND FILTERS

Two Small and Two Large Settling Basins—Alum and Hypochlorite Fed Together into Water—Most of Purification Effected in Settling Basins—Water Reaching Filters Practically Sterile

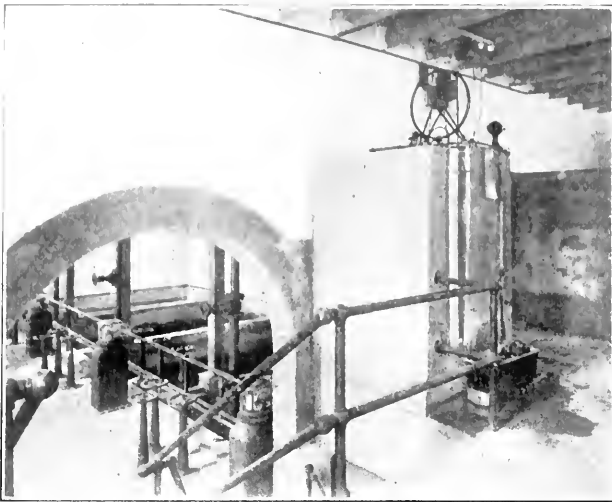
By H. G. LYKKEN, City Engineer

THE city of Grand Forks, N. Dak., takes its water supply from the Red Lake River which has a flow ranging from 600 second feet at its lowest stages in the winter time to an average summer run off of about 2500 second feet. During the spring freshets and after rains the water is very turbid, carrying a fine clay with some black loam from the fields along the bank. There is, however, more or less turbidity at all times.

The hardness averages about 17 grains per gallon, equally distributed between the sulphates and carbonates of lime and magnesia. The water is considerably polluted by the sewage from small towns above the city. In the winter time, when the flowage is at the lowest stage and the river frozen over with from one to two feet of ice, the B. coli will average for weeks at a time over 20, and often run over 40 per cubic centi-

meter. In the summer time this falls down to an average of about four. The bacterial content runs from 1,000 to 1,500 in the winter and increases to 7,000 to 10,000 in the summer.

The city of Crookston, with a population of 7,500, is situated about thirty miles up stream and is the chief source of the sewage contamination. By hourly bacteriological tests of the water at Grand Forks, made especially at its lowest stages in the winter time, it has been possible to show a decided fluctuation in the presence of the B. coli corresponding to the maximum and minimum flow of the sewage in the city above. The sewage flow in a city of this size will be very small at certain hours of the night with a maximum occurring at a certain time or times during the day. Owing to the small amount of water flowing in the river a decided variation in the pollution will



HYPO TANK, WITH GLIMPSE OF OPERATING FLOOR.

consequently result. The fact that this variation can be detected is proof of the positiveness and directness of the contamination and its dangerous character if charged with germs of pathogenic origin.

The first attempt at water purification in Grand Forks had its inception in a frightful typhoid epidemic that devastated the city in the spring of 1894, when about 25 per cent of the population was stricken and about 200 deaths occurred. A slow sand filter of one-half acre, modeled after the Lawrence, Mass., plant, was installed the same fall. This filter did service till the fall of 1910, although having been inadequate in size for some years. During all this time few tests were made as to its efficiency, as no pronounced epidemics of typhoid again occurred and it was generally taken for granted that the filter made the water safe. No doubt a great improvement was effected; at least, the water was perfectly clear and free from turbidity and color at all times.

Yet only 20 per cent of the more frequent tests made of the water during the last two years that the slow sand filter was in service showed absence of *B. coli*. In other words, the water was never safe, as disease germs might get through and be present at any time. This is readily understood when the great contamination of the water is considered, and in view of the further fact that, owing to the turbidity of the water it was sometimes necessary to scrape the sand as frequently as every ten days. The settling basins, even with the use of alum, seemed unable to remove the finer silt that would clog the sand. As only the one sand bed, run at its maximum capacity, was provided, it was necessary to begin filtering immediately after the scraping, if this could be called filtering.

Two facts can be established out of the experience of this city with a slow sand filter. One is the absolute necessity of two or more beds with capacity sufficient that a scraped bed can be properly put in condition for filtering before it is again put into service, which requires at least four or five days. And a second is the almost certain futility of attempting to filter turbid water with a slow sand filter. I mean here river water with fine clay in suspension that even several days of sedimentation will not remove. The cost of scraping or cleaning the sand beds, with the unavoidable loss of sand, makes it too expensive.

On account of the high cost of sand, heating the filter and settling basins in winter, and frequent scrapings, it cost from \$5,000 to \$7,000 a year to operate the one-half acre of sand. The average water consumption was less than 1,000,000 gallon per day, making the filtration costs excessive.

In the fall of 1910 the City Council voted to make the change to a rapid sand filter with increased capacity, and the plant now installed was constructed by the Pittsburgh Filter Company in accordance with plans made by the writer. Considerable opposition was met with at first from those who had taken it for

granted that the slow sand filter had always given perfect results, and who were reluctant to try something they thought new. Owing, however, to the location of the old filter plant in a place where no additional ground was available for increasing its size to meet the increasing demand for water, and also to the fact that it was becoming more and more difficult to get the quality of sand necessary, all opposition had to give in.

The additional building made necessary by the new filter consists of a brick structure 35 feet by 78 feet, two stories in height, having reinforced concrete floors throughout. This building was constructed on part of the space formerly occupied by the old sand bed. The rest of the space is used as settling basins. A concrete wall dividing this old filter bed into two equal parts was also constructed, as shown by the plans.

As best shown by the plan here referred to, the plant consists of two small trough-like basins into which the water is first pumped and flows the entire length of both. They are so arranged, however, that either one can be thrown out of service for cleaning, at which time the water is pumped into the other. Being trough-like in construction, with slanted openings at the bottom, they are readily cleaned by simply drawing them off while keeping the material in agitation with a fire hose. A basin half full of mud is cleaned out in a few hours' time with a minimum loss of water and labor.

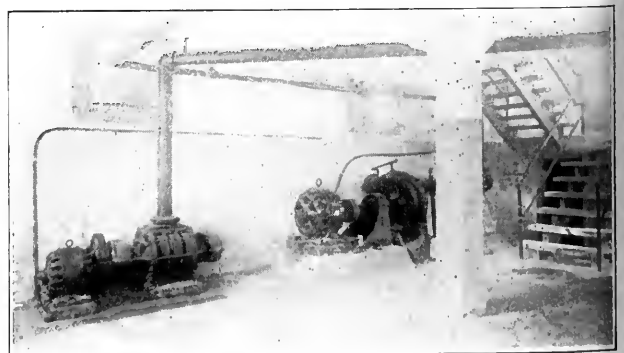
As the water leaves the small settling basins it enters a distributing chamber where it is controlled by gate valves and may be let into either or both of the larger settling basins. The water is distributed along one end of these large settling basins by a vitrified pipe imbedded in concrete and placed along the floor. Openings are provided at intervals of 2½ feet. No baffles are used and the water is permitted to move freely to the opposite end of the basins, which are 140 feet in length. At this end the water is taken off near the top by a collecting trough from which it enters the filter building. The water is carried at about 10 feet in depth in all the basins.

The present plant was designed for 2,000,000 gallons capacity in four units, the basins being made somewhat larger, however, than is the general practice on account of the small head available. Space for four additional beds is provided for when the need of the city may demand it. On the first floor of the filter building is a large room, 26 by 33 feet, in which the wash pump and blower are located, and which provides ample room for storage of chemicals, etc.

A door with a few steps down leads into the filter gallery. A stairway up leads to the operating floor in front of the filter basins, and, in the front end of the building, to the mixing tanks and the operator's office.

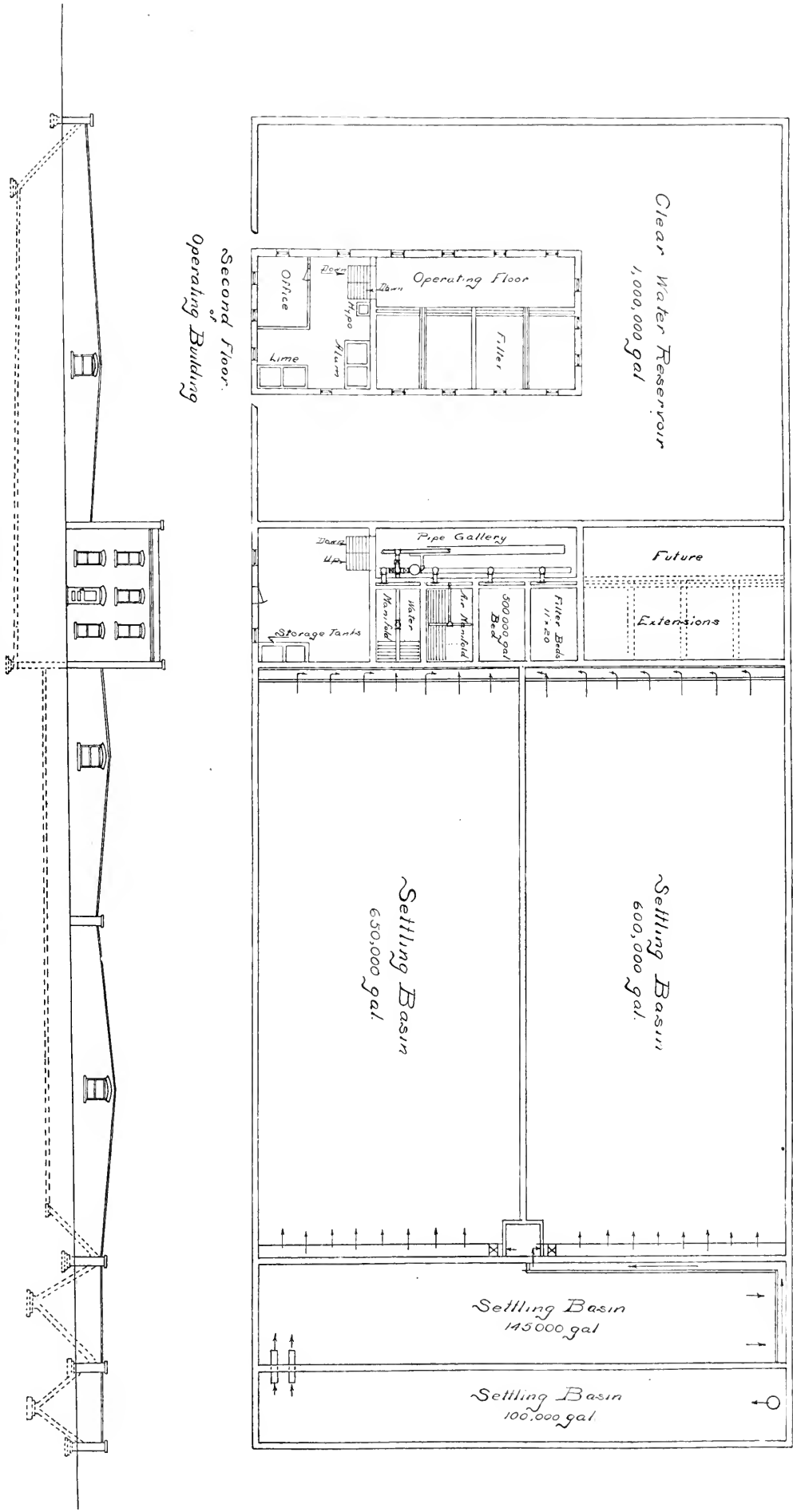
The water as it enters the filter building flows in a trough between each pair of filter beds to the operating end of the beds, where all gates for controlling the water both for filtering and washing are located. The filtered water flows into the 1,000,000 gallon clear water well, or may be by-passed directly to the pumps.

From 10 to 15 pounds of aluminum sulphate and one pound of hypochlorite of lime per 100,000 gallon of water filtered



WASH PUMPS AND BLOWER.

PLAN AND SIDE ELEVATION OF FILTER PLANT, GRAND FORKS



is used. These chemicals are mixed in separate concrete tanks in the mixing room, a continuous stirring device being used in the hypo tank. Both solutions are then run in the same pipe and enter the raw water in the supply pipe from the pump. This method of feeding the chemical was determined upon after considerable experimentation and feeding the chemicals at various points and in various ways. The results establish beyond a doubt that the chemicals fed in this manner do not interfere with each other; on the contrary, the proper reaction seems to be facilitated, though this has not been accurately established.

The water is tested by a competent bacteriologist two to three times a week, several samples being taken each time. After several months of service in no single instance has *B. coli* been found in the filtered water. The number of bacteria in the filtrate average below 20 per cubic centimeter. When it is considered that at all times the water is highly polluted and that during the greater part of this period the *B. coli* ran from 30 to 40 per cubic centimeter, the efficiency of the treatment becomes apparent, and in addition the fact that the efficiency of the hypo is in no way impaired by being added to the water in its muddiest condition, as it enters the settling basins, and together with the alum. The hypo is, of course, the chief agent accountable for the bacteria efficiency, but being added in the small quantity of one pound to each 100,000 gallons of water certainly no objection can be raised against its use. The cost is negligible.

The whole available settling area is utilized, with the result that the water as it enters the filter beds is fairly clear irrespective of how muddy it may be in the river. Most of the mud is thrown down in the small basins, where it is readily washed out. Most of the remaining material goes to the bottom in the larger basins, which can be alternately drained and cleaned. It is anticipated that one cleaning a year will be sufficient with these, however.

At the present rate of filtration, 24 to 36 hours elapse between the time of application of the alum and the time the water reaches the filters. This is perhaps not in accordance with common practice, but no difficulty is experienced in getting a blanket on the filters. Sufficient material goes over, whether it be alum flock or just clay, to form the proper filtering medium. Care is taken to let each bed stand for some time after each washing to permit the sand to adjust itself and the slime film to form on top. In this case no attempt is made to depend on the filter beds to strain out the bacteria. The filters as operated give a perfectly colorless and clear water. The preliminary treatment in the settling basins is depended upon for the bacteriological efficiency.

The advantage of this method of operation is obvious. All the water in the settling basins is practically sterile so that a slight variation, or even cessation for hours of the chemical will not let any untreated water through. Much less alum is necessary as only sufficient to remove and settle the mud is used. The absence of a heavy blanket necessary for a high bacterial efficiency by the straining process alone, necessitates less washing of the beds, also less careful and expensive attention.

The filter works continuously, but is operated by one man, a young boy receiving a mere nominal wage, and such assistance by the general superintendent of the water works as may be necessary when the beds are washed. No watchman is on duty during the night, as the relative height of water in the different basins is controlled from the pumping station. The filters are washed once a week, the water being supplied by a centrifugal pump and the air by a Root blower, both electrically driven from the city power plant.

The plant is provided with automatic rate controllers, recording loss-of-head gages, and the best equipment possible in chemical feed devices and other appliances. With two to three times the amount of water available and provisions for doubling this capacity, the new filter is being operated at less

than one-quarter the cost of the old plant. But of more importance is the fact that the water is always absolutely safe, clear, colorless and sparkling. During the spring months color due to swamp vegetation gave trouble with the slow sand filter. This has been entirely eliminated; whether it be due to the alum treatment or a bleaching effect of chlorine has not been determined.

The writer has studied in detail the plans and results of some seventy filtration plants and found that a common mistake is to make the settling basins too small. The experience of plant after plant has been that all waters carrying any silt whatsoever require more time for settling than is commonly supposed, and that in no case can the basins be too large. The settling and coagulating basins, if indeed the two can be made distinct, are in my opinion the main elements in modern water purification. By the judicious use of alum, the settling silt and alum flock will carry down much of the impurity. Then, by sterilizing the water, as well, at this point, or at least destroying all the pathogenic germs, the main object of any purification works is accomplished. By having the basins large they will act as a regulator or factor of safety interposing a large amount of safe water between the raw water supply and the filter effluent. No sole dependence need in this case be placed on purely mechanical devices or the care of operators.

The filter beds become merely finishers in the process, removing the silt and suspended matter that still may remain in the water as well as to do all any filter can do in removing whatever bacteria that may get to them. The modern type of rapid sand filter is eminently suited for this purpose on account of its simplicity and economy in operation. With conveniently arranged settling basins, the cost of water purification becomes a small matter in cost. Where no sewage pollution exists the sterilizing can, of course, be dispensed with. A coagulant added in large basins, giving the water ample time to settle, reduces the cost of filtering to a minimum. With sewage-polluted water, however, sterilization in the settling basins has much to commend it and reduces both the difficulties of attaining the results required and the cost of operation.

NEW YORK'S HEALTH CONDITIONS

MORTALITY records of New York City for the first quarter of 1911, which have recently been made public, show most gratifying improvement over those of previous years. The death rate from all diseases was 17 per thousand, as against 17.43 during the first quarter of 1910. Comparing this year with the previous five years we find a falling off in the number of typhoid deaths of 35, diphtheria and croup, 261, consumption, 250, acute respiratory diseases, 545, and smaller decrease in most of the common diseases; there being increases, however, in the deaths from whooping cough, influenza, organic heart diseases, diarrhoeal diseases under five and accidents; each of these increases running under one hundred, except heart disease. As these are total cases, with no allowance for increase in population, the percentage rates would show still more favorable figures. Most of the decrease was among the younger children, amounting to 468 deaths in children under one year, and 1,099 in children under five years. On the other hand there was an increase of 85 in those over 65 years. As death must come at some age to every one, sanitation and medicine can but postpone it, consequently the measure of their effectiveness is not only the reduction of death rates but also the transferring of deaths from the younger to the older groups of the population.

There was a decrease of 1,575 deaths in tenement houses an indication of the fact, actually shown by other figures, that a large percentage of the child mortality is found in such districts. The general death rate during the previous five years had been an average of 18.33; therefore the rate during this quarter of 1911 was more than 7 per cent. lower than the average for the previous five years.

SEWAGE-POLLUTED SEA WATER

Chemical Changes Occurring in One Per Cent Mixtures of Sewage with Sea Water, as Determined by Laboratory Experiments

An investigation of the chemical changes which occur in a water when mixed with one per cent. of sewage was made for the Royal Commission on Sewage Disposal (England) by A. Letts and E. H. Richards, the former professor of chemistry in Queen's College, Belfast, and reported upon in a paper before the Royal Institute of Public Health. This paper, somewhat condensed, was as follows:
 Eighteen samples of sea water were collected from the Irish Channel and analyzed. The average and extreme results obtained were:

	NITROGEN IN PARTS PER 100,000 AS:	
	Average.	Extremes.
Free ammonia.....	0.0003	0.0014—0
Albuminoid ammonia.....	0.0073	0.011 —0.005
Nitrates	0.0043	0.009 —0.002

Free Ammonia.—It will be seen that the amount of this factor was minute, but the authors have satisfied themselves that it is apt to increase when the samples are kept. This fact is given considerable trouble in certain of the experiments which they are conducting. The authors have some grounds for believing that the increase in ammoniacal nitrogen is due to the decay of the minute organisms which constitute the *fauna* found in both fresh and sea water.

As this matter is of some importance, further experiments are in progress.

Albuminoid Ammonia.—It will be seen that on an average the amount in the samples was about twenty-five times as great as that of the free ammonia, and the question arises as to how much of this is due to living organisms, and how much dissolved nitrogenous compounds?

Experiments are therefore in progress on this matter, the object being to determine the albuminoid ammonia in the sample drawn, and again after filtering it through a Pasteur-Chamberland filter.

Nitrates.—The authors have satisfied themselves that nitrates were present in the samples of sea water examined by them. A certain of these nitrates were tested for qualitatively, and their presence at once indicated either by the blue tint which was produced when some of the water was added to a 2 per cent. solution of diphenylamine in sulphuric acid, or by the mucic test. Regarding the latter, 25 c.c. of the sea water placed in a porcelain dish along with a few drops of brucine-sulphate solution, and 25 c.c. of strong sulphuric acid added, showed the transient pink color quite distinctly and a well-marked yellow tint afterwards, which was permanent for twenty-four hours, while in a comparison experiment with the same quantities of distilled water and reagents, the mixture remained colorless.

The nitrates were determined by the zinc-copper couple in place of a better method, and while it is possible that the determinations were affected by the effect which Purvis and Burtauld discovered in relation to the breaking down of the organic matter by the couple, with evolution of ammonia, the error, if introduced at all, was probably minute and sufficiently constant to render the results strictly comparable with each other.

A study was made of the chemical changes occurring in one per cent. mixtures of sewage and sea water from the Irish Channel and these compared with those taking place in corresponding mixtures of sewage and fresh water, the samples being incubated in completely filled and stoppered bottles at finite temperatures after being saturated with air at those temperatures.

Three series of such experiments have been made, viz:

(1) With one per cent. Belfast sewage (screened and settled) at 65° F. for five days. (One analysis of each).

(2) Ditto. (But with a sample collected on a different day) at 80° F. (Analyses were made of the original mixtures when made and after intervals of one, four, seven and thirty-five days).

(3) Ditto. (But again with a sample of sewage collected on a different day) at temperatures of 60°, 70° and 80° F. respectively. (Analyses were made of the original mixtures when made and after intervals of five, fourteen and forty-two days).

In all, nearly 300 separate determinations were made, so that the work was laborious.

The following general conclusions were drawn by the authors from the results of the analysis.

(a) **Free Ammonia.**—In each of the three series the analysis of the original mixtures showed a distinctly greater yield of free ammonia in those containing sea water. Thus:

NITROGEN AS FREE AMMONIA AS PARTS PER 100,000 IN THE ORIGINAL MIXTURE.		Ratio of Ammonia in Sea-water mixture to that in Tap-water Mixture.
Sea-water Mixture.	Tap-water Mixture.	
(1) 0.030	0.017	176:100
(2) 0.030	0.018	167:100
(3) 0.041	0.035	117:100

Probably this effect is due to the action of the alkaline salts in the sea water on the nitrogenous matters of the sewage. Obviously, this is a point of considerable importance when interpreting the results of analysis of polluted sea water samples, for if the amount of free ammonia be taken as the index of sewage pollution, as is frequently done, a given sample of sea water may appear to be much more highly polluted than a sample of fresh water containing the same proportion of sewage, and it may be nearly twice as much.

(b) **Albuminoid Ammonia.**—This did not diminish by more than about one-third of the original amount in either of the series after an interval of five to six weeks. Both the fresh and sea water mixtures behaved similarly as regards this factor, and temperature did not appear to exercise much influence on it in either.

(c) **Dissolved Oxygen.**—The rate of disappearance of dissolved oxygen in four or five days at temperatures between 60° to 80° F. was very similar for both the sea and fresh water mixtures. Thus:

DISSOLVED OXYGEN DISAPPEARING IN C.C. PER LITRE AT N.T.P.		
Tap-water Mixture.	Sea-water Mixture.	
(1) 1.5	1.4	5 days at 65° F.
(2) 1.1	1.4	4 " 80° "
{ 1.2	1.6	5 " 60° "
	1.8	5 " 70° "
{ 2.4	2.0	5 " 80° "

These results have a certain amount of importance as it has been suggested that the salts of sea-water interfere with the growth and inhibit at an early stage the development of the organisms present in sewage.

There is good reason for believing that disappearance of dissolved oxygen in polluted waters is largely, if not entirely, due to micro-organisms, the process in its earlier stages being analogous to respiration, and as a consequence the oxygen becoming converted to a considerable extent into carbonic anhydride (as was indeed proved to be the case in the experiments performed by the authors); and if this be so, the disappearance of dissolved oxygen is an index to bacterial activity, which was therefore considerable in the periods mentioned above, and was practically the same in both the sea and fresh water mixtures. The authors are therefore of the opinion that the salts in sea-water do not inhibit the first or "carbon" stage of fermentation occurring in such water when polluted.

(d) The disappearance of dissolved oxygen after five or six weeks is distinctly greater in the tap-water than in the sea-water mixtures. Thus:—

DISSOLVED OXYGEN DISAPPEARING IN C.C. PER LITRE AT N.T.P.		
Tap-water Mixture.	Sea-water Mixture.	
(2) 4.6	3.8	5 weeks at 80° F.
{ 3.3	2.8	6 " 60° "
	2.9	6 " 70° "
{ 5.2	4.5	6 " 80° "

But it must be recollected that sea-water saturated with air

at a given temperature contains less oxygen than fresh water similarly saturated. Thus: One litre sea-water saturated with air at 60° F. and 760 mm. contains 5.8 c.c. dissolved oxygen at N.T.P.; one litre distilled water under the same conditions contains 7.2 c.c.

Distilled water therefore contains over 22 per cent. more dissolved oxygen under these conditions than sea-water.

But apart from this, the more rapid disappearance of dissolved oxygen from the tap-water mixture is probably to be explained by differences in the behavior of the two mixtures in respect of the second or "nitrogen" stage of fermentation which occurs in polluted waters.¹

(c) *Nitrification*.—This nitrification occurred to a decided less extent (under the conditions of the authors' experiments) in the sea-water than in the tap-water mixtures. In the latter it commenced about the fourteenth day and was practically complete (in relation to the free ammonia originally present) in five weeks. While on the other hand the most favorable result with the sea-water was the nitrification of less than one half the free ammonia originally present.

Nitrates were determined by the zinc-copper couple in all the samples, and while it is possible that the results in the case of the sea-water mixtures were influenced by the Purvis-Courtauld effect, the error if introduced at all would probably be the same in all the determinations and would therefore not affect the results in relation to the gain in nitrates.

C. Fowler concluded that only the stage of nitrite formation is reached when sea-water is incubated with sewage sludge. Adeney (*loc. cit.*) came to the same conclusion in comparative experiments with 20 per cent. mixtures of sewage and tap-water on the one hand, and sea-water on the other, the experiments being carried out under aerobic conditions, while Purvis in collaboration with others, also observed the production of nitrites in incubated samples of sea-water polluted with sewage.

The authors at the end of their experiments in Series 3 examined carefully for nitrites in all the samples, but their notebooks only record "doubtful traces" in the cases of two of the sea-water mixtures.

As this matter is one of some importance, and the results obtained as yet are not absolutely conclusive, they are conducting further experiments on it.

(f) *Effects of Temperature*.—Regarding the effects of temperature on the nature and speed of the chemical changes occurring in the polluted mixtures experimented with, there can be no question that the amount of dissolved oxygen disappearing was greatest throughout the experiments of 80° F., least at 60° F. and intermediate at 70° F. in both the sea-water and fresh-water mixtures.

But it is difficult to say whether nitrification was promoted or retarded by increase of temperature.

In the third series of experiments with the tap-water mixture the latter effect was observed, while with the sea-water mixtures the results were irregular and not carried far enough to be conclusive. At the highest temperature, the exhaustion of the oxygen by the carbon fermentation was quite possibly too great to allow of the subsequent nitrogen fermentation, and also the amount of dissolved oxygen originally present was lowest.

At 60° F. not only was more oxygen present originally, but the results show that after a fortnight or so, both kinds of fermentation proceeded together, so that it is conceivable that the relative powers of the two classes of bacteria concerned were more evenly balanced.

If such were the case, it may involve a practical point of some importance, for in the case of a water continuously polluted in warm weather the whole of the available oxygen may be used up in carbon fermentation as fast as the water

it naturally aerated, and nitrification as a consequence be impeded.

In colder weather on the other hand, nitrification may proceed more rapidly or with greater ease.

The fact that green *algæ* are most abundant in water at the time of the year when the former conditions prevail, may perhaps be Nature's provision to balance matters, since by the absorption of ammoniacal nitrogen these *algæ* would prevent an excess of unoxidized nitrogen from accumulating in the water, while the *algæ* would also arrest or prevent putrefactive changes by supplying an abundance of dissolved oxygen.

MISSOURI BILLBOARD DECISION

THE Supreme Court of Missouri recently handed down a judgment affirming a previous decision sustaining the St. Louis billboard ordinance. This ordinance was passed in 1905 as part of a revised building code; an injunction was granted in January, 1906, appealed from at once by the city and a decision rendered in March, 1910, one judge dissenting. This decision has just been affirmed.

The sections of the ordinance in question required:

1st. That no structure, building or shed could be altered, repaired or removed without a permit from the Commissioner of Public Buildings.

2nd. That various fees should be paid for such alteration or repair, one dollar being the fee for every 25 feet of the area of a sign and one dollar for every 5 lineal feet of a billboard.

3rd. That no rotten or unsafe sign shall be permitted in any place and that no sign exceeding 20 square feet shall be erected on any building without a permit. None but metal signs may be attached to any building if larger than 3½ by 10. No sign shall project more than 18 inches over the building line, nor nearer than 8 feet from the ground or pavement, nor to interfere with any fire escape.

4th. No billboard having more than 25 square feet of area shall be erected without a permit from the Commissioner of Public Buildings and on his approval. No billboard shall exceed 14 feet in height above the ground and there must be an open space of at least 4 feet between the lower edge of the board and the ground. No billboard shall be nearer than 6 feet to any building or the side line of any lot nor nearer than 2 feet to any other billboard, nor shall any such billboard exceed more than 500 square feet in area, nor to approach the building or alley line nearer than 15 feet. Rotten or unsafe billboards are subject to removal.

The opinion says in part:

In this general statement, we might also add that there is but one virtue connected with this entire business, and that is the advertising itself. This is a legitimate and honorable business, if honorably and legitimately conducted, but every other feature and incident thereto have evil tendencies, and should for that reason be strictly regulated and controlled. The signboards and billboards upon which this class of advertisements are displayed are constant menaces to the public safety and welfare of the city; they endanger the public health, promote immorality, constitute hiding places and retreats for criminals and all classes of miscreants. They are also inartistic and unsightly.

The amount of good contained in this class of business is so small in comparison to the great and numerous evils incident thereto that it has caused me to wonder why some of the courts of the country have seen fit to go as far as they have in holding statutes and ordinances of this class void, which were only designed for the suppression of the evils incident thereto and not to the suppression of the business itself. While advertising, as before stated, is a legitimate and honorable business, yet the evils incident to this class of advertising are more numerous and base in character than are those incident to numerous other businesses which are considered *mala in-se*, and which for that reason may not only be regulated and controlled, but which may be entirely suppressed for the public good under the police power of the State. My individual opinion is that this class of advertising as now conducted is not only subject to control and regulation by the police power of the State, but that it might be entirely suppressed by statute, and that, too, without offending against either the State or Federal Constitution.

¹ Adeney (Appendix vi. to Fifth Report of Royal Commission on Sewage Disposal, p. 55), experimented with 20 per cent. mixtures of sewage with both tap- and sea-water under aerobic conditions, and his results in relation to the absorption of dissolved oxygen agree to a considerable extent with those obtained by the authors.

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CHANGE OF ADDRESS

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 and without cost.

JUNE 21, 1911.

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Laboratory and Field Investigations

WHILE we do not often publish in *Municipal Journal* articles extremely technical in their nature, believing that these have more place in text books than in periodicals, the matter of disposal of sewage by dilution in large bodies of water is such an important one at the present time that we have made an exception of a brief paper dealing with this subject which is abstracted in this issue. It will be noticed that these experiments were made with mixtures of sea water and sewage, which mixtures were made and retained in the laboratory. It would seem that this was the only way to be at all certain of just what character of sewage entered into the mixture, and in what proportion; but results from such experiments should not be considered as too closely paralleling those which occur in the actual disposal of sewage by dilution, but only as indicating what is likely to occur under laboratory conditions; the conclusions being modified to allow as far as possible for other affecting conditions which may exist in each particular case. A suggestion of one such condition is given in the concluding paragraph of the paper, where the authors suggest that the green algæ present in water during the summer months may absorb sufficient ammoniacal nitrogen to pre-

vent an accumulation of unoxidized nitrogen in the water and arrest or reduce putrefactive changes by supplying dissolved oxygen. These algæ would, of course, not be present in the laboratory experiments, and thus the latter might indicate actions and resulting conditions considerably different from those which would take place in actual cases under consideration.

There are many other conditions, mostly physical, which might have a very considerable and even a determining effect upon the conditions resulting from discharging sewage into water, among these being the stirring up of the water due to the passage of boats, the vertical currents caused by alternate heat of day and cold of night and by irregularities in the bottom combined with the current of a stream or motion of the tide. The effect of animal life also, as well as of the vegetable life referred to, may be more or less appreciable, especially in the removal of the finer suspended matters.

The laboratory study of chemical and bacteriological changes has its value which we would not deny or minimize, but these should be supplemented by careful observation and study of actual conditions and what effect they may produce. Studies of this kind—such as are being made by the Metropolitan Sewerage Commission of New York, for instance, which were described in our issue of Sept. 14, 1910—are apt to bring about many discoveries which are at first apparently inconsistent not only with laboratory experiments but frequently with each other, but which probably can generally be interpreted to mean, not that either laboratory or field tests are incorrect, but rather that some further affecting conditions must be looked for.

Fire Hydrant Rates—a Correction

IN the article bearing this title in last week's issue, the sentence at the beginning of the second paragraph on page 843 should have read "The authors assume that the average per capita consumption in gallons per day may be taken to be $32\sqrt[5]{\frac{X}{Y}}$ ". A number of copies were printed before it was discovered that the printers, in spite of repeated instructions from the editorial department, had omitted the index figure 5.

Municipal Abattoir in Amsterdam

ONE of the largest and most important municipal utilities of Amsterdam is the city abattoir. It is situated at the eastern end of the harbor, surrounded by canals and docks and connected by branch lines with the local railroad system.

The buildings comprise two slaughtering houses for cattle, a slaughterhouse for hogs, and one for horses; three stables for cattle, and three each for hogs and horses. There are other buildings also, for the treatment of waste and hog's hair, for blood drying, tripe boiling, a forge, the sterilization of meat, a laboratory for the microscopic examination of trichinæ and offices of administration. There is also a space for a cattle market, on which are a café and stables for visitors' horses and vehicles. Once a canning factory was operated, but became unprofitable and was abolished. The total surface occupied by the buildings and cattle market exceeds 100,000 square yards.

All the slaughtering of animals for food in Amsterdam must be done here. Some meat slaughtered elsewhere is brought to the city, but it must be inspected at the city abattoir and be marked with a stamp the same as meat slaughtered there. If any such meat is found unfit for consumption it is converted into fertilizer. Meat not perfect is sometimes made edible by sterilizing and salting.

The slaughtering is not done by the city, but by owners of stock or dealers in meat, who pay for the use of the abattoir 64 cents for each cow, ox, or horse, 34 cents for a hog or a fat calf, and 10 cents each for a young calf, a sheep, or a goat. For examining meat not slaughtered there, the charge is about a fifth of a cent a pound for beef and pork and a tenth of a cent for other meat. The charge for examining a live animal is 56 cents. The meat is taken from the abattoir to the shops in town in specially arranged conveyances.

A report of the abattoir's operations is prepared annually, but that for 1910 is not yet completed. In 1909, the total number of animals slaughtered was 150,530; in 1908 it was 144,025. —*Consul Frank W. Mahin in Consular and Trade Reports.*

CONCRETE METHODS IN ROCHESTER

Further facts and two corrections concerning the description published under the above title in our issue of June 7 and the preceding description in that of May 31st are contained in a recent letter from principal assistant engineer, John F. Skinner of Rochester. He states that the hammer or "monkey" used in the pile driver employed for compacting the clay in the expansion joints between wall blocks weighed 200 pounds and not 20 pounds. Also that in the Central avenue bridge no re-tempering was contemplated for the concrete proper, but only for the mortar used in bonding the new and the old concrete.

Each keyway between blocks is now furnished with flush-handled covers set over the keyway flush with the top of the wall coping and easily removable when it is desired to repack the clay. Mr. Skinner states that he has employed the same plan of keyway and clay packing in several other constructions; namely, between the wall blocks of the swimming pool at one of the Rochester municipal bath houses, where the keyway consisted of an opening 4 in. square, one-half in each block. A similar plan was adopted for a sprinkling filter designed in 1906 in connection with the Sommerville sewerage system, which plant was built in the following year; the method in this case being to form the keyway by inserting a 3-in. wrought iron pipe between the blocks as a form, occasionally turning the pipe during the setting of the concrete so that it could be withdrawn. When the pipe was removed the keyway was packed with clay. The same plan was used in the design for a sprinkling filter system which will probably be constructed this summer. It was also employed in the construction of the water works reservoir at Olean, N. Y., which was designed in 1907.

SMOKE ABATEMENT IN BOSTON

Result of Six Months' Enforcement—New Law Practicable—Simple Standard of Measurement and Co-operation with Plant Owners.

PRONOUNCED progress has been made in the abatement of the smoke nuisance in Boston under the new state law which went into effect July 1 of last year, but which has been actually enforced only for a little more than six months. Owing to complications with the state Civil Service Commission over the selection of a smoke inspector this official, provided for by the new law, was not really in office until the end of last November. Since then, however, he has made more than 1400 smoke inspections, using the Ringelmann charts as a standard; has given instruction in the fireroom to many firemen and engineers; and has brought the smoke output, with one or two exceptions, within the maximum allowed by the law.

The new law has proved perfectly practicable. There has been no difficulty whatever over the enforcement of it. There have been no legal rulings in regard to any of its provisions, simply because no owner of a power plant has felt that there was any use in contesting the law. How little resistance there has been will appear from this fact: The law requires the Board of Gas and Electric Light Commissioners to give a public hearing to any person charged with violating the smoke law before they proceed in the courts to enforce the penalties provided by the law for violation. Not one such hearing has been held. Power plant owners have recognized the necessity, and the prudence, of obeying the law; have realized that they could gain nothing by fighting it; and have, therefore, set themselves energetically to complying with it.

Two main reasons lie behind this wholesome and gratifying unanimity of action on the part of power plant owners. In the first place, the standard of measurement—the Ringelmann

charts—is so simple that the owner's engineer can apply it just as well as the state inspector. The framers of the law studied the experience of other cities, and came to the just conclusion that a good deal of the trouble elsewhere had been due to variable and capricious standards—what the railroad man would call "head rates," peculiar to the inspector who happened to be on the job. When the power plant engineer doesn't know what to expect from the inspector he trusts a good deal to luck in the hope of escaping condemnation. The definite standard of smoke intensity prescribed by the new law is the foundation of its success. The owner doesn't have to wait for the inspector to tell him that he is breaking the law; let him give his engineer a little practice and he will know the whole story, and the requirements, for himself.

Second in importance in getting good results from the law has been the attitude of the state in offering to power plant owners friendly co-operation toward smoke reduction, instead of merely a rigid and stringent enforcement of a severe law. The statute itself makes the standards increasingly severe over a period of three years in order to give power plants ample time to become accustomed to the new standard of smokelessness in operation. Following out this idea the state inspector under the law, while applying the standards of the first year of the statute fully and without favoritism, has done everything in his power to co-operate with the owners and operators of power plants, and to assist them in finding ways to avoid making more smoke than the law allows.

This co-operation between the state inspector and the workers in the power plant has naturally resulted in a much more complete knowledge of what power plant usage commonly is than it would be possible to get in almost any other way. Perhaps the commonest disclosure is that the great majority of firemen do not know how to fire properly, and that the great majority of engineers take no responsibility whatever for the way their furnaces are fired. There is a small proportion of the "don't care" element in each class; but the greatest obstacle has been found to be lack of proper knowledge. More than a few engineers and firemen, for instance, have complained to the state inspector that they did not know the proper way to use the steam jets with which their furnaces were equipped. In such cases, and many other kinds, it has been the task of the inspector to go into the fireroom and teach proper methods. This has often gone further and led to a considerable overhauling of the boiler plant.

In something like twenty-five lumber plants, for instance, the fuel has been wet shavings, fed into the furnaces above the grate in an air-blast. This blast of shavings has been deflected upward by the bridge wall, in most instances, and so chilled by contact with the boiler that much of the incipient combustion went no further than the production of great quantities of brown or yellowish smoke. It was the smoke inspector who discovered that the way to avoid this smoke and to save fuel was to cut down the bridge wall practically to a level with the grate bars. All but one of these lumber plants, burning wet shavings, is now inoffensive within the limits prescribed by the law for the first year of operation.

It is worth while to note, in connection with the smoke from shaving-burning plants, that their smoke involved some nice discretion on the part of the inspector because the wood smoke differs entirely in color from the grays presented by the Ringelmann smoke charts. The law, however, declares that smoke must be tested for its "density," and under this provision the inspector has had to cut away from the natural tendency to test smoke by its relation to the depth of the grays on the charts, and to make his tests depend, instead, on the degree to which he can see through wood smoke. This may sound difficult, but for a technically trained man, like the Massachusetts inspector, it is in no wise difficult. Taken altogether, the Massachusetts smoke law is notable for its entire workableness, and for the fact that it has in six months been applied without serious friction and with decided benefit to the atmospheric conditions in and about Boston.

NEWS OF THE MUNICIPALITIES

Current Subjects of General Interest, Under Consideration by City Councils and Department Heads—Streets, Water Works, Lighting and Sanitary Matters—Fire and Police Items—Government and Finance

ROADS AND PAVEMENTS

Use Street Car for Sprinkling

Birmingham, Ala.—The city of Birmingham has accepted a plan of the Birmingham Railway, Light and Power Company to operate an electric street car sprinkler. For thirty days the plan as outlined will be tested, and if at the expiration of that time it is producing the benefits claimed for it the service will be retained. It is planned to operate the car twelve hours per day at a total cost of \$480. Of that amount the city is to pay \$280, while the company will pay the remaining \$200, provide the car, provide the men and work the service twelve hours per day.

Improve Town by Laying Pavements

Williamsport, Md.—The street committee of the Town Council has begun making extensive improvements to the streets of the town, beginning operations on the main block of Conococheague street, which has been macadamized and is now being rolled. A block on Potomac street will next be treated in the same manner and the improvements will be continued throughout the summer at considerable cost.

Street Improvements Blocked for Two Years.

Spokane, Wash.—Practically no more street improvements ordered for two years in Spokane is the proposition the City Commissioners are facing as a result of the new State law which recently went into effect. According to Commissioner Coates nearly every street improvement made by the city costs more than the limit of 50 per cent of assessed valuation set by the new law. He says the new condition means that almost all street improvements except those already initiated by petition or by resolution of the Council will be halted till the Legislature can meet again to correct the mistake in the new law. The clause providing that no improvement costing more than 50 per cent of the assessed valuation of property is the result of a mistake made by a recording clerk at Olympia.

Want County Money for City Streets

Lexington, Ky.—Believing that the five magisterial districts included in the city of Lexington are entitled under the Kentucky statutes, section 1888, to their pro rata of the fund apportioned annually by the County Fiscal Court for the maintenance of the roads of the county, which would aggregate from \$30,000 to \$50,000 annually on the basis of the county apportionment, Mayor Skain has brought the matter officially to the attention of the General Council and that body has directed the City Solicitor to make an investigation of the city's claim, which, if sustained, will mean that this amount will be available for repairs and maintenance of the streets of Lexington.

Ten Miles of New Sidewalks Put Down

Tampa, Fla.—Tampa is enjoying a great boom in sidewalk construction, which is going on with leaps and bounds. Never before in the history of the city has so much work of this kind been in progress, and judging by the many permits which have been issued by the Board of Public Works in the past few days the work will go merrily on for months to come. It can be noted that sidewalks are being laid in all sections of the city, in the new territory as well as the downtown section.

Officials Visit Neighboring City to Inspect Pavements

Newark, N. J.—Board of Works Commissioners Mungle, O'Connell and Kraemer and Assistant City Engineer Halleck recently made a trip to Boston, Mass. They went to inspect the bitulithic pavements laid on the streets in that city. Some of these pavements have been down several years, and the Newark officials were desirous of ascertaining, by inspection, their capacity to withstand the wear and tear of heavy traffic and general use.

SEWERAGE AND SANITATION

Mason City Has Problem

Mason City, Ia.—Mason City must spend thousands of dollars in securing expert engineers and putting in and rearranging the sewage outlet east of the city limits. This was announced by Mayor Norris, who has quietly been making an investigation of conditions. For years the sewage has been emptied into Lime River, two miles below the city. Low water the past few years has allowed a great quantity of matter to collect, which has practically choked the channel of the stream, has polluted the water and caused trouble and disease. The president of the State Board of Health ventured the opinion that the epidemic of infantile paralysis may have been caused by the condition.

Abatement of Mosquito Nuisance Due to Oiling Streets

New Haven, Conn.—The annual "mosquito census" of the New Haven Board of Health shows that the number of the pests is steadily decreasing. The present plan of oiling the city streets is held largely responsible. Oil from the streets is washed into the sewers, whence it finds its way into the harbor and eventually is deposited by the tides upon the marshes where the mosquitos breed.

Fumigation Regulation

Wilmington, Del.—The Board of Health has adopted a new regulation which provides that houses in which deaths from tuberculosis have occurred must be fumigated. Heretofore it has been the custom to fumigate in such cases, but there was no law making it obligatory, and in some instances the occupants of the house refused to allow the health officers to make the fumigation. Under the new regulations, as soon as a death from tuberculosis is reported to the Board of Health an executive officer will be dispatched to the house and immediately fumigate it.

Appoint Sanitary Inspectors to Improve Conditions

Dallas, Tex.—Upon nomination by the Board of Health, five sanitary inspectors for work in the City of Dallas have been appointed by the Board of Municipal Commissioners. Their work is to be under the general direction of the Board of Health, more directly under the supervision of the city health officer. These men are to make inspections in all parts of the city, looking after any infraction of the sanitary regulations in the city, the failure to make sanitary sewer connections, the accumulations of trash or refuse or dangerous matter in alleys or about premises and the securing of evidence for cases filed in court.

Improved Sanitation of Stables Required.

Spokane, Wash.—An order for housecleaning of livery stables, affecting from 25 to 30 establishments, has been sent out by Health Officer J. B. Anderson, with the result that two big downtown stables, unable to comply with the department orders, must seek new locations. Cement floors with proper drainage, whitewashed walls and connection with a city sewer were the requirements demanded by the Health Department, with the authorization of Mayor Hindley, of over 25 stables, as a result of a recent thorough inspection of this class of business in Spokane.

Abate Nuisance of Smoking Chimneys

Salt Lake City, Utah.—Holding the smoke nuisance to be vital in the civic improvement problem the sanitation committee of the Commercial Club has decided to wage a war of extermination against the smoking chimneys of the city, and authorized the chairman to appoint a subcommittee of five to find out why the city ordinances on the subject are so repeatedly violated. A hotel proprietor told the committee that he had installed a smoke consumer that not only solved his smoke problem but had saved him \$156 in coal bills during the first two months.

WATER SUPPLY

Water Plant Out of Debt

Kenosha, Wis.—The last cent of indebtedness on the Kenosha water plant has been paid and the trust deed, which had been given by the city in 1895, to insure the payment of the bonded indebtedness of the municipal plant, was discharged. The plant is now entirely free from debt and has a balance of \$20,000 in the bank. The original bond issue amounted to \$140,000, and in addition to paying off all of the bonds the value of the plant has been more than quadrupled in the fifteen years. It is declared that the water plant in Kenosha is the most successfully operated municipal plant in the United States.

Watershed May be Purchased

Waterbury, Conn.—Members of the Board of Works are giving consideration to the acquisition of a considerable watershed in Prospect, where it is the ultimate intention of the city officials having the matter in charge to locate a reserve reservoir, which shall prove auxiliary to the East Mountain and Prospect reservoirs, should it seem best to the Board of Aldermen. These now furnish the main source of the water supply of the high service section of the city. The capacity of the proposed reservoir is said to be double that of the East Mountain supply, which at its best is nothing to boast of, and the water is of the best quality. Should this watershed be secured at a moderate price it could be kept in reserve and utilized when the city needs it. If it should be secured by another city that section would never be available for Waterbury, however great the need. It is probable that the purchase will be considered at an early date by the Board of Works.

Geyser in the Street

Buffalo, N. Y.—A 12-inch water main burst one day last week at Seneca and Chicago streets. The trouble was first evident when the pavement was disrupted and the water began to well into the street. As it gathered headway the asphalt was torn apart and the cobbles of the stone pavement were washed out. The alarm was telephoned to the Water Bureau and two repair wagons were sent to the scene with a crew of men. The workmen on the first wagon sized up the seriousness of the break immediately and telephoned the Water Bureau and the whole available force of repair men were ordered on the job. The repairing job was by no means an easy task. The men have encountered worse breaks, but never one in so difficult a position. The broken pipe is about seventeen years old. Foreman Taughran said: "You can never tell about water pipe. Sometimes the best casting will burst in a year, while pipe that an expert would class as poor quality will last for years and years."

Propose Fine for Water Wasters

Denison, Tex.—At a meeting of the City Council last week City Attorney Decker was ordered to draw an ordinance providing for a fine of not more than \$100 to be assessed against any water user convicted of willfully wasting water. Superintendent Berry, of the Water Department, reported to the Council that he had reason to believe that some water consumers were sprinkling lawns and otherwise using water in a manner not justified by the existing state of the water supply. Hence the ordinance referred to above.

Water Waste Survey Is Started

Milwaukee, Wis.—An investigation of water waste, involving a study of the efficiency of operation of the Water Works Department, was begun by Consulting Engineers Ray Palmer and W. R. Brown. The investigation is under the direction of the Bureau of Economy and Efficiency, on request of the Commissioner of Public Works. It will probably take the entire summer, and the cost will be met from a fund of \$5,000 set aside by the Council. Ray Palmer, who is in charge, will take up as his particular lines the plant efficiency and electrolysis surveys. He is consulting engineer for some of the largest manufacturing concerns in Chicago and has had extensive experience in electrolysis work. W. R. Brown, who has direct charge of the water wastes survey, is a division engineer of Chicago, where he conducted a successful water wastes survey.

Reservoir Chemically Cleaned to Receive Filtered Water

Cohoes, N. Y.—Reservoir No. 2, of the Cohoes water supply system, has been completely drained in order that the basin may be cleaned. The walls and bed of the reservoir will be subjected to chemical treatment and later the large lake will be made the storage basin for the filtered water which will be sent through the mains to the lower or eastern section of the city. The big standpipe at the new filtering plant will hold the water for the consumers of the hill district.

Rush Work on Wells; Will Soon Be Ready

Fort Worth, Tex.—When deep wells now being drilled and others planned are completed the city's daily supply of artesian water will be increased at least 2,000,000 gallons. Two deep wells with a capacity of 500 gallons a minute have been sunk 1,100 feet through stone and dirt to the Trinity water-bearing sands. These new deep wells are located on the Cobb tract, near the Cobb Brick Works. In the same vicinity a new shallow well is being sunk to a strata known in the geological survey of the county as the Paluxy sands. Five hundred feet of boring will be necessary to strike water for the shallow well. "These two new deep wells and the shallow well should be playing a part in the daily water supply by the first of next month," said Water Commissioner Powell last week. "The work of assembling a plant is now under way and barring breakdowns or unlooked-for accidents it will be working in about two weeks. It is our intention to sink three additional deep wells to the Trinity sands for artesian water. When that is done the daily supply should be increased by more than 2,000,000 gallons. That, at least, is the extra yield upon which we are now figuring. I am unable to say when the mains of the city will be entirely free of river water, but I hope such a condition will prevail within two weeks, and feel safe in saying that the mains will carry nothing but artesian water by July 1."

STREET LIGHTING AND POWER

Favor Licenses for Electricians

Madison, Wis.—The Senate has passed a bill authorizing the city of Milwaukee to license persons, firms and corporations engaged in the installing of wires for electric lights and power in buildings, the annual license fee to be from \$25 to \$50. The Senate also passed a bill prohibiting the wiring of buildings for electric light and power in Milwaukee without a permit from the City Building Inspector.

City Gets \$3,425 as Lighting Rebates

Woonsocket, R. I.—Chairman Charles H. Cabana and his associates on the joint standing committee on street lights are being warmly and justly complimented and congratulated by taxpayers and city officials because of the advantageous settlement that they secured of this city's claim for alleged poor lighting during an experimental period of eighteen months ending in May of last year, when the present lights were substituted for the ones that the Woonsocket Electric Light and Power Company had been operating here after the arc lights had been discarded. The committee and Alfred W. Townsend, the lighting company's general manager, terminated the series of conferences that they had been holding by making an agreement whereby the company will pay the city \$3,425, and cancel about \$800 in bills upon receiving from the city a properly executed release of all claims because of alleged poor lighting under consideration.

Will Employ Expert to Determine Use of Conduits

Los Angeles, Cal.—In order to determine the city's policy with respect to the occupation of the streets with manholes and other underground chambers by the utility corporations, the Board of Public Works will ask the City Council to appropriate a sum sufficient to engage K. B. Miller, an expert engineer from Chicago, to outline a plan to be followed. Mr. Miller has been assisting the Board of Public Utilities in gathering data on which to fix the telephone rates. He is especially conversant with telephone work, and as the principal difficulty at present is with the phone companies, the Board believes he would be an excellent man for the job.

Cluster System May Be Ready Before Winter

Columbus, O.—With 400 candlepower to a standard and 4,000 to a block, the cluster lighting system, which is soon to be installed on several of the principal streets of Columbus, will give 25 per cent better light than is now afforded by the clusters on Main street, and 250 per cent more than that which emanates from the present system of arches, say its promoters. The lamps to be used on a standard will number five each, with 80 candlepower to each 100-watt tungsten globe. This makes 100 more candlepower to a standard than the system now in vogue in the Hub district, and will increase by 2,400 candlepower the light of every block on High street under the present system of illumination. There will be 860 such standards in use under the present plan of the system, according to a statement made by Service Director Harry S. Holton. Work on the installation of the clusters ought to begin, he added, by August 15, if no unusual delays are encountered.

Start Municipal Plant

Porterville, Cal.—Work was started on probably the first co-operative electric power plant in California, when ground was broken for the raceway of the plant for the Tulare Power Company on the upper Tule River. This plant is financed by the dairymen and orange growers, who are power users. C. H. Holley is in charge of the construction work and water rights sufficient to develop 7,500 electric horsepower have been located.

Town Celebrates Installation of Cluster Lights

Hamilton, O.—The inauguration of the cluster electric lighting system in the business center of the city last week was a brilliant success and marks a material advancement in the city's progress. The movement was started some time ago, was supported by the Chamber of Commerce and City Council and met with the co-operation of the Retail Merchants' Association, which took an active interest in the matter and carried it through to a final and successful consummation. Much credit for the opening of the cluster light system in Hamilton must be given to Superintendent James O'Toole, of the Municipal Electric Light Plant. Mr. O'Toole personally took charge of the work of installing the new system.

Company Offers Lower Rate to Stop Municipal Plant

North Yakima, Wash.—Rates for electric light which it is willing to offer the people of North Yakima have been announced by the Pacific Light and Power Company. The reduction is to 12 cents a kilowatt hour for small consumers and 8 cents for large consumers. The officers state that next year the rate would be cut down to 11 cents and in 1913 to 10 cents. On their part, however, the officers of the power company want the city to abandon its plan of a municipal lighting plant. After a meeting lasting two hours and a half, in which city officials and business men expressed their opinion, the Pacific Light and Power Company was asked to submit its proposition in writing and a further meeting between its officials and the City Council was arranged. President Guy W. Talbot, Vice-President A. S. Grenier and other officials of the company were here from Portland for the meeting. Mayor Schott some weeks ago filed on a water right in the Yakima River for the city and the City Engineer was instructed to make estimates of the cost of a water and light plant. It was hoped that the power company would give a 10-cent rate here, in which event the municipal plant idea would have been postponed, since the city is anxious to bond itself for a trunk sewer which will cost some \$200,000 or more.

Improve City by Removing Poles

Portland, Ind.—Superintendent B. W. Sissell, of the Portland light plant, and his men are now engaged in taking from the streets throughout the entire west part of the city the electric light poles and wires and transferring them to the alleys. The work is being pushed as rapidly as possible without interference with the service. It is said that aside from improving the appearance of the street, the change will benefit the service in removing the wires to a great extent from possible contact with others belonging to the telephone company.

FIRE AND POLICE

Pleased with the New Police Signal System

Buffalo, N. Y.—Mayor Fuhrmann, Commissioner Zeller, Superintendent Regan and other city officials witnessed a test of the new police signal system installed at the Pearl street station. The inventor explained the working of the new system. The feature is that it keeps the station house and the patrolmen on the beat in close touch at all times. A call was sent out to one of the signal boxes at Clinton and Oak streets. Ten seconds after the bell sounded a policeman on that beat was in communication with the desk sergeant at the station house. Mayor Fuhrmann and Commissioner Zeller expressed themselves as well pleased with the working of the new system.

Motor Cycles for Patrol Duty

Lynn, Mass.—The motor cycles which will be used for patrolling the outskirts of the city, especially in East Lynn and West Lynn, have been purchased for the Police Department by Purchasing Agent Carleton. The cycles are two-cylinder, five-horsepower and will be put in commission next week, when Mayor Connery and Chief Burckes decide which officers shall operate them.

Officials Visit Neighboring City to Inspect Apparatus

Lawrence, Mass.—Mayor Edward Smith, City Clerk Arthur Phinney, Fire Chief Lane and Aldermen Morgan, Clough and Barry, of Manchester, N. H., visited the city one day last week en route to Boston while on a tour of inspection to look over some ladder trucks which the Manchester department intends to buy. The "Queen City" delegation of city officials arrived in Lawrence shortly after 9 o'clock a. m., and went to the central fire station on Lowell street, being accompanied by City Clerk E. J. Wade, of this city. Fire Chief Carey joined the party and directed the visiting city fathers to the Franklin street engine house, where a ladder truck similar to the one wanted by the city of Manchester was viewed. The out-of-town party then continued on its journey to Boston in an automobile.

GOVERNMENT AND FINANCE

Mayor Cuts Own Salary

Springfield, O.—Taxation affairs, which have caused no end of discussion in Ohio city governments for the last few months, owing to the passage of the Smith 1 per cent tax law, have come to a climax in Springfield with the announcement by Mayor C. J. Bowlus that he has cut his salary almost in half in order to have this city proceed with the many public improvements planned here. Mayor Bowlus has been receiving \$2,500 a year, but now announces that he has decided that \$1,500 will be enough for him to live on. He also makes the statement that he does not expect to be the only official here who will chop his salary. This announcement has caused an alarm among the county officials, all of whom say they will not cut their salaries even though the Mayor should choose to cut his out altogether. Mayor Bowlus has called a meeting at which this question will be talked over in plain words. He says the officials must cut their salaries at least one-third.

Municipal Tangle in Oklahoma City Settled by Court

Oklahoma City, Okla.—The commission form of government adopted by Oklahoma City is constitutional and the election under the laws of the State was properly held, was the substance of the decision of the Supreme Court, acting on the Oklahoma City charter. That the people have an inherent right to form whatever form of government they desire as long as it is not in conflict with the Federal Constitution, was the holding of the higher court. With the announcement of the stand taken by the Supreme Court, old officials at the City Hall, who have fought the new charter form since others than they were elected to the offices, gave way to the new regime and announced they were ready to abide by the decision of the court. The first thing Mayor Whit M. Grant did after taking his office was to sign salary warrants totaling more than \$8,000. These had accumulated.

Women to Have Vote on Buying Water Plant

Des Moines, Ia.—The question of the right of women to vote on the proposition of the purchase of the water works by the city has been raised. The best authority is that the women have the right to vote on the question. Asked by newspaper men whether the women could vote at the special election June 19, when this question will be decided, Special Counsel Lees, of Attorney General Cosson's office, said he thought they could. Section 1131 of the code of 1907 provides:

The right of any citizen to vote at any city, town or school election on the question of issuing bonds for municipal or school purposes and for the purpose of borrowing money or on the question of increasing the tax levy, shall not be denied or abridged on account of sex.

It is the belief of Mr. Lees and others who were consulted that this section of the code enables the women of Des Moines to vote on the question. The law above quoted was passed by the Twenty-fifth General Assembly.

Proposes Northwest Civic League

Tacoma, Wash.—The formation of a Northwest Civic Improvement Association was proposed by Mayor Seymour at an informal gathering of Mayors of various Northwestern cities, held at the Rainier Club at Seattle one evening last week. The meeting of Mayors was due to the action of Mayor Seymour, who conceived the idea of discussing with the heads of other cities various municipal problems. Behind the meeting, however, is the larger civic project, which Mayor Seymour said he expected to see developed at a second meeting of the Mayors next Fall. A civic association as contemplated by the Mayor embraces all the cities of the State and Northwest, including Victoria and Vancouver, B. C. Its chief object, he explained, is the holding of annual conventions of several days' duration for the discussion of problems affecting the welfare of cities. Besides the officials of various cities included as members, anybody interested in the advancement and solution of the problems of cities will be eligible to membership.

Transfer City Funds

Tacoma, Wash.—Formal transfer of \$128,989.70 from the various city funds to the light and water fund in payment of old light and water bills was made by the City Treasurer during May by Commissioner Freeland of the Department of Finance. The Light and Water Department, however, had to refund to the general fund \$110,583.26, the amount representing the interest the city has paid on bonds of the department, as follows: Gravity water system bonds, \$99,125; power plant bonds, \$11,458.26. The interest for the water bonds covered the period between May, 1910, and May, 1911, while the other interest included the period from June, 1910, to April, 1911. During the year ending May 1, 1911, the city used \$56,500 worth of water and \$72,399.70 worth of light, but until last month the Light and Water Department had never been credited with those sales to the city.

Atlanta Wants a Commission

Atlanta, Ga.—Steps toward establishment of a commission form of government for Atlanta were taken recently when at a meeting of citizens it was decided to petition the Legislature to pass laws necessary to hold an election on the question. The Legislature will convene this month. It was declared at the meeting that the desire for a change in municipal administration was not due to any actions of city officials, but to the so-called obsolete city charter.

Bayonne Votes "No" on Commission Rule

Bayonne, N. J.—The attempt to end the present form of government of Bayonne, N. J., and substitute therefor government by commission, under the act passed by the last Legislature at the behest of Governor Wilson, failed after a spirited election last week by just two votes. There were 2,234 votes cast in favor of the plan to 2,236 against it. In the Fourth District of the First Ward the Election Board threw out two ballots because they were marked wrongly. No one knew if these two votes were for or against the reform method of government. The Hudson County Board of Elections will hold an official count in about two weeks, and if the two rejected ballots are counted for the commission plan the election will have resulted in a tie. In this event another election will probably be held

STREET CLEANING AND REFUSE DISPOSAL

Municipal Garbage Collection

Duluth, Minn.—For some time the city has been experimenting with municipal garbage collection. The experiment has demonstrated these essential facts: That city garbage collection is cleaner and better and more thorough than private garbage collection; that it gives the city a better chance to see to it that all garbage is properly cared for; that the city can do it as cheap as, if not cheaper than, individuals, as well as better, and that it can be done not only without cost to the city, but actually at a profit. The one garbage wagon operated by the city in the downtown district has not only paid its way, but in one year has practically repaid the original cost of horse and wagon out of profits.

Cost \$895.20 for Municipal Clean-Up

Eric, Pa.—Superintendent of Streets John O'Hagan reported to Mayor Liebel last week that the cost of cleaning up the rubbish on municipal cleaning day was \$895.20. The work took four days with every available team working. The average cost per load was 92 cents for 974 loads. The Mayor has figured out that by the city doing the work the property owners were saved at least \$5,000 from what they would have had to pay draymen. Money for the team work comes from the ward funds by appropriation of councils.

Praises City Cleaning

Toledo, O.—Recognizing the beneficial results of the civic housecleaning conducted May 1 by the Civic Federation of the Commerce Club, Service Director John R. Cowell has communicated with the officers of the federation confirming the report that the city has decided to maintain a daily clean-up and requesting the federation's moral support.

RAPID TRANSIT

Municipal Railroad to Coyote Point Favored

San Mateo, Cal.—A movement was started at a meeting of the San Mateo board of trustees for a municipally owned railroad from San Mateo to Coyote Point, on San Francisco Bay, about a mile and a half from the center of San Francisco. It is also planned to construct a municipal wharf for the purpose of establishing a ferry service between San Francisco and San Mateo. Davenport Bromfield was asked to estimate the cost of the wharf and railroad.

Special Street Car Committee Submits Report

Jacksonville, Fla.—After practically three months of patient waiting the special committee from the City Council and citizens at large, appointed to investigate and make certain recommendations regarding the street railway service in this city, presented its report at a meeting of the City Council last week, said report digging deeply into defects alleged to be existing at present and making preparations to avoid any defects which might exist in the future. The report was quite exhaustive, embracing an entire library of manuscript, and recommending everything that could be imagined to make a street railway system absolutely ideal. Following the reading of the report various members of the council made brief talks and a full discussion of the committee's findings was indulged in. Many motions in regard to the disposition of the report were made, all of which were killed finally and a further motion, offered by Councilman Holt, providing for the publication of the report in the daily papers, and an additional supply of 300 copies for distribution from the office of the city recorder, prevailed.

New Street Car Line Rumor

Denison, Tex.—While the plans or the names of the people interested have not been made public there is a well-defined movement on foot to build a second street railway in the city, according to a prominent citizen who declined to allow his name to be used in connection with the reports. According to his statements capitalists from Ohio have made two trips of inspection over the city of Denison. The streets and avenues of the city have been gone over as late as last week by men who represent ample capital and who have made the construction and maintenance of street and interurban railways their specialty.

MISCELLANEOUS

Plan Deeper Channel for Providence River

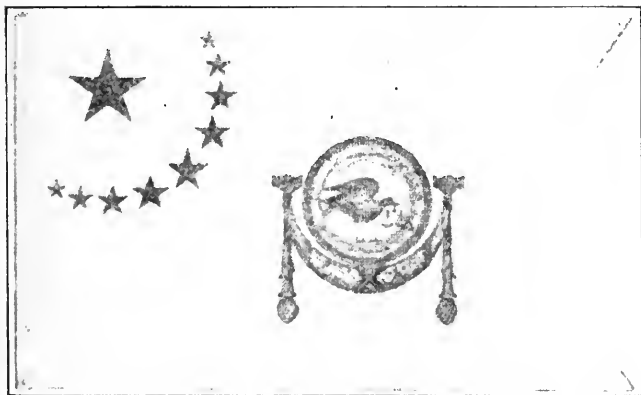
Providence, R. I.—Proposition of a 30-foot channel for Providence River and Narragansett Bay is a matter of much consideration at the present time, Representative George H. Utter having had frequent consultations with the officials of the War Department for the purpose of hastening the report on the examination and survey of Providence River and Harbor. Mr. Utter is very desirous of having the examination and survey completed as soon as possible so that the report may be considered by Congress at once. Mr. Utter has sent a communication to the United States Engineer at Newport, who is in charge of this survey, asking for information as to the exact scope the examination and survey is taking, with a view of introducing a resolution in Congress asking for additional authorization if it is found necessary.

City Plan Commission Is Called Together

Newark, N. J.—At the suggestion of City Clerk Connelly, David Grotta, whose name headed the list of nine appointed to the city plan commission by Mayor Haussling last week, has issued a call for a meeting of the commission. At that time the members will be sworn in and will effect organization. Under the bill creating the commission, which was passed by the last Legislature, it will have power to employ experts to confer as to methods of beautifying the city and developing the community along a general scheme that will bring out all that is best in the city's improvement. The sum of \$10,000 is allowed to the commissioners to spend in a single year, they themselves serving without compensation.

City Adopts Municipal Flag

Indianapolis, Ind.—A municipal pennant has been adopted by the Municipal Flag Commission, recently appointed by Mayor Shank, and the pennant has been approved by the Mayor, and will become the official emblem of the city of Indianapolis. Hereafter Old Glory will share honors with the city's emblem in front of the City Hall Building. The new pennant also will be used in demonstrations by the city and by civic and commercial bodies. The new pennant, which was designed by Dr. William H. Johnson, of the City Council, has a blue field, and, as indicated in the ac-



companioning illustration, in the upper left-hand corner is a large, five-pointed star, representing the executive department. Around the large star, in crescent shape, are nine smaller stars, representing the City Council, which is composed of nine members. At the right hand is the city's seal, representing the legal department and below the seal is a conventional wreath. The stars, seal and wreath are in gold. It is likely the new pennant will be seen in public the first time the Fourth of July, when the emblem will appear in the parade of school children that is being arranged by the Commercial Club.

Appoint Charities Commission to Stop Street Begging

Spokane, Wash.—Arrest and fine or imprisonment will be the lot of any person soliciting funds for charitable purposes without a certificate from Mayor Hindley's charities commission, according to the Mayor's preliminary draft of his proposed ordinance which is now in the hands of the

city legal department to be put in formal shape for submission to the council. The legal department has been instructed to shape the bill to provide for a commission of six members to serve without pay, two members to be appointed with the approval of the City Council every year. The ordinance will provide for an appropriation of \$1,800 for the salary of a permanent secretary and office expenses. "It is now against the law for an individual to solicit funds for himself, which is begging," says the Mayor. "If the measure passes soliciting or begging for others will also be unlawful unless the commission has passed on the worthiness of the cause being solicited for. While the ordinance provides only for the certification plan the commission will be allowed to draw up its own rules and regulations and there is nothing to prevent it from doing charity work itself, supervising the charities of the city and conducting such investigation as it may see fit."

Advertisements on Sprinkling Carts

Ottawa, Can.—That its water carts should spread information as well as water is an idea that has appealed to Ottawa. That city's waterworks committee heard Commissioner Baker of the publicity bureau state the advantages of placing advertising on the water carts, and it was decided to recommend that the idea be adopted, so far as two of the carts are concerned. The wording suggested was as follows: "You are in the chief power city of Canada. Get maps and all information at the publicity and industrial bureau."

Up-to-Date Apparatus Meets Approval of Expert

Dallas, Tex.—The interest in playgrounds for children received a stimulus in the visit of Dr. Henry S. Curtis, who visited Dallas to conduct an educational campaign in behalf of the local playground movement. The value of playgrounds as a means for the proper physical development of the child and the conservation of its health was the general theme of one of his talks. Dr. Curtis stated that when the playgrounds were first started the general thought in the



Courtesy Dallas News.

ENJOYING THE FLYING RINGS

minds of the people was that the purpose of the playground was to keep the children off the streets. To-day they have come to see that the playground has a specific training to give, which is no less definite and perhaps no less important than the training of the school itself. The child to-day gets practically all of his physical strength from his play. Fifty years ago he was getting strong from the work he did, but to-day the work of the city boys has disappeared. Dr. Curtis inspected the playgrounds, which are in full operation, and was much pleased with the up-to-date apparatus.

To Study Chicago Parks

Indianapolis, Ind.—A number of city officials will go to Chicago to study the park and boulevard system of that city. Those who will make the trip are Mayor Shank, Dr. Henry Jameson, John J. Appel and Charles E. Coffin, of the board of park commissioners; Elmer W. Stout, attorney, and Daniel Deupree, engineer for the board; all the members of the City Council except Frank E. McCarthy; Herman Munk, of the board's real estate advisory committee, and Henry W. Klausmann, city engineer; George E. Kessler, the park board's landscape architect, will join the party in Chicago. Expenses of the trip will be borne by individual members of the park board.

LEGAL NEWS

A Summary and Notes of Recent Decisions—Rulings of Interest to Municipalities

Change of Grade—Damages

City of Rawlins vs. Murphy et al.—In an action against a city for damages to abutting property caused by changing the grade of two streets on a finding that one of the streets was not a public highway, it was not error to segregate the damages, and allow recovery on account of the other street.—Supreme Court of Wyoming, 115 P. R., 436.

Negligence of Subcontractor—Liability of City

McNamara vs. City of New York et al.—Defendant city contracted for the construction of a viaduct, and the contractor subcontracted the steel construction work. Plaintiff was injured while walking under the viaduct, while the steel work was being painted by the subcontractor, by an employee letting a piece of plank used as a scaffold in painting fall upon him. Held that, since the work of painting was not inherently dangerous, the city was not liable for the injuries which were caused by the negligence of the subcontractor's workman, either under the doctrine of respondent superior or otherwise.—Supreme Court of New York, 129 N. Y. S. 230.

Defective Sidewalks—Ice

Barker vs. City of Jefferson.—A city permitting snow and ice frozen together to form in ridge across a walk so as to be dangerous to pedestrians and to remain long enough for it to know of the conditions and remove the danger, is liable for injuries to a pedestrian caused thereby. A city must keep its streets reasonably safe for travel; and the fact that it cannot enforce penalties against abutting owners failing to remove dangerous obstructions to travel does not absolve it from the performance of its duty.—Kansas City (Mo.) Court of Appeals, 137 S. W. R., 10.

Police Judges—Salaries—Statutory Provisions

Holman vs. City of Macon.—Revised Statutes provides for the election of police judges. A section empowers the city council to fix the compensation of all officers of the city. A city passed an ordinance that, in addition to the fees allowed by law to the city officers, a salary of \$240 per annum should be paid to the police judge from the common or other fund as may be provided for that purpose. Other ordinances relate to the assessment, collection and disposition of the police court fees, and provide that all fees, costs and fines in proceedings had in such court should be collected by the Marshal, and paid to the police judge's court fund of the city treasury. Held, that the ordinances give no other compensation to the police judge than the salary provided.—Kansas City (Mo.) Court of Appeals, 137 S. W. R., 15.

Invalid Franchise

Monett Electric Light, Power & Ice Company vs. Incorporated City of Monett, Mo., et al.—A city having power to grant an exclusive franchise to an electric light company for a term of years undertook to do so by an ordinance which was void because not passed in conformity to law. The grantee accepted the ordinance, built a plant, and furnished light and power to the city and its inhabitants for the greater part of the term, receiving payment therefor. Held, that the fact that the contract had been performed for such length of time did not render it valid nor give the company the right to enforce it in equity for the remainder of the term.—United States Circuit Court, 186 F. R., 358.

Acquisition of Highway—Abandonment

Valentine Blatz Brewing Company vs. City of Milwaukee et al.—Where a highway is laid out by a municipality or by dedication, and the municipality for more than twenty years opens and uses a strip of land of the same width as such highway, which strip by mistake does not coincide with the lines of the highway laid out, the city acquires the right to use that particular strip for its highway, and abandons the part of the laid out way not included within the strip actually used.—Supreme Court of Wisconsin, 131 N. W. R., 416.

Personal Injuries—Contributory Negligence

Mastin v. City of New York.—Plaintiff, a photographer, who while standing on the curb of a street covered his head with a focusing cloth, and remained thus blinded for five minutes, when he was struck by defendant city's ash cart, was as a matter of law guilty of contributory negligence.—Court of Appeals of New York, 94 N. E. R., 611.

Changing Grade of Street—Liability

Dickerson v. Town of Okolona.—Constitution declares that private property shall not be taken or damaged for public use without just compensation therefor. Kirby's Digest provides that, where a municipal corporation shall be liable for damages to the owner of grounds by the grading of streets, the damages shall be assessed by three disinterested freeholders of the city. A section provides that if a person shall neglect or refuse to accept the amount so assessed, and shall prosecute the municipality and not recover more than the amount allowed by the assessors, he shall pay all costs, and that no claimant for damages shall bring suit until he shall have filed a claim for greater damages with the city clerk within a certain time, and that no suit shall be commenced until after the assessors shall have been appointed and made return of their assessment as provided, nor for 30 days thereafter. Held, that the owner of abutting property may recover from a city for damages thereto from raising or lowering the grade of a street where the damages are direct and peculiar to such property, and not such as are shared by the general public, and the remedy prescribed by the statute is not exclusive, but suit may be brought for such damages where the municipality fails and neglects to appoint an arbitrator as required by the statute.—Supreme Court of Arkansas, 135 S. W. R., 83.

Change of Grade of Street—Damages

Milwaukee Trust Company vs. City of Milwaukee.—Milwaukee city charter entitles the owner of land affected or injured by the alteration of the grade of a street theretofore graded to the former established grade to compensation, and provides that such damages and the costs of improvements as provided and the changing of the grade of any street shall be considered and allowed in assessing benefits and damages because of the street improvement, and, if the damages exceed the benefits, the excess shall be paid out of ward funds unless waived, and a section provides for appeal to the Circuit Court from such assessment as confirmed by the Common Council. Held, that the city is liable to an abutting owner for the damages in excess of benefits resulting from an alteration of grade; the same being recoverable on appeal to the Circuit Court in an improvement proceeding.—Supreme Court of Wisconsin, 131 N. W. R., 439.

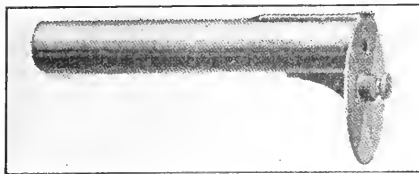
Illegal Expenditures—Recovery

Village of Reed City vs. Reed City Veneer & Panel Works.—The complaint alleged that certain persons, representing themselves as the finance committee of the plaintiff village, executed a contract with defendant, by which the village agreed to purchase property and erect buildings costing \$10,000, and convey it to defendant in consideration of its operating certain manufacturing works therein, employing a certain number of laborers, that the purpose of the contract was to give defendant a \$10,000 bonus without consideration, and that the village purchased realty with village funds for \$4,000 and advanced \$6,000 for erecting a building; that the building was used for manufacturing purposes until destroyed by fire, and a draft representing the proceeds of an insurance policy, payable to the village as its interest might appear, was delivered to defendant and deposited in bank for a certificate of deposit payable to defendant and the village, and the prayer was that the validity of the contract, complainant's rights to the machinery, buildings, etc., and to the proceeds of the policy be determined, and that defendant be required to indorse the certificate of deposit to complainant and pay the difference between it and the \$6,000 advanced. Held, that the complaint was framed on the theory of pursuing and recovering money unlawfully taken from the village treasury and traced into the realty described and the bank deposit, and not to enforce the invalid contract, and was not demurrable.—Supreme Court of Michigan, 131 N. W. R., 385.

MUNICIPAL APPLIANCES

Smoke Meter

THE Kunze smoke meter, invented by Edward J. Kunze, East Lansing, Mich., shown in the illustration, consists of a metal tube 6 inches long and one inch in diameter, at the end of which is a disc of transparent celluloid. Four tints are employed—grades 1, 2, 3 and 4 of the Ringelmann chart. Grades 0 and 5 are omitted, as anything lighter than 1 may be regarded as zero and anything darker than 5 may be called black, without any appreciable error so far as the work of a smoke inspector, for whose use the instrument is intended, is concerned. Grades 3 and 4 are most vital, as they constitute a violation of most municipal smoke ordinances. In the center of the tints as shown on the disk are small holes.



KUNZE DEVICE FOR COMPARING DENSITY OF SMOKE.

The observer looks through the instrument with one eye closed. The smoke is seen through the small hole in the center of the colored spot on the disk and an exact comparison can be made with the color of the spot as there is no disturbing influence. In operation the disk is revolved until the shade of the smoke corresponds to one of the tints on the disk, or most nearly to it. If the smoke is darker than the surrounding tint a dark spot will appear in the center. If the smoke is lighter, the spot will appear quite light in comparison. The contrast is great until the shades correspond to one another, at which time the contrast suddenly ceases to exist and the tint at the end of the tube is unbroken.

The disks are best tinted by photography, but they may be painted. Spots are painted on cardboard corresponding to the desired tints. This is then photographed and printed on a sensitized celluloid disk. By using an electric light for printing uniform grades can be secured for any number of prints. The celluloid disk may be further protected by a glass disk, its edge being protected by a rim of celluloid.

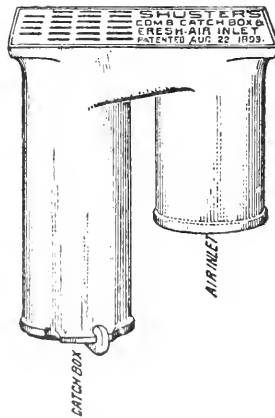
Chlorination Plant for the Disinfection of Water Supplies

The New Jersey Security Company, Paterson, N. J., has placed on the market a plant for mixing calcium hypochlorite with drinking water. The outfit, which was planned by Dr. Leal, may be used either as an emergency plant, its capacity being sufficient for any purpose, or it may be used as a permanent installation. The plant works most conveniently in treating 10,000,000 gallons of water a day, but of course may be used to treat less as well as more. An upright steam engine requiring little floor space is furnished to turn the paddles in the large tanks and operate the device for feeding the chemical. The tanks are of steel and may be lined with a noncorrosive coat-

ing if required. There are two porcelain lined orifice regulating boxes. The depth of the solution is regulated by a flat valve and the orifice is protected by a screen. The regulated and controlled quantity of hypochlorite, generally about 2 per cent, then passes by pipes to the point where it is desired to add the solution to the water supply.

Vent and Catch Box

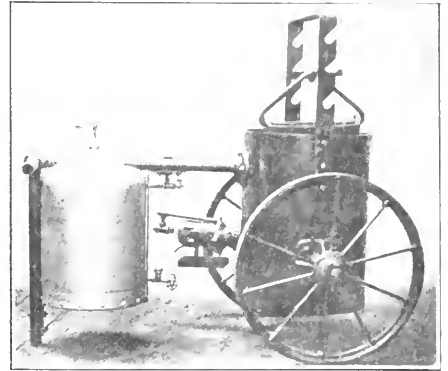
The Shuster Plumbing Supply Company, northeast corner of Franklin and Willow Streets, Philadelphia, Pa., manufacture a combination vent and catch box, shown in the illustration. The vent is for use as an air inlet to a house drainage system and is ordinarily set in the sidewalk or lawn, where, if there is no means provided for keeping out the dirt, it is apt to fill up and render the ventilating system useless. In the Shuster vent, the



COMBINED CATCH BOX AND FRESH AIR INLET. air pipe to the sewer is offset. Half of the cover is perforated and under the perforated section is the catch box.

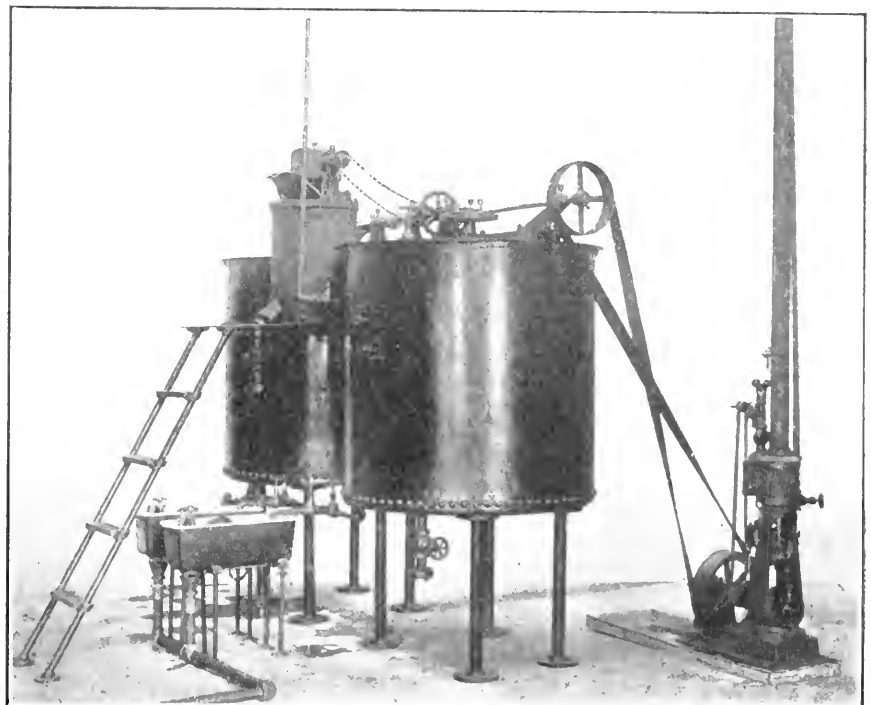
Portable Lead Furnace Using Kerosene as Fuel

THE Hauck Manufacturing Company, 140 Livingston street, Brooklyn, N. Y., who are specialists in the manufacture of kerosene torches and oil burning appliances, manufacture a portable lead melting furnace shown in the illustration. The burners attached to the furnace are of the compressed air type. The air tank is carried firmly on a framework connecting the lead pot with a leg on which the outfit rests when not being moved about. The air



LEAD FURNACE.

pump is of the direct piston type, no troublesome levers to get out of order. An air gauge is provided, as well as necessary valves for air and oil. The furnace wheels are made of steel with wide rims. A convenient rack over the furnace allows the melting pot to be held at such height as is desired. These melting furnaces are made in three sizes—13½-inch diameter, 6½ inches deep, capacity 200 pounds; 15-inch diameter, 11 inches deep, capacity 450 pounds, and 18-inch diameter, 13 inches deep, capacity 850 pounds. The Hauck kerosene burner produces a clear flame and eliminates the dangers of gasoline explosions.



PLANT FOR MIXING HYPOCHLORITE LIME WITH WATER.

NEWS OF THE SOCIETIES

International Association of Chiefs of Police.—The eighteenth annual convention was held at Rochester, N. Y., June 13-16. Major Richard Sylvester, Superintendent of Police, Washington, D. C., president of the association for the past ten years, presided. Mayor Hiram H. Edgerton made the address of welcome, expressing the hope that the members would have time to look at the beautiful homes and parks of Rochester. Major Sylvester replied. He then invited Chief W. S. Seavy, Seattle, Wash., to take a seat on the platform. Chief Seavy, while chief at Omaha, conceived the idea and took the first steps toward the formation of a police association. In his annual address Major Sylvester spoke of the value of the association. He said an identification bureau acted as a deterrent to crime, but there was no general bureau. In the United States 134 cities use the Bertillon system and 69 the system of identification by finger prints, but of these 64 also used the Bertillon system, so that there are really 169 departments which used identification systems. Major Sylvester spoke of the immigration criminal situation and referred to many of the problems which confront the chief in the performance of his duty.

On Wednesday, the second day of the convention, John B. Taylor, Superintendent of Police, Philadelphia, Pa., read the report of the National Bureau of Criminal Identification. He said that nearly 10,000 new descriptions were added during the past year, 719 identifications were made and nearly 14,000 letters were written. Arrangements are being made to install the finger print system on July 1.

President Sylvester read communications from a number of police chiefs of foreign countries, including the Prefect of Police, Paris; the Commissioner of Police, Vienna; the Chief Constable of Glasgow; the Inspector General of Police of New South Wales and chiefs of a number of South American cities.

Chief William Young, St. Louis, read a paper, in which he referred to the development of the police system of getting evidence. Superintendent of Police John B. Taylor, Philadelphia, read a paper on the carrying of concealed weapons, which he considered as one of the most important questions of the day. Federal and State constitutional provisions giving citizens the right to bear weapons were quoted. The carrying of concealed weapons with unlawful intent is quite another matter. When a crime is committed the police are confronted with the difficulty of tracing a weapon to its user because of lack of proper supervision of the sale of these weapons. Statistics gathered from 13 cities show how serious this condition of affairs has grown to be. There were 3848 arrests in 1909 for carrying concealed deadly weapons, and in 1910 this record grew to 3904. There were 2681 arrests in 1909 for murder, manslaughter and similar crimes committed by the use of revolvers, and in 1910 this number increased to 3172. The speaker said that laws should be passed in all States making it obligatory on all retail dealers to keep a daily record of all sales of weapons and explosives.

Joseph Rogers of the Ontario Provincial Police read the Canadian law,

which went into effect in April, regarding the carrying of weapons. He said it had met with universal favor.

Commissioner Dougherty, New York, referred to the way in which one of his men detected gun toters. He watched the pawnbrokers' offices and when a man purchased a gun he followed him outside and arrested him. A banquet was given at the Powers Hotel Wednesday evening.

On Thursday morning the session began with the reading of a paper by Chief W. E. Griffin, Kansas City, on the Relation of Police Departments to Other City Departments. He said the police department should be looked upon as the strong arm to assist all other municipal departments. He recommended having the police officer assist in taking care of the condition of the city by reporting such things as defective sidewalks, piles of rubbish, nuisances, etc. He also referred to one of his men who has the position of assistant to the unemployed, and his duty was to visit the cheap lodging houses and assist in obtaining employment for the men.

Chief Henry D. Cowles, New Haven, described the probation system in vogue in New England. He said that cheap poolrooms and like places tended to develop criminal instincts. Idleness is the mother of crime, and children should be kept busy. The results obtained by the probation law were not satisfactory. Too much sympathy with young criminals demoralized both officers and accused. The methods employed by the police years ago were more effective than those employed now.

Joshua B. Gray read a paper on Probation Laws and Their Workings. His observations were unfavorable to the work of the probation officers.

Deputy Police Commissioner George M. Dougherty, New York City, spoke of the benefits derived from the finger print system of identification as used in the New York detective bureau.

On Thursday, the final day of the session, the entire list of officers was re-elected and Toronto was selected as the next meeting place. The officers are: Major Richard Sylvester, Superintendent of Police, Washington, D. C., president; Michael Regan, Chief of Police, Buffalo, N. Y., first vice-president; Joseph M. Quigley, Chief of Police, Rochester, N. Y., second vice-president; Harvey O. Carr, Chief of Police, Grand Rapids, Mich., secretary-treasurer. As a token of their appreciation of his efforts in behalf of the association and the convention Chief Quigley was presented with a handsome engraved gold watch and chain with a diamond studded watch charm and Mrs. Quigley was presented with a pair of gold candlesticks and a gold clock.

Chief Vincent McKinnon, Superior, Wis., presented the first paper of the morning on the Juvenile Offender. He said there was no subject or field of activity on which the police are daily called to act which requires so intelligent efforts as the treatment of the juvenile offender. The criminal of to-day was the juvenile delinquent of yesterday. The speaker said that one of the grandest institutions ever devised by law is the establishment of the juvenile court. It could be much more effective, he said, if its decrees were placed in the hands of trained and experienced men and women for execution rather than as now, in many cases, in the hands of police

officers. "It is vital and imperative that our probation officers should not only be schooled in their work, but they should also have that natural inherent personality that makes for the highest degree of success in this noble and important calling, and in my judgment both the institutional and court probation officer should by statute be made civil service officers and they should be required to pass an examination testing their fitness to qualify for the work.

"Ninety-five per cent. of our juvenile offenders are normal boys and girls, and under sixteen years of age they are all plastic or corrigible and susceptible, under intelligent guidance, to influences that make for better citizenship. Mark you well, the time is coming, slowly perhaps, but surely, when this important problem will, because of its possibilities and far reaching influences, overshadow all other social and economic problems, and I trust and hope that in the vanguard in this noble work will be found every chief of police in this our beloved country."

Chief Carlos M. Aguirre of Havana, Cuba, presented a paper, which was read by President Sylvester and vigorously applauded, in which he described fully the workings of the Havana police.

President Sylvester introduced Eugene Van Buskirk, superintendent of the National Bureau of Identification, who spoke at some length on how the best results could be obtained by the subscribers to the bureau.

Chief Regan of Buffalo, invited the members to visit Buffalo and inspect a new signal system which has been installed in one precinct.

After the reading of the papers in the afternoon the party took chartered cars to Manitou Beach, where the afternoon was spent and dinner served. In the evening they went to Ontario Beach Park.

There were a number of exhibitions of police equipment in a room adjoining the convention hall. One of the best exhibits was that conducted by the Charles D. Reese Company of New York, manufacturer of badges and all sorts of police paraphernalia. Arranged at the rear of the booth are a score of pretty, tasteful police badges; on the sides Mr. Reese had hung police clubs, pocket billies, ankle irons, handcuffs, thumb cuffs, whistles, leg irons, belts, cords, tassels and straps. One of the devices that seemed to attract considerable attention from the visiting chiefs is a new bed strap device, to be used in preventing insane persons or persons afflicted with the delirium tremens from harming themselves. Mr. Reese himself was in charge of the exhibit and his class of goods attracted considerable comment. Mr. Reese manufactured the gold badges being worn by Chief Quigley and Inspector Zimmerman, and he had on exhibition several duplicate gold badges manufactured for chiefs of police of other cities.

New York State Association of Chiefs of Police.—The annual convention was held, Rochester, N. Y., June 13-16. President James W. Rynex, Chief of Police, Schenectady, in his annual address spoke of the laws pending in the State Legislature affecting the work of police departments. One of these, amending the penal law relating to assaults upon or oppression of persons under arrest, would prohibit the taking of data for purposes of identification and the questioning of prisoners

except in the presence of counsel. If passed, he said, this law would greatly hamper the work of police departments. A measure providing for the establishment of a State farm for tramps was highly commended. He recommended the organization of classes for the instruction of policemen in first aid to the injured. At the afternoon session the following officers were elected: President, Charles H. Goodrich, Binghamton; vice-president, James J. Lang, Little Falls; secretary-treasurer, James L. Hyatt, Albany, re-elected; director for three years, James Donovan, Port Chester. Binghamton was chosen as the place for next year's convention.

International Association for the Prevention of Smoke.—The convention will begin at 10 o'clock, June 28, in the council chamber of the City Hall, Newark, N. J. Mayor Haussling will deliver an address of welcome, which will be responded to by the chairman of the convention. The formalities of ascertaining the representations of active and associate members present and reports of standing committees will consume the morning session.

The afternoon session of Wednesday will be held in the board of works room, which is adapted to the use of slides for pictures. There will be an illustrated address on the subject of "Gas Producers, the Burning of Fuels Smokelessly and the Value of Briquets," by Professor R. H. Ferrald, chief engineer of the United States Geological Survey.

Another address of this session will be by James T. Whittlesey, chief engineer of the Public Service Electric Company. He will be assisted by Henry S. Vasser, assistant chief engineer of the same company. The addresses will be followed by a general discussion of the subjects.

There will be a discussion of mechanical stokers and steam jet devices, special furnaces and devices for smoke prevention and economy Wednesday night.

One session only will be held on the second day of the convention. That will be in the morning, when Dr. Ernest J. Lederle, of New York, will deliver an address on the progress of the movement for smoke prevention and regulation in that city, of which he is Health Commissioner. Richard J. Watrous, secretary of the American Civic Association, will deliver an address at this session on "Smoke vs. City Beauty."

Thursday afternoon will be devoted to entertainment. The delegates and their wives will be taken for a trip to Coney Island, with a tour of Luna Park and other amusement places and a clam bake dinner at Feltman's as incidents.

The session Friday morning will begin at 9.30 o'clock. A paper on the workings of the recently enacted Ohio smoke law, prepared by State Senator John Krause, formerly smoke inspector of the city of Cleveland, will be read.

There will also be discussion relative to railroad smoke and the efforts to abate it. Representatives of the railroads and members of the association will take part in this discussion.

Other short addresses will be made on appropriate subjects, and the final session will witness the election of officers for the ensuing year, the selection of the convention city and the farewell address, which will be made by Secretary-Treasurer Richard C. Harris, of Toronto, Can. F. E. P.

Calendar of Meetings

- June 21-22. National Conference of Poor Law Officials.—Boston, Mass.—Dr. Robert W. Hill, President State Board of Charities, 105 East Twenty-second street, New York City.
- June 21-22. New York State Association of Fire Chiefs.—Annual Convention, Glens Falls, New York.—Henry R. Yates, Secretary, Schenectady, N. Y.
- June 22-24. Intermountain Good Roads Association.—Annual Convention, Pocatello, Ida.—Caleb Tanner, State Engineer.
- June 26-27. Kentucky State Firemen's Association. Annual Convention, Covington, Ky.
- June 27-29. South Carolina State Firemen's Association.—Annual Convention, Columbia, S. C.—Louis Behrens, Charleston, S. C.
- June 27-29. Northwestern Indiana Volunteer Firemen's Association.—Annual Convention, Winchester, Ind.—Chief Guy Way, Winchester, Ind.
- June 27-July 1. American Society for Testing Materials.—Fourteenth Annual Meeting, Hotel Traymore, Atlantic City, N. J.—Edgar Marburg, Secretary, University of Pennsylvania, Philadelphia, Pa.
- June 28-29. South Carolina Water Works Association.—Meeting for Organization, Columbia, S. C.—W. F. Steiglitz, Temporary Secretary, Columbia, S. C.
- June 28-30. International Association for the Prevention of Smoke.—Annual Convention, Newark, N. J.—R. C. Harris, Secretary, City Hall, Toronto, Ont.
- July 3-8. South Dakota State Firemen's Association.—Tournament and Convention, Lead, S. D.—Charles P. Coolidge, Lead, S. D.
- July 21-23. Wisconsin State Firemen's Association.—Annual Convention, Fort Atkinson, Wis.
- July 25-26. Western New York Firemen's Association.—Convention, Springville, N. Y.
- July 25-28. Iowa Firemen's State Association.—Tournament, Des Moines, Ia.—N. J. Francis, Secretary, Des Moines.
- August 1-3. Ohio Chiefs' Association.—Convention, Cedar Point, O.—Chief, A. Hegeman, Cedar Point.
- August 15-17. Utah State Firemen's Association.—Convention, Provo, Utah.—C. F. Stillman, Bingham, Utah.
- August 15-18. Firemen's Association of the State of New York.—Rochester, N. Y.—Thos. Honohan, Secretary, Frankfort, N. Y.
- August 23-25. Virginia State Firemen's Association.—Convention and Tournament, Newport News.
- September 12-15. International Association of Municipal Electricians.—Annual Convention, St. Paul, Minn.—Clarence R. George, Secretary, Houston, Tex.
- September 18-30. International Municipal Congress and Exposition.—Chicago, Ill.—Curb M. Treab, Secretary, Great Northern Building, Chicago, Ill.
- September 18-October 1. Fourth International Good Roads Congress.—Chicago, Ill.—J. A. Rountree, Secretary, Birmingham, Ala.
- September 19-22. International Association of Fire Engineers.—Annual Convention, The Auditorium, Milwaukee, Wis.—James McFall, Secretary, Roanoke, Va.
- September 19-22. American Hospital Association.—New York City. J. N. E. Brown, M.D., Secretary, Toronto General Hospital, Can.
- September 24-30. International Congress on Tuberculosis.—Rome, Italy.—Professor Ascoli, Secretary-General, Via Lucina, Rome, Italy.
- September 26-29. American Society of Municipal Improvements.—Grand Rapids, Mich.—A. Prescott Folwell, Secretary, 239 West Thirty-ninth street, New York City.
- October 4-6. League of American Municipalities.—Annual Convention, Atlanta, Ga.—John MacVicar, Secretary, Des Moines, Ia.
- November 13-17. National Municipal League.—Annual Meeting, Richmond, Va.—Clinton Rogers Woodruff, Secretary, North American Building, Philadelphia, Pa.

PERSONALS

AGUIRRE, COL. CHARLES M., Chief of Police of Havana, Cuba, attended the police convention in Rochester last week. Colonel Aguirre, who was appointed to the command of the Havana police on March 1, has established many reforms during his three months of service and has reduced the number of monthly robberies to about one half.

AYMARD, L. G., for over four years city clerk of Pensacola, Fla., has been reappointed by Mayor Reilly, and the appointment unanimously confirmed by the city council.

BENNETT, E. H., civic architect, has prepared plans and sketches for the improvement of Portland, Ore., which were on exhibition at the recent City Planning Convention at Philadelphia, and attracted a great deal of attention. In the month of July the great development scheme is to be submitted by Mr. Bennett for the city's adoption.

BLAKE, G. IRVING, has been appointed chairman of a committee to plan for making a city beautiful of Erie, Pa. Mr. Blake, while residing in Hartford, Conn., was secretary of the city planning movement there. It is the idea of the committee to plan a system of harmonizing the parks, boulevards, grade crossings, business thoroughfares and residence avenues so that all will tend to a city beautiful.

BROWN, FRANK, former Governor of Maryland, has resigned as City Collector of Baltimore.

BROWN, COL. OSCAR, has been elected Mayor of Lulu, Ga.

CALLAGHAN, BRYAN, is the new Mayor of San Antonio, Tex.

CHRISTENBERY, DR. H. E., has been elected Mayor of Knoxville, Tenn.

CURTIS, DR. HENRY S., playground expert, has been engaged to give a course of lectures and instruction at the University summer school at Salt Lake City.

DILLON, JAMES E., has been appointed fourth deputy police commissioner of New York City under Commissioner Waldo.

FORD, FREDERIC L., of Hartford, Conn., recently delivered a lecture on City Planning at Tampa, Fla.

GAMPER, HERMAN, superintendent of the municipal light plant of Columbus, Ohio, has handed in his resignation to Mayor Marshall, to take effect on July 15, on which date he will go to Erie, Pa., to accept the superintendency of the light plant of the Erie Electric Light Co.

GOLDSBOROUGH, A. S., who for four years has been secretary to Mayor Mahool, of Baltimore, has been appointed secretary to the Factory Site Commission in that city, at a salary of \$3,000.

GROTTA, DAVID, has been elected chairman of the City Plan Commission recently appointed by Mayor Haussling, of Newark, N. J.

HOWELL, DR. HARRISON W., is the new Mayor of Wilmington, Del.

MAXON, THOMAS H., an English landscape artist who is now in this country studying the rapid advancement that is being made here in altering our towns on scientific lines, has received offers from Cornell, Yale and Harvard to establish a chair of "City Planning."

SPEER, ROBERT W., Mayor of Denver, has sailed for Europe. At Boston he joined the civic party which sailed June 17 from New York to study the municipal activity of the old world. In Paris Mayor Speer will go over with Frederick McMonnies the plan for Denver's civic center, which has been approved after a long fight in the courts.

THE MUNICIPAL INDEX

In Which Are Listed and Classified by Subjects All Articles Treating of Municipal Topics Which Have Appeared During the Past Month in the Leading Periodicals

It is our purpose to give in the second issue of each month a list of all articles of any length or importance which have appeared in all the American periodicals and the leading English, French and German ones, dealing more or less directly with municipal matters. The index is kept up to date, and the month of literature covered each time will be brought up to within two or three days of publication. Our chief object in this is to keep our readers in touch with all the current literature on municipal matters. In furtherance of this we will furnish any of the articles listed in the index for the price named after each article, except that where an article is continued in two or three issues of the paper, the price given is for each of said issues. In addition to the titles, where these are not sufficiently descriptive or where the article is of sufficient importance, a brief statement of its contents is added. The length also is given, and the name of the author when it is a contributed article.

ROADS AND PAVEMENTS

Road Improvement in the South. By the U. S. Office of Public Roads. Illustrated, 8 pp., Better Roads, May. 10 cts.

Road Construction in Dade County, Florida. Illustrated, 1 p., Contractor, June 1. 20 cts.

A Modern California Highway. By P. E. Clark. 2 pp., Good Roads, May. 10 cts.

South California Roads. 1-4 pp., Municipal Journal, May 17. 10 cts.

Road Construction in British Columbia. 1 1-2 pp., Contract Record, May 3. 20 cts.

Road Methods in Great Britain. Road Board's directions and specifications for surface tarring, tar macadam and pitch grouted macadam. Specifications for tars from gas works and tar distillers, pitch and tar oils. 3 pp., Municipal Journal, May 17. 10 cts.

Work of the Los Angeles County Highway Commission. 3 pp., Engineering Record, May 20. 10 cts.

Road Improvement in Nova Scotia. 1-3 p., Municipal Journal, May 17. 10 cts.

Highway Improvement. Construction and maintenance of earth, sand-clay and oiled earth roads, and culverts. By W. S. Gearhart. Illustrated, 92 pp., Bulletin, Kansas State Agricultural College.

Permanent Way and Highways of Croydon. Paper before Institution of Municipal and County Engineers. By E. F. Morgan. 3 1-2 pp., Surveyor, June 2. 40 cts.

Mountain Road Construction in California. 1 p., Engineering-Contracting, May 21. 10 cts.

Road Building in Delaware. 1-4 p., Municipal Journal, May 17. 10 cts.

Newhall Highway Tunnel, near Los Angeles. Illustrated, 1 1-2 pp., Engineering Record, May 20. 10 cts.

Construction of the Galveston Causeway. Illustrated, 3 pp., Engineering Record, May 27. 10 cts.

Progress of Road Improvements in the South. Paper before Good Roads Congress at Birmingham. By L. W. Page. 1 2-3 pp., Engineering Record, June 3. 10 cts.

Missouri's Diversified Roads. 1-4 p., Municipal Journal, May 17. 10 cts.

Roads of London. 1 1-2 pp., Good Roads, May. 10 cts.

Road Improvements in West Virginia. 1-2 p., Municipal Journal, May 17. 10 cts.

Road Work in Massachusetts. Surface treatment recommended for light traffic; heavy oils heated for surface preservation. Oil and sand building up process. 1 p., Municipal Journal, May 17. 10 cts.

Highways of Croydon. By E. F. Morgan. 2 pp., Contract Journal, April 26. 20 cts.

Experimental Road Work in Allegheny County, Pa. Paper before Engineers' Society of Western Pennsylvania. By S. D. Foster. 1 p., Engineering-Contracting, May 31. 10 cts.

Modern Road Experiments. 1-4 p., Municipal Journal, May 17. 10 cts.

Notes on Object Lesson Macadam Roads Constructed in 1909-10 by the U. S. Office of Public Roads. 1 p., Engineering-Contracting, May 17. 10 cts.

The Bronx Experimental Road. Methods of laying and cost of each of eighteen sections; conditions after six months' use. Bituminous pavements: hand and machine mixing and penetration method. Illustrated, 7 pp., Municipal Journal, May 17. 10 cts.

Demonstration of Constructing Roads. By Curtis Hill. Illustrated, 7 pp., Public Officials' Magazine, May. 10 cts.

Laboratory, Ohio State Road. 1-3 p., Municipal Journal, May 17. 10 cts.

Mechanical Tests to Determine the Relative Value of Various Stone for Road Construction and Maintenance. Paper before Second Irish Road Congress. By H. F. Gullan. 1 p., Engineering-Contracting, May 17. 10 cts.

Road Problem in the Light of Our Present Information. Paper before National Good Roads Congress. By Clifford Richardson. 2 pp., Engineering Record, May 27. 10 cts.

Road Administration, Principles Which Should Govern in. By L. W. Page. Illustrated, 3 pp., Southern Good Roads, June. 10 cts.

State Supervision of Public Roads. By

J. H. Pratt. Illustrated, 3 pp., Southern Good Roads, June. 10 cts.

Tabular Data Concerning State Aid. 2 pp., Municipal Journal, May 17. 10 cts.

Instructions of the Ohio State Highway Department for Inspectors on State Aid Road Work. 1 1-2 pp., Engineering and Contracting, June 7. 10 cts.

Building, The Tractor in Road. Illustrated, 4 1-2 pp., Good Roads, May. 10 cts.

Specifications for Michigan Highways. Construction necessary for receiving state reward; specifications for clay-gravel, gravel, stone-gravel, gravel-stone and stone roads. 1 3-4 pp., Municipal Journal, May 17. 10 cts.

Specifications for Macadam Roads. Bituminous macadam and bituminous concrete paving; asphalt and coal tar cements. Mixing and laying. 3 pp., Municipal Journal, May 17. 10 cts.

Discussion of Road Board's Specifications. 5 pp., Surveyor, May 5; 3 pp., May 12. 40 cts.

Grade Crossing Elimination in Bloomfield and Montclair. Illustrated, 3 pp., Engineering Record, June 10. 10 cts.

Culverts, Some Facts Concerning Concrete. By C. H. Hoyt. Illustrated, 2 pp., Southern Good Roads, May. 10 cts.

Engineering, Art and Science in Highway. By W. W. Crosby. 2 pp., Good Roads, May. 10 cts.

Park Roads. Construction and maintenance of park roads by Metropolitan Park Commission of Massachusetts. 1 p., Municipal Journal, May 17. 10 cts.

Parks and Boulevards of Oklahoma City. By S. T. Bisbee. Illustrated, 2 pp., Municipal Engineering, June. 25 cts.

Sand Clay Object Lesson Road Constructed in 1909-10 by U. S. Office of Public Roads, Some Details of. 2 pp., Engineering-Contracting, May 3. 10 cts.

Gravel as a Road Material. By C. E. Morrison. Illustrated, 3 pp., Good Roads, May. 10 cts.

Traffic, Effect of Motor, on Oil Macadam. By J. S. Van Ornum. 3 pp., Pacific Municipalities, April 29. 20 cts.

Growth of Ordinary Traffic on Irish Rural Roads. Paper before Second Irish Road Congress. By E. K. Dixon. 1 p., Surveyor, May 12. 40 cts.

Development of Mechanical Traction on Roads in Great Britain. Paper before Institution of Mechanical Engineers. By L. A. Legros. 1 p., Engineering News, May 4. 15 cts.

Culs-de-Sac. Roads that are Not Public Roads, and. Paper before Second Irish Road Congress. By W. J. Shannon. 1-2 p., Surveyor, May 5. 40 cts.

Footway Tunnel, Woolwich. Paper before Institution of Municipal and County Engineers. By E. H. Tabor. 1 p., Surveyor, June 2. 40 cts.

Association for Highway Improvement. 1-4 p., Municipal Journal, May 17. 10 cts.

Abstracts of Papers before Irish Road Congress. 3 pp., Contract Journal, April 26; 2 pp., May 3; 3 pp., May 10; 1 p., May 17. 20 cts.

Oil Macadam Specifications Compared. 1 p., Municipal Journal, May 17. 10 cts.

Construction of Oil Macadam Roads in Los Angeles County, Cal. 4 pp., Engineering-Contracting, May 21. 10 cts.

Oil and Tar Distributors. Illustrated, 4 pp., Good Roads, May. 10 cts.

Cost of Oiling Roads. 1-4 p., Municipal Journal, June 7. 10 cts.

Tar Macadam, Kentish Rag. Paper before Institution of Municipal and County Engineers. By T. W. Harrison. 2 pp., Surveyor, May 26. 40 cts.

General Directions and Specifications of the Road Board of Great Britain for the Treatment of Roads with Tar. 2 1-2 pp., Engineering & Contracting, June 7. 10 cts.

Dust Prevention and City Streets. 1-2 p., Municipal Journal, June 7. 10 cts.

Dust and Its Prevention on City Streets. From paper before New England Conference on Street Cleaning. By A. H. Blanchard. 2-3 p., Engineering and Contracting, June 7. 10 cts.

Additional Data on Artificial Dust Layers. Illustrated, 1 1-2 pp., Good Roads, May. 10 cts.

Bituminous Road Compounds, The Scale Paraffine Test as Applied to. By A. W. Dow and F. P. Smith. 3 pp., Engineering News, June 8. 15 cts.

Street Widths, Economic Aspects of. Paper before Third National Conference of City Planning. 3-4 p., City Life, May 25. 5 cts.

Standardized Street Widths. Paper before Third National Conference of City Planning. By John Nolen. 1 1-3 pp., Engineering-Contracting, May 31. 10 cts.

Street Standards and "Elastic" Streets. Street Planning to provide for both present and future; scientific calculation of traffic requirements; initial provision for widening roadway and sidewalk. Papers before National Conference of City Planning. By John Nolen and B. A. Haldeman. Illustrated, 5 1-2 pp., Municipal Journal, June 7. 10 cts.

Standardized Street Widths. Paper before Third National Conference on City Planning. 1 p., Engineering News, May 25. 15 cts.

Width of Wholesale Streets. 1-4 p., Municipal Journal, June 7. 10 cts.

Narrowing Minor Residence Streets. Effect on tenants and property owner; too wide streets require crowded buildings; buildings restriction. From paper before Street Planning Convention. By E. M. Robinson. 2 pp., Municipal Journal, May 24. 10 cts.

Street Surface, The. By G. W. Tillson. 2 1-2 pp., Canadian Municipal Journal, June. 10 cts.

Roads and Pavements in the Borough of Richmond. By T. S. Oxholm. Illustrated, 5 pp., Good Roads, May. 10 cts.

Chicago Street Paving Report. Organization of street department complete and efficient; specifications and contracts criticized; concrete foundations; vehicle tax. From report to Chicago Commission on City Expenditures. By S. Whinnery. 2 pp., Municipal Journal, May 10. 10 cts.

Street Work in Madison, Wis. Tar-bound macadam petitioned for; protecting gutters while applying oil; oiling lessens cost of cleaning catch basins. 1-2 p., Municipal Journal, May 17. 10 cts.

Some Features of Streets and Buildings under the English Public Health Acts. Paper before Institution of Engineers. By J. R. Fayres. 3 pp., Surveyor, May 5. 40 cts.

Pavement Crowns in Washington. Method used for seventeen years; development of formulas for curbs at same and at different elevations. From paper before American Society of Civil Engineers. By T. J. Powell. 3-4 p., Municipal Journal, May 10. 10 cts.

Street Paving Crowns, Washington, D. C. From paper before American Society of Civil Engineers. By T. J. Powell. Illustrated, 1 p., Canadian Engineer, May 4. 15 cts.

Granite Block Specifications of Association for Standardizing Paving Specifications. 2 pp., Canadian Engineer, May 11. 15 cts.

Wood Block Pavement in Chicago. Creosoted. From Report by S. Whinnery to Commission on City Expenditures. 1 p., Engineering Record, May 13. 10 cts.

Brick, Standard Ratter for Testing Paving. 1 p., Engineering-Contracting, May 10. 10 cts.

Causes of Cracking in Cement Grouted Brick Pavements. From Paper before Michigan Engineering Society. By E. R. Whitmore. 1 p., Good Roads, May. 10 cts.

Asphalt Pavement Construction. By S. R. Murray. 1 p., Municipal Journal, May 24. 10 cts.

Asphalt Paving History in New York. Communication from E. P. North. 2-3 p., Engineering Record, May 13. 10 cts.

Plants and Methods of Operation of the Asphalt Paving Companies Operating in New York City. From paper before Brooklyn Engineers' Club. By G. B. Goodsell. 1 p., Engineering-Contracting, May 3. 10 cts.

Asphalt Repairing in Reading. 1-4 p., Municipal Journal, May 31. 10 cts.

Denver Municipal Asphalt Plant. Work done during 1910. Repairs, cement gutters, costs of materials, labor and plant. By

S. R. Murray, Superintendent of Plant. 3-4 p., Municipal Journal, May 10. 10 cts.

Concrete Street Paving in Mason City, Ia. Paper before Iowa Engineering Society. By F. P. Wilson. 2-3 p., Engineering News, June 8. 15 cts.

Concrete Roads in Michigan. 1-4 p., Municipal Journal, May 17. 10 cts.

Suggested Concrete Roadway with Reinforcement of Steel near Top Surface. 1-3 p., Engineering Record, June 7. 10 cts.

Portland Cement Concrete in Highway Construction. Paper before Canadian Cement and Concrete Association. By W. A. McLean. 4 pp., Cement, April. 25 cts.

2-1-2 pp., Concrete, May. 15 cts.

Sidewalk Fallacies. By J. B. Landfield. 1 p., Municipal Journal, May 31. 10 cts.

Notes on Concrete Sidewalk Construction. By J. B. Landfield. 1-1-2 pp., Contract Record, May 31. 20 cts.

Curbs and Sidewalk Work, Macadam and Brick Paving at Gary, Ind. 4 pp., Engineering-Contracting, May 10. 10 cts.

Maintenance of Rural Highways. From paper before Second Irish Road Congress. By Arthur Gladwell. 1 p., Engineering-Contracting, May 17. 10 cts.

Road Appliances, Home-Made. Illustrated. 1-1-2 pp., Municipal Journal, May 17. 10 cts.

Control and Cleaning of Streets. Entire control of street pavement, including sidewalks, under one authority; suggested method of assessing cost; broom cleaning and flushing. Paper before Conference of Mayors of New York State. By A. Prescott Folwell. 2 pp., Municipal Journal, June 7. 10 cts.

House Numbering by Latitude and Longitude. 1-4 p., Municipal Journal, May 10. 10 cts.

SEWERAGE AND SANITATION

Sewerage System, Revision of Downtown Chicago's. 2 pp., Engineering-Contracting, May 17. 10 cts.

Main Drainage of Govan, Scotland. Paper before Institution of Municipal and County Engineers. By F. G. Holmes. 1 p., Engineering Record, June 3. 10 cts.

Sewer Work Costs. Comments on Excavation and. From paper before Western Society of Engineers. By Victor Windett. 2 pp., Engineering Record, June 10. 10 cts.

Cost of Pipe Sewers and Appurtenances in Water Bearing Sand, Gary, Ind. Illustrated. 2 pp., Engineering-Contracting, May 10. 10 cts.

Sanitary Engineering Conditions in Milwaukee. 1-1-3 pp., Engineering Record, May 20. 10 cts.

Sewage-Polluted Sea Water with One per Cent Sewage, Chemical Changes Occurring in. By E. A. Lettis and E. H. Richards. 7 pp., Journal, Royal Institute of Public Health, May. 60 cts.

Sewage Disposal Works, Proper Methods for Guarding Against Odors in. Address before Congress of Technology. By G. W. Fuller. 3 1-2 pp., Canadian Engineer, May 4. 15 cts. 3 pp., Municipal Engineering, June. 25 cts.

Disposal of Sewage and Protection of the Water Supply of the City of Milwaukee. From Report by J. W. Alford, G. C. Whipple and H. P. Eddy. 6 pp., Engineering-Contracting, May 24. 10 cts.

New Sewage Disposal Works and Pumping Station, Stratford-upon-Avon. Paper before Municipal and County Engineers. By H. D. Bell. 1 p., Contract Journal, May 17. 20 cts. 1 p., Surveyor, May 26. 40 cts.

Sewage Purification at Reading. 1-2 p., Municipal Journal, May 31. 10 cts.

Treatment of the Govan Sewage. Paper before Institution of Municipal and County Engineers. By W. C. Easton. Illustrated. 3 pp., Surveyor, June 2. 40 cts.

Purification of Sewage. By M. de Montriehier. 5 pp., La Technique Sanitaire, May. 50 cts.

Experimental Imhoff Sewage Clarification Tank at Philadelphia and the Original Tanks in the Emscher District of Germany. By Rudolph Hering. 1-1-3 pp., Engineering News, June 1. 15 cts.

Sediment in an Experimental Imhoff Tank. 1 p., Engineering Record, May 13. 10 cts.

Financial Losses and Proposed Preliminary Treatment of Sewage at the Berlin Sewage Farm. 1-2 p., Engineering News, May 4. 15 cts.

Grossman System of Sludge Treatment. 1-4 p., Municipal Journal, June 11. 10 cts.

Health Laws of North Carolina, Act to Amend the. 15 pp., Bulletin, North Carolina Board of Health, March.

Municipal Ordinances, Rules and Regulations Pertaining to Public Hygiene Adopted Since Jan. 1, 1910. Public Health Reports, 4 pp., June 2; 4 pp., May 26; 3 pp., May 12; 4 pp., May 19; 3 pp., June 9.

Function of Research in Municipal Health Administration. From Bulletin, Department of Health, New York. 2 pp., City Life, May 25. 5 cts.

Milk: From Cow to the Consumer. Paper

before Ohio Boards of Health. By G. D. Lummis. 5 pp., Bulletin, Ohio State Board of Health, April.

Diseases, The Fight Against Preventable. Paper before Association of Life Insurance Presidents. By E. H. Porter. 5 pp., Bulletin, Texas State Board of Health, April.

WATER SUPPLY

Water Supply of Marseilles. By M. de Montriehier. 4 pp., La Technique Sanitaire, May. 50 cts.

Catskill Water Supply. Progress made to date on the Ashokan reservoir and aqueduct; masonry dam will be completed this year. Expansion joints; tunneling under the Hudson; mud seams and caves; handling seepage. Illustrated. 4 1/2 pp., Municipal Journal and Engineer, June 11. 10 cts.

New Water Supply of Tynemouth, England. By H. G. Coventry. Illustrated. 3 pp., Engineering Record, June 3. 10 cts.

Existing Los Angeles Water Works. By B. A. Heintz. Illustrated. 7 pp., Municipal Engineering, June. 25 cts.

Water Works of Danville, Ill. Illustrated. 4 pp., Municipal Engineering, June. 25 cts.

Greenwood (S. C.) Water and Light Plant. 1/4 p., Municipal Journal and Engineer, May 10. 10 cts.

Water Supply and Fire Protection in the Klondike Gold Fields. 2 pp., Engineering Record, June 3. 10 cts.

Wells, Determining Yield Of. Paper before Illinois Water Supply Association. By A. N. Talbot. Illustrated. 1 1/2 pp., Canadian Engineer, May 11. 15 cts.

Methods and Costs of Deep Well Drilling. From Water Supply Paper No. 257, U. S. Geological Survey. Illustrated. 5 pp., Engineering-Contracting, May 3. 10 cts.

Reservoirs, Construction of Impounding. Paper before Association of Water Engineers. By Edw. Sandeman. Illustrated. 4 1/2 pp., Canadian Engineer, June 8. 15 cts.

Survey of a Reservoir, Made from a Barge. By H. B. Joslin. Illustrated. 2-3 p., Engineering News, June 8. 15 cts.

Constructing of Impounding Reservoirs. Paper before Association of Water Engineers. By Edw. Sandeman. Illustrated. 4 pp., Surveyor, May 19. 40 cts.

The Island Barn Reservoir. Illustrated. 4 pp., Contract Journal, May 3. 20 cts.

Dam Construction, Masonry. Provision for slight settlement and resulting stresses; increase in unit pressure and reduction in section warranted; American engineers commended. Illustrated. 1 1/4 pp., Municipal Journal and Engineer, June 14. 10 cts.

Geology of Dam Trenches. Paper before Association of Water Engineers. By Herbert Lapworth. 2 pp., Surveyor, May 26. 40 cts.

Run-Off, of Minnesota Streams, Variability of During the Low Water Season of 1910. By Robt. Follansbee. Illustrated. 3 pp., Engineering News, May 4. 15 cts.

Interstate Waters, the Law Governing Division of. By C. F. Randolph. 2-1-3 pp., Engineering News, June 1. 15 cts.

Interstate Waters, the Law Governing of. By C. F. Randolph. 2-1-3 pp., Engineering News, June 1. 15 cts.

Law Regarding Control of Waters Crossing State Boundaries. 1-1-3 pp., Engineering News, June 1. 15 cts.

Intake Troubles, Toronto Water Works. Six-foot steel pipe intake stopped with anchor ice; pipe shifted and filled with sand; method of cleaning. Illustrated. 2 pp., Municipal Journal and Engineer, May 10. 10 cts.

Tanks, Concrete, and How to Make Them. From pamphlet issued by Association of American Portland Cement Manufacturers. Illustrated. 2 pp., Canadian Engineer, May 11. 15 cts.

Pipe, Steel and Cast Iron. Paper before American Water Works Association. By Allen Hazen. 1 1/2 pp., Fire and Water, June 7. 10 cts.

Flow of Water in Clean Iron Pipes. By A. E. Guy. Illustrated. 3 pp., Power, June 6. 5 cts.

Instrument for Measuring the Flow of Water in Large Pipe Lines. Paper before Western Society of Engineers. By R. M. Hosea. 2 pp., Engineering-Contracting, May 24. 10 cts. Illustrated. 1 1/2 pp., Engineering Record, May 27. 10 cts.

Aqueduct, Los Angeles. Illustrated. 7 pp., Pacific Municipalities, May. 20 cts.

Tunnel, Rondout Pressure of the Catskill Aqueduct, New York City. By A. D. Flinn. Illustrated. 7 pp., Engineering News, June 1. 15 cts.

Sinking a Wet Shaft. Paper before American Society of Civil Engineers. By J. P. Hogan. Illustrated. 6 pp., Canadian Engineer, May 4. 15 cts.

New Water Supply Tunnel Under New York City. 2-3 p., Engineering News, May 11. 15 cts.

Reinforced Concrete Water Tunnel at Sioux City. Illustrated. 2-3 p., Engineering Record, June 3. 10 cts.

Pumping Plant, Municipal. By T. E. Butterfield. Illustrated. 6 pp., Isolated Plant, June. 10 cts.

Test of a High-Duty Pumping Engine. By R. W. Angus. Illustrated. 1 p., Power, June 13. 5 cts.

Comparative Tests of Large Engines and Turbine-Driven Centrifugal Pumps. By Francis Head. Illustrated. 1-1-3 pp., Engineering News, May 11. 15 cts.

Efficiency and cost of Modern Pumping Engines. Paper before American Society of Civil Engineers. By C. A. Hague. 2 pp., Engineering-Contracting, May 10. 10 cts.

Notes on Designs of Centrifugal Pumps. Paper before Franklin Institute. By M. W. Akimoff. Illustrated. 1 1/2 pp., Canadian Engineer, May 25. 15 cts.

Purity, Standards of. 1 1/2 pp., Municipal Journal and Engineer, June 11. 10 cts.

Pollution Through Water Mains. 1-3 p., Municipal Journal and Engineer, May 10. 10 cts.

Protection of Water Supply. Paper before Society of Engineers. By H. C. H. Shenton. 3 1/2 pp., Surveyor, May 12. 40 cts.

The Red Water Plague. Effort to determine cause of rust in water drawn from faucets; effect of alum treatment; galvanic action; action on iron increased by heat and pressure; remedies suggested. From paper before American Water Works Association. By G. C. Whipple. Illustrated. 6 pp., Municipal Journal and Engineer, June 14. 10 cts.

Esthetic and Commercial Characteristics. 1/4 p., Municipal Journal and Engineer, June 14. 10 cts.

Purification of Drinking Water. By J. L. Leal. Paper before American Water Works Association. 1 p., Fire and Water, June 14. 10 cts.

Modern Methods of Water Purification. By S. Rideal. 1 p., Surveyor, May 26. 40 cts.

Filtration and Purification of Water for Public Supplies. Paper before Institution of Municipal and County Engineers. By Wm. Ransom. 8 pp., Surveyor, May 12. 40 cts.

Multiple Filtration Without the Use of Chemicals. Paper before Association of Water Engineers. By Walter Clemence. 1 p., Surveyor, June 2. 40 cts.

Multiple Filtration. 1/4 p., Municipal Journal and Engineer, June 11. 10 cts.

Construction of Springfield Filters. Paper before Boston Society of Civil Engineers. Illustrated. 6 pp., Canadian Engineer, May 18. 15 cts.

The Rock Island Filter Plant. 2 1/2 pp., Engineering Record, June 3. 10 cts.

Operation of Torresdale Filters and Tests of Schmutzdecke. 1 1/2 pp., Engineering Record, June 3. 10 cts.

Data on the Action of Ejectors for Filter Sand. Paper before New England Water Works Association. By Maurice Knowles. 3 pp., Engineering Record, June 10. 10 cts.

Mechanical Filtration Plant at Cohoes. Illustrated. 2-1-3 pp., Engineering Record, June 3. 10 cts.

Construction of Maiden Creek Slow Sand Water Filters for Reading, Pa. By Mandes Golder. Illustrated. 1 p., Engineering News, May 4. 15 cts.

Louisville Water Works Filters. Illustrated. 1 1/2 pp., Municipal Journal and Engineer, May 31. 10 cts.

Operating Cost and Qualitative Results of Slow Sand and Mechanical Filters, Baltimore County, Md. By S. T. Powell. Illustrated. 2 1/2 pp., Engineering News, May 4. 15 cts.

Sterilization of Water by Ultra-Violet Rays. Paper before Association of Water Engineers. By Max de Recklinghausen. 1 1/2 pp., Surveyor, June 2. 40 cts.

Sterilizing by Ultra-Violet Rays. 1-3 p., Municipal Journal and Engineer, June 14. 10 cts.

Disinfection of Water. Paper before Conference of Ohio Local Boards of Health. By R. G. Perkins. 1 1/2 pp., Engineering Record, May 31. 10 cts.

Apparatus for Applying Chemicals to Water Flowing in Pipes Under Pressure. Illustrated. 1 p., Canadian Engineer, June 8. 15 cts.

Hypochlorite Disinfection of Indoor Swimming Tank at Northwestern University. By W. L. Lewis. 1 p., Engineering News, June 8. 15 cts.

Water Waste Survey in Memphis. Census taken by service districts; consumption registered continuously for a week by pitometer; sources of leakage. Illustrated. 2 pp., Municipal Journal and Engineer, June 14. 10 cts.

Water Meters. The Introduction of, and Water and Health Conservation in New York City. 1 p., Engineering News, June 8. 15 cts.

Water Rate Decision in Illinois. 1 p., Engineering Record, May 13. 10 cts.

Determination of Water Rates for Madison, Wis. 3 pp., Municipal Engineering, June. 25 cts.

Water Rates. Scientific calculation of rate on basis of cost of service; service charge and quantity charge; former regulated by size of service and meter; adequate method of accounting essential. 1 p., Municipal Journal and Engineer, June 14. 10 cts.

Water Works Rate Making. 2-3 p., Municipal Journal and Engineer, June 14. 10 cts.

Fire Hydrant Rates. Rational method of fixing hydrant rates, based upon cost of service; percentage of cost of distribution system chargeable to such service; cost per capita; value of fire protection. From paper before American Water Works Association. By Leonard Metcalf, Emil Kaichling and W. C. Hawley. Illustrated, 6 pp., Municipal Journal and Engineer, June 14. 10 cts. 7 pp., Engineering Record, June 7. 10 cts.

Management Water Works. Paper before Indiana Sanitary and Water Supply Association. By C. H. Hurd. 2 pp., Municipal Engineering, June. 25 cts.

Water Famine in New York City. The Peril of a. What Can Be Done to Avoid It? Illustrated, 3 pp., Engineering News, May 18. 15 cts.

Prepare Now for Water Shortage. ¼ p., Municipal Journal and Engineer, May 10. 10 cts.

New York, Future of Municipal Water Supplies in. Paper before Conference of New York Mayors. By Walter McCulloh. 2 pp., Fire and Water, June 7. 10 cts. Survey, Illinois Water. ¼ p., Municipal Journal and Engineer, June 14. 10 cts.

Notes, Water Works. ½ p., Municipal Journal and Engineer, June 14. 10 cts.

Madison (Wis.) Water Notes. 1-3 p., Municipal Journal and Engineer, May 10. 10 cts.

Questions, Water Works. ¼ p., Municipal Journal and Engineer, May 31. 10 cts.

STREET LIGHTING

Street Lighting Equipment in New York City. By H. T. Owens. Illustrated, 3 pp., Electrical Review, May 27. 10 cts.

Electric Street Lighting. By Albert Scheible. 1½ pp., Electrical Review, May 13. 10 cts. 1½ pp., May 20. 10 cts.

Ornamental Street Lighting a Luxurious Necessity. By C. L. Eshleman. Illustrated, 8 pp., Illuminating Engineer, June. 20 cts.

Illumination, Ratio of Light to. Paper before Illuminating Society of London. By H. P. Harrison. 1½ pp., Electrical Review, June 3. 10 cts.

Fixtures, Development of Street Lighting. By H. T. Owens. Illustrated, 3 pp., Illuminating Engineer, June. 20 cts.

Automatic Street Lighting. 1-3 p., Municipal Journal and Engineer, May 31. 10 cts.

Luminous and Flame Arcs versus Open and Enclosed Carbon Arcs for Street Illumination. Illustrated, 10 pp., General Electric Review, June. 20 cts.

Street Mains and Service Construction Policy. Paper before Southern Gas Association. By K. L. Simons. 1½ pp., Progressive Age, May 15. 20 cts.

Rates, Discrimination in Central Station. By F. F. Fowle. 9 pp., Engineering Magazine, June. 25 cts.

Excessive Rates for Gas and Electric Lighting Through the Operation of a Holding Corporation. 1 p., Engineering News, May 4. 15 cts.

Cheaper Street Lighting in Wichita. ¼ p., Municipal Journal and Engineer, May 10. 10 cts.

Appraisal of Gas Properties in Chicago and Investigation as to Reasonable Rates for Gas. From report by W. J. Hagenah. 12 pp., Engineering-Contracting, May 17. 10 cts.

FIRE AND POLICE

Fire Waste in the United States. Paper before National Fire Protection Association. By W. L. Fisher. 1-2 p., Engineering News, June 1. 15 cts.

Prevention and Control of Fire Through Scientific Methods. Paper before Congress of Technology. By E. V. French. 1 p., Fire and Water, April 26. 10 cts.

Poor Fire Protection at Macon. 1 p., Fire and Water, May 24. 10 cts.

The Fire Prevention Bill of the Merchants' Association, New York. 4 pp., Proceedings, Merchants' Association, May.

Fire Alarm System, Independent. From engineer's report to mayor of Los Angeles. 4 pp., Pacific Municipalities, April 29. 20 cts.

Police Signals and Fire Boxes. 1-4 p., Municipal Journal, May 31. 10 cts.

Fire Boats, Modern Turbine and Electric. Illustrated, 1 1-2 pp., Fire and Water, May 24. 10 cts.

Hydrants, Use of Fire. 1-4 p., Municipal Journal, May 10. 10 cts.

Conflagration, Bangor. 7 pp., Insurance Engineering, May. 25 cts.

Concy Island Conflagration. Illustrated, 1 1-2 pp., June 3. 5 cts.

Fireproof Building Destroyed by Fire in Montreal, P. Q. Illustrated, 1 p., Canadian Engineer, May 11. 15 cts.

Identification of Criminals. New Method for the. 1 p., American Review of Reviews, June. 25 cts.

Underwriters' Laboratories. Equipment and scope of work. Illustrated, 6 pp., Insurance Engineering, May. 25 cts.

Commissioner Waldo's Economics. 1 p., Fireman's Herald, May 27. 5 cts.

RAPID TRANSIT

Rapid Transit in the World's Great Cities. By E. M. Bassett. Illustrated, 3 pp., Public Service, June. 20 cts.

Subway Construction by Country Methods. Illustrated, 5 pp., Bulletin, General Contractors' Association, May. 10 cts.

Lengthening the Station Platforms of the New York Subway. By W. G. Federlein. Illustrated, 3 pp., Engineering Record, May 13. 10 cts.

The Pont Mirabeau Crossing of the Seine, Metropolitan Subway, Paris. Illustrated, 2-3 p., Engineering News, May 18. 15 cts.

The 191st Street Subway Station, New York City. Illustrated, 2 1-3 pp., Engineering Record, May 20. 10 cts.

The New North-South Subway in Paris. By W. F. Johnston. Illustrated, 1½ pp., Engineering Record, May 13. 10 cts.

Tunnel, Constructing Land Section of La Salle Street, Chicago. Illustrated, 1 p., Engineering-Contracting, May 3. 10 cts.

Appraisal of the Third Avenue Street Railway System, New York City. 4 pp., Engineering-Contracting, June 7. 10 cts.

BRIDGES AND

STRUCTURAL MATERIALS

Bridges, Concrete. By W. M. Denman. Illustrated, 2 pp., Western New England, May. 15 cts.

Concrete Arch Roadway Bridge. Across the Genesee river at Rochester; reconstructing and extending masonry piers; details of concrete work; imitation granite facing; tower distribution of concrete. Illustrated, 3 pp., Municipal Journal and Engineer, May 31. 10 cts.

Adaptation of Concrete to Long Span Bridges. Paper before Canadian Cement and Concrete Association. 5 pp., Cement, April. 25 cts.

Centering for the 281-ft. Concrete Arch of the Monroe Street Bridge, Spokane, Wash. Illustrated, 2 pp., Engineering News, May 4. 15 cts.

Concrete Bridges and Culverts. By T. H. McDonald. 2 pp., Canadian Engineer, May 4. 15 cts.

Reinforced Concrete Through Arch Bridge in Ohio. Illustrated, 2 pp., Good Roads, May. 10 cts.

Road Bridges in Colorado. ¼ p., Municipal Journal and Engineer, May 17. 10 cts.

New Bridges Over False Creek at Vancouver. Illustrated, 3 pp., Canadian Engineer, May 11. 15 cts.

Design for the Steel Centers for the Rocky River Bridge, Cleveland, O. From paper before American Society of Civil Engineers. By W. J. Watson. Illustrated, 2 pp., Engineering-Contracting, May 10. 10 cts.

Highway Bridge Construction for Municipalities. Illustrated, 4 pp., Western Municipal News, June. 10 cts.

Observations on Recent Steel Bridge Construction in America. From Cornell Civil Engineer. By H. S. Jacoby. 2-3 p., Engineering-Contracting, May 3. 10 cts. 1 1-3 pp., Engineering News, May 18. 15 cts.

Concrete Abutments for Highway Bridges. By H. E. Bilger. Illustrated, 2½ pp., Canadian Engineer, June 8. 15 cts. Illustrated, 2½ pp., Good Roads, May. 10 cts.

Iron. Rusting of. Paper before Brooklyn Engineers' Club. By A. H. Sabin. 1½ pp., Engineering News, May 11. 15 cts.

Concrete Methods. ½ p., Municipal Journal and Engineer, May 31. 10 cts.

Economy of Proper Concrete Plant Arrangement. Illustrated, 2 pp., Cement World, May. 15 cts.

Machine vs. Hand Mixing of Concrete. By Joe Frank. Illustrated, 1½ pp., Pacific Builder and Engineer, April 29. 15 cts.

Handling of Concrete During Cold Weather. By J. H. Chubb. 6 pp., Cement, April. 25 cts.

Retempering Concrete. ½ p., Municipal Journal and Engineer, June 7. 10 cts.

Concrete Methods in Rochester. Retempering concrete an advantage for certain purposes at least; experiments showing strength increased by rettempering and deformation decreased. Use of clay for expansion joints. Illustrated, 2 pp., Municipal Journal and Engineer, June 7. 10 cts.

Further Experiments on the Electrolytic Disintegration of Reinforced Concrete. Illustrated, 1 p., Engineering News, June 8. 15 cts.

Lime, Manufacture and Properties of Hydrated. By R. K. Meade. Illustrated, 4 pp., Engineering News, May 11. 15 cts.

Depreciation of Quick Lime. By W. R. Copeland and W. A. Sperry. Illustrated, 2 pp., Engineering Record, May 13. 10 cts.

Creosote, Analyzing Coal Tar. From American Railway Engineering and Maintenance of Way Association. Illustrated, 1 p., Canadian Engineer, May 4. 15 cts.

Reliability of Materials. Paper before Congress of Technology. By W. C. Fish. 1½ pp., Canadian Engineer, May 25. 15 cts.

MISCELLANEOUS

Garbage and Ashes in New York, Removal of. By Alfred Rossiter. 1½ pp., City Life, May 25. 5 cts.

Street Cleaning Accounting. 1-3 p., Municipal Journal and Engineer, June 7. 10 cts.

Street Dust and Street Cleaning in Relation to Health, Comfort and Economy. Paper before Conference of Ohio Boards of Health. By J. H. Landis. 1½ pp., Canadian Engineer, June 8. 15 cts.

Data on Street-Cleaning Efficiency in Berlin. By Rudolph Hering. 2½ pp., Engineering News, May 18. 15 cts.

City Planning Conference. 1-3 p., Municipal Journal and Engineer, May 24. 10 cts.

City Planning Exhibit and Conference at Philadelphia. Effectiveness of models demonstrated; street dimensions; surface and sub-surface construction. Illustrated, 4 pp., Municipal Journal and Engineer, May 24. 10 cts.

The Third National Conference on City Planning. 2½ pp., Engineering News, May 25. 15 cts.

A Continental Tour. Birmingham's deputation on town development. Illustrated, 2½ pp., Municipal Journal, London, May 27. 15 cts. 1½ pp., May 20. 15 cts.

Town Development on the Continent. The Birmingham deputation's report. Illustrated, 3 pp., Surveyor, May 5. 40 cts.

German Town Planning. 1 p., Municipal Journal, London, May 13. 15 cts.

Relation of Technical Men to City Planning. ¼ p., Canadian Engineer, May 18. 15 cts.

Town Planning and Co-Partnership Housing. By J. S. Nettelford. Illustrated, 4 pp., The Survey, June 3. 25 cts.

Housing Awakening, The. Foreign invasion of a New England town. By E. W. Rogers. Illustrated, 7 pp., Survey, June 3. 25 cts.

House Crowding and House Limitation. By Raymond Unwin. 3 pp., Municipal Journal, London, April 15. 15 cts.

Architecture, High Building in City. ½ p., Municipal Journal and Engineer, June 7. 10 cts.

Revision of Toronto Building By-Laws. 5 pp., Canadian Engineer, May 25. 15 cts.

Beautifying Municipal Property. Illustrated, ¼ p., Municipal Journal and Engineer, May 24. 10 cts.

Bathing Pavillion, Oakland Beach, Rye, N. Y. Illustrated, 4 pp., Architecture and Building, April. 20 cts.

Abattoir, a European. Paper before Society of Engineers. By S. M. Doddington. 2 pp., Municipal Engineering, June. 25 cts.

Park Maintenance, Cost of. ¼ p., Municipal Journal and Engineer, May 31. 10 cts.

Retaining Wall, Study of Economic Design of, for a Special Condition. By J. H. Prior. Illustrated, 2 pp., Engineering-Contracting, May 10. 10 cts.

Municipal Works of Cambridge. Paper before Municipal and County Engineers. By Julian Julian. 1½ pp., Contract Journal, May 10. 20 cts. 3 pp., Surveyor, May 12. 40 cts.

Some of the Public Works of Croydon. Paper before Institution of Municipal and County Engineers. By G. F. Carter. Illustrated, 7 pp., Surveyor, May 5. 40 cts. 2 pp., Contract Journal, April 26. 20 cts.

Municipal Undertakings at Harwich. Paper before Institution of Municipal Engineers. By Thos. Green. 5 pp., Surveyor, May 19. 40 cts.

Woolwich and Some of the Works Completed Since 1905. Paper before Institution of Municipal and County Engineers. By J. R. Dixon. 6 pp., Surveyor, June 2. 40 cts.

Stratford-Upon-Avon Municipal Work. By Roden Dixon. Paper before Municipal and County Engineers. 2 pp., Contract Journal, May 17. 20 cts. 4 pp., Surveyor, May 19. 40 cts.

Public Works Notes of Reading, Pa. 1/2 p., Municipal Journal and Engineer, June 14. 10 cts.

Manhattan Island, Proposal to Extend Four Miles Down New York Bay. Communication from T. K. Thompson. Illustrated, 1 p., Engineering News, May 11. 15 cts.

Municipal Engineering at Hamilton, Ont. 3 1/2 pp., Contract Record, May 10. 20 cts.

Need of Professional Co-operation Among Engineers. By A. C. Koenig. 1 1/2 pp., Engineering News, June 8. 15 cts.

Engineering School Graduate: His Strength and His Weakness. Paper before Congress of Technology. By H. P. Talbot. 4 pp., Chemical Engineer, May. 25 cts.

Drafting, Notes on Field. From the Wisconsin Engineer. By H. H. Hunter. 1 p., Canadian Engineer, May 4. 15 cts.

Contracting Practice. By D. V. Moore. Illustrated, 5 pp., Municipal Engineering, June. 25 cts.

Methods of Awarding Contracts. By D. J. Hauer. Illustrated, 3 pp., Contract Record, May 17. 20 cts.

Cost-Keeping for Contractors. 1-3 pp., Municipal Journal and Engineer, May 24. 10 cts.

Competition in Public Contracts. By C. E. Gillette. 3 pp., Contractor, June 1. 20 cts.

Contractors' Foremen and Their Work. 2 pp., Contractor, June 1. 20 cts.

Purchasing Tools and Plant Charges. By D. J. Hauer. 2 pp., Contractor, May 1. 20 cts.

Notes on the Contract System and the Troubles of a County Surveyor. Paper before Second Irish Road Congress. By E. K. Dixon. Illustrated, 1 1/2 pp., Surveyor, May 5. 40 cts.

A Court Decision as to the Enforcement of the Time Penalty in Engineering Contracts. 1 p., Engineering News, May 18. 15 cts.

Construction Work, Details of. By D. J. Hauer. 2 pp., Contractor, May 15.

Rock, Sounding Bar for Locating. Illustrated, 1/2 p., Municipal Journal and Engineer, June 7. 10 cts.

Underground Trunk Lines of the American Telephone and Telegraph Company. New. Illustrated, 3 pp., Engineering News, May 25. 15 cts.

Auditor's Duties. By M. L. Hanscom. 5 pp., Pacific Municipalities, May. 20 cts.

Budget Exhibit in Hoboken. Illustrated, 3/4 p., Municipal Journal and Engineer, May 10. 10 cts.

Paris Municipal Budget. By L. Dausset, President Municipal Council. 1 1/2 pp., Les Amis de Paris, April. 20 cts.

Efficiency Engineering as Applied to Municipal Problems. By H. G. Field. 2 pp., Pacific Builder and Engineer, May 6. 15 cts.

Efficiency Records. System employed in New York. Division into three classes. Use by Civil Service Commission. By L. F. Fuld. 1 1/4 pp., Municipal Journal and Engineer, May 31. 10 cts.

Socialism, Cities Trying. 1-1 1/2 pp., Literary Digest, May 6. 10 cts.

Public Utility Commission, Causes and Effects of a. Paper before Illinois Gas Association. 5 pp., American Gas Light Journal, May 29. 10 cts.

Appraisal of the Seattle Telephone Companies by the Railroad Commission of Washington. By H. S. Gray. 3 1-2 pp., Engineering-Contracting, May 3. 10 cts.

Photographing for the Civic Good. By J. Horace McFarland. Illustrated, 2 pp., Suburban Life, June.

The Art of Roadmaking. By Harwood Frost. New York. Published by the author. 1910. Cloth, 6x9 inches, illustrated, 544 pp. Price, \$3.

The author, an editor by profession who is accustomed to dealing with engineering topics, states that his object in writing the book is to give in a style suitable for the non-technical reader an exposition of the technical and financial problems involved in road-making and paving. It should not be assumed, however, that the book is of no value to the engineer. The contrary is the case, for the descriptive portions dealing with more recent styles of construction are not so well presented in any text books, although the reader who keeps posted on current technical magazine literature may

not find much that is novel to him. The topics dealt with in the opening chapters are the conventional introducing ones, resistance to traction, road and pavement economics, and the principles underlying the selection of pavements for different purposes. These chapters constitute Part I of the book. The second part deals with country and suburban roads, and the third with city streets and pavements. The second part is that which will perhaps be the most read, because it deals with a topic of great general interest. The location of roads with a view to securing suitable grades and other factors is given a chapter. Construction and protective works, in which the importance of drainage is clearly brought out, are given a chapter, together with a brief discussion of highway bridges and retaining walls. The agencies, chemical, physical and mechanical, which cause the destruction of roads, are explained in connection with an enumeration of road building materials and their relative values. Earth, gravel, sand and clay roads, are described at considerable length, and broken stone roads are given a separate chapter. The chapters on road maintenance and dust prevention contain many practical instructions. Under the caption "State Aid Laws" there are included extracts from a number of State specifications. chapter contains information not easily accessible, at least in one volume. In the third part of the book specifications, methods of construction and costs of stone block, brick, wood block, asphalt and concrete are discussed, and the merits and defects of each kind of pavement are pointed out fairly and impartially. Modern methods of street cleaning, including flushing, are described, and even the treatment of the roadside, the selection of trees, is not forgotten. In general, it may be said that the author has accomplished his stated purpose, and the book should prove valuable to officials in charge of roads and citizens generally interested in the subject of roads and pavements who may not have had the advantage of a technical education. When it is borne in mind that the responsibility for the selection of road and street pavements rests generally on those who are assessed for it, the number to whom the book appeals is not few. The illustrations are well selected, with a view to bringing out practical points treated of in the text.

Practical Talks on Contracting. Being reprints from the Contractor of valuable papers by Frank B. Gilbreth, C. A. Worden and E. S. Hanson, Chicago: Contractors' Publishing Company, 1910. Cloth, 5 1/2 by 9, 128 pp. Price, \$1.50.

The leading paper in this series concerns the systematizing of a contractor's office. From this it need not necessarily be inferred that the book is of no value to the large number of contractors who have their offices under their hats. In the short space of 128 pages it is scarcely possible to establish rules by which all contractors may make a lot of money. However, as one good idea might be worth the price of the book and the hour or so necessary to read it, we can conscientiously recommend the book to both large and small contractors. As having a bearing on the general subject of contractors' accounting, an incident may not be amiss. A superintendent for a large contracting company, which had one of the best systems of reporting and accounting, went into business for himself. His foremen make no daily reports and his bookkeeper and cashier spends most of his time acting as a plant foreman. It seems to the reviewer that this contractor is making a mistake, although the contractor is a man of wide

experience and marked ability. The advent of the automobile, however, has something to do with the question. A superintendent or contractor can now give personal attention to work to an extent hitherto unknown, therefore he need not depend so much on reports.

The captions of the papers give a good idea of the scope of the work. They follow: Systematizing a Contractor's Office. Organization—How to Effect and Maintain It. Between Profit and Loss. Office System for Construction Work. Liability Insurance for Contractors. Important Things to Consider in Estimating. Purchasing Records for Contractors. Tools and Equipment Records. Contractor's Daily Reporting System. Earthwork Records. The Operation of Camps and Commissaries. How Contractors Use Photography.

Bricklaying System. By Frank Gilbreth. New York and Chicago. The Myron C. Clark Publishing Co. Cloth, 6 by 9 inches, illustrated, 321 pp. Price, \$3.

As the author states in his introduction the art of bricklaying is thousands of years old, and during this time the bricklayer has not had to compete with machinery. The knowledge of the art has been handed down from journeyman to apprentice for generations. The purpose of the author is to put this knowledge in print that it may assist the apprentice and enable him to become a proficient workman in the shortest possible time. Besides this the author has introduced some ideas of his own, the result of long study of the motions ordinarily made by a bricklayer. His claim is that by making these motions as simple as possible a greater speed in laying brick may be attained without any greater exertion required by the old ways. The meeting on the same piece of work in the United States of men who learned the trade in different countries has done much to show the best methods and eliminate the slow ones. In the course of the volume, every detail of bricklaying seems to be gone into minutely, with matters of economy always in view. The chapters on motion study and their application to the subject in hand will doubtless be of most interest to the reader who is not a bricklayer.

Shade Trees in Towns and Cities. By William Solotaroff. Octavo, cloth; 280 pages; illustrated. John Wiley & Sons, New York. Price, \$3 net.

The author of this work is Secretary and Superintendent of the Shade Tree Commission of East Orange, N. J., and has written many articles on the general subject of shade trees, several of which have appeared in "Municipal Journal," and is a recognized expert on the subject. The scope of this book is indicated by the sub-title, "Their selection, planting and care as applied to the art of street decoration; their diseases and remedies; their municipal control and supervision." Not the least valuable part of the work are the illustrations, practically all of which are from photographs taken by the author to illustrate the various trees, both their general appearance and their leaves and fruit; injuries and diseases; injurious insects; methods of pruning, surgery, etc. The information given is that needed by shade tree superintendents and thoroughly covers the ground. Much of it is not readily accessible elsewhere, or only in scattered volumes. It should also be of value to the private owner who has shade trees on street or lawn. The final chapters are arguments for city control of shade trees and a summary of the legislation of the several States on the subject. The book can be commended as thoroughly reliable.

INDUSTRIAL NEWS

Cast Iron Pipe.—Chicago: Prices continue firm. Quotations: 4-inch, \$25.50; 6 to 12-inch, \$24.50; 16-inch and up, \$24. Birmingham: Shipments continue fairly satisfactory. It is reported that a foundry that has been idle thus far this year will likely change hands at an early date, with a view of its being put in operation. Quotations: 4 to 6-inch, \$22.50; 8 to 12-inch, \$22; over 12-inch, \$21. New York: Considerable inquiry has sprung up from the general trade. Quotations: 6-inch, car-loads, \$21 to \$22.

Lead.—Market is stronger. Quotations: New York, 4.45c; St. Louis, 4.30c.

Crushing Ashes and Rubbish.—Knowles & Co., Boston, Mass., the contractors for reclaiming objects of value from the rubbish collected by the Public Works Department of Boston, have installed a No. 3 Gardiner crusher at their plant at the west end of Massachusetts avenue. Objects of value, as heretofore, are picked out and the remaining rubbish, including paper, tin cans, bottles, etc., are crushed up together with ashes and the product used for filling land.

Auto Engine Test.—Chairman J. Ross Bowdre, Macon, Ga., is greatly disappointed over the showing made to date by the new LaFrance auto chemical engine. This was purchased at the same time as the two new Webb machines and arrived several weeks ago. It has failed to give satisfactory service and seems to be in such poor shape that the company has been requested to send an expert to repair it. The two Webb auto engines are doing fine work whenever called upon. The Webb chemical is expected next week. If the LaFrance chemical ever performs satisfactory work and just as soon as the new Webb chemical arrives the South Macon and Vineville fire houses will be equipped.

Annual Report.—The annual report of the Westinghouse Electric & Manufacturing Co. for the year ending March 31, 1911, shows gross earnings of \$38,119,312 and manufacturing and selling expenses of \$32,510,547, leaving a net manufacturing profit of \$5,608,765. An income of \$1,515,532 was also received from interest, discounts, dividends, royalties and other sources, making a total income of \$7,124,297. The expenditures for interest, depreciation and other charges were \$2,243,191, leaving a surplus of \$4,881,106 for the year, which was the largest in the company's history as respects both gross earnings and net income. The directors believe, however, that the volume of business now offering is on a diminishing scale and that the results of the last year are no certain indication of a continuance for the future of gross earnings and net profits such as the past 12 months have produced. Another condition affecting profits is the expiration of the patent agreement between the Westinghouse and General Electric companies, which expired April 30, 1911, and will probably not be renewed; the patent agreements with other companies have been canceled because they might be considered in violation of the anti-trust laws. For these and other reason the directors decided to pass dividends on the ascending stock.

Asphalt Macadam Roadways.—The American Asphaltum and Rubber Co. have published in pamphlet form a paper called Asphalt Macadam Roadways and the Success of the Penetration Method of Applying Binder, read at the annual meeting of the Michigan Engineering Society at Lansing, January 12, 1911. The paper gives a description of a suitable binder, defining the specific gravity, melting point and other properties. Taking up the question of thickness of bituminous material the fallacy of the argument that four inches of bituminous material is twice as good as two inches is exposed. The increase in cost is not accompanied by a corresponding increase in durability and a thickness of two inches is considered as sufficient. The question of quality and grading of stone is taken up and a size varying from 1¼ inch to 2½ inch in the largest dimension advocated. The necessity of proper rolling before the binder is put on is explained. The methods of applying binder are discussed and the use of an ordinary 500 gallon heater and ordinary pouring cans advocated for small work at least. Good advice to the contractor is given regarding such details as heating the binder, putting on top dressing, applying paint coat and brooming. A complete copy of specifications for asphalt macadam roadways, penetration or pouring method is added.

Concrete Bridge Patents.—The National Bridge Company, of Indianapolis, Ind., now owns 17 Lutten patents on cost-saving devices in concrete bridges. Forty-seven other applications for Lutten patents are still pending. Several of the above patents have been declared valid in the United States Circuit Courts with injunctions issued against infringers and numerous other suits for infringement are being filed. The National Bridge Company now announces that in the future as in the past all Lutten patents will be available to any contractor as a license on prepayment of a fixed royalty; that infringers who have infringed in the past will not in general be prosecuted for such past infringement; but when an effort has been made by licensees of this company to secure consideration of plan designed by Daniel B. Lutten, consulting engineer, and the award has been made to other contractors, on plans embodying features of the Lutten patents, that then a suit for an injunction will be filed against the infringing contractor.

New Police Alarm System.—The new signal phone police alarm system at Mishawaka, Ind., installed by the Signal Phone Company of Milwaukee, is now complete and in operation. The numbers of boxes are as follows: 4, Main and Second streets; 5, Second and Smith; 6, West and Seventh; 7, Eighth and Main; 21, Joseph and Main; 22, Margaret and Lawrence; 24, Battell; 25, Joseph and Cedar streets; 26, Union and Fourth; 32, Merrifield avenue and Second street. Flashlight and bells will be used at Sixth and Main, Wells and Second, Cedar and Second, Sixth and Main, Joseph and Battell and Battell and Main. E. E. Salisbury, for the company, gave the final touches to the system for a final test. The system is now in use under the direction of Chief of Police Harvey Frick.

Consulting Engineers.—Messrs. Rudolph Hering and George W. Fuller, hydraulic engineers and sanitary experts of New York City, announce the termination of their ten-year partnership agreement under the firm name of Hering & Fuller, excepting as to certain existing engagements which they as a firm will complete. For all new engagements they will hereafter conduct independent offices at their present address, 170 Broadway, New York.

Messrs. Rudolph Hering and John H. Gregory announce that they have entered into partnership as consulting engineers and sanitary experts, with offices at 170 Broadway, New York City, and will conduct an engineering business covering investigations, reports, designs and superintendence relating to projects concerning water supplies, water purification, sewerage, sewage purification and refuse disposal.

Auto Fire Engine.—For the second time the Knox gasoline propelled and gasoline pumping fire engine and hose wagon, with which the New York Fire Department has been experimenting, failed last week, this time ceasing to operate at Twenty-second street and Coney Island boulevard, Brooklyn, while undergoing a test for speed. It had started out from the repair shops at Fifty-sixth street and Eleventh avenue, Manhattan. Battalion Chief Howe, Capt. Demorest of the Bureau of Repairs and Supplies, and Capt. Henry, the supervising engineer of the Fire Department, were following the engine in another machine. Under the contract terms the engine was to pump 700 gallons of water for three hours. Two weeks before a test of her pumping capacity was given at the repair shops in Manhattan. After pumping for seven minutes the machine caught fire and the test was abandoned.

Imhoff Patents.—The Pacific Flush Tank Company, Singer Building, New York, N. Y., and The Temple, Chicago, Ill., announce that they have become the American representatives for the patents covering the Imhoff tanks for sewage treatment.

Corporation Election.—Westinghouse, Church, Kerr & Co., New York, announce that John F. Wallace has been elected president of the company.

Mueller Sewer Rod.—H. Mueller Mfg. Co., Decatur, Ill., have placed on the market a steel sewer rod for use in opening clogged sewers. The rod is flexible enough so that it can be carried about in a coil, yet stiff enough to do the required work. It is a continuous strip of special spring steel; its flexibility will allow it to follow irregularities in the line of the sewer. However, it has enough strength and spring to keep it from buckling or breaking. When it is withdrawn it becomes a straight steel rod that can be readily coiled as it is taken from the sewer.

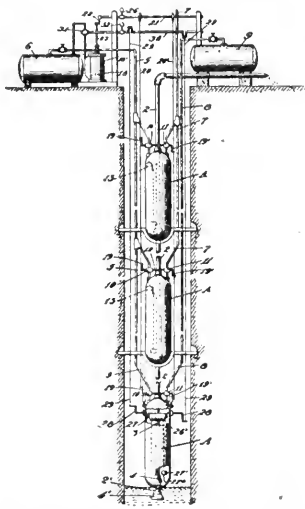
The working end is provided with a sharp spear point which will easily penetrate any obstruction in the passage. Just back of the point there are a number of tacks bent outward but projecting backward from the spear point so that they will not interfere with the penetration of the rod. By working the rod back and forth obstinate stoppages may be torn loose.

The Mueller sewer rod is furnished in lengths of 25, 40, 50, 60, 75 and 100 feet. Rods of all these lengths for use in 8-inch and smaller sewers are made of ½ x 1¼-inch steel. Rods 75 and 100 feet long for use in sewers larger than 8 inches are made of ½ x 1½-inch steel.

PATENT CLAIMS

995,248. DEEP-WELL PUMP. Peter J. Gildea, San Francisco, Cal. Serial No. 564,469.

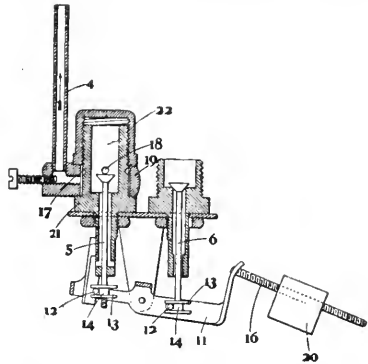
An apparatus to raise liquids, said apparatus comprising a series of superposed spaced cylinders or receivers, with connecting pipes and check and foot valves, means to fill the lowermost cylinder, connections through which air under pressure is intro-



duced above the surface of the liquid to force the liquid successively from each cylinder to the one above, a valve-controlled air supply to said pressure connections, and means controlled by the level of the liquid in a cylinder for opening the air supply valve to admit air to said pressure connections.

994,140. GAS LIGHTING AND EXTINGUISHING APPARATUS. Edmund H. Elton and Richard Stephens, Cleveland, England. Serial No. 476,411.

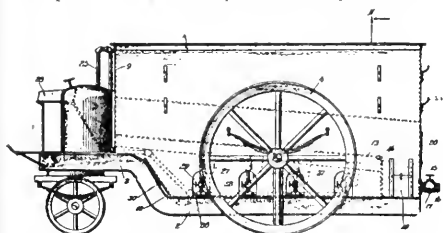
Apparatus for lighting and extinguishing gas burners from a distance comprising main and pilot burner valves, a lever in connection with said valves, an adjust-



able weight on said lever, a diaphragm, and means permitting of retaining the main burner valve open on a slight decrease of gas pressure comprising a pivotally mounted lever on said lever means limiting the rocking movement of said second lever and means connecting the second lever to the diaphragm.

994,579. SNOW-MELTER. Christian Eberstaller, Roselle, N. J. Serial No. 557,748.

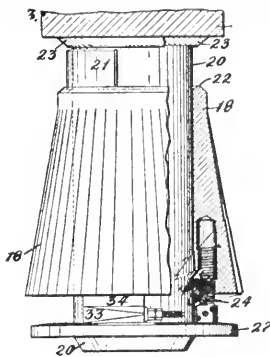
A snow melting apparatus comprising an outer main body or receptacle, an inner snow receiving receptacle of sufficiently less cross sectional area and less depth to provide lateral space and space below



the bottom of said snow receiving receptacle, said inner receptacle having a depending extension forming a well below the plane of the bottom of said inner receptacle, at its rear end, and means for heating the bottom of said inner receptacle.

995,044. HEAD-ADJUSTING DEVICE FOR GYRATORY STONE-CRUSHERS. Edgar B. Symons, Milwaukee, Wis., assignor to Smith & Post Co., Milwaukee, Wis., a Corporation of Wisconsin. Serial No. 535,227.

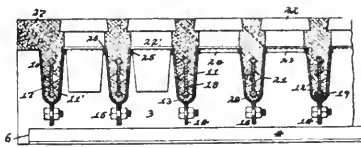
In a rock crusher, a crusher shaft, shoulders projecting from said shaft, a crusher head slidable along said shaft, re-



movable distance collars in halves spacing said head from one shoulder and a screw tapped into the head and reacting against the other shoulder for holding said head and collars up to said shoulder.

994,540. MOLD FOR FORMING SIDEWALKS AND OTHER LIKE CONSTRUCTIONS. Henry C. Seipp, Coraopolis, Pa. Serial No. 550,213.

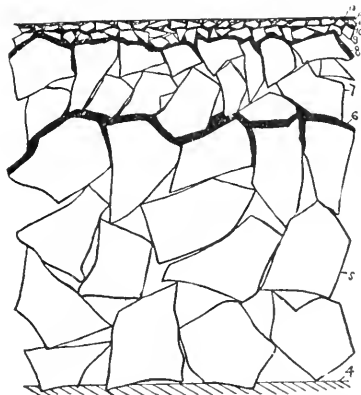
In a mold for forming sidewalks and other like constructions, the combination with re-



movable supporting means, of a vertical slotted mold forming plate on said means, and a removable mold section of trough-shaped form on said plate.

995,147. COMPOSITE PAVEMENT. Harry G. Jennison, Toledo, Ohio. Serial No. 538,348.

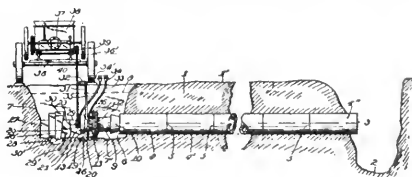
The combination in a pavement of a base, a hydrocarbon binder thereon, a wearing layer wholly of road metal anchored by said binder, said layer having unfilled voids, and a hydrocarbon binder covering said



road metal layer and spaced from said anchor binder, the quality of binder being gaged to preserve cushioning effect of the unfilled voids in road metal layer upon laying to thereby confine hydrocarbon binders to serve only as binders.

995,404. MEANS FOR CLEARING OBSTRUCTED DRAIN-PIPES. Artemus N. Hadley, Indianapolis, Ind. Serial No. 435,548. Divided. Serial 515,186.

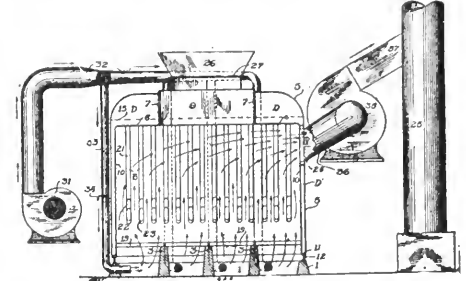
Apparatus for clearing a drainage pipe line embedded in the ground, including a water-delivering machine provided with a



delivery end adapted to be placed unattachably to the end of a section of the pipe line, and means independent of the pipe line for holding the delivery end forcibly in contact with the end of the section.

994,636. GARBAGE-INCINERATING AND STEAM-GENERATING SYSTEM. Charles A. Byrne, Minneapolis, Minn., assignor of one-half to Frank Dunning, Osseo, Minn. Serial No. 535,034.

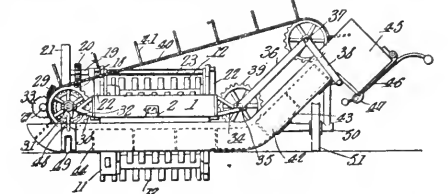
An apparatus for incinerating garbage comprising in combination, a single combustion chamber having an outlet, a fire grate therein, means supplying forced draft to said grate, positive mechanical means



communicating with said outlet for maintaining an induced draft, and means in said chamber for suspending the garbage over and closely adjacent the grate at a point between the grate and the outlet whereby products of combustion from the grate penetrate and pass through the garbage.

994,746. DITCHER AND GRADER. Robert E. Raynes, Spencer, N. C. Serial No. 565,793.

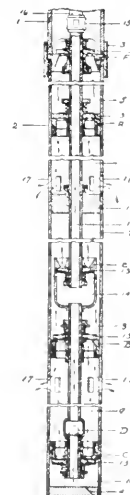
In a ditching machine, a journaled rotor having at its periphery radially disposed bits, a shaft journaled at the side of the rotor and operative from the same, a cam carried by said shaft, a pivoted arm at one end located in the path of movement of the



cam, a scraper carried by said arm and at times located in the path of movement of the bits, the parts being so arranged that the cam engages the arm and swings the same so that the scraper is carried beyond the path of movement of the bits as the bits approach the same.

994,310. DEEP-WELL PUMP. James Gleason, Green Bay, Wis. Serial No. 577,122.

In a deep-well pump a suspension pipe, a pump cylinder attached thereto, said cylinder closed at the lower end, a diaphragm in said cylinder dividing the working space into two approximately equal parts, a diaphragm valve between the cylinder and the suspension pipe, two rows of ports in the sides of said cylinder opening into the two working spaces, a sucker rod, a hollow pump rod open at its lower end, and



connected to the pump rod with a coupling having open port holes, a downwardly opening bucket at the lower end of the pump rod, a ball valve in said pump rod above the lower bucket, an upwardly opening bucket attached to the pump rod in the lower working section of the cylinder, a cage valve on said pump rod above the upwardly opening bucket, an upwardly opening bucket attached to said pump rod above said diaphragm in the upper working space of said cylinder, as set forth.

THE WEEK'S CONTRACT NEWS

Relating to Municipal and Public Work—Street Improvements—Paving, Road Making, Cleaning and Sprinkling—Sewerage, Water Supply and Public Lighting—Fire Equipment and Supplies—Bridges and Concrete Work—Sanitation, Garbage and Waste Disposal—Police, Parks and Miscellaneous—Proposals and Awards.

To be of value this matter must be printed in the number immediately following its receipt, which makes it impossible for us to verify it all. Our sources of information are believed to be reliable, but we cannot guarantee the correctness of all items. Parties in charge of proposed work are requested to send us information concerning it as early as possible; also corrections of any errors discovered.

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREET IMPROVEMENTS				
Ohio	Cincinnati	June 23, noon	Repairing portion of Blue Rock pike; also for oiling Colerain pike in Colerain twp. and Cleves and Bridgetown pike in Green and Miami townships.	Stanley Struble, Pres. Bd. Co. Comrs.
Dist. of Col.	Washington	June 23, 2 p.m.	Laying gutters and bituminous macadam pavement and setting curb on various streets.	C. H. Rudolph, Chm. Commissioners.
Pennsylvania	Pittsburg	June 23, noon	Furn. 5,000 bbls. of Portland cement during nine months ending March 31, 1912.	J. R. Cunningham, County Compt.
Ohio	Rocky River	June 23, noon	Constructing cement walks on North Ridge Road.	W. M. Dean, Town Clerk.
Ohio	Youngstown	June 23, noon	Repairing sheet asphalt streets; and paving portion of Myrtle av.	W. H. McMillin, Clk. Dept. Pub. Ser.
Ontario, Can.	Kingston	June 24, noon	Constr. 15,000 sq. yds. of asphaltic macadam; and 9,700 lin. ft. curb and gutter.	H. B. R. Craig, City Engineer.
Ohio	Bowling Green	June 24, 2 p.m.	Grading, draining, macadamizing and oiling Wallace avenue.	W. A. Mariner, Service Director.
Massachusetts	Holyoke	June 26, noon	Constr. about 5,200 sq. yds. granite block or brick pavement.	Board Public Works.
Iowa	Maquoketa	June 26, noon	Paving with brick blocks, creosoted block & asphaltic concrete various streets.	E. J. Kullmer, City Clerk.
New Jersey	Plainfield	June 26, 8 p.m.	Paving about 40,000 sq. yds. with plain and bituminous.	Jas. T. MacMurray, City Clerk.
Nebraska	Lincoln	June 27, noon	Paving portions of roads Nos. 667 and 1225, 9,564 sq. yds. Class "C" and "G"; 10,760 lin. ft. artificial stone curb.	H. E. Wells, County Clerk.
Ohio	Lorain	June 27, noon	Improving various streets and alleys by paving with macadam, sheet asphalt, block asphalt or vit. brick, with necessary excavation, draining, curbing, foundations, etc.	L. B. Johnson, Clk. Dept. Pub. Serv.
New York	Buffalo	June 27, 11 a.m.	Paving and repaving various streets.	Francis G. Ward, Comr.
Maryland	Havre de Grace	June 27, 8 p.m.	Improving certain streets, consisting of about 5,160 cu. yds. excavation; 8,480 sq. yds. bituminous macadam; 120 cu. yds. masonry.	Murray Vandiver, Chm. Imp. St. C.
Virginia	Norfolk	June 28, noon	Constructing new highways in Wise county.	State Highway Com.
Tennessee	Wise Ct. House	June 28, 11 a.m.	Constructing about 81 miles of county highway.	Bd. Superv. Wise County.
Ohio	Columbus	June 28, noon	Furnishing and applying 10,489 gals. surface treatment on Harrisburg Pike; 15,739 gals. on Sunbury Pike and 13,630 gals. on National Road.	John Scott, Clk. Bd. Co. Comrs.
Ohio	Lowellville	June 28, 2 p.m.	Improving three roads in Mahoning township.	W. J. Maurice, Township Clerk.
California	Sacramento	June 28, noon	Constr. 14 miles of Trinity State Highway.	N. Ellery, State Engineer.
Pennsylvania	Greensburg	June 29, 11 a.m.	Construction and permanent improvement of four county roads about 68,348 feet.	J. D. Miller, Chm. Co. Comrs.
Ohio	Cincinnati	June 30, noon	Treating with tar Hillside ave. and Warsaw pike; oiling Springfield pike in Springfield township.	Stanley Struble, Pres. Bd. Co. Comrs.
Arkansas	Little Rock	June 30, noon	Paving about 13,000 sq. yds. with creosoted block; 25,000 sq. yds. of macadam.	E. A. Kingsley, Engineer.
Arkansas	Argenta	June 30, noon	Constr. about 30,000 sq. yds. creosated block pavement; 25,000 sq. yds. macadam.	Mayor Faucette
Kentucky	Middlesboro	July 1, noon	Constr. sidewalks, curb. and guttering in various streets.	E. S. Helburn, Mayor.
Georgia	Rome	July 1, noon	Grading, curbing and paving various streets with wood block vit. brick, Hassam, asphalt macadam, sheet asphalt and bitu.	J. R. Cantrell, City Clerk.
Indiana	Greencastle	July 1, noon	Constr. about 40,000 ft. of macadam road in Putnam County.	D. V. Moffett, County Auditor.
New Jersey	Westfield	July 3, 8:15 p.m.	Constr. about 3,200 sq. yds. bituminous macadam pavement, concrete culverts, drains and appurtenances; 1,000 cu. yds. ex.	Chas. Clark, Town Clerk.
West Virginia	Parkersburg	July 3, noon	Paving with brick portions of 4 roads in Wood County.	C. S. Skidmore, County Engineer.
New York	Olean	July 5, 8 p.m.	Constr. about 9,800 sq. yds. of wire-cut-lug block pavement; 6,000 lin. ft. stone curbing.	John H. Gaynor, Engineer.
Florida	Tampa	July 5, 2 p.m.	Resurfacing about 1½ mile road in Hillsboro County with shellor its equivalent.	Bd. County Comrs.
Indiana	Vincennes	July 5, 2 p.m.	Constr. about 93,400 ft. of gravel roads in Knox County.	John T. Scott, County Auditor.
West Virginia	Huntington	July 6, 1 p.m.	Paving various streets with vit. brick, asphalt, bitulithic, tarvia or asphalt block.	A. B. Maupin, City Engr.
Oregon	Grants Pass	July 6, noon	Constructing 30,000 sq. yds. of pavement.	F. E. Hobson, City Engineer.
Mississippi	Meridian	July 6, 2 p.m.	Constr. 12.35 mi. Novaculite roadway; 2 mi. sand-clay road.	W. P. Moore, Chief Engineer.
New York	Olean	July 6, 8 p.m.	Constr. about 5,000 sq. yds. wire-cut-lug block pavement on concrete foundation; 3,500 lin. ft. stone curb.	John H. Gaynor, Engineer.
Illinois	Denison	July 6, 2 p.m.	Constructing various macadam roads.	Geo. Gray, Comr. Highways.
Ohio	Cincinnati	July 7, noon	Oiling Harrison pike in Harrison and Whitewater townships; also repairing Indian Hill avenue in Columbia township.	Stanley Struble, Pres. Bd. Co. Comrs.
North Carolina	High Point	July 10, 1:30 p.m.	Grading, curbing and macadamizing various streets, estimated cost \$40,000.	Fred N. Tate, Mayor.
Iowa	Greenfield	July 11, 2:30 p.m.	Constr. about 14,000 sq. yds. brick or cement paving; 4,500 lin. ft. curb; Iowa Engeer. Company, Chase Block, Clinton, Iowa, Engineers.	Town Clerk.
Ohio	Greenville	July 15, noon	Constructing the Althoff road in Patterson township.	Bd. County Comrs.
Tennessee	Johnson City	July 20, 6 p.m.	Constr. 23,000 sq. yds. paving, including bridges, sewers, storm water drain, concrete curb and gutter, consisting of about 5,000 cu. yds. excavation; 23,000 sq. yds. paving; 12,000 lin. ft. curb and gutter.	W. M. Dunlap, City Comr.
SEWERAGE				
Connecticut	South Norwalk	June 25, noon	Laying 925 lin. ft. of 18-in. and 750 lin. ft. of 12-in. vit. pipe sewer with appurtenances.	Samuel W. Hoyt, Jr., City Engineer.
South Dakota	Aberdeen	June 26, noon	Constr. about 1,860 ft. of 18 and 8-in. pipe sew. and 5 manholes.	F. W. Raymond, City Auditor.
Iowa	Nevada	June 26, 7:30 p.m.	Constr. sewage disposal plant consist. of septic tank; 2 filters & about 3,060 ft. of 15-in. vit. sewer and 730 ft. of 15-in. concrete sewers on piers with manholes; also constr. 1,480 ft. of 12-in., 5,920 ft. of 10-in. & 27,090 ft. of 8-in. vit. pipe sewers.	City Clerk.
Rhode Island	Woonsocket	June 27, 4 p.m.	Constr. about 900 ft. of 8-in. sanitary sewer and appurtenances and about 500 ft. surface water drain.	Frank H. Mills, City Engineer.
North Carolina	Red Springs	June 27, 3 p.m.	Constr. a sewer system including 4½ miles of 8 to 15-inch pipe.	A. B. Pearsall, Chm. Bd. Pub. Wks.
Minnesota	Morris	June 27, 8 p.m.	Constr. 3,232 ft. of 8-in. sewer, 4-in. tile drain, manholes, flush tank, etc.	C. B. Burpee, City Clerk.
New York	Hempstead	June 27, noon	Bldg. about 122,930 lin. ft. 8 to 20 in. vit. pipe, about 2,000 lin. ft. 8 to 18-in. cast iron pipe, about 115,300 cu. yds. excavation, 3,000 vert. ft. concrete manholes, 113 flush tanks, 445 manhole covers, 18,000 lin. ft. 6-in. vit. pipe for house service, two pumping plants and one disposal plant.	M. O. Hedges, Clk. Vil. Bd.
Maryland	Baltimore	June 28, noon	Constr. storm water sewers in the bed of Jones' Falls, preliminary to constructing boulevard over Falls.	J. H. Preston, Mayor.
New York	Binghamton	June 28, 4 p.m.	Laying vit. pipe sewer with necessary manholes, catch basins, flushing tanks, and connections, in Union, Brace and Berlin sts	S. W. Murray, Clk. Bd. C. & Sup.

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
SEWERAGE (Continued)				
New York	Hudson	June 29, 6 p.m.	Constr. 10-in. vit. tile sewer on Green street	M. J. O'Hara, City Engineer.
Wisconsin	Independence	June 29, 8 p.m.	Constr. sewers consisting of 10 lin. ft. of 30-in. steel pipe; 1,089 lin. ft. 24-in. vit. pipe; 1,251 lin. ft. 20-in. vit. pipe; 1,254 lin. ft. 15-in.; 1,200 lin. ft. 12-in., with house connections, and appurtenances.	Jacob Jackson, Village Clerk.
Ohio	Bucyrus	June 30	Constr. 7,700 lin. ft. of 10 to 20-in. vit. tile sanitary sewer; 6,700 lin. ft. of 4 and 5-ft. concrete and brick sewer.	F. L. Niederheiser, City Engr. E. L. Williams, City Clerk.
Wisconsin	Appleton	June 30	Constructing sewer in portion of Lawrence Street	
Utah	Salt Lake City	June 30	Extending gravity outlet sewer from present outlet to Great Salt Lake	H. G. McMillan, Chm. Bd. Pub. Wks.
Kansas	Parsons	July 1	Constr. sewers of double strength vit. pipe with septic tank of concrete and pumping station. Est. cost \$65,000 to \$70,000.	City Clerk.
California	San Jose	July 3	Construct septic tank for County hospital	City Clerk
South Dakota	Madison	July 6, 8 p.m.	Bldg. sewer system about 31,465 lin. ft. 6 to 18 in. vit. pipe.	George H. Waskey, Mayor.
North Carolina	High Point	July 10, 1:30 p.m.	Constr. sewer and water lines amounting to about \$50,000.	Fred N. Tate, Mayor.
Ohio	West Lafayette	July 10	Constructing storm water sewers. Est. cost \$16,000.	E. L. Thompson, Village Clerk.
WATER SUPPLY				
Arkansas	Mena	June 23	Constr. new distribution system for water works Dist. No. 2; separate bids for material and construction; 780 tons c. i. pipe and special castings; about 30,000 ft. of 4 to 12-in. mains	John Thompson, Chm. Bd. Imp. Dexter Brackett, Chm. Engr. W. Wk. D. Donohue, City Clerk.
Massachusetts	Boston	June 23	Laying about 10,200 ft. of 24-in. c. i. water pipe in Hyle Park av.	
Minnesota	North Mankato	June 24, 7:30 p.m.	Furn. and install. pump. equip. for village water works	
Minnesota	Paynesville	June 24, 2 p.m.	Extending water mains, consisting of 3 blocks of 8-in. main with hydrants and connections	Frank Tolman, Village Clerk.
Ohio	Euclid	June 26, noon	Laying 6-in. water mains in four avenues	F. H. Schoaff, Village Clerk.
New York	Newburgh	June 26, 5 p.m.	Laying about 1,000 ft. 30-in. water main	Curtis Stanton, Supt. Water Works.
Pennsylvania	Aliquippa	June 26	Constr. brick pump house, laying c. i. water lines and connecting 1,184,000 single action triplex power pump.	W. W. Lester, Boro. Clerk.
Massachusetts	Lynn	June 27	Constr. pumping station and machinery for pumping water from Saugus River to Hawkes Pond	Ulman R. Hunt, Supt. Bldgs.
Michigan	Imlay City	June 27, noon	Wrecking old and constr. new standpipe on brick tower; and furn. c. i. riser pipe with connections complete	Horace Lamb, Pres. Bd. Trustees.
New Jersey	Bridgeton	June 27	Constructing complete pumping station and water filtration works, machinery, pumps, fillers, etc.	J. J. Jones, City Clerk.
Kentucky	Frankfort	June 27, 11 a.m.	Constr. pipe line to Lakeland, consisting of 7,360 ft. 16-in. pipe, 21,680 ft. 12-in. pipe, 10,690 ft. 8-in. pipe.	Albert Scott, Pres. Ken. St. Bd. Con.
Tennessee	Dyer	June 27, 2 p.m.	Furn. material for constructing water works; consisting of 60-H.P. gasoline engine; 150,000 gal. reservoir; 40,000 gal. steel tank on 50-ft. tower; brick or concrete pumping station; water pipe, valves, etc.	R. B. Daniel, Mayor.
Maryland	Baltimore	June 28, 11 a.m.	Furn. a 30,000,000 gal. vertical triple expansion pumping engine, two batteries and two boilers each and appurtenances	Alfred M. Quick, Water Engineer.
Quebec, Can.	Montreal	June 29, noon	Installing pumping machinery, blower and cranes at filtration plant	L. N. Senecal, Secy. B. I. Comrs.
North Dakota	Mandan	June 29, 2 p.m.	Laying c. i. water pipe and appurtenances, constr. power house intake, intake well, settling basins, clear water well etc.; furn. boilers; hydrants, valves, c. i. pipe and special castings	Lee Nichols, City Auditor.
Minnesota	Minneapolis	June 30	Furnishing filter equipment and devices	Henry N. Knott, City Clerk.
Nebraska	Bridgetown	June 30	Constr. water works system. Est. cost \$17,500.	Village Clerk.
Ontario, Can.	Ft. William	July 1	Selling equipment of municipal pumping and electrical generating plant, suitable for town of 5,000 inhabitants.	John Wilson, City Engineer. City Clerk.
Illinois	Mendota	July 3, 7:30 p.m.	Constr. an iron and concrete roof on reservoir	H. H. Canfield, City Clerk.
Ohio	Cleveland Hghts.	July 5, noon	Building 10-in. water main in Cedar Roads.	E. L. Callison, Supt. Road Co.
Louisiana	Kentwood	July 6	Drilling artesian well	W. D. Welsh, Mayor.
Nebraska	Columbus	July 7, 8 p.m.	Constructing and installing a water works extension	City Clerk.
Quebec, Can.	Montreal	July 13, noon	Constr. final filters and appur. forming por. of filtration plant.	L. N. Senecal, Secy. Bd. Comrs.
BRIDGES				
Illinois	Clinton	June 23, 9 a.m.	Constr. a reinforced concrete bridge of two 40-ft. girder type spans with an 18-ft. roadway	R. S. McBride, Town Clerk.
Ohio	Cincinnati	June 23, noon	Constr. bridges, culverts and approaches on County Club road in Sycamore, Silverton and Columbia townships	Stanley Struble, Pres. B. I. Co. Comrs.
Virginia	Rocky Mount	June 24	Constr. two bridges in Franklin County, of iron	J. H. Ferguson, Chm. Bridge Com.
Tennessee	Knoxville	June 24, 9 p.m.	Rebuilding and repairing timber bridges in Knox County	E. L. Callison, Supt. Road Co.
Pennsylvania	Erie	June 26, 8 p.m.	Reconstructing and repairing the 26th St. bridge over Mill Creek	Thomas Hamon, City Clerk.
Washington	Tacoma	June 26, noon	Constr. new bridges on 11th st. Separate bids on (1) substructure; (2) entire bridge except steel work, electrical and other machinery; (3) Furn metal work, electrical equipment; (4) Erecting superstructure; (5) Constr. bridge complete, removing old bridges constr. temporary bridge	City Clerk.
Ohio	Cleveland	June 28, 11 a.m.	Constr. a concrete bridge in Euclid township	John F. Goldenbogen, Clk. B. C. C.
Texas	Houston	July 1	Constr. a reinforced concrete viaduct over Houston ship channel about 1,650 ft. long and 60 ft. wide	F. L. Dormant, City Engr. City Clerk.
Pennsylvania	Pittsburg	July 1	Constructing one concrete arch, estimated cost \$85,000.	Jos. Overfield, Clk. B. I. Co. Comrs.
Pennsylvania	E. Stroudsburg	July 3, 11 a.m.	Constructing 4 stone bridges	
Kansas	Leavenworth	July 3, noon	Building Peterson Bridge, Tonganoxie Twp.; bridge on Limit St., Leavenworth; bridge across Little Stranger, High Prairie township	J. A. Hall, County Clerk.
California	San Jose	July 5, 11 a.m.	Constr. a pony truss bridge over Campbell Creek; also reinforced conc. add. to the abut. of Ford Road Bldg. over Coyote Creek	Henry A. Pfister, Clk. B. C. Sup
Ohio	Cincinnati	July 7, noon	Constr. concrete bridge at intersection of German and Compton roads in Springfield township	Stanley Struble, Pres. Bd. Co. Comrs.
Indiana	Richmond	July 8, 11 a.m.	Constr. a 24-ft. concrete span bridge in Green Twp.; an 18-ft. span on the Cart Road North of Richmond; constr. a concrete floor on the Canal Bridge at Hagerstown; constr. concrete crete wall and earth filled approach of the Middleboro Bridge	Demas S. Coe, County Auditor.
New Jersey	Trenton	July 11	Constr. a steel and conc. bridge over Herrontown Rd., Princeton township	Frank J. Epple, County Engineer.
Indiana	Ft. Wayne	July 12, 10 a.m.	Constr. a bridge over St. Joe River, at Tennessee ave.	Calvin H. Brown, County Auditor.
LIGHTING AND POWER				
Wisconsin	Minocqua	June 23, noon	Constr. electric lighting plant, including engine and equipment, reconstr. build. for power house; pole line and wiring	W. H. Fisher, Town Chairman
Sask., Can.	Prince Albert	June 26	Furn. hydraulic power and electrical power equipment	C. O. Davidson, Secy. Treas.
Iowa	Pocahontas	June 27, 4 p.m.	Installing complete electric light plant	Geo. Schneiders, City Clerk.
Arkansas	England	July 1	Building and operating an electric light plant under a 30-year franchise	H. Galloway, Recorder.
Alherta, Can.	Stettler	July 3	Furn. one 125 KVA generator exciter and switchboard; one tandem compound steam engine, boiler, stack, poles, and pole line material; erecting pole line	David Mitchell, Town Clerk.
Australia	Brisbane	Jan. 30, noon	Designs, supply and erection at Mount Crosby Pumping Station of alternatively one, two and three complete units consisting of power generating pumps and plants, etc.	Geo. Johnston, Albert St., S & W. Bd
FIRE EQUIPMENT				
New Jersey	Princeton	July 5	Furn. auto pumping engine	E. M. Uppdike, Chm. F. & W. Com.
South Dakota	Gettysburg	July 11, 8 p.m.	Furn. 750 ft. of 2 1/2-in. fire hose; one service hose cart	R. L. Flickinger, City Auditor.

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
MISCELLANEOUS				
Massachusetts	Holyoke	June 23, 2 p.m.	Constructing shelter for public playground	Oscar C. Ferry, Assistant Clerk
Indiana	South Bend	June 26, 10 a.m.	Furn. 50 or more voting machines	John W. Haroon, Attnr.
Ohio	Maumee	June 26, noon	Erecting a village hall building	Geo. V. Raab, Village Clerk
North Dakota	Bismark	June 26, 9 p.m.	Erecting a brick fire hall	R. H. Thistlewaite, City Auditor
Oklahoma	Muskogee	June 27, 10 a.m.	Constr. garbage disposal plant of 35-ton daily capacity	Ernest Cook, Comr. Pub. Safety
New Jersey	Paterson	June 28	Collecting and disposing of garbage and refuse for term of 5 years from July 1	T. S. Standeven, City Clerk
Ontario, Can.	Ft. William	June 30, 5 p.m.	Constructing a reinforced concrete subway	John Wilson, City Engineer
Washington	Spokane	June 30	Constructing additions to country jail. Estimated cost \$40,000	Bd. County Comrs.
Illinois	Mendota	July 3	Constr. an iron and concrete roof on reservoir	City Clerk
Illinois	Gillespie	July 5, 5 p.m.	Constructing new city building	G. W. Schmidt, City Clerk
Indiana	Muncie	July 5	Constructing a new barn at County Infirmary, 40x50 ft.	County Auditor
Louisiana	Mansfield	July 5, 10 a.m.	Erecting a two story and basement, semi-fireproof Courthouse	Parish of De Sota

STREET IMPROVEMENTS

Clanton, Ala.—Chilton County is considering \$150,000 bond issue for road construction.

Argenta, Ark.—Plans are being prepared by E. A. Kingsley, engineer, Little Rock, for paving in districts 11 and 12.

Napa, Cal.—Trustees have ordered the City Engineer to draw up plans and specifications for bituminizing of five blocks of street at a cost of \$6,500.

Yuba City, Cal.—Board of Supervisors has granted the petition of J. W. More and others for a new road in District No. 2.

Colorado Springs, Col.—Specifications have been completed for the paving of downtown district and estimates and assessment lists are now being prepared.

Rockville, Conn.—Council has decided to lay macadam on East Main St.; \$4,000 available.

Washington, D. C.—The Secretary of War and the Chief of Engineers of Army, as members of the highway commission of the District, have finally approved revised plans made by District Commissioners of the system of highways for that portion of the District lying between Mount Pleasant st., Irving st., Adams Mills road, Quarry road and Columbia road.

Jacksonville, Fla.—Duval County will at once pave three miles of the John Anderson boulevard with brick; when work is finished contract will be awarded for three additional miles.

Key West, Fla.—Board of Council has passed ordinances for improvement of about ten streets.

Palatka, Fla.—Freeholders will vote July 11 on \$15,000 loan to complete paving of city with vitrified brick.

Albany, Ga.—Citizens have voted \$12,500 bonds for street paving and \$5,000 to open and lay out new streets.

Oglethorpe, Ga.—Macon County will vote July 20 on \$150,000 bonds for road construction.

Pembroke, Ga.—Bryan County will construct road from Moore's bridge across Canoochee River to King's Ferry bridge, across Ogeechee River.

Waycross, Ga.—Street extensions and subway construction involving several thousand dollars have been authorized by Council, with view of connecting all sections of city and eliminating railroad division now existing.

Muncie, Ind.—Board of Works has decided to pave Franklin st. with brick; bids will be asked.

Vincennes, Ind.—Cost of improving Sixth St. has been estimated at \$6,749.80.

Shenandoah, Ia.—City will construct 24,000 sq. yds. of asphaltic concrete paving this summer. F. L. Cain, City Engineer.

Lafayette, La.—Council has authorized Street Committee to advertise for bids to grade and keep streets and bridges in repair.

Hyattsville, Md.—Council has passed ordinance for improvement of Ralston and Wine aves.

Detroit, Mich.—Bids will soon be asked for paving five alleys at cost of \$30,000. J. J. Hoarer, Commissioner of Public Works.

Monroe, Mich.—Council has decided to pave Washington and North Macomb sts.; cost about \$18,000. J. M. White, City Engineer.

St. Cloud, Minn.—M. J. Cleveland, State Highway Engineer, Stearns County, has completed preliminary survey of State road leading from this city to Maine Prairie and Kimball, and is now working on plans and specifications for improving about 1,300 feet of the road.

Iuka, Miss.—Road Commissioners of District No. 1, Tishomingo County, are considering \$35,000 bond issue for road construction.—R. W. Carter, W. L. Goodman and E. F. Parnell, Road Commissioners.

Jackson, Miss.—Citizens will vote June 29 on \$85,000 bonds for paving streets, etc.—A. C. Crowder, Mayor.

Meridian, Miss.—Board of Supervisors of Lauderdale County have sold \$150,000 good roads bonds of District No. 1 to Union Bank and Trust Company, city.

Wiggins, Miss.—Town is considering \$5,000 bond issue for street improvements.

Excelsior Springs, Mo.—Excelsior Springs Road District of Clay County will vote July 29 on \$150,000 bonds for construction of macadam roads.

Trenton, N. J.—County Engineer Frank J. Eppele has completed specifications to be used in resurfacing of Trenton and Lawrenceville Road.

Binghamton, N. Y.—Citizens have voted to construct pavement on Main st.

Brooklyn, N. Y.—Borough President Alfred E. Steers is considering a plan for improvement and widening of Kings Highway; proposed to make the highway 100 ft. wide from Ocean Parkway to Flatbush ave.

Geddes, N. Y.—Citizens have voted \$60,000 to lay out highway from Solvay village to fair grounds, including bridge.

Seneca Falls, N. Y.—Citizens will vote June 27 on \$81,000 bonds to pave streets.

Yonkers, N. Y.—Mayor Lennon has suggested extension of School st.

Lillington, N. C.—Harnett County will vote July 27 on \$100,000 bonds for road construction.

Cincinnati, O.—Council has ordered estimate of cost of improving Sauer ave. with brick and Spring st. with asphalt; the director of Service has submitted approximate estimate of cost of improving Elliott st. Sycamore to Broadway, granite blocks, \$3,994.50; also total costs of improving Plum st., Court to South Canal st., granite blocks, \$5,615.73, and Otte ave., Hamilton ave. to ravine East of Kirby road, \$4,647.46.

Findlay, O.—Council has decided to repave Main St. at cost of \$40,000.

Erie, Pa.—Data will be prepared for grading, curbing and paving Fourth St.

Pittsburg, Pa.—Mayor W. A. Magee has recommended elimination of grade crossings, extension of Morewood Ave. and improvement of streets.

Alken, S. C.—Council has decided to pave Laurens St.

Chattanooga, Tenn.—City will receive bids July 12, 3 p. m., for \$45,000 paving bonds.—T. C. Thompson, Mayor.

Rutledge, Tenn.—Grainger County Commissioners have authorized issuance of \$100,000 road bonds.

Brady, Tex.—Brady Precinct has again voted \$75,000 bonds for road purposes.

Dallas, Tex.—Dallas County will vote July 22 on \$500,000 bonds to build road.

Dallas, Tex.—Specifications have been adopted for paving of North Akard St. extension from Caruth to McKinney Av.

Granger, Tex.—Citizens have voted \$100,000 bonds for macadamizing roads.

Farmington, Utah.—Davis County is planning to expend \$35,000 in road improvements.

Alexandria, Va.—Cost of constructing macadam roadway on Columbus and Henry sts. has been estimated at \$4,000.

Seattle, Wash.—Cost of grading Thirty-seventh st. has been estimated at \$1,350; asphaltizing of Harvard ave., North, \$8,500, and grading Ninth ave., West, \$40,400.

Seattle, Wash.—Bids have been rejected for planking Grand Boulevard; Donaldson & Johnson low bidders, \$14,889.66.

Tacoma, Wash.—Municipal Commission is considering improvement of four streets.

Luxembourg, Wis.—Town Board has decided to grade Main St.

CONTRACTS AWARDED

Gadsden, Ala.—To C. O. Duncan for constructing sidewalks on 3d St., \$5,999.10.

Riverside, Cal.—To Jos. M. Shull for paving Denton St., \$5,652.

Thompsonville, Conn.—Repaving and macadamizing Pearl and South Pearl sts.,

about 11,000 sq. yds., to Amos D. Dridge's Sons, Inc., 97 cts. per sq. yd.

Denver, Col.—By Board of Public Works for paving Broadway, requiring 20,033 sq. yd. bituminous macadam, 2,684 sq. yd. brick, 1,391 lin. ft. sandstone curbing, to Municipal Constr. Co., \$63,424; paving Montview Boule., 21th Ave. and Jasmine Sts., to Denver & Pueblo Constr. Co., Railroad Bldg., \$45,319.

Gilman, Ill.—Paving Central st., to G. W. Prutsman, Danville, \$11,204.

Sterling, Ill.—By Board of Local Improvements for paving of West Tenth St. with Purington repressed brick, No. 1, to McCarty & Fitzgerald, \$1.33 per yd.

Brazil, Ind.—To Allen M. Shattuck for the construction of Hendrix gravel road, including a portion of Hendrix st.

Delphi, Ind.—By Carroll County Commissioners for constructing a gravel road to James r., Pierce, Delphi, \$10,000.

Greencastle, Ind.—By Commissioners of Putnam County for construction of Webster gravel road, 10,616 ft. in length, and Carrigan gravel road, about two miles in length, to James F. Carran, \$8,472 and \$7,820.

Kokomo, Ind.—Constructing two gravel roads, to Silas Sproal, \$14,201.

Laporte, Ind.—To John G. Young, for building of three miles of improved highway in Springfield Township, \$18,000.

Mt. Vernon, Ind.—Gravel roads as follows: To White & Eigenmann, the Dr. R. E. Wilson extension in Lynn Township, \$5,941; Miner M. Fairchild extension in Robb Township, \$4,900; to Mt. Vernon Construction Company, the Tim Crunk extension in Mays Township, \$7,950; road No. 6 in Smith Township, \$698; to S. A. Gano Company, road No. 1 in Center Township, \$8,154; to Samuel R. Adams & Co., of Princeton, for Smith Township, No. 1, \$11,693; No. 2, \$10,048; No. 3, \$3,360; No. 4, \$2,417; No. 5, \$941; to Campbell & Hawkins, Brazil, Ind., for Center Township, No. 2, \$8,211; No. 3, \$1,898; No. 4, \$8,989; No. 5, \$7,775; No. 6, \$1,998; No. 7, \$2,991.

Princeton, Ind.—Six rock road extensions in Gibson county, aggregating \$25,400, to S. R. Adams, city; Edgar Mauck extension, Center Township, \$3,420; Edgar Mauck extension No. 2, Center Township, \$3,963; Mt. Campbell extension, Columbia Township, \$3,697; Theodore Dougan extension, Columbia Township, \$5,237; Wm. Cassidy extension, White River Township, \$54,720; the James W. Bruner extension, White River Township, to Ewing Shields, Seymour, \$4,636.

Rushville, Ind.—Constructing Beckner road, to Wilk & Co., \$8,700.

Wabash, Ind.—Road construction: to H. B. Stark & Co., Bluffton, Creager road, three miles, gravel, \$5,689; Creager road, three miles, stone, \$8,750; to D. P. Brooks, W. H. Miller road, stone, \$2,090; to F. O. North, Murphy road, stone, \$10,349; to George M. Sewell, Noble Township, gravel \$7,400; to Fred A. Grover & Co., Logansport, Tyner road, between Waltz and Liberty and Noble Townships, stone and gravel, \$10,738.

Washington, Ia.—Paving with brick N. Iowa Ave. to J. J. McKeon, Washington, \$2.06 per sq. yd.

Covington, Ky.—To E. J. Ruh Co. for paving with asphalt portions of 5th and Madison Sts.; paving 13th and 20th Sts. to J. Sullivan, 22d and Howell Sts., and Ed J. McKenna, 18th and Greenup Sts., \$2,762 and \$3,977 respectively.

Boston, Mass.—To William J. Rafferty Co. for edgestones, gutters and sidewalks in Hewlett St., between Walter and Centre Sts., \$9,452.25. Other bidders: R. J. Young & Co., \$8,603.75; John Kelly & Co., \$10,061.25; John McCourt & Co., \$10,170.90; West Roxbury Trap Rock Co., \$10,907.75; engineers' estimate, \$10,200. R. J. Young & Co. failed to submit a price on item No. 1; to R. J. Young & Co. for constructing macadam roadway in Quint Ave., Brighton, \$4,952.80; other bidders, John Kelly & Co.,

\$5,380.90; Jeremiah J. Sullivan, \$6,156.50; engineers' estimate was \$9,500, which included cost of materials furnished by city and also the engineering expense; to James Doherty for grading, edgestones, gutters and crosswalks in Flint St., between Norfolk St. and New England Railroad, \$999.40; other bidders, F. S. & A. D. Gore Corporation, \$1,056.35; Connolly & Diamond, \$1,188.20; Daniel E. Lynch, \$1,196.70; engineers' estimate, \$1,200.

Boston, Mass.—Building State highways by the State: Town of Bourne, to M. J. Denault & Co., Lowell, \$8,529; other bidders, Thomas Whelan & Co., Wollleston, \$8,673; Lane Quarry Co., Hingham, \$8,733; H. L. Thomas, Middlesex, \$9,213; Frank Williams, Boston, \$9,832. Town of Dennis: to William Sears, \$3,850. Town of Groveland, to James E. Watkins, \$7,961; other bidders: F. J. Mague, West Newton, \$10,552; John G. Gaffery, Medford, \$11,578; M. L. Camarco, Lee, \$12,105; Hul Construction Co., Boston, \$12,967. Town of Holyoke, to H. L. Thomas, Middleboro, \$3,005. Town of Ipswich, to James E. Watkins, \$5,064. Constructing 17,000 ft. of gravel road in Town of Hancock, to Crow & Walsh, Pittsfield, Mass., \$14,077; other bidders: M. L. Camarco, Lee, \$14,919; J. W. Polcaro, Pittsfield, \$16,347; F. J. Mague, West Newton, \$17,541.

Holyoke, Mass.—To Hassam Paving Co. for proposed work on Main St.

Lynn, Mass.—To David J. Sheehan Co. to pave Essex St., from Chatham St. to Eastern Ave., area of 7,400 sq. yd., \$1.70 sq. yd.; Willow, Pearl and Tremont Sts., aggregating area of 7,100 sq. yd., will be paved by the Shawmut Construction Co., \$1.65 sq. yd.; to the Connecticut Hassam Paving Co. for Oxford St., containing 5,500 sq. yd., \$1.75 sq. yd.

Lynn, Mass.—Building roads to Michael McDonough, of Swampscott, \$5,180; other bidders, John Cudihy, of Marblehead, \$6,012; David J. Sheehan, of Lynn, \$7,500; Essex Traprock Company, of Peabody; Fred E. Ellis, \$7,980.

Detroit, Mich.—Paving with cedar block on concrete foundation: To F. Porbath & Sons, Penobscot Bldg., Willis ave., from Hastings to Russel, \$7,948; 24th st., from Fcrt to Howard st., \$4,607; 24th st., from Porter to Baker st., \$4,293; to Julius Porath, McGraw Bldg., Buchanan st., from 14th to railroad tracks, \$14,255; Provard st., from Elliott to Canfield st., \$11,535; Madison ave., from Brush to Beaubien st., \$1,581 to J. A. Affeld, 761 Campbell ave., 21st st., from Fort to Baker st., \$11,668; to J. A. Mercier, Hammond Bldg., Plumb st., from Second to Fifth ave., \$4,595; Bethune ave., from Woodward ave. to Beaubien st., \$8,062; to Thos. E. Currie, McGraw Bldg., Orleans st., Sections 1 and 2, \$18,000; Waterloo st., from east end to Joseph Campeau ave., \$12,076.

Columbus, Miss.—To McLeod & Baskerville, Macon, for concrete curb and gutter and storm sewers, about \$10,000.—C. L. Wood, engineer.

Gulfport, Miss.—By Harrison County Supervisors to W. A. Hughston to construct 2 1/2-10 miles of gravel road and 15 4-10 miles of dirt roads in District No. 2, \$27,300.—W. A. Griffith, Secretary, Road Commissioners' District No. 2.

Atlantic City, N. J.—Paving New Jersey and Massachusetts and other avenues, to United Paving Co., \$10,116.15 and \$29,614.

Cape May, N. J.—Building 6 1/2 miles of Seashore road, to Frank W. Miller, Cape May, C. H., \$24,752.

Albany, N. Y.—Paving Morris St. from West Lawrence St. to Allen St. to Mulderry Bros., \$10,410.60; paving King Ave. from Central Ave. to Bradford St. to John M. Holler, \$12,275.75.

Albany, N. Y.—Good roads contracts, aggregating over \$900,000: Road No. 948, Voorheesville-New Salem, Albany County, 3.76 miles, to J. and T. Murphy, Cobleskill, \$41,684; No. 5129, Allegany County, to P. H. Murray, Rochester, \$52,450; No. 5148, Part 3, Broome County, to Andrew B. Young, Brookline, \$44,026.30; No. 5141, Part 1, Cortland County, to S. F. Hull, Cortland, \$23,568.32; No. 5136, Dutchess County, to Harvey D. Sproul, Inc., Peekskill, \$52,890; No. 5154, Dutchess County, to Schunermunk Construction Company, Highland Hills, \$46,950; No. 5150, Dutchess County, Part 5, to Harvey B. Sproul, Inc., Poughkeepsie, \$39,641; Road No. 925, Erie County, to Busch and Percival, Buffalo, \$47,989; Road No. 5136 Genesee County, to Thomas Grady, Rochester, \$25,700; Road No. 5153, Herkimer County, to the State Highway Construction Company, Albany, \$5,555.90; Road No. 5152, Jefferson County, to Burns Bros. & Haley, Watertown, \$7,267; Road No. 937, Lewis County, to the St. Regis Construction Company, Malone, \$40,940.64; Road No. 5142, Livingston County, Part 1, to Frank L. Cohen, Buffalo, \$41,000; Road No. 908, Madison County, to R. W. Enison, Geneva, \$53,121; Schenectady County Line-Scotch Bush, Montgomery County, road No. 943,

to John Allen, Schenectady, \$14,111.93; Road No. 749, Niagara County, to Brooks & Julien, Rochester, \$119,000; Road No. 5139, Part 2, Oneida County, to Newport Construction Company, Newport, N. Y., \$76,265; Road No. 932, Oneida County, to T. F. Shaughnessy & Company, Albany, \$14,300; Road No. 5143, Part 2, Onondaga County, to Daniel L. Mott, Utica, \$55,790.60; Road No. 934, Otsego County, to D. I. Snell & Company, Canajoharie, \$49,436.10; Road No. 5138, Otsego County, Part 4, to John and Thomas Murphy, Cobleskill, \$16,673.55; Road No. 910, Suffolk County, to Clancy & Van Alst, Astoria, \$38,826.76.

Brooklyn, N. Y.—Regulating, grading, curbing, recurling, flagging and resetting manhole covers in Weirfield St., Ridgewood, to Charles A. Meyers, \$5,793.20; repaving with asphalt macadam, Broadway, Flushing, from Murray Lane to Tenth St., Bay Side, to Long & Miller, \$22,630; also for Astoria Ave., from Nineteenth to Jackson, Corona, \$22,416; to Clancy & Van Alst for repaving with asphalt macadam Central Ave., Springfield, from Merrick Rd. to city line, at \$24,806, and Cooper Ave., from Myrtle Ave. to Edsall, at \$5,877.50; Hastings Pavement Co. was lowest bidder for paving with asphalt blocks on concrete foundation Academy St., from Webster Ave. to Washington St., Long Island City, at \$5,695.60.

Herkimer, N. Y.—Paving of South Washington St. to E. Manion and D. F. Strobel, New York, N. Y.—Regulating and repaving with wood block pavement to U. S. Wood Preserving Co., 165 Broadway; Ave. B, \$30,772; Ave. C, \$33,741.

Rochester, N. Y.—Brick pavement on Cutler St. to Thomas Holahan, \$4,797; cement walks on Bradley St. to Henry Schrenfeldt, \$296.25.

Schenectady, N. Y.—Paving Washab Ave. to Schenectady Paving Co. for bitulithic.

Syracuse, N. Y.—Paving Onondaga St. with Trinidad asphalt to Warner-Quinlan Asphalt Co., \$25,564.15.

Canton, O.—To Frank A. Downs, Canton, for paving the Canton-North Industry Rd., \$29,397.30. Other bidders: P. Dieffenbacher & Sons, \$29,730.86; Pres. Campbell, \$30,276.46; William H. Stanton, \$33,794.33; Wise, Smith & Krabill, \$33,804.60; R. C. Roush, \$34,228.88; Piere & Talerice, \$34,549.30; Peter Hahn & Son, \$34,421.08; engineers' estimate, \$30,893.72.

Cincinnati, O.—To William P. Flynn for the improvement of Springfield pike, from Gas Hall in Carthage to the C., H. & D. R. R. in Hartwell, \$4,122; estimated cost was \$5,311.

Cincinnati, O.—By Board of Control for paving with granite Spring Grove Ave. from Knowlton's Corner to entrance of Spring Grove Cemetery to J. M. Quill, \$95,780; City Engineer's estimate for the work, \$116,140.

Dayton, O.—Paving Lexington Ave., Broadway to Deal, with brick to J. E. Conley, \$28,520.

Dayton, O.—Paving Summit st. from 3d to Germantown sts., to the Warren Brothers' Paving Company, \$21,404.20.

Ft. Recovery, O.—Paving Wayne & Wiggs sts. to Lowry, Mannix and Hays, \$36,202.35 and \$6,786.30.

Greenville, O.—Building roads: Duncan road, Brown Township, to J. R. Smith, labor, \$5,890, and to Greenville Gravel Co. material, \$4,490; Monnel road, Mississinawa Township, to G. A. Warner, labor, \$13,598, and to Albert Shafer, material, \$2,300; W. R. Little road, Allen Township, to Manning & Walls, labor, \$3,483, and to Greenville Gravel Co., material, \$5,220; Hemelgarn road, Allen Township, to J. F. Hemelgarn, labor, \$1,398, and to Greenville Gravel Co., material, \$2,595.

Baker, Ore.—To Warren Construction Co. to lay 3 miles of pavement, \$2.02 sq. yd.

Altoona, Pa.—To Wm. M. Elder, Baltimore, Md., for resurfacing paved streets with Texaco asphalt.

Edgeworth, Pa.—Improving Woodland Ave. with Kentucky rock asphalt, requiring about 5,200 sq. yd. pavt., 4,700 lin. ft. concrete curb and gutter, etc., to McPherson Bros., Edgeworth.—L. D. Tracy, 245 4th Ave., Pittsburg, borough engineer.

Erie, Pa.—Paving Poplar St., 2d to Park Aves., to John McCormick & Sons; paving East Ave. to Mayer Bros., \$1 per sheet asphalt; grading, curbing and paving 20th St. to J. & M. Doyle, \$1.27 for asphalt.

Greensburg, Pa.—Laying one mile of paving to Luther E. Edwards, Yardley, \$22,212.

Meadville, Pa.—Paving Center St. to G. M. Harris, Jamestown block, \$1.61; native stone curb, 54c.

Warren, Pa.—Constructing a State road, 3 1/2 miles long, in Pine Grove Township, to South Shore Construction Co., Erie.

Knoxville, Tenn.—Paving Distrs. Nos. 89, 90, 91, 93 and 94 to Barber Asphalt Co., about \$100,000.

Salt Lake City, Utah.—Sidewalk extension No. 129 to McKay & Reed, \$86,180.93;

curb and gutter extension No. 16 to Gillis Construction Co., \$9,267.41.

Chehalis, Wash.—To Alfred & James to grade and macadam part 6th St. and Adams Ave., \$2,600.

Seattle, Wash.—Grading 25th Ave. N. W., to J. H. Cullen, 6020 Third ave. N. W., \$18,910.50; paving Ellicott ave., to F. McClellan, Sullivan Bldg., \$192,961.

Minnedosa, Man., Can.—To A. E. Dobson, Deloraine, Man., for about 35,000 sq. ft. of granolithic sidewalks, 20 cts. per sq. ft.

Quebec, Ont., Can.—Paving number of streets with asphalt, to Falardeau & Co., about \$147,000.

BIDS RECEIVED

Washington, D. C.—Furnishing repressed vitrified paving block during the fiscal year ending June 30, 1912, as follows: Proposal (A) furnishing 2,133,000 repressed vitrified paving block, subject to an increase or decrease of one-third; alternate (B) 1,600,000 paving blocks, with the right to order any quantity in excess of that named as the needs of the service may require; American Sewer Pipe Co., Akron, Ohio, (A) \$21.25, (B) \$23.40; alternate (A) \$21.25; alternate (B) \$23.40. Baltimore Clay Products Co., Baltimore, Md., (A) \$21; (B) \$21. Allegheny Valley Brick Co., Tarentum, Pa., (A) \$19.50; (B) \$19.75. Mack Mfg. Co., Philadelphia, Pa., (A) \$22.55; (B) \$22.55; alternate (A) \$24.80; (B) \$24.80. Saxton Vitrified Brick Co., Saxton, Pa., (A) \$23.50; (B) \$23.50. C. P. Mayer Brick Co., Bridgeville, Pa., (A) \$21.40; (B) \$21.40. Layton Fire Clay Co., McKeesport, Pa. (A) \$21.50; (B) \$21.50. William Vire Clark, Baltimore, Md., (A) \$23.90; (B) \$23.90.

Camden, N. J.—Resurfacing Camden and Westfield turnpike from Twenty-seventh st. to county line, W. Penn Corson and the Feeley-Kelly Co. each offered to do work for \$38,702.80; Edward M. and Frank W. Miller, of Cape May, were low, \$36,412.24; award deferred until June 28.

Woodbridge, N. J.—Improving Holton St. and Cliff Road: J. C. Fowler, \$1,869.45; Liddle and Pfeiffer, \$2,038.85; Collins and Gundrum, \$2,473.51. Mutton Hollow Road: J. C. Fowler, \$2,443.29; Collins & Gundrum, \$3,979.38; John Quinlan, \$3,350.01; F. R. Edgar, \$2,821.92; J. C. Fowler, \$2,055; F. R. Edgar, \$2,437.

Salt Lake City, Utah.—Sidewalk extension No. 129 to include 522,729 sq. ft. 4-in. and 11,195 ft. 6-in. cement walk, 24,903 cu. yd. excav., furnishing and laying 4 to 18-in. vitr. pipe; McKay & Reed, \$86,181; Gillis Constr. Co., \$86,281; Jas. Kennedy Constr. Co., \$92,977; Strange & Maguire Constr. Co., \$102,651; Benj. F. Tibby, \$110,895. For curb and gutter extension No. 16: Gillis Constr. Co., \$9,267; McKay & Reed, \$10,561; Strange & Maguire, \$10,960; C. E. Palm, \$11,010; Gilkerson Constr. Co., \$11,171; P. J. Moran, \$12,357; A. A. Clark, \$12,925.

SEWERAGE

Phoenix, Ariz.—Council has rejected only bid received for construction of sewer system.

Washington, D. C.—District Commissioners have ordered extension of sewers in three streets.

St. Petersburg, Fla.—City Engineer M. W. Spencer has asked for addresses of firms who can construct a sewage disposal plant for a city of 5,000 population.

Albany, Ga.—Citizens have voted \$12,500 bonds to improve and extend sewerage and water works system.

Hartwell, Ga.—Plans are being prepared by J. B. McCrary Co., 1311 Empire Bldg., Atlanta, for sewer and water works construction.

Lavonia, Ga.—Plans are being prepared by J. B. McCrary Co., 1311 Empire Bldg., Atlanta, for sewer construction.

Tallahassee, Fla.—City is having plans prepared for sewer and water improvements by J. B. McCrary Co., 1311 Empire Bldg., Atlanta.

Winder, Ga.—City has selected J. B. McCrary Co., Empire Bldg., Atlanta, Ga., as Consulting Engineer for sewer system.

Crawfordsville, Ind.—City will construct 2400 ft. 8 to 10-in. sanitary sewers.—H. C. McClure, City Civil Engineer. (Erroneously reported in issue of June 14.)

Gas City, Ind.—Council has instructed Paul Jones, Clerk, to advertise for bids for new sewer which will be constructed in alley between Main and South A Sts., from Second to Fourth.

Indianapolis, Ind.—City Engineer Klausmann has recommended to Board of Public Works that sewers be built in Lee St., from Morris St. to Jones St., and in Jones St., from Lee St. to Belmont Ave.

Girard, Kan.—Plans and specifications are being prepared for sanitary sewers and sewage purification works; bids will probably be received about Aug. 1.—Burns &

McDonnell, Scarrett Bldg., Kansas City, Mo., Engineers.

Camden, N. J.—Council has decided to construct sewer drains in Everett and 10th sts. A. L. Sayers, Street Commissioner.

Trenton, N. J.—Board of Health has recommended construction of sewer in Greenwood Ave. from Gartfield Ave. to city line.

Binghamton, N. Y.—Bids will be asked for constructing sewers on Berlin, Union and Grace sts.

Hion, N. Y.—Board of Sewer Commissioners has accepted plans for Morgan St. sewer.

Palatine Bridge, N. Y.—Vrooman & Perry, of Gloversville, are preparing plans for sewer system and sewage plant.

Cincinnati, O.—Council has decided to construct 12-in. vit. pipe sewer in Saunders st., at cost of \$3,197; cost of constructing sewers in West Park road has been estimated at \$11,170, and in Kinley alley and other streets, \$6,100; plans have been submitted for sewer Sixth ave. and Duck Creek road.

Toledo, O.—Board of Control has approved contract authorizing W. J. Sherman to secure necessary data on sewage in ten-mile and Swan Creeks, \$2,800.

Wilmington, O.—Council has retained Riggs & Sherman, Toledo, to make necessary surveys and plans for construction of sewerage system.

Edmond, Okla.—Citizens have voted \$20,000 sewer, water and light bonds.

Eugene, Ore.—City has sold \$28,000 bonds for installing two trunk sewers to Morris Bros.

Clearfield, Pa.—Council is asking for bids for preparation of plans for comprehensive sewer system and sewage disposal works.—J. D. Connelly, Clerk of Council.

Collingdale, Pa.—Borough Engineer Damon is preparing plans for erection of sewerage and sewage disposal works for portion of city.

East Stroudsburg, Pa.—Consulting Engineer Clyde Potts, 30 Church St., New York City, has been retained to design sewerage and sewage disposal works for portion of city.

East Washington, Pa.—Citizens have voted \$25,000 bonds for connecting borough with sewage disposal plant of Washington Borough.

Monaca, Pa.—Council has finally passed ordinance providing for extension of sewer system.

York, Pa.—Bids for construction of 510 ft. of sewers on Eighth ave. in North York will be invited soon by Council; Engineer R. B. McKinnon has completed specifications.

Phoebus, Va.—Upon recommendation of Committee on Sewers, Town Council has adopted resolution authorizing Committee to build a sewer along Armistead and Curry sts.

Walla Walla, Wash.—Council has established Sewer Districts No. 12 and 14.

Mariette, Wis.—Council has voted to appropriate \$9,000 for the extension of trunk sewer. J. L. Fisher, Mayor.

North Bay, Ont., Can.—Citizens have passed \$45,000 by law for sanitary and storm sewers.—T. N. Colgan, Commissioner of Works.

Oshawa, Ont., Can.—Town Engineer Frank Chappell is preparing plans for sewage disposal plant.

Simcoe, Ont., Can.—Engineers Chapman & Power, Natl. Bldg., Toronto, are preparing plans for sewage system and disposal plant.—W. C. McCall, Town Clerk.

St. John, N. B., Can.—City is considering construction of garbage disposal plant to cost \$50,000.—Wm. Murdock, Engineer.

CONTRACTS AWARDED

Danielson, Conn.—Laying 1700 ft. of 12-in. vitrified pipe sewer in Mechanic st., to F. A. Davis, \$1,74 per ft.

Hoopeston, Ill.—To Henry Rees, Quincy, for constructing proposed sewer system, \$48,000.

Tolleston, Ind.—To Michael Byrne, Gary, for construction of sewer system, \$165,698.

Easton, Md.—To John R. Jeffreys, Elberon, N. J., for constructing 8 miles of sewers, bids for which were opened on April 15.—Clyde Potts, 30 Church St., New York City, Supervising Engineer.

Adams, Mass.—Sewer and paving work has been awarded to the J. E. FitzGerald Co., of New London, Conn., \$10,090.—Lindholm & Fuller, Agricultural Bank Bldg., Pittsfield, Engineers.

Omaha, Neb.—To Jas. Jensen, 3024 24th St., for reconstruction of Burt St. main sewer, \$21,393, and construction of south-west branch of South Omaha main sewer, \$13,129.

Englewood, N. J.—By Englewood Sewerage Co. for complete construction of a sewage disposal works, to Atlantic Construction & Supply Co., Atlantic City, \$16,227; other bidders: P. H. Hennessy, Mt. Vernon, \$10,519; Cement Paving & Con-

struction Co., Jersey City, \$14,995; W. G. Broadhurst, Hackensack, \$16,370; Hard & Worm, New York, \$17,513; F. R. Long, Hackensack, \$19,197; J. W. Heller, Newark, N. J., \$20,545; Lewis & Perkins, New York, \$23,325; Ind. Eng. Co., New York, \$24,702; R. H. Brooks Co., New York, \$20,137. Clyde Potts, 30 Church st., New York, Engineer.

Erie, Pa.—To Clement Wolfran for building sewers in 20th St., \$1.09 per ft. for 9-in. pipe; 23d St., 94c., and Line Ave., \$1.25; sewer in 25th St. to John McCormick & Sons, \$1.25.

Pittsburg, Pa.—Reconstruction of Troy St. drainage basin to the M. O'Herron Co., \$113,746.

Dallas, Tex.—Furnishing inlet grates for storm sewer work to Mosher Manufacturing Co., \$6.90 each.

Salt Lake City, Utah.—Building sewer extensions Nos. 287 and 248 to Jas. Kennedy Construction Co., \$1.07 and \$1.29 per lin. ft.

Richmond, Va.—To I. J. Smith & Co., Inc., for constructing deep sewer in Broad st., \$6,316.70.

Seattle, Wash.—Building sewers on Ninth ave. N. E., to Krogh & Jessen, 4011 Greenwood ave., \$8,235.89.

WATER SUPPLY

Jackson, Ala.—Citizens will vote July 10 on bonds for constructing water works; if voted affirmatively city will furnish stand-pipe, mains and fire plugs and Bigbee Ice & Development Co. will supply water and pumping power.

Troy, Ala.—Council has ordered extension of sewerage system.

Long Beach, Cal.—Citizens will vote June 27 on municipal ownership of water works.

Oakdale, Cal.—Citizens have voted \$82,000 bonds for construction of water works and sewer system.

Bristol, Conn.—The Bristol Water Co. has decided to increase its capital from \$200,000 to \$300,000 for the improvement and development of storage facilities.

Delmar, Del.—Citizens have voted to install water works.

Milton, Del.—Bids will be received about July 6 for laying three miles of pipe, constructing a 75,000-gallon standpipe, sinking two wells, and constructing a pumping plant; estimated cost, \$14,000. G. E. A. Fairley, 511 Equitable Bldg., Baltimore, Md., Engineer.

Dayton Beach, Fla.—Citizens will soon vote on \$8,000 bonds to install water works system.

Albany, Ga.—Citizens have voted \$12,500 bonds to improve water works and sewerage systems.

Hartwell, Ga.—Water works plans are being prepared by J. B. McCrary Co., 1311 Empire Bldg., Atlanta.

Lavonia, Ga.—Water works plans are being prepared by J. B. McCrary Co., 1311 Empire Bldg., Atlanta.

Talapoosa, Ga.—Plans are being prepared by J. B. McCrary Co., 1311 Empire Bldg., Atlanta, for water and sewer improvements.

Villa Rica, Ga.—City will construct water works; plans being prepared by J. B. McCrary Co., 1311 Empire Bldg., Atlanta.

Canton, Ill.—City has decided to purchase 2,000,000-gallon pump and an 800-ft. compressor. Joseph Waugh, City Clerk.

Moline, Ill.—Need of new boilers to cost \$15,000 at water works is being urged.

Virden, Ill.—City has decided to install waterworks system.

West Terre Haute, Ind.—Council is considering construction and equipment of waterworks plant.

Coin, Ia.—Citizens will vote June 27 on \$12,000 bonds for installation of water works system.

Worthington, Ia.—City is considering the construction of water tank.

Augusta, Kan.—City has decided to install filtration plant for waterworks system; cost, \$12,000.

Coffeyville, Kan.—Carl Stromquist, Superintendent Water & Light Department, has completed plans and specifications for improvement of the water system at cost of \$100,000, including filter plant and additional water mains.

Bad Axe, Mich.—Citizens have voted bonds to extend city water mains.

Detroit, Mich.—Water Board has asked for bids for 11,000 tons of iron pipe.

Barnesville, Minn.—All bids for extending water works have been rejected; city will do work by day labor.—M. P. Phillippi, City Clerk.

Montgomery, Minn.—Mathias Machacek, New Sprague, is preparing plans for construction of reservoir; J. W. Kaisersatt, City Clerk.

Red Wing, Minn.—City is considering construction of water mains.—A. E. Rhame, City Engineer.

McComb, Miss.—City is considering \$15,000 bond issue to improve and extend water works.

Festus, Mo.—Fuller, Coult Co., Chemical Bldg., St. Louis, Mo., consulting engineers, will prepare plans for construction of system of waterworks.

Crawford, Neb.—Issuance of \$24,000 bonds for establishment of gravity water system is being considered.

Milltown, N. J.—Installation of water works system is being considered. Address Mayor Richter.

Woodbury, N. J.—Citizens will soon vote on \$70,000 bonds to lay water mains.

Cornwall, N. Y.—Village has been authorized by State Water Commission to spend \$30,000 in constructing and additional storage reservoir.

Beach, N. D.—Bids will be received about July 1 for the construction of waterworks; W. Plamason, engineer.

Fremont, O.—Citizens will vote, July 11, on \$54,000 bonds for water main extensions and fire department improvements.

Toledo, O.—Service Director Cowell will prepare plans and specifications for connection of high pressure fire service pumping station.

Urbana, O.—Council has authorized Director of Public Service to engage consulting engineer in connection with proposed improvement of the waterworks system.

Berwyn, Okla.—Installation of \$3,500 water works system is being considered.

Custer, Okla.—Western Engineering Co., Oklahoma City, is preparing plans for water works and electric light plant; cost, about \$40,000.

Edmond, Okla.—Citizens have voted \$20,000 water, light and sewer bonds.

Nowata, Okla.—City has sold \$75,000 water works bonds to Spitzer, Rorick & Co., Toledo, O.

Bethlehem, Pa.—Citizens will vote in November on \$175,000 bonds to erect water plant.

Glen Rock, Pa.—Jacob H. Brillhart, 34 N. 7th Ave., Bethlehem, has been selected to prepare plans and specifications for additional water supply.

Shrewsbury, Pa.—City will construct waterworks improvements; \$12,000 bonds have been sold.

Greenville, Tenn.—Citizens have voted \$60,000 water and light bonds.

Dallas, Tex.—Plans are being considered by City Commissioners for connecting up of the cement plant wells, sinking of gang wells of shallow wells along line of the pipe to be laid, development of water gravel stratum west of the city and sinking of five or more artesian wells to wood-bine stratum along line of West Dallas gravel pit main.

Dallas, Tex.—Bids have been ordered by the Board of Municipal Commissioners for electric motors and belt-driven air compressors for the pumping of six artesian wells in center of city.

Denison, Tex.—Council has decided to immediately begin sinking of artesian well at the new pump station at Shawnee Reservoir.

Montpelier, Vt.—National Board of Fire Underwriters has recommended installation of additional water mains and hydrants.

Seattle, Wash.—Board of Public Works has adopted plans and specifications for floodgate at Lake Union plant.

Sparta, Wis.—City is considering laying 1400 ft. of 10-in., 400 ft. of 8-in., 750 ft. of 6-in., and 1200 ft. of 4-in. c.-i. water mains; C. H. Gregory, Superintendent Water Works.

North Bay, Ont., Can.—Citizens have passed \$100,000 by-laws for water works for city.—T. N. Colgan, Commissioner of Works.

West Lorne, Ont., Can.—F. W. Farncombe, London, is preparing plans for water works.

CONTRACTS AWARDED

San Francisco, Cal.—Completing laying of pipe for the auxiliary water system in district bounded by Market, Castro, 29th, Mission, 26th, Harrison and 11th Sts., to the Raich Improv. Co., \$91,500.

Chicago, Ill.—Building foundations for pumps at 22d St. pumping station to Myron B. Reynolds, 4711 Kenmore Ave., \$9,500.

Joliet, Ill.—To Hill-Tripp Pump Co., of Anderson, Ind., for equipment of new city pumping station, \$5,985.

Stamford, Ill.—Building water works to C. C. Bowman, Bloomington, \$5,800; the work includes brick pumping station, pumping machinery, pump pit, hydro-pneumatic tank and a small system of water mains.

Seneca, Kan.—To Hybman & Wiley for improvements to waterworks system, \$15,000; Burns & McDonnell, Scarritt Bldg., Kansas City, Mo., engineers.

Marquette, Mich.—Extending water system into lake to Wanless & King, Duluth, Minn., \$60,000.

Libby, Mont.—To Crane-Ordway Co., of Great Falls, for material for waterworks system; cost, \$18,000.

Bladen, Neb.—Furnishing c. i. pipe and specials to the American Cast Iron Pipe Co., Kansas City, Mo.; construction work was let to the Inter-Mountain Bridge and Construction Co., Tecumseh, Neb.—Charles Balderston, City Clerk.

Rahway, N. J.—By Pumping Station Committee for the erection of building to house new \$14,000 pump to be installed at the water works to E. F. Wilson, \$1,294.

Schenectady, N. Y.—Laying water mains in five streets to Thos. R. Crane.

Masontown, Pa.—Water filtration plant to the Pitt Constr. Co., Pittsburg.—Chester & Fleming, Union Bank Bldg., Pittsburg, Engineers.

Pittsburg, Pa.—To the Allis-Chalmers Co., Milwaukee, Wis., for furnishing 2 pumps for the new pumping station at filtration plant at \$102,810 each.

Newport, Tenn.—To the American Light and Water Co., Chicago, Ill., constructing gravity water system; daily capacity about 300,000 gallons, \$16,940; W. P. Bullock, Kansas City, Mo., engineer.

Fort Worth, Tex.—Constructing settling beds for use with proposed reservoir to Pittsburg Filter Manufacturing Co., \$65,983.

Dallas, Tex.—Erecting two boilers at White Rock pumping station to A. G. Wright for two Casey-Hedges Co. boilers, \$2,045.

Basin, Wyo.—Water works and electric light improvements to the Katz-Craig Contracting Co., Omaha, Neb., for entire work, \$58,582.72; includes American cast iron pipe, \$11,948.72; hydrants and valves, pumping and electrical machinery, \$12,250; other general bids on construction: Des Moines Bridge & Iron Works, \$30,890; W. D. Lovell, Minneapolis, \$30,996; Lindstrom & Oren, Billings, \$31,500; Bruer & Stanton, Basin, \$32,772; Tanner Bros., Webster, S. D., \$32,900.

LIGHTING AND POWER

Helena, Ark.—Plans and specifications have been completed by Scofield Eng. Co., Arcade Bldg., Philadelphia, Pa., for power house and equipment for Helena Gas & Electric Co.; bids are now being asked.

El Centro, Cal.—Imperial Valley Gas Co. is considering extending mains to Brawley, about 15 miles.

Fillmore, Cal.—Ventura County Power Co. is planning to rebuild transmission line.

Santa Barbara, Cal.—Santa Barbara Gas & Electric Co. is considering an increase in its bonded indebtedness from \$1,000,000 to \$2,000,000 for improvements.

Gunnison, Colo.—Bids will be received about July 1 for purchase of \$90,000 bonds to be used for construction of water power plant to furnish water and power for domestic and commercial purposes.—M. J. Schmitz, Town Clerk.

Albany, Ga.—Citizens have voted \$50,000 bonds to erect municipal gas plant.

Colquitt, Ga.—Plans are being prepared by J. B. McCrary Co., 1311 Empire Bldg., Atlanta, for electric light plant.—P. E. Wilkin, Mayor.

Fort Wayne, Ind.—Board of Public Works has decided to ask for bids for furnishing lamp posts.

Hartford City, Ind.—Crescent Gas & Oil Co., of Hartford City, owned by T. N. Barnsdall, of Pittsburg, has been sold to J. L. McCullough, Marion, who will supply Hartford City with artificial gas, along with Fairmount, Gas City and other smaller cities; central point of manufacture will be Marion.

Takoma Park, Md.—Mayor W. G. Platt will confer with officials of Potomac Electric Power Co. with view to installing electric lamps; oil lamps are now used.

Marshall, Mich.—Commonwealth Power Co., of Jackson, is considering the construction of dam across Kalamazoo River, 6 miles from Marshall.

North Branch, Minn.—Village Council has granted electric light franchise to Eastern Minnesota Power Co., Pine City.

Billings, Mont.—Establishment of improvement district for decorative lighting purposes is being considered.

Fergus Falls, Mont.—Election on bonds for development of electric light plant is being considered.

Springfield, Mo.—Springfield Railway & Light Co. has issued \$30,000 of bonds for improvements and extension of system; betterments will include installation of turbine unit, doubling generating capacity of electric lighting system and additional gas producing equipment and extension of gas and electric distributing systems.

Custer, Okla.—Western Engineering Co., Oklahoma City, is preparing plans for electric light plant and water works; cost, about \$40,000.

Edmond, Okla.—Citizens have voted \$20,000 light, water and sewer bonds.

Eugene, Ore.—City has sold \$25,000 bonds for installation of electric street lighting system to Morris Bros.

Newberry, S. C.—Southern Lower Co. has applied for franchise for transmission line from Newberry to Greenwood.

Custer, S. D.—Installation of electric system is being considered.

Plankinton, S. D.—W. A. Kuntz, Woolsey, has petitioned Council for franchise for electric light plant.

Greenville, Tenn.—Citizens have voted \$60,000 light and water plant.

Austin, Tex.—Austin Gas Light Co. will erect generator house, with elevator, tower and engine; cost, about \$12,000.

Bishop, Tex.—F. Z. Bishop, owner of local electric light plant, will enlarge same.

Loraine, Tex.—City is interested in establishment of electric light plant.—W. T. Mulin is interested.

Luling, Tex.—Luling Electric Light and Power Co. will enlarge and improve plant.

Richmond, Va.—Appalachian Power Co. will soon call for bids for machinery; Blackwell & Buck, 49 Wall st., New York, engineers.

Centralia, Wash.—Washington-Oregon Corporation, which owns local street car, power and water service, is about to install power plant at Kalama River at cost of \$750,000; pipe connection covering distance of 60 miles will be laid down to reach the power to twin cities of Centralia and Chehalis. Isaac Anderson, Tacoma, President.

Clarkston, Wash.—Council passed an ordinance granting to the Clarkston Improvement Co. right to construct an electric light and power system.

North Yakima, Wash.—Citizens will vote July 1 on \$200,000 bonds for construction of municipal electric light plant.

Hamilton, Ont., Can.—Engineer E. J. Sifton has estimated cost of municipal power, lighting and distribution plant at \$502,000; plan includes 8,000 electric standards, placed 100 ft. apart over entire city, 200 commercial lighting customers and 1,000-H.P. for power customers; 3,051-H.P. will be required, and rates for house lighting will be 4 8-10 cts. per K.W.-hour, as compared with 7.52 now paid to the Cataract Power Co.—S. H. Kent, City Clerk.

CONTRACTS AWARDED

Webster City, Ia.—Furnishing equipment for municipal electric light and power plant to Murray Iron Works, Burlington, for installing engines, boilers, piping and heaters, \$12,200; to Westinghouse Electric & Manufacturing Co., Pittsburg, Pa., for electric generators and switchboards, \$9,998.

Midway, Ky.—Building municipal light plant, covering both generating station and line construction, to Moore-Young Electric Co., Lexington.

Springfield, Mass.—Furnishing additional equipment for electric light plant to General Electric Co., Schenectady, N. Y., \$3,377.50.

Iron Mountain, Mich.—Construction of a concrete dam and power plant for Peninsular Power Co., to the Newton Engineering Co., Milwaukee, Wis.

Marquette, Mich.—Construction of a dam on Dead River to Powell & Mitchell, Marquette, \$57,000; for Silver Lake dam to Wahlman & Trebilcock, Ishpeming, \$15,000.

New Hartford, N. Y.—Village Board has entered into contract with Utica Gas & Electric Co. for lighting of streets for period of five years.

Terrell, Tex.—Building concrete and steel power house to house city light and water plants to Sherwood Concrete & Paving Co., \$5,950.

Basin, Wyo.—Electric light and water works improvements to Katz-Craig Contracting Co., Omaha, \$58,582.72.

FIRE EQUIPMENT

Sacramento, Cal.—Plans for two new fire houses, one for the northeast and one for the southeast section of city have been approved by Fire and Building Committees of City Trustees. E. C. Hemmings and R. A. Herold, Architects; both houses will be equipped with auto apparatus.

Bridgeport, Conn.—Board of Fire Commissioners has recommended erection of fire house, truck house and building to house signal system.

Milton, Del.—Town will issue \$15,000 bonds to equip fire department and erect water plant.

Preston, Ida.—Volunteer fire department has been formed.—A. W. Stephen, Chief.

Decatur, Ind.—City has agreed to contract terms of which create stock company of twenty-five business men who are to build \$18,000 city hall and equip it with automobile fire department, they to receive stated dividend each year until amount is paid; committees have been appointed to purchase equipment and plans for building have been completed.

Fort Wayne, Ind.—Board of Public Safety will at once ask bids for 2,500 ft. of fire hose.

Wichita, Kan.—Fire Chief A. G. Walden has recommended purchase of 4,000 ft. of new hose and auto fire engine.

Winchester, Mass.—Site at Vine and Church Sts. has been purchased for erection of \$60,000 fire house.

Worcester, Mass.—Fire Chief Coleman is favorable to purchase two large combination trucks.

Bay City, Mich.—Auto combination chemical and hose wagon, together with a chief's auto, will be added to Fire Department apparatus.

Duluth, Minn.—Site at Seventh ave. East and Ninth st. has been purchased for erection of fire hall.

Billings, Mont.—Bids will soon be asked by Council for purchase of 1,000 ft. of fire hose.

Manchester, N. H.—City will erect fire station at Goffs Falls.

Newark, N. J.—Bigelow & Tuttle will prepare plans for erection of \$50,000 fire house for double company.

Dunkirk, N. Y.—Site on Eagle st. has been purchased for erection of proposed fire hall.

Far Rockaway, L. I., N. Y.—Plans have been filed for erection of \$50,550 fire house on Central ave. for Engine Co. 161.

Sauquoit, N. Y.—Fire company has been formed and chemical engine will be purchased.—W. D. Cress, Chief.

Ashboro, N. C.—Fire company has been organized.—S. B. Stedman, Chief.

Cuyahoga Falls, O.—Plans have been completed for fire station to be built on Broad st.; total cost will be about \$6,000.

Fremont, O.—Citizens will vote July 11 on \$54,000 bonds for fire department improvements and water main extensions.

Massillon, O.—Council has decided to purchase 1000 ft. of fire hose.

New Carlisle, O.—Council has decided to purchase 500 ft. of fire hose.

Yoe, Pa.—Citizens' Fire Company is considering erection of fire station.

East Providence, R. I.—Rumford Hose Co. has asked for 800 ft. of hose.

Montpelier, Vt.—National Board of Fire Underwriters has recommended erection of central fire station; purchase of auto chemical engine equipped with two 50-gallon tanks; two horse hose wagons, new hose and minor equipment.

CONTRACTS AWARDED

Milltown, N. J.—Furnishing \$4,100 chemical fire truck to Boyd Bros. Co., of Philadelphia.

Albany, N. Y.—Repairs to fire truck 2, American-La France Fire Engine Co., \$3,900.

Beaumont, Tex.—Furnishing fire engine, cap. 13,000 gallons of water per minute, to Ahrens-Fox Fire Engine Co., Cincinnati.

BRIDGES

Tampa, Fla.—Commissioner Snow of First District will at once get estimates for widening bridge over Spanishtown Creek.

Tampa, Fla.—Board of Public Works has decided to ask for bids for erecting bridge over Hillsborough River at Lafayette st.

Covington, Ga.—Bids will be received for constructing a concrete bridge 20 ft. high, 60 ft. wide and 100 ft. long, and for paving with macadam a street 45 ft. wide, 1,400 ft. long. Geo. T. Smith, Mayor.

Michigan City, Ind.—County Commissioners have decided to erect \$6,000 bridge across Kankakee River.

Peru, Ind.—Commissioners of Miami and Cass Counties are preparing to ask for bids for construction of a bridge over the Wabash River, between Jefferson Township and Miami Township.

Church Point, La.—Town will construct bridge and levee across Bayou Plaquemine.

Lafayette, La.—Council has authorized Street Committee to ask for bids to keep bridges and streets in repair.

Holyoke, Mass.—City Engineer T. J. MacCarthy has completed plans for Cabot St. canal bridge.

St. Paul, Minn.—Fred Nussbaumer, Superintendent of Parks, is having plans prepared for Park Commission, for a steel and concrete bridge across River Boulevard at St. Clair st.; cost, \$3,000.

Arlington, Neb.—Dodge County will build bridge across Elkhorn River.

Las Cruces, N. M.—Board of Trustees has ordered construction of 21-ft. bridge over Onqua at foot of Las Cruces Ave.

Geddes, N. Y.—Citizens have voted \$40,000 bonds to erect bridge near fair grounds and lay out highway from Solvay village to fair grounds.

Cincinnati, O.—City Engineer Shipley has submitted plans and estimates for flooring of the new Fern St. bridge; estimate is \$11,635, of flooring of reinforced concrete with covering of asphalt; plans and estimates for substructure of Ludlow Ave. viaduct, which is to eliminate the

grade crossing of the B. & O. Railroad have also been submitted to Director Sundmaker; cost, \$76,000.
 Pittsburg, Pa.—Mayor W. A. Magee has recommended erection of Sawmill Run, Bloomfield and Sylvan Ave. bridges.

CONTRACTS AWARDED

Wilmington, Del.—Building bridge over western arm of Smyrna River to Jos. Anderson, Delaware City, \$1,500.
 Salem, Ind.—By Washington County Commissioners for construction of one concrete and one steel bridge to E. J. and H. F. Burk, Richmond, Ind.
 Waverly, Ind.—Construction of a 5-span concrete bridge across White River by the Morgan County Commissioners to National Concrete Co., \$38,750.
 Mankato, Minn.—Constructing two concrete bridges, to Marsh Engineering Co., Des Moines, Ia., \$5,650.
 Newark, N. Y.—Erecting three bridges on flats north of village during next three months to Oswego Bridge Co., largest bridge, \$1,500, and two smaller ones to Z. T. Darrow & Sons, Canandaigua, \$2,500 each; reinforced concrete will be used.
 Milwaukee, Wis.—Constructing a 1-leaf bascule bridge across the Milwaukee River at Oneida st. to Milwaukee Bridge Co., Milwaukee, \$55,745 for superstructure, \$92,845 for entire work; other bidders: Modern Steel Structural Co., Waukesha, Wis., superstructure, \$71,469; Hell Co., Milwaukee, superstructure, \$53,875, entire work, \$99,875; A. Vogel, Starke Dredge and Dock Co., Milwaukee, entire work, \$104,272; Strobel Steel Construction Co., Chicago, Ill., superstructure, \$66,400; J. E. Hathaway & Co., Milwaukee superstructure, \$44,000. L. J. Klug, Superintendent Bridges.

MISCELLANEOUS

Bessemer, Ala.—City is planning to erect \$30,000 hospital.
 Decatur, Ala.—City has sold \$25,000 city hall bonds to W. N. Coler & Co.
 Huntsville, Ala.—Bids will be received at once by Mayor Smith for erection of municipal hotel.
 Moulton, Ala.—Lawrence County Commissioners are considering erection of jail.
 Glendale, Ariz.—Town is considering erection of town hall and jail.

Pasadena, Cal.—The City Commissioners are considering plans for city aviary and will at early date have architects assist them in devising attractive birdhouse at Central Park.
 Wilmington, Del.—Phoenix Fire Company has decided to purchase auto ambulance.
 Washington, D. C.—Consul George Helmrod, of Berne, Switzerland, has reported that plans for municipal slaughterhouse, to cost several hundred thousand dollars, are being prepared by Architect Max Muench, of Berne, who has been allowed a period of six months by city for the completion of his preparatory work; American firms desiring to make offers for installation, etc., should address the Berne municipal building department (Städtische Bau-Direktion, Berne), but letters, and, if possible, descriptions should be in German or French.

Albany, Ga.—Citizens have voted \$10,000 bonds to beautify and enlarge parks.
 Freeport, Ill.—Dr. J. A. Poling has recommended purchase of three or four sanitary garbage wagons.
 Poseyville, Ind.—Town will issue bonds to erect \$6,000 town hall.
 Carlisle, Ky.—Council has decided on plans for erection of city hall on Chestnut St.
 Boston, Mass.—Commissioner Rourke, of the Public Works Department, has rejected all bids received for disposal of the city's garbage and refuse for next ten years; he will at once prepare specifications for new bids.
 Winchester, Mass.—Citizens have voted \$90,000 bonds for purchase of property for park and boulevard.
 Newaygo, Mich.—Board of Corrections has ordered Board of Supervisors to erect permanent jail.
 St. Louis, Mo.—Citizens will vote Nov. 7 on \$2,250,000 bonds for completion of municipal bridge.
 Kearny, N. J.—To house town ambulance, patrol wagon and new auto fire apparatus: Town Council will erect a brick building at Berlin and Windsor Sts.
 Westfield, N. J.—Park Commissioners have decided to issue \$10,000 bonds for improvement of Mountain av. park.
 Woodbury, N. J.—Council has advertised for bids for automobile for use of Water Superintendent in going to and from pumping station.

Binghamton, N. Y.—As soon as specifications can be prepared Board of Contract and Supply will advertise for bids on remodeling, grading and improvement of Kent playground in Sixth Ward.
 Schenectady, N. Y.—Bids will be received June 28, noon, for \$100,000 bonds for erection of jail and courthouse.—J. I. Winne, County Treasurer.
 Toledo, O.—Service Director Cowell has \$12,000 available for purchase of six garbage wagons, equipment and horses.
 Muskogee, Okla.—City and county officials are considering \$500,000 bond issue for erection of joint ten-story office building.
 Klamath Falls, Ore.—Citizens will soon vote on \$30,000 bonds to erect town hall.
 Pittsburg, Pa.—Mayor W. A. Magee has recommended passage of ordinance for erection of city hall and municipal refuse plant; also park and wharves improvement.
 Salt Lake City, Utah.—Council has appropriated \$2,500 for use of Park Board in installing apparatus in playgrounds at Pioneer Park and to complete playgrounds at Liberty Park.
 Portsmouth, Va.—Council has decided to erect modern \$40,000 office for clerks.
 Upton, Wyo.—Owing to election contest, bids for proposed construction work will not be received until later date, probably about 30 days.—Burns & McDonnell, Scarett Bldg., Kansas City, Mo., Engineers.


CONTRACTS AWARDED

Boston, Mass.—To F. S. Marvel, Newburg, N. Y., for building steel hull ferryboat for Boston service, \$118,000.
 Manchester, N. H.—Furnishing garbage truck to W. C. Shear, local agent for Peerless garbage truck, \$4,000.
 Brooklyn, N. Y.—To Joseph N. Early, New York City, for furnishing 1,059 street signs of five different varieties in different parts of borough, \$1,495.80.
 Schenectady, N. Y.—To Jas. H. Johnson, city, for erecting county tuberculosis hospital, \$35,471.
 Doylestown, Pa.—By Bucks County Commissioners to W. A. Collins, of Falls township, to build dykes at the mouth of Scott's Creek, \$4,895.
 Salt Lake City, Utah.—Building city stables to P. J. Moran, \$42,647.

TOO LATE FOR CLASSIFICATION

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREET IMPROVEMENTS				
Wisconsin	Corliss	June 23, 8 p.m.	Constr. six blocks of cement sidewalks, and eleven st. crossings.	H. B. Schmid, Village Clerk.
Iowa	Waterloo	June 26, 7:30 p.m.	Constr. 5,850 sq. yds. sheet asphalt paving; 4,043 lin. ft. combined curb and gutter.	R. C. Thompson, City Clerk.
Wisconsin	Green Bay	June 27, 2 p.m.	Improving various streets by grading, constr. sidewalks of Portland cement; concrete combined curb and gutter; paving with asphalt, vit. brick, tar macadam or creosoted wood block.	W. W. Rand, City Engineer. Clarence Bird, Village Clerk.
New York	Saratoga Spgs.	June 28, 3 p.m.	Constructing concrete walk.	W. W. Rand, City Engineer. Clarence Bird, Village Clerk.
Ohio	Hamilton	June 29, noon	Improving portion of Fairgrove Ave. by paving roadway with bituminous macadam.	C. M. Robertson, Clk. Dept. P. Serv. John W. Gauthier, Dir. Pub. Serv.
Ohio	Akron	June 29, noon	Paving portions of various streets.	Bd. Freeh., Hudson County.
New Jersey	Jersey City	July 5	Paving the Plank road.	Bd. Freeh., Hudson County.
SEWERAGE				
Iowa	Waterloo	June 26, 7:30 p.m.	Constr. 5,170 ft. 10-in. sewers; 1,890 ft. 12-in.; 1,220 ft. 15-in.; 400 ft. 30-in.	R. C. Thompson, City Clerk. H. Seymour Getman, Chm. B. S. C.
New York	Frankfort	June 29	Constructing a complete sewer system.	H. Seymour Getman, Chm. B. S. C.
Pennsylvania	Ligonier	July 1	Building sewage disposal plant, including sedimentation tank, sprinkling filter, sludge bed and pumping station; F. H. Shaw, Lancaster, Engineer.	I. F. Brandt, Boro. Clerk.
New Jersey	Elizabeth	July 3, 8:30 p.m.	Constr. 665 ft. 24-in. pipe sewer; 510 ft. 20-in.; 510 ft. 18-in.; 560 ft. 15-in. house connections, and appurtenances.	N. K. Thompson, Street Comr. Iowa Engr. Co., Clinton, Ia., Engrs.
Iowa	Valley Junction	July 13, 7 p.m.	Constr. 5½ miles 8 to 20-in. sewers and a sewage disposal plant.	John T. Moore, Mayor.
Georgia	Macon	July 10, noon	Digging trenches and laying 5,003 ft. 12-in. pipe; 3,140 ft. 8-in.; 5,363 ft. 6-in., hydrants, valves, special castings etc.	John T. Moore, Mayor.
WATER SUPPLY				
Pennsylvania	Franklin	June 28, 3 p.m.	Furn. one horizontal duplex direct acting triple expansion steam pumping engine, daily capacity 3,000,000 gals., with foundations, erected complete. One tubular 72-in. by 18-ft. horizontal 150 pounds working steam pressure boiler, with dome, complete and wrought iron stack 100 ft. high.	Geo. S. Criswell, Chm. B. W. Comrs. Wm. T. Patton, Town Clerk.
Indiana	Rockville	July 3, 2 p.m.	Digging a well 8-ft. in diameter and 32 ft. deep, walled with con.	Geo. S. Criswell, Chm. B. W. Comrs. Wm. T. Patton, Town Clerk.
LIGHTING AND POWER				
New York	Buffalo	July 1, 11 a.m.	Furn. and erecting power plant equipment at tuberculosis hospital at Pertsysburg, N. Y.; power house and laundry; wiring to main building; constr. water supply system laundry machinery, ice machinery.	Francis G. Ward, Comr. Pub. Wks.
BRIDGES				
Iowa	Waterloo	June 26, 7:30 p.m.	Constr. concrete steel arch bridge over cut-off on Whitney road.	R. C. Thompson, City Clerk.
FIRE EQUIPMENT				
Pennsylvania	Oil City	June 26, 7:30 p.m.	Furn. 2,500 ft. 2½-in. fire hose; 500 ft. ¾-in. fire hose.	C. W. Mullalley, Comptroller.
MISCELLANEOUS				
Connecticut	Waterbury	June 27, 8 p.m.	Remodeling City Hall.	James R. Lawlor, Clk. B. C. P. Wks.
New Jersey	Garwood	July 5, 8 p.m.	Constructing a borough hall.	Wm. Darroch, Boro. Clerk.



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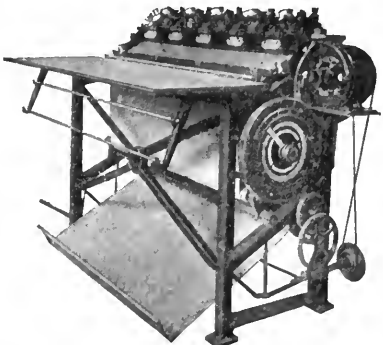

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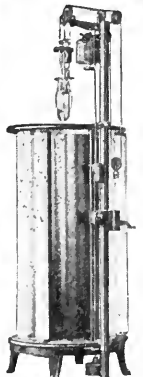
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STREET IMPROVEMENTS

Washington, D. C.—Arrangements have been made by office of public roads of the Department of Agriculture to put in two miles of demonstration road, running from Chevy Chase Circle to and beyond Bradley lane, half of the road will be built with an appropriation of \$10,000 that will be available from national government July 1, and similar amount will be contributed by Maryland.

Washington, D. C.—District Commissioners have passed orders for repaving A St. N. E. at estimated cost of \$2,500.

Crawfordsville, Ind.—City will lay 6534 sq. yd. of paving and 3 m. of 5-ft. concrete walks and gutter.—N. C. McClure, City Civil Engineer.

Clinton, Ia.—Council has ordered repaving of Fifth ave.

Des Moines, Ia.—Council has decided to pave with sheet asphalt, Thirty-third, Westworth and Twentieth Sts.

Kearny, N. J.—Council is planning street improvements, including repaving of Kearny ave. from Harrison ave. to Bergen County line at cost of \$150,000.

Pittsburg, Pa.—Council is considering ordinances for grading, curbing and paving four streets.

CONTRACTS AWARDED

Denver, Col.—To Colorado Company, for the work in West Twenty-third Avenue Paving District No. 2, \$21,771; other bidders: Denver & Pueblo Construction Co., \$22,293, and Commonwealth Construction Co., \$22,805; work calls for the paving with asphalt macadam a total of 14,912 sq. yds.

Grand Rapids, Mich.—To C. E. Williams, for improvement of Clancy st. with West-rumite.

Hibbing, Minn.—Curbing and guttering several blocks of streets to Johnson-Mey-nahan Construction Co., 39½c. per lin. ft.

Virginia, Minn.—Laying 23 blocks of bitulithic paving on concrete base on Cleveland, Mesaba and Central Aves. and Cook and Spruce Sts. by the Council to the H. L. Bartlett Co., Virginia, \$83,856.60, or \$2.40 per sq. yd. for laying paving and 60c. per cu. yd. for excavating; P. McDonnell, Duluth, was awarded the contract for laying 13 blocks of cressote block paving on concrete base, 3¼-in. block, weighing 16 pounds, \$2.61 per sq. yd. for paving and 68c. per cu. yd. for excavating; total, \$37,005.58. The other bidders were Warren Bros., Duluth; C. C. Butler Contracting Co., Virginia; the Pastoret-Lawrence Co., Duluth; J. P. O'Connor, Duluth.

Hastings, Neb.—Paving with asphalt St. Joe and Denver aves., to M. Ford, Omaha, \$2.11 per sq. yd.; combined curb and gutter, 54c. per lin. ft.; resetting old curb, 10c. per lin. ft.; paving brick portion of same thoroughfares, to E. R. Bing, city, \$1.88 per sq. yd. for Hastings brick block paving.

Roselle, N. J.—Curbing and guttering Chestnut st. and Fourth ave., to the A. L. Clark Stone Company, Elizabeth, 81c. per lin. ft., there being 6,243 lin. ft.

Rochester, N. Y.—By Board of Contract and Supply to Whitmore, Rauber & Vincinus for Park Ave. and Gardner Ave. asphalt pavements, \$26,120 and \$15,613; Copeland St., brick pavement, to Clarence Aikenhead Co., \$6,033; Pinnacle Road, brick pavement, to F. V. Brotsch, \$7,858; Magee Ave., cement walks, to W. A. Margrander, \$893; Mohawk St., grading and walks, to Julius Friedrich Co., \$619.50.

Toledo, O.—By Board of Control to establish the grade of Post St. at the Lake Shore & Michigan Central tracks to Chas. P. Peters & Son, \$23,947.

York, Pa.—To York Stone & Supply Co. to furnish broken stone for asphalt paving on West Philadelphia St., \$1.15 per perch.

Sumter, S. C.—To Geo. W. Waring, Columbia, to put down paving on Main st. roadway.

Lynchburg, Va.—To S. B. Bennington, for building tar macadam driveway in Miller Park, about \$5,000.

SEWERAGE

Washington, D. C.—Report from American consular officer states that municipality in his district is contemplating establishment of new sewerage system within 6 or 8 months; preliminary work is now being carried on by an engineer, and report suggests that American manufacturers of sewerage equipment should get in communication with this person as soon as possible, with view to having their equipment adopted in system. Address No. 6331, Bureau of Manufactures.

Fort Dodge, Ia.—Council is considering construction of sanitary sewer on Seventh ave. North.

Beverly, N. J.—Council has authorized building of 3,300 ft. of 8-in. sewer pipe on Broad st.

Pittsburg, Pa. Council is considering ordinances for sewerage nine streets.

Aberdeen, S. D.—W. P. Manson, Troy, N. Y., and City Engineer R. B. Easton will inspect system of sewage disposal now in operation at Santa Monica, Cal., and later report to Council if system is practical for this city.

Richmond, Va.—Council has ordered construction of sewers on following streets: Beverly, \$2,113; Lodge st., \$1,256, and Clay, \$2,388.

Rocky Mount, Va.—Citizens have voted \$75,000 bonds for establishment of sewerage, water works and municipal electric light plant.

Seattle, Wash.—Board of Public Works has rejected all bids for constructing sewers on Eleventh ave. West, and will ask new bids.

CONTRACTS AWARDED

Clinton, Ia.—To Greene & Son, Appleton, to complete sewer system, Dist. 4, \$124,375.

Grand Rapids, Mich.—To Carpenter & Anderson, for building east side sewer, \$356,722.63.

Richmond, Va.—Constructing sewer on Thirty-first st., to H. W. Maynard & Co., \$6,727.

LIGHTING AND POWER

Elkhart, Ind.—Indiana & Muncie Electric Company has announced plan to rebuild dam over St. Joseph River and erect a power house developing 2,500 horse power.

North Branch, Minn.—Council has granted franchise to Eastern Minnesota Power Co., Pine City, to operate electric light.

St. Paul, Minn.—Chief Engineer Claussen has completed specifications for city lighting covering gas and electric lighting and gasoline lamp post system; bids will be asked on at least twelve propositions in connection therewith.

Clydepark, Mont.—W. B. Calhoun is interested in proposed installation of electric light plant.

Hardwick, Va.—Village has appropriated \$65,000 to increase electric light plant; \$15,000 will be spent for equipment.

Rocky Mount, Va.—Citizens have voted \$75,000 bonds for establishment of municipal electric light plant, water works and sewerage.

Spokane, Wash.—Henry L. Doherty & Co., controlling Spokane Falls Gas Light Company, will expend \$500,000 on erection of gas plant.

FIRE EQUIPMENT

Washington, D. C.—American consul in Canada reports that at recent meeting of town council in his district an order was passed instructing Town Clerk to write manufacturers of motor fire trucks for prices and other information; combination hose and ladder truck is desired, which could also be used, by removing the top, for coal-hauling purposes. Address No. 6879, Bureau of Manufactures.

Ventnor, N. J.—Ventnor Fire Company is urging purchase of chemical engine and bettering of fire alarm system.—Address Chief Kuhl.

Tacoma, Wash.—Council is considering erection of \$28,000 fire hall at E. 26th and C sts.

CONTRACT AWARDED

Lansford, Pa.—Installing fire alarm system, to the Gamewell Fire Alarm Telegraph Co., \$1,700.

BRIDGES

CONTRACTS AWARDED

Sherburne, N. Y.—By highway authorities of the towns of Hamilton and Sherburne, for building abutments for new cement bridge over Chenango River in Earlville, to C. C. Chandler, Earlville.

Richmond, Va.—To George Donald, for building reinforced concrete arch bridge over Gillies Creek; \$9,011.93.

MISCELLANEOUS

New Haven, Conn.—City has been granted authority to issue \$75,000 bonds to erect contagious disease hospital.

BIDS RECEIVED

Boston, Mass.—By Park Commissioners for construction of the bear-den section of Franklin Park Zoological Garden; J. A. Rooney, lowest bidder, \$11,445; the other bidders were: Carroll Construction Co., \$11,750; M. F. Culbert, \$12,850; West Roxbury Trap Rock Co., \$21,795, and the Timilty-Shawmut Construction Co., \$22,221; iron work of den, Smith Construction Co., \$7,700; W. A. Snow Iron Co., \$7,740, and F. A. Houdlette & Sons, \$17,435.

PROPOSALS

FIRE HOSE

Oil City, Pa.

The undersigned will receive bids up to 7:30 P. M., Monday, June 26, 1911, for furnishing the following fire hose:

2500 feet 2-12" fire hose.

500 feet ¾" fire hose

C. W. MULLALLEY,
Controller.

CAPITAL WANTED

WANTED Partner with \$200,000

To place on the market the HARRIS SMOKILESS AND ODORLESS GARBAGE INCINERATOR, Patent just allowed.

In large units generates 1,200 horsepower from its steam boilers, capable of heating public buildings and lighting towns and cities of 100,000 inhabitants.

Ground floor propositions now open to men with money and brains. Plans open to inspection at this office. Address

J. B. HARRIS, M.D.
210 Stahlman Bldg.,
Nashville, Tenn.

BOOK NOTICE

Clarification of Sewage.—By Rudolf Schmeitzner. Translated by A. Elliott Kimberly. Cloth, 7½ x 5 in., illus., 15 + 114 pp. New York, The Engineering News Publishing Company; London, Constable & Company, Ltd., 1910, \$1.50.

This book is the result of a visit by the author to a number of the larger German clarification plants where preparatory devices constitute the entire treatment of sewage. The plants are discussed from an engineering standpoint, the chemical and bacterial phases of the question being but briefly mentioned, and the book is a critical review of the design of screens of various types of sedimentation tanks, of towers, and of methods of sludge removal and disposal at present in use in Germany. The Contents are: Introduction; General Principles of the Design of Clarification Plants; The Composition of Sewage; Component Parts of a Clarification Plant; Sludge Removal and Treatment for the Recovery of By-Products; Practical Arrangement of Clarification and Purification Plants; Addendum; List of Plates; Index.

FOR INFORMATION

or Books relating to Municipal Matters, write

MUNICIPAL JOURNAL

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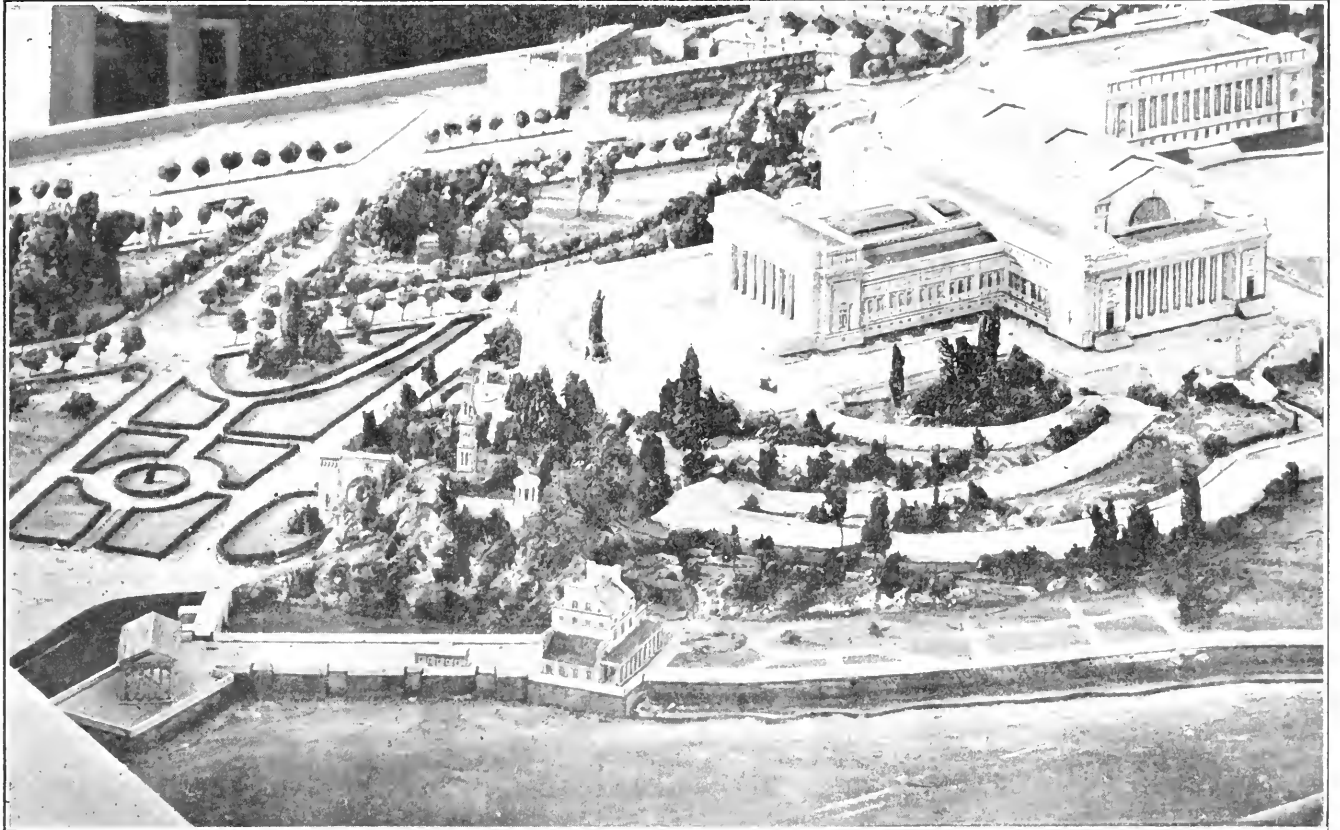
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Municipal Journal

VOLUME XXX

NEW YORK, JUNE 28, 1911

No. 26



VIEW OF PART OF PHILADELPHIA MODEL, SHOWING TREES, RIVER AND BUILDINGS

CONSTRUCTION OF MODELS

Buildings Cut from Wood Blocks, or of Card Board—Sponges, Wool Shavings and Felt to Represent Trees, Shrubs and Lawns—Cigar Ashes, Glass, Beads and Wire Used
Reproducing Surface Topography

THE practice of informing the taxpayers as fully as possible concerning contemplated plans in connection with all public enterprises is becoming more common, and commendably so. Partly as the cause and partly as the result of this, the average citizen is becoming more proficient in understanding both reports and drawings. It still remains true, however, that not only the average citizen but even the engineer or architect himself can more fully appreciate the appearance of proposed buildings, layouts of parks, etc., from a model made accurately to scale than from the best of plans. The best example of

such models which we have seen was the exhibit in connection with the Conference on City Planning, in Philadelphia, described in our issue of May 24. It seems to us that city officials in charge of or interested in the adoption of plans for public improvements might well make freer use of models than heretofore has been the practice. For this reason we offer a few suggestions as to how these may be prepared.

The most elaborate and realistic model at the exhibit referred to, and what is said to be the most complete ever constructed, was one of the proposed parkway in Philadelphia, a photo-

graph of which was presented in connection with our article above referred to. The parkway plan from which the model was made was designed by William E. Groben, architect of the Department of Public Works of that city. The model was constructed from these plans and under the architect's personal supervision, 20 skillful modelers, colorists, and expert Swiss wood carvers especially selected for this work being employed upon it.

The base or platform of the model is about $3\frac{1}{2}$ inches in thickness and was made in three layers, each with the grain of the wood running in a direction different from the others to avoid cracks and warping. The central layer is cored, i. e., the wood was laid in very thin strips and firmly glued together. Because of its great length and to permit of its being transported, the base, which is 30 feet long, was made in three sections, dowelled together. The natural grade or slope of the ground was obtained by planing down and carving the upper layer. The streets between the curbs were also cut out $1/16$ -inch deep to give the effect of roadways.

The buildings are solid wooden blocks cut accurately to the general shape of the buildings. On these blocks were pasted drawings representing the several faces of the building, showing windows, the joints of the masonry, etc.

To overcome the flat appearance in the ordinary cardboard model, moldings were applied to the buildings after the drawings had been pasted on the blocks, and were painted to represent cornices and band courses. These moldings throw the proper shadows and give a wonderfully realistic appearance to the model. The ornamentation of the buildings was made by pen or color on the drawings. Free-standing columns were made of wood carved or turned on a lathe. The capitals and bases were modeled out of composition. Pylons, monuments, statues and fountains were delicately carved from hazel wood by the Swiss workmen.

A very realistic touch was given to the model by the reproduction of the trees and other foliage along the streets and in the parks. Trees were made from small pieces of sponge cut to shape, dipped in green dye and fixed on nails. Bushes and branched trees were made by sticking the sponges on pieces of flexible wire instead of nails. Occasionally scraps of tree fern from the florist were used to make dense park foliage. Grass was simulated by "flock" or wool shavings thrown on wet green paint. Flowers were sponges tinted various colors by dipping in dyes. Hedges were tiny strips of green felt glued in place.

Rocks and stones were made of bits of jagged wood tinted to proper color with gray paint and crusted with cigar ashes. Hills were formed by applying the wooden blocks to the base and carving them out to the required slope and height. The Schuylkill river was gelatine tinted with water color and applied in a very thin coat to avoid cracking. The effect was so realistic as to actually cast the reflections of the buildings along its banks. Glass was inserted in basins and fountains to represent water, and blown glass for jets of water. Roadways were painted to represent asphalt or macadam. By this scheme the true natural colors were represented, which is impossible on plaster or cardboard models. The marble mosaic pavements in the court yards and entrances of buildings were made by painting them first on paper and then pasting on a wooden base. A street light was made of a glass bead on the top of a wire; of a single lamp, bent at the top, to represent a shepherd's crook standard. Where there were two or more lights a corresponding number of pieces of finer wire were twisted together for the column, the individual wires branching out at the top for arms.

Along the river were imposing parapets, balustrades and retaining walls, carved out of wood and painted to represent stone and marble. The city hall and other existing buildings were constructed with the aid of the original plans, or by measurements and photographs taken on the spot.

This model attracted so much attention from those who visited the exhibit that numerous requests have been made that

it be sent to other cities in the United States, and it is expected that this will be done during the coming year. As stated above, the base is made in three sections easily disconnected. The buildings are held in place by screws from the underside of the base, these being inserted in fairly deep auger holes in order to reduce the length of screw required. The buildings can therefore be readily removed and packed in sawdust for shipment, or if the model is to be stored at any time.

Other models at the exhibit illustrated somewhat different methods of construction. For instance, buildings made to large scale were constructed of heavy Bristol board, all features of minor relief being represented by shaded lines and shadows; the balconies, gables and the like being actually reproduced in thinner Bristol board. In place of wool shavings, grass was represented in some of these by green felt. Where glass is used to represent lakes or other bodies of water, blue paper placed beneath it greatly heightens the illusion.

For representing topography of ground surfaces where this is irregular and where cross section lines have been run or contour maps plotted, there are two convenient methods of using the data. Where the elevations have been taken, and the ground can be most conveniently represented, by a series of lines at right angles to the general trend of the contours, cross sections at frequent intervals can be drawn on stiff cardboard, accurately cut out with a sharp knife, and these cardboard strips mounted erect upon a stiff base at the proper intervals. The spaces between the strips can then be filled in with plaster of Paris, cement, papier mache, pottery clay, putty or other materials which are easily worked and convenient to obtain, and shaped, using the top edges of the cardboard strips as a guide.

The other method is especially applicable to situations where the contours are more or less circular or oval, rather than following the one general direction, as where the ground is covered with hills, knolls, etc. In this case each contour line is copied on to a piece of cardboard by means of transfer paper, and the included area cut out carefully with a sharp knife. At the same time that the outline contour is drawn the next higher contour is also transferred to the cardboard in order to indicate the exact position for placing the cardboard which represents this contour. These pieces of cardboard, when cut out, are pasted one above the other, the proper position of each on the next lower being indicated as just stated. The contour intervals and thickness of the cardboard should be adjusted to give the proper scale. It is difficult to cut with the knife cardboard more than $1/20$ of an inch thick, and $1/30$ to $1/40$ is perhaps the most convenient thickness to work with. Thick mucilage or thin glue we have found to be preferable to paste. This leaves the model of the ground surface in a series of steps. The angles between these can be filled by the use of putty, "plastacene," potters' clay or a similar substance. Plaster of Paris has the fault of setting too quickly unless made very thin, in which case it is apt to soften the glue between the cards and generally disintegrate the model by moisture. Neat Portland cement also might be used for the same purpose.

For coloring, ordinary paint can be used on the putty, or putty or plastacene already colored to the desired shade can be used. Plaster of Paris can be treated with a sizing and painted similar to a plaster wall. Portland cement will not hold ordinary paint, but paints are sold designed especially for adhering to cement.

Next to models, probably a good bird's-eye-view sketch is most satisfactory in informing the average citizen concerning proposed improvements or existing ones. One instance of this was shown by the illustration of the Poughkeepsie water works plant, reproduced in our issue of March 24, 1909; another by the plan for a park and playground at Somerville, Mass., on another page of this issue. Such bird's-eye views require considerable artistic ability, while the models, although generally taking more time, can be prepared by anyone with a little care and patience, and it seems to us are more satisfactory.

EXHIBIT BY SEWERAGE COMMISSION

FOLLOWING the Budget Exhibit of a few months ago, a public commission of New York City—the Metropolitan Sewerage Commission—has recently been endeavoring to inform the people concerning the aims of and results obtained by the commission, through the medium of an exhibit of charts, models, photographs, etc., placed in the Metropolitan Museum of Natural History. The largest part of this exhibit comprised photographs showing various pollutions of New York harbor, the boats and appliances used by the commission in its investigations, and finally photographs and plans of sewerage systems in a number of cities. Interspersed among these were a number of placards bearing phrases which were intended to catch the eye and interest almost any citizen. One of these contained a photograph of the Flatiron building, twenty stories high, accompanied by the statement, "The sewage produced in the Metropolitan district would fill this building every 43 minutes." Among the other placards were the following:

There are over 500 sewer outlets discharging into New York harbor.

Either the sewage or the public should be kept out of the water.

The water is black and effervescing with sewage in

- Gowanus Canal,
- Newtown Creek,
- Bronx River,
- Harlem River,
- Passaic River

and along many of the docks and piers of the New York water front.

Why not pump the sewage to sea?—The cost would be excessive.

Why not utilize the sewage on farm land?—There is not enough land within reasonable distance of New York.

Why not extract the manurial ingredients?—Experience shows that it costs more to extract them than they are worth.

The sewage treatment plants which were illustrated included those at Paris, Berlin, Dublin, Hamburg, Essen, Frankfurt, Amsterdam, Birmingham, Salford, Glasgow, Leeds, London and Manchester in England, and Worcester, Mass.; Columbus, Ohio; Providence, R. I.; Baltimore, Md., and Saratoga Springs, N. Y.

Probably the most striking part of the exhibit was one which was not strictly a part of the exhibit of this commission, but comprised models prepared by the model-making department of the museum and which will remain as permanent exhibits. Among these were models of the Plainfield, N. J., contact beds, together with two boxes containing samples of the stone used in them.

A grit chamber, a fine revolving screen and a coarse bar screen.

A deep sedimentation tank (like that at Toronto), rectangular sedimentation tank with scum boards, etc., and an Emscher tank.

Bleaching powder disinfecting plant.

Columbus sprinkling filters and samples of Taylor and Columbus sprinkler heads.

Gathering drift wood at the Battery and oysters in Jamaica Bay (both presumably polluted by sewage).

Bathing at Corlear's Hook, showing sewage flowing into the river from a sewer immediately above the bath house, and from there, but little diluted, into the bath house itself.

In making these models advantage was taken of the experience of the expert model makers in the use of plaster, composition similar to papier-mâché, wood, etc. Quite effective in the last-named model was the use of glass having an uneven surface to represent rippling water, this being painted on the underside a greenish-blue to represent the comparatively clear river water and a yellowish-brown to represent the sewage.

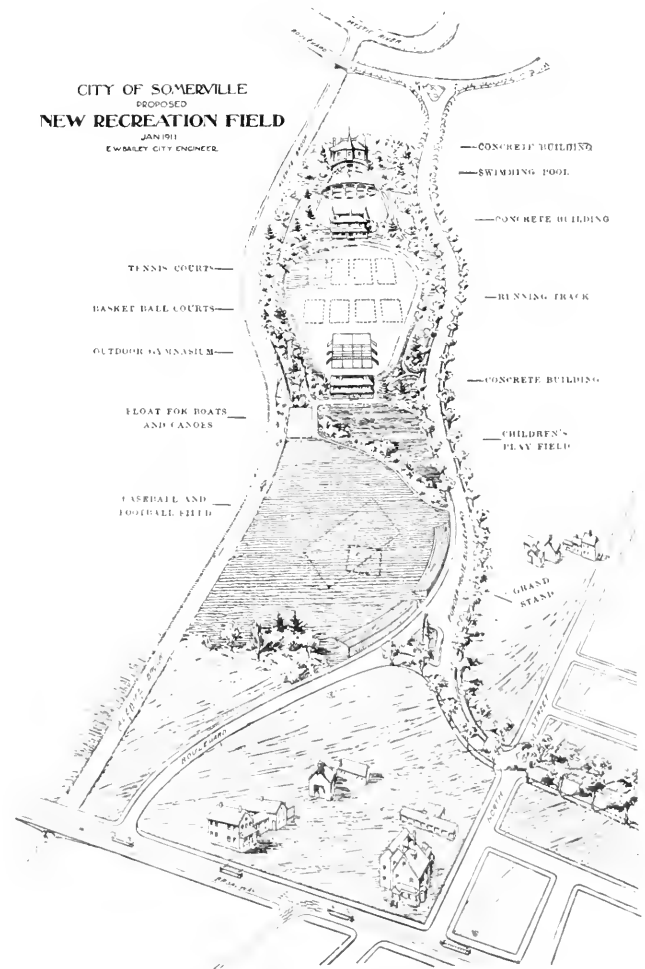
The Department of Sewers of the city also contributed to the

exhibition a number of photographs and drawings showing sewers and sewer outlets, catch basins and other appurtenances.

Altogether the exhibit gave the average citizen who visited it an excellent idea of the conditions in New York harbor as to pollution of water by sewage, the method of investigation carried on by the commission and the opinions and decisions reached by the commissioners. The citizen who seldom visits the water front was thus given an idea of conditions there, although the idea was by no means complete, as photographs failed to show the greasy scum, the opaque turbidity and the odors which are found not only at most of the sewer outlets but in some cases for a long distance below them. Probably the residents of New York most familiar with these conditions are the boys who are found bathing by the hundreds in this foul water, but these have no vote and little influence upon the public administration in any way.

SOMERVILLE PLAYGROUNDS

THE designing, construction and maintenance of parks and playgrounds of Somerville, Mass., form a part of the duties of the engineering department of that city of about 80,000 population. In his report for the year 1910, City Engineer Ernest W. Bailey states that there are at present twenty separate parcels of land used for parks and playgrounds, with a total area of 67.9 acres, in addition to a boulevard about 1 1/3 miles long. The original cost of the land included in these was \$368,591.13. The first cost of construction was \$246,298.73, to which there has been added at intervals additional construction amounting to \$54,139.94. The city maintains under its supervision seven baseball fields, three football fields and minor smaller playgrounds containing outdoor gymnasiums, running



SKETCH OF RECREATION FIELD

tracks, tennis courts, etc. in this respect the city believes it is in advance of most cities, but that this is necessary because of the density of population, which averages 18,500 to the square mile for its entire area. In several of the parks are field houses, which are heated, lighted and equipped with rest and toilet rooms. The ball fields are constantly in use by athletic teams, and about 300 games were arranged for and regularly scheduled last year. The entire expenditure for the year was \$13,828 for parks, cemeteries, boulevard and parkway roads, of which \$4,008.13 was for playgrounds and recreation. This expense was met by a city appropriation of \$11,800, \$267 from the High School Athletic Association, \$100 from the elevated railway company for partial maintenance of parkway, \$1,050 from the public grounds appropriation, \$150 from the Playgrounds' Association, and miscellaneous items for material and labor furnished by other departments made up the balance.

"Considering the popularity and general feeling of the public in regard to athletics and outdoor exercise in general, as shown in our own city in the last ten years' time, the question arises of the city's having at least one large permanently located field for such a purpose. A plan has been made recently, showing the layout of a new proposed field located in the northwestern section of the city, including an area of about 16 acres. This proposed field, when completed, would be the finest recreation ground owned by any city, and would include areas for baseball, football, basketball, tennis, croquet, play field for children, outdoor gymnasium, running track, swimming pool and boating and skating on the brook, a concrete grandstand and field houses equipped with shower baths, lavatories, dressing rooms, lockers, etc., and could be constructed in a term of years as the city finances would allow." Already about five acres of this area have been acquired and graded.

FERTILIZER FROM CITY REFUSE

A REPORT of a U. S. Consul, quoted in our issue of April 12, referred to a machine for crushing city refuse and preparing the same for use as fertilizer, and it was described in the May 10 issue. Since this was published we have obtained further information concerning this process. Arthur Harrison, borough engineer and surveyor of Southwark, London, stated, under date of May 27, 1911, that there is at present in use in that borough three machines of this kind, each running 54 hours per week and dealing with a daily quantity which is ordinarily between 60 and 70 tons. The refuse treated is the ordinary house-bin refuse and trade refuse. The loads are brought into the depot and dumped in front of the machines, to which they are fed by hand. During the process of feeding, the men throw out tin cans, iron, large rags, mats, oil-cloth, baskets, etc. The rags and other inflammable material are burned in a furnace and the metals are sold. The prices obtained at present for the metals are as follows: Tin cans, \$5.22 a ton; all kinds of light iron and wire, \$5.46; galvanized iron, \$3.15; enameled iron, \$2.45 per ton. These sums are received for material delivered at the works. Two of these machines were installed in 1906 and the third in 1908. The machines cost \$2,425 each; and the shafting and conveyors and electric motors, steel work and buildings brought the total cost for the three up to \$20,230.

The material fed into these machines is pulverized and the product is sold to farmers, who find it useful on stiff or clay soils. Naturally they make the most use of it in the spring and very little during the growing season, during which time it is stored at various places in the country, whence the farmers remove it during the winter months. Up to March 31 of this year the farmers had purchased 39,502 tons of this material, for which they paid about \$19,720.

This plant was described by Mr. Harrison in a paper before the Municipal Health Exhibition in 1908, in which it was offered as a method for reducing rough refuse "in one operation to a material resembling mould, suitable for immediate use on the land as manure, or for mixing with clay or heavy soil." The plant started work toward the end of October, 1906. At first there was considerable breaking of the beaters

and grids, caused by the quantity of steel and iron found in the refuse. These parts were replaced by heavier ones, which greatly reduced this breakage. The plant was driven by two 40-h.p. electric motors, belt connected, running at 650 revolutions per minute and producing about 1200 revolutions per minute in the machines.

The cost of operation, including power, labor, etc., but excluding overhead charges, is about 50 cents per ton. Of the 57 cents per ton received for the crushed material, handling and transportation leaves only about 14 cents to be applied toward the cost of crushing, leaving the net cost of this about 36 cents per ton. Of the operating cost, electric power (at 2 cents per k.w.h.) costs about 16 cents per ton; labor, 26 cents a ton; beaters, grids and repairs, 6 cents per ton; oil and sundries, 2 cents per ton; a total of 50 cents a ton.

Mr. Harrison stated as the advantages of this method that it occupies very little space and crushes the refuse without any nuisance from dust or smell, and practically deals with the whole of the refuse, leaving a very small quantity to be dealt with by sale and burning. A considerable quantity of the food condemned by the sanitary staff is disposed of quite easily by passing it through the crushers with the other refuse.

The machine described is being introduced into this country under the name of the Gardner crusher and one has been operated at the Southampton street dump, Boston, for several weeks by Daniel P. Sullivan, a bidder for the contract to dispose of the city's garbage. Newspaper reports state that on June 22 Commissioner of Public Works Rourke witnessed a test of the machine in which the waste was reduced to about 50 per cent of its former bulk, the product closely resembled coal ashes. This machine is operated by electricity. A capacity of 25 tons a day is claimed for it, or even more if fed automatically.

ALASKA ROAD COMMISSION

SINCE collecting and publishing the data concerning State road construction and supervision a few weeks ago, we have received, too late for tabulation in that issue, information from the engineer officer of the Alaska Road Commission, Glen E. Edgerton, concerning the work done by that commission. The commission is under the U. S. War Department and consists of a Lieutenant Colonel, First Lieutenant and Second Lieutenant. For administrative purposes the territory is divided into districts (at present five in number), each under immediate charge of a resident district superintendent.

The funds at the disposal of the commission consist of special appropriations from Congress for main military roads and 70 per cent of the "Alaska Fund" which is drawn from the collection of trade licenses outside of the incorporated towns in the territory.

The U. S. commissioner in each local precinct appoints a road overseer, who collects a poll tax of \$8 or two days' labor, and expends such funds and labor locally where collected. This road overseer is entirely independent of the commission and his expenditures are usually made on local routes conforming to the general plan of the commission. Owing to the fact that the law is not enforced in many of the precincts and that residents of incorporated towns are exempt, these expenditures are very inconsiderable.

During the year 1910 the territory built 39.05 miles of wagon roads, 86.25 miles of winter sled roads and 373 miles of trails; spending a total amount of \$375,000. The amount available this year will probably not exceed \$275,000.

The wagon roads are simply earth roads surfaced in the natural soil with road machines and drags, being graveled or corduroyed only where excessive moisture makes this necessary. Sled roads are unsurfaced, being intended only for winter travel. Trails are locations usually made with a view to ultimate development into roads, and are cleared, graded and bridged to be passable by pack trains in summer and dog sleds in winter. Laborers' wages vary from \$2.00 to \$10.00 per day and other expenses and materials vary accordingly. Consequently, unit costs would mean nothing unless accompanied by full details as to prices.

STREET DEPARTMENT DEVICES

THE Superintendent of Streets and Sewers of Waterbury, Conn., Benjamin Chatfield, in his report for 1910 describes a device which is used in emptying into the street department's carts the cans which have been filled by the patrol sweepers with street sweepings. Thirty-five uniformed men are employed, each having a section of paved streets assigned to him. All the sweepings are placed by him in cans as they are collected, and these cans are emptied four times a day. In emptying the cans the device shown in the illustration is used and has been found to greatly reduce the wear on the cans and the amount of time and labor required to empty them. As may be seen from the illustrations, this consists of a simple derrick with fixed boom and a drum operated by a hand wheel and provided with a friction brake. One man can readily operate the drum, while the other guides and dumps the can and returns it to its place on the sidewalk.

Three double teams are constantly employed collecting the dirt from these cans, and during the year 1910 removed 5,703½ cubic yards of street sweepings from the paved streets. Rubbish cans to the number of forty were placed about the city in conspicuous places for receiving waste paper, etc.

Another contrivance is the stone wagon for handling curbing, flagstones, etc. This is an ordinary low-hung stone wagon provided with a frame of I-beams, two resting on the rear axle and a third on the front axle, a deep horizontal I-beam at the top serving to carry on a trolley a friction hoist. The general form of construction is shown sufficiently in the accompanying cut. This should be quite effective in preventing the damage done to curbstones and flagging in unloading them from the wagons, and the perhaps even more frequent damage to the pavements.

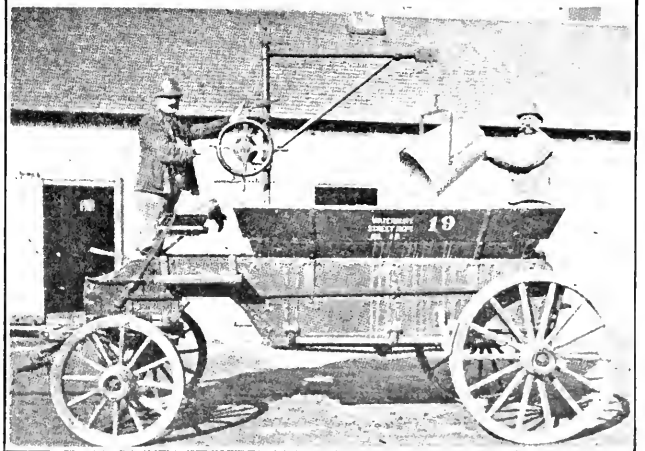
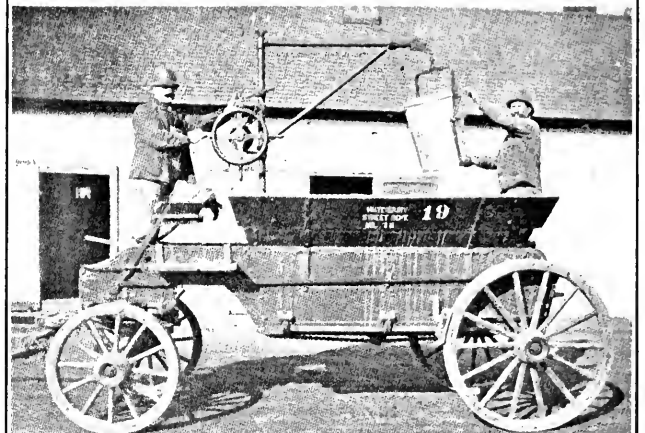
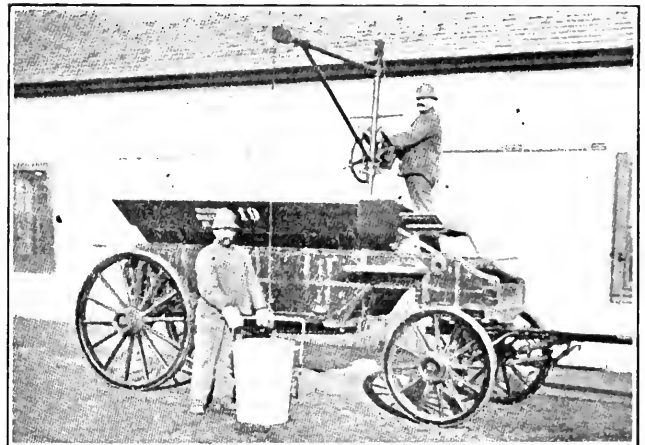
In addition to pavement cleaners, six uniformed men are employed on crosswalks about the city, and one gang of four men with a cart is constantly employed raking stones and picking up paper and rubbish on dirt and macadam streets. It requires two weeks for this gang to cover all the sections once. It is hoped to be able to employ two gangs this year and thus clean all the streets at least once a week.

METER READING DIRECTIONS

THE Water Commission of East Orange, N. J., has issued a six-page leaflet, which it has distributed among all the consumers, giving instructions for reading water meters and advising and urging each consumer "to read and record the registration of your meter regularly at least once every week. By doing so you will be able to detect leaks in the pipes and fixtures in your house and have them repaired before excessive loss has occurred; and also to guard against waste or excessive use of water on your premises. . . . This systematic reading of the meter is urged, first, for your own protection against excessive bills, and second, to avoid friction and misunderstandings with the water department."

"While the water department must necessarily charge you for all the water registered by your meter, it desires that your bills should not be excessive, and asks your co-operation in preventing leakage or waste, which is nearly always the cause of excessive bills. In the ordinary family the water used should not exceed 6 cubic feet or 45 gallons per day for each occupant of your house (including servants), and if you find the meter is registering much more than that quantity we advise that you look into the matter carefully to discover and remedy the cause."

The pamphlet includes a diagram showing a top of a meter and gives instructions in detail for reading the same. It also gives a few suggestions as to where leaks and wastes are most likely to be found in a residence. Such communications as this from a company or water department to its consumers probably assists in maintaining a cordial feeling between the two and inspiring the consumer with confidence that the company or department is not anxious to see the consumer run up large bills but wishes merely to receive pay for the amount of water actually consumed usefully.



DEVICE FOR HOISTING STREET SWEEPINGS CAN



STONE WAGON EQUIPPED WITH ONE-TON HOIST AND TROLLEY

EXCESS CONDEMNATION. ASSESSMENTS

Advantages of the Former—More Equitable to Property Owners and to City—Assessing for Local Improvements

Extract from a paper before the conference on City Planning by Lawson Purdy, President Department of Taxes and Assessments, New York City.

In Europe it has been common to take more land than is required for the immediate public purpose for which land may be taken and thereafter sell it or lease it under appropriate restrictions. This method has been adopted lately in London in the opening of the King's Way and several other streets. In one case the sale of the land acquired bordering the newly open street has entirely paid for the land taken for the street and for its cost. It is expected that in the case of the King's Way the cost of the new avenue will be very slight, if anything, in excess of the money received for the land sold.

In the United States the taking of more land than immediately needed for the particular improvement has been seldom resorted to. An old decision of the New York Court of Appeals may perhaps render it impossible to pursue this policy in the State of New York until the Constitution is amended. An amendment has been approved by the Legislature and if again approved will be submitted to the people in November, which defines the taking of additional, adjoining, continuous or neighboring property as a taking for a public use. The evil to be remedied is grave. When the streets are widened or new streets cut through old parts of the city, irregular and small-sized plots of land are left totally unsuitable for improvement. There are streets in New York today which have been widened for ten years, but still look as though they had been devastated by an earthquake. The reason is that when the map is inspected it is found that there are all sorts of small bits of land in separate ownerships, just as they were when the street was widened. If, when the street was widened, the city had acquired approximately 100 feet more land than was taken for widening, the land could have been sold to advantage, and would have been improved immediately by the erection of suitable structures. The land would have been sold for more than the city had to pay for it. The additional money received would have helped to have paid for the improvement. As it was the property fronting on the street was assessed for the expense of the improvement, and the owners of the property were heavily burdened although unable to reap the benefit of the increased value given to the land by the widening.

When Delancey street was widened a few years ago, lots less than 10 feet deep in some cases were left fronting for 100 feet on the widened street. Adjacent to these lots were other lots fronting on the side streets and lying parallel to Delancey street. Delancey street was widened because it was needed as a great thoroughfare for the approach to the Williamsburg Bridge. The land on Delancey street after it was widened was worth very much more than the land on the side street intersecting it. If the city had taken about 100 feet more land than was required for the widening, the land could have been sold for a profit, the owners of the land so taken would have been saved excessive assessments and the street would have been quickly improved with structures adapted to the new uses demanded by the new conditions.

ASSESSMENTS FOR LOCAL IMPROVEMENTS

It is by no means necessary in all cases for the city to take more land than is required for a street. When the street is opened through property which is not improved, the simplest procedure is the best, and that is to assess the cost upon the property benefited. In order that a city plan may be developed the power to assess the cost upon the property, which is enhanced in value, is an absolute necessity.

In most cities of the country the cost of new streets, including paving and sewerage, is paid for by the assessment of

the cost upon the property benefited. This should be the method in all cities, although power should also be given to the proper local authorities to determine what part of the cost should be borne by the city at large. There are cases where new streets are such a general benefit and the cost so greatly exceeds what would be spent for merely local improvements that it is but just that the city as a whole should bear a part of the expense. Under ordinary circumstances, however, a new street enhances the value of abutting land by a sum much in excess of the cost of the street. There is no injustice, therefore, in assessing the cost upon the property benefited. The general policy of assessment for benefit may well be extended to the payment for the construction of street railway or rapid transit lines. A provision of this kind is now incorporated in the Public Service Commission law of New York.

ESTABLISHING STREET GRADES

SUPERINTENDENT of Streets and Sewers Benj. Chatfield, of Waterbury, Conn., in his report for 1910 calls the attention of the Mayor and Council to a condition of affairs which is found to a greater or less extent in nearly all the cities of this country. His discussion of the matter is as follows:

Although our Charter states that no private or public way shall be opened until lines and grades have been established by the city, this section has never been enforced. Miles of streets are being opened by private persons or corporations in violation of this section in all parts of this city. The lines and grades are made to suit the lots and in a great many cases the whole extent of the grading is the turning over of the turf for a strip of 40 feet in width. Lots are then sold and people commence to build, some believing that the city will accept the street as it is graded, others anticipating that the city will eventually fill or cut in front of their lots, build above or below the present grade.

After a time, improvements are wanted, such as sewers, water mains, curbing and sidewalks, but before these improvements can be made the street must be legally accepted. Petitions are accordingly presented to the various Boards and if not followed closely by petitioners are often laid on the table or referred to various Committees or Boards and lie in this state for months and sometimes years. Building continues and soon the majority of the lots have houses on them.

Every municipal engineer knows the difficulties encountered in establishing lines and grades on streets where houses have been erected. No matter how skillful, he cannot adjust them to the satisfaction of all the abutting owners, nor can he establish them to as good advantage as would have been possible before any buildings had been erected. Owners claim heavy damages for any change in the grade or line. Some have been told, by the selling agent from whom they bought, that there would be no change; others were informed that the greatest change would be six or seven inches. Lines and grades are finally established and one-half the abutting owners are dissatisfied with them.

According to the Charter the city should receive in assessments two-thirds of the estimated cost of grading new streets. This is seldom the case. More often, the city pays two-thirds and the abutting property owners one-third. This extra expense is caused by the building of retaining walls and steps which are not taken into consideration by the Board of Assessments nor the property owners, at the various hearings. It is not until after the street is graded that the majority of property owners fully realize how a 2-foot cut or fill affects their property.

Further on in the report Mr. Chatfield recommends the establishment of at least lines and grades on all main roads to the town lines. "They will have to be established sometime and this can be done at less expense now than later. The land damages would be slight on account of the present small land values and the assessments would not be payable until the road was finally graded, which might be years. Fewer property owners would have to be dealt with and I believe waivers could be secured in the majority of cases." Such lines and grades having been established, not only would future buildings be constructed in a position which could be permanent, but the city could from time to time bring the road to its final grade as funds permitted or as there was a demand for earth for filling or for dumping spots to receive waste earth or ashes.

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 unusual facilities for furnishing the same, and will do so gladly
 and without cost.

JUNE 28, 1911

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Sanitation in the South

FIRE insurance companies have for many years united in carrying on investigations and performing missionary work looking to the reduction of fire risks throughout the country—this solely as a business precaution. A combination of life insurance companies to encourage sanitary conditions throughout the country would seem to be equally desirable from a business point of view; and such has been suggested by a representative of a Hartford life insurance company who has recently been investigating sanitary conditions in southern cities in behalf of that company. He visited thirty-two cities, mostly in the south and southwest, and carefully inspected them with reference to their water supply, sewerage, garbage disposal, food inspection, boards of health, climatic and topographical conditions and the sentiments of the people and officials in respect to municipal sanitation.

He reports in general that southern cities have made great progress during the past ten years and that they are now as a rule paying as much attention to the health of their citizens

and spending as much money in improvements affecting the general health as the cities of the north. Most of the cities have a fairly good water supply, and in many it could be called excellent. The same could be said concerning the sewage systems. There is one respect, however, in which great improvement is to be desired, and this must largely depend upon the creation of favorable public opinion. The extent to which city water is used by all the citizens varies from 20 per cent to nearly 90 per cent, probably 70 per cent being a high estimate of the average percentage of inhabitants of cities of 50,000 or over which use city water. The remaining 30 per cent obtain their water supply elsewhere, mainly from shallow wells, most of which are subject to pollution. The percentage of residences connected with the public sewers is even smaller, and is estimated by the investigator, Hiram J. Messenger, to approximate 60. In two of the cities boards of health have no authority to compel residents to connect houses with the sewer or with the city water mains, even when these are laid in the streets in front of the houses. Laws requiring this to be done have been opposed in some cities by builders and others who complained of the cost of making such connections where the houses have already been provided with wells and cess-pools. Here certainly is room for effective work by civic societies and others. The failure of families to make use of the purer city water and the public sewers is a matter of interest to all citizens, since the contamination from cess-pools is by no means confined to the dwellings or grounds of those using them, and an epidemic of typhoid or other sickness originating in a house using impure surface wells is almost certain to spread to families which have taken the precautions referred to.

Of all the cities visited Mr. Messenger reports Savannah, Ga., as being in every sanitary respect most commendable. Every house in the city, even the most wretched negro hovel, was connected with the city water supply; and every building, except in one small new section, was connected with the public sewers, these facts being learned by personal inspection and not merely from the report of city officials. The Health Department generally, including the bacteriological laboratory, was highly commended for its efficiency and thorough equipment.

It is indeed gratifying that a presumably unbiased expert should report so favorably concerning the precautions being taken by our southern municipalities to safeguard the health of their citizens of all classes.

Ontario Health Laws

THE chief health officer of Ontario, John W. McCullough, has issued a notice to the municipal authorities of that Province calling their attention to the fact that the law requires that the municipal council of any municipality undertaking the establishment of a system of water works or sewerage submit the plans and specifications thereof to the Provincial Board of Health for approval, such approval being necessary to the legality of by-laws for raising the money for carrying out the plans. In the case of a public water supply an analysis of the water is required, which will be furnished by the laboratory of the Provincial Board of Health, which furnishes sterilized bottles for taking the samples.

"Having in view the importance of preserving the pure character of the rivers, streams and lakes of the Province, the regulations of the board strictly provide that garbage, manure, excreta, vegetable or animal matter or filth should not be discharged into or allowed to pollute such waters."

Purchasing Coal by Specifications

THE School Board of Boston, Mass., has for some time been buying coal on specification, but not until recently had it taken any steps to determine whether it was receiving what it was paying for. A few weeks ago it began analyzing the coal delivered and discovered that it was below the stipulated quality. As the result of one analysis, costing \$10, a coal dealer was required to pay the city a rebate of \$873.01 for coal delivered.

STREET LIGHTING DATA

City	Date of Contract	Length of Contract	Approximate Number of Lamps Used.	Type of Lamp.	Wattage of Lamps.	Amperage of Lamps.	Lighting Schedule (Hours.)	Contract Price (per lamp per year.)	Remarks.
Akron, O.	1902	10 yrs.	400 Overhead	Magnetite...	320	4	abt. 2800	About \$80.00	Steam
Baltimore, Md.	Sept. 3, 1910	1 yr.	717 O.H. 457 U.G. 1012 O.H. 577 U.G. 520 O.H.	Enclosed arc. Magnetite... Incandescent.	520 320 60	6.6 4 4 + 6.6	4000	60.25 O.H. 75.00 U.G. 60.25 O.H. 75.00 U.G. 23.50 O.H. 48.50 U.G.	Steam and Wat'r Pow.
Boston, Mass.	May 5, 1909	5 yrs. (Allows 1 yr. renewals after 5 years.)	1200 100 500	Magnetite... Genl. Electric Gilbert.....	500 500 500	Av. c.p.800 Av.c.p.1600 6.6	3828	103.54 156.27 92.39	
Buffalo, N. Y.	Mch. 1, 1907	5 yrs.	3204 O.H. 568 U.G. 159 O.H. 78 O.H. 10 U.G.	Enclosed arc. Magnetite... Incandescent.	455-488 320 Cluster 5-60 ea.	6.6 4	3948½	56.00 O.H. 75.00 U.G. 56.00 37.50 O.H. 37.50 U.G.	Water power 22 miles distant
Canton, O.	Mch. 29, 1906	10 yrs.	791 O.H.	Open arc....	460	6.2	All night Moonlight	60.00 O.H. 64.00 U.G. 41.50 O.H. 44.00 U.G.	Steam power
Cleveland, O.	Jan. 1, 1911	1 yr.	1090 O.H. or U.G. 50 175 278 1178 400 60	A.B. Encl... A.B. Encl... Enclosed arc. A.B. Encl... Open arc.... Magnetite... Enclosed arc..	450 495 495 638 480 320 600	6.6 7 6.6 5.6 9.6 4 7.5	3760	53.88 53.88 53.88 53.88 53.88 53.88 53.88	
Covington, Ky.	Jan. 6, 1908	1 yr. (1 yr. renewals up to 5 yrs.)	729 125	Enclosed arc. Incandescent.		6.6 32 c.p.	4000	55.00 27.00	
Dayton, O.	1910	10 yrs.	Minimum 600	Enclosed arc. Incandescent.	462	6.6 60 c.p.	3830	66.00 24.00	
Denver, Col.	June, 1906	10 yrs.	1603 O.H. 252 O.H. 524 O.H. 765 O.H. 166 U.G. 112 O.H.	Open arc.... Enclosed arc. Magnetite... Incandescent. Ser.Tungsten. Enclosed arc..	450 350 320 200 75 450	9.6 6.5 4 50 c.p. 7.5 7.5	3800	60.00 60.00 60.00 28.00 28.00 60.00	Steam and water power
Detroit, Mich.			4565 in 1909	Magnetite... Enclosed arc..	320	4	3874	50.00	Municipal plant
Fort Wayne, Ind.	Aug. 29, 1908		500 O.H. 30 U.G. 50	Magnetite... Tungsten....	360 100	4	3500	53.00 O.H. & U.G. 15.00	Municipal plant
Hartford, Conn.	Apr. 1, 1909	5 yrs.	425 O.H. 156 U.G. 1522 O.H. 69 U.G.	Magnetite... Incandescent.	300 at arc 125	4	3960	60.00 O.H. 64.00 U.G. 17.00 O.H. 25.00 U.G.	Steam and water power
Indianapolis, Ind.			1875 O.H. 109 U.G. 391 O.H. 109 U.G. 200 O.H.	Open arc.... Enclosed arc. Incandescent.	450 500 75	9.6 9.6-6.6-5		70.30 O.H. & U.G. 70.30 O.H. & U.G. 35.00	Steam plant
Lexington, Ky.	Mch. 1, 1911	1 yr.	541 O.H. 35 O.H.	Magnetite... Incandescent.	495 50	6.6 116-volt multiple	All night	74.00 8.40	Steam plant
Lima, O.	Apr. 1909	10 yrs.	212	Magnetite....	320	4	All night	57.50	Lighting Co. made several concessions
Los Angeles, Cal.	Jan. 1, 1911	1 yr.	118 2902 62 765 91 28 671 posts, 5 lamps ea.	Enclosed arc. Enclosed arc. Magnetite... Tungsten.... Carbon inc. Carbon inc. Tungsten....	430 450 320 50 100 ea.	6.6 6.8 4 6.6 16 c.p. 32 c.p.	3000 3838 3838 3838 3000 3000.	60.00 75.60 75.60 7c per kw-hr. no lamp re 7.80 with lamp renewals 19.80 with lamp renewals 4c per kw-hr. no lamp re	Water power and steam auxiliary. renewals
Louisville, Ky.			2461	Magnetite....	520	6.6	4000	67.00	
Memphis, Tenn.	No Contract		1110 O.H. 82 U.G. 23 O.H.	Enclosed arc. Incandescent.	500 80	7.5 7.5	4000	75.00 O.H. & U.G. 27.00	
Milwaukee, Wis.	Dec. 5, 1905 No new contract	5 yrs.	1027 O.H. 1128 U.G.	Open arc.... Enclosed arc..	514.8 475.2	9.9 6.6	3813	65.00 O.H. & U.G. 65.00 O.H. & U.G.	Steam and water power
Minneapolis, Minn.	No contract		794 O.H. 16 U.G. 574 487 U.G.	Open arc.... Magnetite... Ornamental..	450-500 495 5-100 ea.	9.6 6.6	3760	70.00 O.H. & U.G. 70.00 O.H. & U.G. 72.00	Water power. New bid called for
Newark, N. J.	Sept. 1, 1908	4 yrs.	2369 O.H. 240 U.G. 172 124 U.G.	Enclosed arc. Incandescent. Flaming arc...	450 100 1300	7.5 7.5 16	4000	70.00 15.00 300.00	Steam power plant
New York, N. Y.	Jan. 1, 1911	1 yr.		Enclosed arc. Enclosed arc..	450 2 @ 250ea.	10	3950	95.00 130.00	
Pittsburg, Pa.	Feb. 1, 1911	1 yr.	3067 O.H. 363 U.G. 710 O.H. 217 U.G. 135	Enclosed arc. Magnetite... Incandescent.	100	4 & 6.6 6.6 & 7.5	3900	70.00 O.H. 90.00 U.G. 70.00 O.H. 90.00 U.G. 25.00	Steam power plant
Providence, R. I.	1892	20 yrs.	1519 O.H. 365 U.G. 27 U.G. 2404 O.H. 40 U.G.	Open arc.... Magnetite... Incandescent.	450 32 c.p.	9.6 10 5.5 & 9.6	4000	100.00 O.H. & U.G. 164.50 24.00 O.H. & U.G.	Steam power plant 5% franchise tax on gross receipts of company.
Reading, Pa.	Apr. 4, 1910	5 yrs.	774 O.H. 503 O.H.	Magnetite.... Tungsten....	320 75	4 5.5	All night	67.50 19.20	

STREET LIGHTING DATA—(Continued)

City.	Date of Contract.	Length of Contract	Approximate Number of Lamps Used.	Type of Lamp.	Wattage of Lamps.	Amperage of Lamps.	Lighting Schedule (Hours.)	Contract Price (per lamp per year.)	Remarks.
Rochester, N. Y.	July 1, 1907	5 yrs.	2678 O.H. 1218 U.G. 250 O.H. 50 U.G. 448 O.H. 117 U.G.	Enclosed arc. Magnetite . . . Mazda	450 280 60	7.5 4 7.5	4000	\$57.95 O.H. \$68.00 U.G. 57.95 O.H. 68.00 U.G. 19.34 O.H. 22.63 U.G.	Water power plant
Salt Lake City, Utah.	Jan. 1, 1911	3 yrs.	845	Magnetite . . .	320	4	All night	\$60.00	Water power
Seattle, Wash.			860 O.H. 5200 O.H. 800 posts	Enclosed arc. Incandescent. Tungsten Clusters	50 50 50	6.6 6.6 8 volts	4000	54.00 13.80 42.00 30.00 21.00	Water power
Springfield, Mass.	May 1, 1909	5 yrs.	715 O.H. 479 U.G. 185 O.H. 9 U.G.	Enclosed arc. Incandescent.	350 75	5 5	4000	71.50 O.H. 83.00 U.G. 15.00 O.H. 20.00 U.G.	Steam and water power
Springfield, O.	Dec., 1909	10 yrs.	420 O.H.	Open arc.	540	7.5	All night	68.00	Steam power
St. Louis, Mo.	Sept. 1, 1910	10 yrs.	1775 O.H. & U.G. 780 O.H. & U.G.	Magnetite . . . Incandescent.	480 100	6.8 1	4055	12.25 per 1000 hours 4.49 per 1000 hours	Steam power
Syracuse, N. Y.	July 1, 1907	5 yrs.	1503 O.H. 168 U.G.	Magnetite . . .	325	4	4000	68.00 O.H. & U.G.	Steam and water power
Toledo, O.	Oct. 12, 1906	10 yrs.	1375	Magnetite . . .	320	4	All night	45.00	
Worcester, Mass.	No contract		330 O.H. 550 U.G. 300 O.H.	Magnetite . . . Incandescent.	380 75	4	4000	91.25 O.H. & U.G. 23.50	One duct in all underground construction is reserved for use of city.
Zanesville, O.	Feb. 15, 1911	5 yrs.	350 45	Enclosed arc. Tungsten . . .	400 true 75	6.6	3830	57.00 23.00	Steam and water power
Cincinnati, O.	June 1, 1902	10 yrs.	5000 O.H. 1000 U.G.	Enclosed arc.	300	4	3914	60.00 O.H. 72.00 U.G.	
	June 1, 1912	10 yrs.	Ornamental posts with	Magnetite . . . Tungsten clusters Series Tungsten . . .	320 5 @ 60 ea. 80	4 110 volt 4	3914	50.00 O.H. 55.00 U.G. 56.00 per post per year 13.00 O.H.	4975 magnetite lamps, 800 clusters and 3000 tungstens used as a basis of comparing bids

O. H. = overhead. U. G. = underground.

STREET LIGHTING IN SEVERAL CITIES

In our issue of March 1 we published an abstract of a report upon street lighting by certain consulting engineers and citizen's organizations of Cincinnati, these reports having been made preliminary to the letting of new street lighting contracts by the city. Shortly after the publication of this article the advertisement for the contract was withdrawn and many of the suggestions contained in the reports abstracted were adopted in modifying the original provisions. Recently a contract has been awarded to the Union Gas & Electric Company, the prices being shown in the accompanying table.

While the study of the problem was being made an investigation was conducted by the Bureau of Municipal Research, blanks being sent to various cities in an effort to collect a considerable amount of information concerning existing conditions and prices. Through the courtesy of J. E. Barlow, of that Bureau, we are enabled to present herewith a tabulation of the information so obtained.

TRAFFIC ON FLEET STREET, LONDON

It has been customary for a number of years to take a census of the traffic for a single day upon some principal London thoroughfares. The same day of the month has been selected as nearly as possible from year to year, so that the enumeration might be made under approximately similar conditions.

One street chosen for the census is Fleet Street, a very important thoroughfare extending from one end of the Strand to Ludgate Circus. It is a convenient and direct route to the city proper, and is traversed by several lines of omnibuses. The

striking feature of the census on Fleet Street (and this would be true in greater or lesser measure of all the other London streets) during the past five years has been the rapid displacement of horse-drawn vehicles.

The traffic of Fleet Street was taken for 12 hours, from 8 a. m. to 8 p. m., on April 19, 1911, and compared to the same period and day in 1907. On April 23, 1907, 4,143 horse cabs and omnibuses passed along Fleet Street and only 1,043 motor cabs and motor omnibuses, while on April 19, 1911, there were 4,300 motor cabs and omnibuses against 486 horse cabs and omnibuses. On the day that the census was taken this year a strike was threatened by the taxicab drivers, so that the number of hansoms in use was in all probability much in excess of the daily average.

On the 1907 census day there were only 48 taxicabs, against 1,902 horse cabs, but on April 19, 1911 the number of horse cabs was reduced to 391 and the number of taxicabs increased to 1,616.

The 62 motor vans passing on Fleet Street on April 19, 1911, was an increase of 106.66 per cent over the number in use on the corresponding day in 1909 and nearly 38 per cent over the number on the April day selected for 1910. The increasing use of motor vans is urged in London because of the great delay that is now occasioned to motor traffic by the procession of heavy horse-drawn wide drays proceeding slowly along the principal business streets, many of which are very narrow and easily blocked.

The total motor traffic on Fleet street more than quadrupled in the four years. On the April day in 1907, 1,126 vehicles passed; in 1908, 2,073; in 1909, 2,302; in 1910, 3,884; and in 1911, 4,481.

NEWS OF THE MUNICIPALITIES

Current Subjects of General Interest, Under Consideration by City Councils and Department Heads—Streets, Water Works, Lighting and Sanitary Matters—Fire and Police Items—Government and Finance

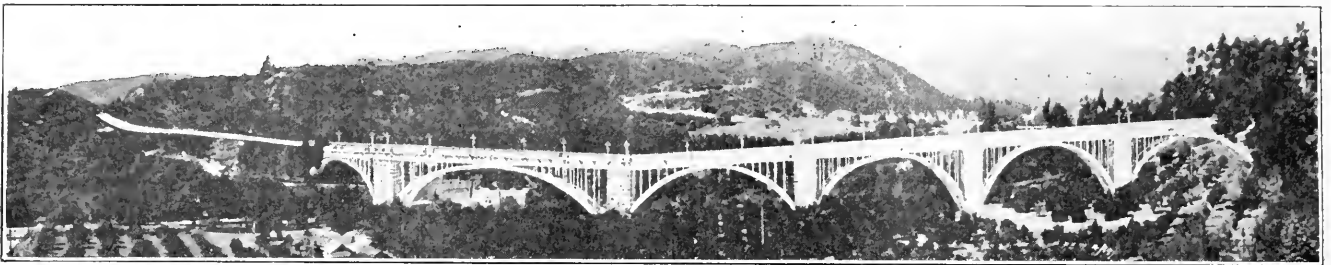
ROADS AND PAVEMENTS

Streets are Oiled on Both Sides at Once

Lexington, Ky.—The oiling of the city streets which was begun about 10 days ago has been pushed rapidly in spite of several days of unfavorable weather, and between 20 and 25 streets have been completed. About 60,000 gallons of oil have been spread to date, and the remainder of the amount contracted for—between 100,000 and 175,000 gallons—which was estimated to be sufficient to complete every street in the city, will be disposed of as fast as it arrives and the streets can be put in condition to receive it. The policy announced by Mayor Skain of oiling but one side of a street at a time has practically been abandoned. The residents of the first streets on which the proposed scheme of oiling but half the road at a time was tried objected to such an operation, and since then the oiling has been almost without exception on both sides of the street at once.

Council Refuses to Accept Street Work

Berkeley, Cal.—Following several protests from residents of South Berkeley, the Berkeley Council has instructed the City Clerk to notify the Southern Pacific Company that the character of rock being placed on California streets was unsatisfactory to the Council and the street would not be accepted. The adverse resolution followed a statement of the conditions on the new street, in which Commissioner Hoff requested the entire Council to visit the work and see for themselves its unsatisfactory character. Hoff was endorsed by Commissioner Norton, who declared that some of the rock had already been condemned by City Engineer Jessup, but that much of an inferior character was still being used. Norton declared that the Southern Pacific Company was as anxious as the city to have good work done, and after scoring the contractors in no uncertain language, he moved the resolution refusing to accept the street.



WEST COLORADO STREET BRIDGE, PASADENA, CAL. ABOUT TWO MONTHS AGO \$200,000 BONDS WERE VOTED FOR ITS CONSTRUCTION. IT MAY INCLUDE THE LONGEST REINFORCED CONCRETE ARCH IN THE UNITED STATES

Thirty-three Miles of Road Built in Three Hours

Trinidad, Col.—Five hundred men and boys with teams, plows, scrapers and graders buidit 33 miles of scenic roadway in three hours one day last week, between this city and Stonewall, a beautiful scenic resort west of this city, at the foot of Stonewall Mountain. The distance was divided into 40 sections and each portion built by 12 or more men and boys in charge of an experienced roadbuilder. Nearly 100 automobiles were used in transporting the workers to the different divisions, and the completion of the task was celebrated by a big open air dinner at Stonewall. Millionaires doffed their coats and worked by the side of scores of unemployed who were given this opportunity to earn a few dollars and a square meal, and 100 or more boys, among them the Boy Scouts of this city and Sopris, aided in the work by clearing the roadway of loose stones.

Safety Station in Street Requested

San Francisco, Cal.—The Board of Works has been asked by the Merchants' Association to provide for a safety station on the south side of Market street, opposite Lotta's Fountain, to accommodate people going to the ferries. It has been thoroughly demonstrated that these stations are no real obstruction to teams and that, on the contrary, they facilitate the passage of vehicles at congested points by requiring them to proceed in orderly lines. The number of people boarding cars there to go to the ferries is very large, particularly during the late afternoon and evening, and these people are subjected to danger from automobiles and passing vehicles, as they have no protection on the south side of the tracks while waiting for a car or boarding the same. The cost of these stations is very small and a greater number of people probably receive more benefit from them every day than from the same amount of money expended on any other improvement.

Supervising Engineer May Be Employed.

Lexington, Ky.—The Joint Improvement Committee was called together for the purpose of considering ways and means of having a supervising engineer appointed to act in conjunction with the City Engineer and his assistants in inspecting the new streets, especially those made of asphalt, which are to be constructed in the near future under contracts let a few days ago. There was not a quorum present at the meeting, but it was announced that in order to save further delay in getting committee action and to bring the question to something definite an ordinance would be prepared and presented at the next meeting of the Council, without any committee action whatsoever. This method of inspection of streets is largely followed elsewhere, especially in the larger cities, and seems to work well, relieving the local Engineering Department of much of the tedious routine work of inspection, such as examining the sand, cement, asphalt and the mixtures of the various ingredients which go into the finished streets.

Disfiguring of Streets to Stop

San Francisco, Cal.—The movement inaugurated in 1908 by the Mission Promotion Association against the disfigurement of the streets in the Mission has been revived, and the assistance of the improvement bodies of the district secured in placing that part of the city in a presentable condition during the next four years. Overhead wires on Valencia and Mission streets, as far southerly as Army street, have been removed during the present year, after strenuous efforts by the Committee on Laws, Ordinances and Charter Amendments, which was appointed by the Association to draft an ordinance requiring the public service corporations gradually to eliminate their poles and wires in the Mission, as well as in other sections of the city. As a consequence of the enforcement of this ordinance the appearance of the Mission streets has been greatly improved.

SEWERAGE AND SANITATION

Easton Makes Semi-Holiday of Big Improvement

Easton, Md.—Business was practically suspended here the day the town started its \$110,000 improvements by breaking ground for its new sewer system. Mayor Higgins lifted the first clod, in the presence of a vast crowd, while speeches were made by prominent citizens.

Sanitary Drinking Fountains Installed

Youngstown, O.—It is pleasing to note the installation of sanitary drinking fountains in different parts of the city, a measure that has been all too long neglected. The sanitary water fountain, which does away with the germ laden drinking cup, is a mark of progress. The dangers of the public drinking utensil have long been apparent, yet the public has been slow to listen to the warning of science against its use. Youngstown now has three fountains of the kind mentioned and they have been made possible by public spirited citizens or organizations who have done the city a great service by installing them. Such an example should be followed by other like gifts, for which there is much room and of which there is a great and growing need.

Board of Health Orders Clean-up

South Bend, Ind.—South Bend is to undergo a renovation, according to a notice issued by the Board of Health. With the hot days the danger of disease from accumulated garbage and rubbish is greatly increased, and the Board intends to strike at the root of the greater amount of sickness by preventing it altogether. The order calls for the sending of all table refuse, decayed meats and fish and dead animals to the city crematory. Ashes and other rubbish may be dumped in the city dumps at the foot of the Sample street bridge or in Leeper Park dump. Private dumps are permitted where the refuse is kept covered, but garbage, dead animals and decayed fish and meat cannot be so dumped but must be sent to the crematory. Officers of the Health Board state that it is the intention to enforce the law and prosecution will follow failure to observe it.

Authorities Order Open Wells Filled Up.

Chattanooga, Tenn.—The city health authorities are now beginning a campaign against the open well, to the end of having every one of them filled up. It will prove surprising to everybody to learn that there are probably 120 open wells now in the city from which the people are using water. In the opinion of Commissioner Evans, an opinion that will be shared by every citizen who is posted in matters of sanitation, there is no one thing more dangerous to the health of the city than the practice of drinking water from an open well. Aside from the fact that the city has outgrown the day of wells, it is a scientific truth that pure water can hardly exist in a well in a city the size of Chattanooga. There will be no delay in removing the menace of the wells. Within 48 hours from the receipt of the instructions by the Chief of Police it is expected that there will not be an open well within the corporate limits.

Plan Campaign to Prevent Disease

Dallas, Tex.—Dallas is to have an educational course in sanitary and clinic measures proper for preventing the spread of contagious or infectious diseases. This much seems assured from a joint meeting of the Board of Health, the Board of Municipal Commissioners, the Red Cross, the United Charities and other organizations. Following reports from the sanitary inspectors concerning conditions in the city, and statements from physicians about conditions in the schools and measures needed to improve the general health of the children, there was discussion of plans and a committee was appointed to prepare for a general mass meeting to be held at some early time before the opening of the city schools for the work of a new year. The purposes of the mass meeting will be to deliberate upon measures for securing nurses and physicians for inspection work in the city schools, the need for the new city hospital and more adequate facilities for handling the tuberculosis troubles in or out of the schools, and the bettering of sanitary conditions.

WATER SUPPLY

Town Aims to Condemn Water Works System

Pasco, Wash.—The City Council has passed an ordinance to third reading, providing for the purchase of the city water works from the Pacific Power and Light Company by condemnation proceedings. The Council wants to push the matter through, acquire the plant by eminent domain proceedings, and bring it up to a high state of efficiency, as it is now inadequate for the city's needs.

Filtration Plant Nearing Completion

Rensselaer, N. Y.—The extensive improvements under way at the filtration plant of the Rensselaer Water Company are progressing and will probably be completed early in the fall. The improvements include a one-story brick building which will be equipped with a new filter. The additional facilities will provide for the filtering of 1,000,000 gallons of water in 24 hours. When the improvements are completed, Rensselaer will have one of the best filtration plants in the country.

New City Water Found Pure

St. Paul, Minn.—Water from the new wells at McCarron Lake, which was turned into the city supply last week, has been analyzed by the Bacteriological Department of the Health Department and found to be an ideal drinking water. Report on the analysis is that from both the chemical and bacteriological standpoints the water is good. Water Board members say St. Paul's reputation for supplying pure water will remain unchanged by reason of new sources of supply.

Pure Water Furnished Citizens of Knoxville

Knoxville, Tenn.—The fact that Knoxville is furnishing its citizens the purest of water is proven by the analysis of the water, according to reports on file in the office of the Knoxville Water Commission, showing the true condition of the water each day in the year except Sunday. These reports and examinations are made by Dr. William R. Cochrane, secretary of the City Board of Health. The reports are open for inspection and so is the entire plant. For the past few weeks local physicians have been advising their patients to boil the water, and this advice, and the story of a break in a sewer, have caused untold rumors to spread all over the city, until it has driven some people to the point of using well water, spring water from White Spring, and other springs near the city which may perhaps cause sickness.

Peril in Leaky Reservoir

Pittsburg, Pa.—One of the city's large reservoirs in Highland Park, having a capacity of 120,000,000 gallons a day, has been condemned following an inspection by the members of Pittsburg's new Council, Mayor William A. Magee and Joseph T. Armstrong, director of public works. Each of the officials expressed surprise that a bad accident had not occurred, and Director Armstrong said: "Acceptance of such a piece of work by the city, to be paid for out of tax money to the people, was a crime." The reservoir was completed a number of years ago at a cost of over \$500,000. Great holes and cracks line the entire basin, and close to \$200,000 will be necessary, experts say, to repair and make it safe. Meanwhile, the reservoir will be abandoned.

To Insure Purity of the Water

Portland, Me.—The trustees of the Portland Water District have filed with the register of deeds and County commissioners papers in initial proceedings pertaining to the taking by right of eminent domain of land at Sebago Lake, in the vicinity of the intake, on both side of it, sufficient to fully protect the interests of the district for years to come. The property taken extends from the location of the Mountain Division of the Maine Central Railroad to Chadbourne's Landing. Papers are in preparation providing for the taking additional land extending a half mile along the shore of the lake, so as to make altogether a stretch of about a mile and a half, on both sides of the intake. The object of this is to insure the purity of the water for the consumers of the district.

Water Meters Save Money

Spokane, Wash.—A record in water meter installation has been made by Commissioner of Public Utilities C. M. Fassett. A report from the construction department before him last week shows that 630 meters were installed voluntarily by property owners at their own expense between January 1 and June 1. This is an average of 116 a month, breaking all records. The rate of installation is increasing, the report showing that so far this month 140 meters were installed by request of water consumers. The rush for water meters is caused by the spreading conviction among the consumers that buying water that way is the most economical way.

Steps Taken to Avoid Water Shortage

Tacoma, Wash.—Seeking to avert a serious water shortage, Commissioner B. J. Weeks, of the Department of Light and Water, has issued a warning to all patrons of the city system to use extreme care to prevent any unnecessary waste. Special night and day inspectors will patrol all districts where sprinkling is done and any violations of the old sprinkling ordinance or any of the regulations of the department will be penalized. Automatic sprinklers will not be tolerated; the hose must be held in the hand when sprinkling and, as in the past, extra charges for sprinkling will be levied during June, July and August.

Municipal Water Plant Nearly Completed

Gadsden, Ala.—The great pressure pumps are being placed in the municipal waterworks plant and it will require something like three or four weeks to complete the work. All operations around the plant are progressing very satisfactorily and the plant will be completed by or before August 1. It is expected that the new pumps will be put in operation within the next two or three weeks, but they will be run for some time, in order to get all the adjustments perfect, before turning them over to the city. The pumps are high duty cross compound, fly wheel extended type pumps, with a capacity of 3,000,000 gallons each 24 hours. Not all this water will be required for the present and the plant will be able to furnish the city with water after the population is more than doubled.

Officials Inspect Watershed

Rochester, N. Y.—An inspection of Hemlock and Canadice Lakes was made last week by Mayor H. H. Edgerton, Commissioner of Public Works F. T. Elwood, City Engineer E. A. Fisher and reporters representing each of the daily newspapers of the city. The feature of the trip was the declaration of the Mayor that a third conduit is soon to be laid from Hemlock to the city. There are now two conduits from the lake to the city. The third conduit will be a positive assurance that the city will never have its water supply cut off, and will provide a greater pipeage from the source of supply to the center of consumption. The capacity of the present conduits is now taxed in supplying the demand for water.

City Water Found Free from Contamination

Columbia, S. C.—The report on the Columbia Waterworks Department, submitted by Mr. William A. Boyd, city health officer, is of particular interest in view of the fact that Columbia was recently the scene of the meeting of the State Waterworks Association. It embodies the report of the bacteriologist in charge of the department who makes daily examinations of the water and who pronounces it absolutely pure. Dr. Boyd brings out the fact that both by nature and by treatment the city water is peculiarly free from contamination, either bacterial or chemical. The water supply is obtained from the Saluda River, which runs for miles over a sandy and rocky bed, with many bends, thus facilitating the natural sedimentation and purifying of its waters. The water is pumped from the Saluda River into a large settling basin, which holds a supply sufficient for two weeks' ordinary use; so that that the water undergoes a settling process of at least one week. Recent researches have shown that the simple storage of water will purify it. From the settling basin the water is delivered to the coagulating basin, where it is treated with aluminum sulphate (filter alum), two grains being used to the gallon of water.

STREET LIGHTING AND POWER

New Street Lighting System Being Put In

Eric, Pa.—New street lighting system is being installed in this city by the Cleveland Street Lighting Company for the Eric Gas Company's lights. Old globes are changed for new ones, and new burners are being replaced. These are fitted with automatic lighters, and it is expected that the new system will afford 100 per cent more illumination. Colored globes will be placed near fire alarm and police patrol boxes. Colors red and green will be used, red for the fire alarm boxes and green for the police patrol boxes.

Public Service Company Ready to Remove Wires

Hoboken, N. J.—As a result of action by the Public Service Electric Company in writing to the Hoboken Street Commissioner on the proposition to remove overhead wires, there now seems to be a chance of the electric light wires coming down on several streets at least. The Public Service Electric Company is ready to proceed with the work of constructing subways and underground conduits for a system of underground distribution and is ready to commence work promptly. It will take about three months to complete the laying of the ducts and the construction of the manholes. The company, of course, will protect its openings and assume all responsibility of damage occurring from the prosecution of the work.

City Demands Lower Rates From Gas Company

Baltimore, Md.—Unless the Consolidated Gas, Electric Light & Power Company elects to reduce its rates for gas and electricity by July 15 the city will make application to the Public Service Commission for a thorough investigation of the company's business. This decision was reached by Mayor Preston at a conference with City Solicitor Edgar Allan Poe. The conference followed a meeting of members of the Public Service Commission and Mr. Poe. The company will be advised immediately by Mr. Poe of the city's intentions. Although the city's future course with respect to the matter will be based on the company's willingness or unwillingness to make reasonable reductions in its rates, the conference between the Mayor and the City Solicitor did not reach any definite conclusion as to what would be considered "reasonable" in the way of a reduction. It is believed that the city officials have in mind a reduction in gas rates from 90 cents per 1,000 cubic feet to at least 85 cents, and perhaps 80 cents, and a general revision of the electric rates for industrial use. The decision of the Mayor to give the company until July 15 to make reductions is the first definite step taken toward a solution of the rate question. For more than a year the matter has hung fire, while the city, though employing experts for the purpose, has accomplished nothing in the way of bringing the case to a head.

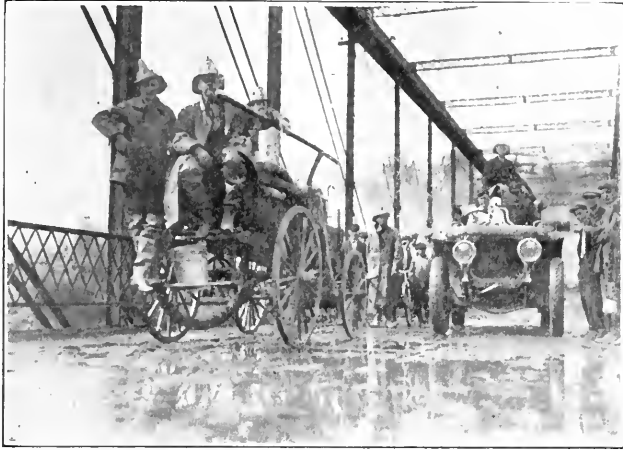
Municipal Lighting in Lansing

Lansing, Mich.—The annual report of the City Water and Electric Light Board of Lansing is a very satisfactory document to the taxpayers of that city. The two systems are conservatively valued at \$800,000 after depreciation is allowed for. In 1885 the city issued \$125,000 in bonds to buy the waterworks and in 1892 issued \$60,000 in bonds to buy the electric lighting system. Of these bonds \$75,000 has been paid. The annual report shows that for the fiscal year ending May 31, the electric light plant earned \$117,926, an excess of \$55,079 over the operating expenses of \$62,846. There is \$13,318 in cash in the treasury and the waterworks fund has been loaned \$19,183. During the year \$12,000 has been paid for a new turbine engine, \$8,216 for new boilers and \$7,500 for a new generator, showing that the board is keeping the plant in first-class condition. The earned receipts for the fiscal year of the waterworks system were \$75,710. The total payment for operating expenses was \$28,086. During the year there has been expended for construction, extension of mains and new wells \$45,793, the board having devoted the year to extensions which the growth of the city made necessary, but it is to be noted that there is an excess of \$47,623 in earnings over the operating expenses, which shows that the plant is capable of providing funds with which to make these extensions. Municipal ownership of both these utilities, but especially of the lighting plant, has been a conspicuous success.

FIRE AND POLICE

Ancient and Modern Fire Apparatus Used Side by Side

Lowellville, Ohio.—Lowellville was all but wiped out one night last week when a fire swept an entire block. Dynamiting, the services of the Youngstown Fire Department, added to that of the volunteer department of Lowellville, saved the day. The flames, when they were stopped, were sweeping along the river carrying everything before them, and Lowellville on that side of the river seemed doomed. It was only by the heroic efforts of the volunteer firemen that the flames were stayed until help could be secured from Youngstown and its department. A small Howe en-



Courtesy Youngstown Telegram

ANCIENT AND MODERN FIRE APPARATUS USED AT LOWELLVILLE FIRE

gine hand pump and a bucket brigade was the only protection against fire. The pump had not been used for some time and neither had it been inspected. It failed to respond readily, and but for the arrival of the Youngstown Fire Department's auto truck little would have remained of the section of Lowellville lying south of the Mahoning River. The sight of the ancient and modern fire apparatus working side by side attracted a great deal of attention.

New Police Patrol System

New York, N. Y.—Police Commissioner Waldo has announced that the plan of placing policemen on stationary posts where they might be found at any hour of the night would be tried in one of the inspection districts. It is the belief of Commissioner Waldo that a stationary policeman will prove of greater benefit to the city than two policemen covering posts which may take them through half a dozen side streets and into one or more avenues. By the plan proposed by Commissioner Waldo there will be a policeman within two blocks anywhere in the Third Inspection District. These policemen will remain on post for four hours, when they will be relieved for the next four hours.

Auto Fire Engine Arrives

Long Beach, Cal.—Information has been received by Fire Chief Shrewsbury that the \$8,500 fire automobile pumping engine, which the city ordered some time ago, has arrived from St. Louis. This will be the only engine of its kind on the Coast. The fire department will give a public test, at which the fire chiefs of Southern California will be in attendance.

Improving Fire Alarm Service

San Francisco, Cal.—An improved method of increasing the prominence of the locations of fire alarm boxes throughout San Francisco is being effected by the Department of Electricity. Globes painted red are being placed on electric arc lights, and will be lighted during all hours of the night and early morning. The same result during the day has been secured by carrying the bright color of the alarm box itself entirely around the pole supporting the alarm box. The Department of Electricity announces that 50 of the latest style fire alarm boxes have been received and will shortly be placed in commission.

Auto Engine Proves Superior to Steam Fire Engine

St. Louis, Mo.—A fire, June 16, fanned by high winds, destroyed eight acres of factories, warehouses and lumber yards and caused a million dollars damage. A general alarm summoned all available fire fighting apparatus in the city to the scene. Two motor engines of the new type were put in operation and did remarkably effective work. The test was the longest and most severe to which the automobile engines have been subjected in St. Louis. One engine, directed by A. C. Webb, the former automobile racing driver, who is head of the company that constructed it, ran eight and one-half hours without a stop. It furnished two streams that were declared by firemen to be superior to any thrown by the steam engines at the fire. This one engine consumed 40 gallons of gasoline as fuel during the run and kept the two streams at a constant pressure of



LUMBER YARD FIRE, ST. LOUIS, MO.

150 pounds to the square inch. Chief Swingley was enthusiastic over the effective work of the new engines.

GOVERNMENT AND FINANCE

Aldermen Vote an Increase in Taxation

Burlington, Vt.—The Board of Aldermen in special session has voted a tax rate of \$1.75 for 1911, and passed the tax budget, calling for the estimated expenditure of \$344,247.05. The tax rate is five cents more than last year and the reason therefor is an attempt to reduce as much as possible the city's floating indebtedness.

City Comptroller Files Report

Tacoma, Wash.—According to the monthly report of City Comptroller J. F. Meads, filed with the Municipal Commission, it cost the city nearly \$195,000 to operate various departments in May. This brings the total expenses for the first five months of the year up to almost \$500,000. The estimates for the year were \$905,521.40. Expenses of various departments for the month were: Health and sanitation, \$2,864.80; finance, \$9,889.48; public safety, \$24,252.66; public works, \$23,308.92; water, \$117,362.23; light, \$85,570.56. Light receipts for May were \$105,668.08, while water receipts were \$83,932.60. The actual cash balance on hand as shown by the controller's books on June 1 was \$3,192,792.22.

Spokane Spends Vast Sum

Spokane, Wash.—More than \$17,500,000 will be expended on municipal and railroad work and building operations in Spokane this year, and of this amount the city's share is approximately \$6,000,000. The Chicago, Milwaukee & Puget Sound, the Northern Pacific and the third division of the Oregon-Washington Railroad & Navigation Companies have plans for work costing \$6,500,000 and architects and contractors estimate that fully \$5,000,000 will be invested in new buildings before the close of the year. Municipal work in progress or confirmed amounts to \$1,721,280 to date, and in addition there is \$3,936,280 for bridges and buildings, as follows: City Hall, \$665,000; South Central high school, \$450,000; Monroe street bridge, \$450,000; Latha bridge, \$245,000; reservoir, \$150,000; fire stations, \$40,000; isolation hospital \$25,000.

Mayor Ordered by Court to Call Special Election

Walla Walla, Wash.—Mandamus ordering Mayor Eugene Tausick to call an election to submit the commission form of government under the Allen law, to the people of Walla Walla has been granted by Judge Brents of the Superior Court. The decision was accompanied by the expression that the case would be carried to the Supreme Court in any event; and that had he the final decision, he would declare the law unconstitutional.

Commission Government for Trenton

Trenton, N. J.—Trenton has adopted the commission form of government, abolishing the offices of Mayor and Common Council and placing the whole of the government of the city, with the exception of the public schools, in the hands of five Commissioners to be elected within the next two months. Because of a campaign unequalled in recent years for bitterness, an unusually large vote was polled, and interest in the contest continued unabated until the result of the contest was announced. The vote as recorded was 6,792 for and 4,890 against. Only four of the fourteen wards of the city voted against the plan. Party lines were completely broken. The next move will be to nominate and elect the Commissioners and then the new form of government will be put into effect.

Small Council Takes Place of Large

Scranton, Pa.—Scranton's Council of five members was inducted to office one day last week and in a few minutes the legislative branch of this government changed from the old order of 62 members in two branches of council to one body of five members. P. P. Jordan, former selectman from the Eighth Ward, was elected president of the body, the salary was fixed at the minimum figure, \$2,000 a year for each councilman, and a fine of \$5 provided for to be imposed on members who miss regular or special meetings of Council or committee sessions. The act of assembly creating the Council of five fixed the maximum salary of councilmen at \$6,500 a year and the minimum salary at \$2,000 a year. The Council was given the power to fix the salary between these figures. The salary was fixed at \$2,000 which will remain during the term of office, the act providing that the salary cannot be raised during the tenure of office.

City Run by Manager

Staunton, Va.—From Virginia comes the novelty of municipal government administered by a general manager whose prototype is to be found in every large corporation. This scheme is a modification of the commission form of government. Three years of experimentation have been satisfactory to Staunton, with a population in excess of 12,000, and one of the most enterprising communities in Virginia. When, in March, 1908, it was decided to give the general manager a chance, it was argued that councilmen, having their private affairs, could not reasonably be expected to give their time and service gratuitously to the community. This, it was pointed out, led naturally to indifference and to the administration of affairs by a select few or by contractors interested in public work. Under the new plan it is reported that this system of favoritism is a thing of the past. The constitution of Virginia requires cities to maintain their Mayor and Council and in cities of the first class, those having a population of 10,000 or more, two branches of the Council are required. Therefore, Staunton was unable to abolish the Council and adopt a commission form of government. However, as the provisions of the code permit the Council to establish such offices as may be necessary to conduct properly the city's affairs, the idea of a general manager was conceived. The general manager devotes his entire time to the duties of his office and has entire charge and control of all the executive work of the city in its various departments, and entire charge and control of the heads of departments and employees of the city. He makes all contracts for labor and supplies and in general performs all of the administrative executive work usually performed by the several standing committees of the Councils, except the Finance, Ordinance and Auditing Committees.

STREET CLEANING AND REFUSE DISPOSAL

City to Collect Garbage at Night

Trenton, N. J.—Council's Police Committee has concluded to try out the plan of collecting garbage and ashes at night. This subject has long been agitated in Trenton, but there was always the objection that conditions were different here and that the city could not be compared with those municipalities in which such innovations had been successfully undertaken. Now, however, the conclusion has been reached that the time is ripe for night collections and they will begin next week. It is proposed to continue the plan through the summer, at least.

Street Department Adds New Equipment

Lexington, Ky.—Recently the Lexington Street Cleaning Department has taken on an aspect characteristic of the larger cities and lately, when several little push carts in which to sweep the trash were added to the equipment of the white garbed street sweepers, pedestrians smiled pleasantly at the city-like scene they presented. Several street sweepers have been put in the business district to keep the streets swept clean during the day, while the sweeping machines continue to clean up in general during the night.

Garbage Company to Have Competition

Akron, O.—Akron is likely to have competition in the garbage collection business as a result of the big increase in prices that has been exacted from the public by the Akron Garbage Co. in the past few seasons. The rate which Akron people must pay this year for garbage collection service is 20 cents a week. Not long ago the rate was 10 cents a week, showing an increase of 100 per cent in a comparatively short time. In many cities where garbage disposal has been systematized the garbage itself pays for the service of taking it away, and there are many private individuals glad to take away garbage for the privilege of disposing of it. A number of Akron citizens are now studying the Akron situation and believe they could easily get most of the local garbage business at the rate formerly charged Akron people and get a good profit out of the business. It is probable that a company will be organized.

Protest Against Collection of Garbage without License

Long Branch, N. J.—The collection of garbage by outside parties has caused a protest to be made by the Sea Board Utilization Company, which has the city garbage contract. Complaints have reached E. E. Taber, sanitary inspector, and at a recent meeting of the Board of Health Inspector Taber had a number of garbage collectors before the Board. David Groves, who represents the Utilization Company, was present to interpose his objection, calling attention to the fact that although his company was authorized to collect the city's garbage, people from Eatontown and other nearby places were removing garbage from the city limits without paying a license or complying with any of the health ordinances. A number of those who have been operating without a license were notified by Inspector Taber to cease operations until the Health Board could decide the matter. A special meeting will be held for the purpose.

City Will Improve Reduction Plant

Ft. Wayne, Ind.—The board of public works have investigated conditions and have found that it costs the city considerably less than \$1 to reduce one ton of garbage, instead of the \$1.60, claimed by the health department to be the expense. At that, though, according to the board members, the plant is far from an up-to-the-minute institution, and some effort will be made within the next few months to correct this condition. A drying room at the plant, it is claimed, would solve the question, at least temporarily, by expediting the incineration of the garbage, as well as reducing the cost by at least half.

Considering Purchase of Auto Truck for Garbage

Toledo, O.—It has been suggested to the public improvement committee to buy an automobile truck for the purpose of transporting the garbage to the plant and the committee likes the idea, but referred the matter to Service Director Cowell for his approval. A truck holding ten tons can be secured for \$5,500 and will make six miles an hour when loaded and ten miles an hour when empty.

RAPID TRANSIT

Electric Power for Mountain Incline Road

Chattanooga, Tenn.—As soon as quick work can turn out the motors and other machinery necessary and the same can be shipped to Chattanooga, the Lookout Mountain incline cars will be hoisted by electric equipment and the old cable system will be discarded. The new cars are already on the ground, ready for installation into service. They are larger than the old and handsomer. Freight will be carried inside the cars instead of upon a platform on the outside, as the old arrangement has been. There will be two motors, each of them of 200-hp. capacity, and each able to alone handle the average load up the mountain. There will be the best of safety appliances that mechanical skill can contrive and the schedules will be much reduced when the new cars are put into operation. Possibly the arrangement that will appeal to the mountain people as the most beneficial to them will be the final plan of handling freight to the top of the mountain. As soon as the new machinery is installed on the passenger incline the company will begin operations to install the old machinery on the old incline and freight will then be handled to the mountain top in carload lots, and naturally at greatly reduced rates. The company has summer rates now in effect on the incline, and the usual heavy traffic of the heated term is being handled.

Plan Big Extensions of Street Car Lines

Salt Lake, Utah.—The Utah Light & Railway Company is preparing to spend many thousands of dollars in improvements and extensions during the year commencing July 1. The fiscal year for Harriman properties runs from July 1 to July 1, and there is an inflexible rule that appropriations made for one year cannot be drawn upon until that year commences. Just now the street railway company is engaged in extending the West Temple street line two blocks south from Tenth to Twelfth South streets, and repairs are being made on South Main street, between Second and Third South streets, where a crossover has been taken out to make the track smoother. The old 72-pound rails on First and Second South streets, between State and West Temple streets, are to be replaced with 80-pound rails on new ties laid in a bed of concrete. The cobblestones between the rails are to be replaced with asphalt. The work is already in progress on West Second South street and the surveys have been made for the First South improvements. The old rails were put down fifteen years ago and are considerably worn. After July 1 the East Second South or Mt. Olivet line is to be extended six blocks from the present terminus. This will afford street car service to the high school and Judge Mercy Hospital, which is now two blocks from a car line. The proposed Halliday extension of the Sugar House line will be five miles long. It will run out the county road, south, through Highland Park. The company has until September, 1912, to complete this line and Manager Wells does not know yet whether the road will be built this year or next. A branch will likely be run south through the center of Highland Park when that section is built up next year. An extension of one of the south end lines to the proposed new Country Club's golf links in the foothills near Fort Douglas is also contemplated for next year.

City Awarded \$51,612

Boston, Mass.—In a suit brought by the city of Boston to recover the cost of installing elevators and machinery in the Atlantic avenue station of the East Boston tunnel, Judge Fessenden made a finding of \$51,612 in favor of the former. The Elevated claimed that the Transit Commission should pay for the elevators and machinery inasmuch as that body was required to erect the stations and approaches. The road claimed that the elevators were approaches. The city claimed further that the elevators were means of communication between the tunnel and the street and the elevated level, for which the company was liable. This suit grew out of the wish to avoid delay in opening the tunnel and the Transit Commission agreed to pay for the installation of the elevators, if the company would leave the liability to a court decision.

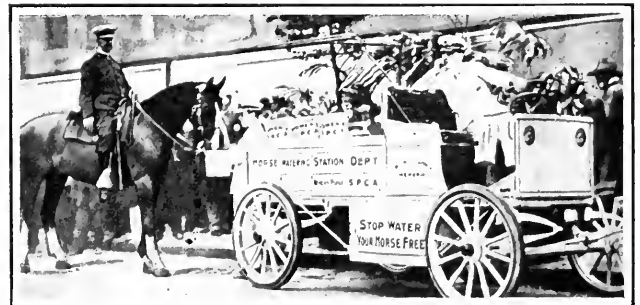
MISCELLANEOUS

Red Light Is Auto Insurance

Chicago, Ill.—Street cleaners on Michigan boulevard have adopted a new method of keeping out of the path frequented by automobiles at night. They have a miniature electric light globe pushed through the top of their hats, with a battery in their pockets and wires connected through the hat. The globe is red. The City Department, as well as the hotels and clubs along the boulevard, insist on cleaners working on the street all evening, and several have been struck and seriously hurt by machines. At first they had just common white lights on their hats, but drivers took them for cigarettes.

Water in Auto Tanks Is Carried to Horses

Philadelphia, Pa.—Thirty drinking stations for horses have already been opened by the Women's Society for the Prevention of Cruelty to Animals, the inauguration of the summer relief work being marked by ceremonies at Broad and Arch streets. The relief station at that point was dedicated to Archbishop Ryan. The ceremonies also marked



Courtesy North American, Philadelphia, Pa.

AUTOMOBILE SERVICE FOR WATERING HORSES

the establishment of an automobile service for furnishing water to horses on Market street. Owing to the heavy traffic, both on the street and on the sidewalks, it has been deemed inadvisable to place watering troughs on Market street. The society therefore has inaugurated the automobile tank wagon service to give relief to the horses. Buckets are carried on the tank for watering horses at any point on the street.

New Soil for Central Park

New York, N. Y.—Central Park soil is to be improved at once. At the request of Park Commissioner Stover and after hearing a report on the condition of the soil, the Board of Aldermen authorized the issue of \$150,000 in corporate stock for the adoption of the recommendations contained in the report. As it will take time to carry out these recommendations, the Board decided to appropriate \$50,000 immediately for the work, and to apportion the remaining \$100,000 for next year and the year after. The new treatment will consist in part of plowing up the open spaces and wornout sections, particularly, and sowing them in clover and other grasses, to form a heavy turf, which will hold moisture.

Park Addition To Be Donated

Youngstown, O.—Through a donation of land, which will be made at an early date by Horace Williamson and B. M. Campbell, the city of Youngstown will come into possession of about 15 acres of land adjoining South Side Park. The land in question will make an excellent addition to the South Side Park, inasmuch as the greater part of it is covered with large trees, which will tend to make up for the inadequate shade the park now affords. With this addition, the park will comprise about 22 acres and can be converted into an ideal pleasure spot. The Park Commission has been desirous of procuring this portion of the realty company's land for some time, but owing to the figure at which it was held it was thought that the city could better do without for the time. The name of Williamson Park will be suggested to the Park Commission as a courtesy to Horace Williamson, who will be one of the donors of the land. Mr. Williamson has also done much toward advancing the civic conditions of that section of the city.

LEGAL NEWS

A Summary and Notes of Recent Decisions—Rulings of Interest to Municipalities

Disposal of Refuse—Contracts

City of New York vs. Paoli et al.—A contract by the Street Cleaning Department of New York City selling the privilege of picking over refuse at the city dumps is a valid exercise of power.—Court of Appeals of New York, 94 N. E. R., 1077.

Regulating Working Hours of Municipal Employees

In re Opinion of Justices.—The Legislature may, subject to constitutional limitations, control the counties, cities and towns of the State, and direct the method by which they shall conduct their public business, and it may restrict employees on public works to eight hours per day. Supreme Judicial Court of Massachusetts, 94 N. E. R., 1044.

Defects in Alley—Liability

Dallas vs. City of Concordia.—A city which knowingly permits a deep cellarway to remain open and unguarded in a public alley, a few feet from a principal street, is responsible in damages to one who in the darkness of night and without negligence falls therein.—Supreme Court of Kansas, 115 P. R., 558.

Personal Injuries—Obstructions—Cellarways

City of Lewiston vs. Isaman.—The provisions of the city charter expressly authorized the construction of cellarways and the placing of doors thereover, and it is the duty of the city to keep such doors, which are a part of the sidewalk, in repair, if the owner fails to do so, and assess the expense thereof to the abutting lot. The obligation and duty to keep the streets and sidewalks in a safe condition is placed by the provisions of its charter upon the city, and the city has been provided by said charter with authority and power to discharge such duty, and, in case it fails to perform such duty, the city is made expressly liable, under the provisions of the charter, for any damage to person or property.—Supreme Court of Idaho, 115 P. R., 494.

Sewer Assessments—Ordinances

Kirkpatrick vs. City of Dallas.—An ordinance providing that the cost of sewers shall be assessed to the property abutting on the streets where the same are laid and benefited thereby does not, at least clearly, indicate exercise of the power, under the city's charter, optional with the Council, to assess property adjacent to, as well as that abutting on, the streets in which a sewer is laid.—Supreme Court of Oregon, 115 P. R., 424.

Dedication of Streets—Acceptance

Wade vs. Town of Cornelia.—Where the owner of an acre of land located in a municipality subdivides the same into lots and streets, and dedicates the streets to public use, and the municipality accepts the dedication by working the streets and otherwise exercising control over them, the municipality acquires, for the benefit of the public, an easement in the use of the streets.—Supreme Court of Georgia, 70 S. E. R., 880.

Sewer District—Sufficiency of Ordinance

Williams vs. City of Caldwell.—Where a city ordinance declaring the intention of the Council to organize a sewer district and construct a sewer system states that "the character of the proposed lateral system shall be that of gravity and according to the plans and specifications now on file in the office of the city engineer," it is a sufficient compliance with the terms of subdivision 3, section 2353, Rev. Codes, which requires that the ordinance of intention shall state the "general character of the proposed sewerage system and sewerage disposal works." In such case the reference to the plans and specifications is sufficient to give notice to all parties interested of the general character of the proposed works.—Supreme Court of Idaho, 114 P. R., 519.

Grading Street—Injury to Building

Meyer et ux. vs. City of Rosedale et al. The measure of damages for injuries done to a building may differ according to the facts in each case. Under the evidence in this case the rule prescribed by the court that the amount of damage, if any, should be the cost of restoring the building to the same condition in which it was before the injury occurred is the correct rule.—Supreme Court of Kansas, 113 P. R., 1043.

Contract for Purchase of Voting Machines

Darling vs. City of Manistee.—Where a contract by a city for the purchase of voting machines required them to be returned to the seller if they did not comply with the conditions it must be deemed to have accepted them in full compliance with the warranties in the contract if it kept and used them, without complaint or offer to return, for three years after the contract was made, it being the city's duty to return them within a reasonable time if they did not comply with the contract.—Supreme Court of Michigan, 131 N. W. R., 450.

Supplying Water Outside of City

Steitenroth et al. vs. City of Jackson.—A municipality owning and operating a water works plant has no power to supply water to persons living outside the municipality, and such a power does not result by necessary implication from the power the municipality to supply water to its own citizens.—Supreme Court of Mississippi, 54 S. R., 955.

Defective Sidewalks—Gratings

Corry vs. City of Columbia.—Even if a city must so guard gratings in a sidewalk, reasonably necessary for adjoining buildings, that one wearing a small heel shoe or using a cane or crutch may not be endangered by a fall from the heel, cane or crutch going into one of the small openings, a corresponding duty must devolve on such pedestrians to exercise due care to avoid such danger.—Supreme Court of South Carolina.

Obstruction of Street by Railroad—Injunction

Town of Cheraw vs. Seaboard Air Line Ry.—An injunction, at the suit of a municipality against a railroad for obstructing a street, should not be granted where there is a prima facie showing that a side track used and claimed by the railroad was constructed within a right of way granted by the municipality, and where the existence of any nuisance is doubtful and has not been established by law, and where there has been an injunction in a suit between the defendant and a third party claiming to derive its rights from the municipality over the same obstruction.—Supreme Court of South Carolina, 71 S. E. R., 40.

Personal Injuries—Unguarded Trench

Robinson vs. Town of St. Matthews.—Under Civic Code 1902 a municipality is liable for injuries through a defect in a street occasioned by its neglect or mismanagement. The neglect alleged was in digging a ditch in a street to a depth dangerous to ordinary travel and leaving same uncovered and unlighted. Held, it was not error to fail to instruct that it is discretionary with a municipality to place permanent lights in a street, as the case presented not merely a failure so to do, but a defect in the street as a result of neglect in leaving an uncovered and unlighted ditch in a street.—Supreme Court of South Carolina, 71 S. E. R., 234.

Payment by Warrant

Hart et al vs. Village of Wyndmere et al.—The delivery by a village of its legal warrant in payment of a contract, providing for payment by it in cash, is payment of such contract obligation.—Supreme Court of North Dakota, 131 N. W. R., 271.

Change of Grade—Damages

Filer & Stowell Company vs. City of Milwaukee.—Under Milwaukee City Charter, providing that where the grade of a street has once been established, and the owner of any lot is injured by an alteration of the grade, he shall be entitled to compensation therefor; the grade of a street, once lawfully established, cannot be legally changed without proceedings for the determination of the damages and benefits.—Supreme Court of Wisconsin, 131 N. W. R., 345.

MUNICIPAL APPLIANCES

An Automatic Float-Switch

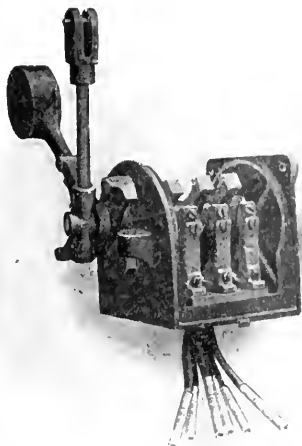
AN automatic float-switch of new design has recently been placed upon the market by the Westinghouse Electric & Manufacturing Company. The new design embodies several features that recommend it for the control of motors driving pumps that empty into reservoirs, or drain pumps, sewers, etc. The operation of the switch is entirely automatic and the mechanism requires no attention beyond an occasional inspection and oiling. The switch is operated by a cylindrical steel float which plays between brass stops on a vertical rod, as shown in the cut; the stops are adjusted to the upper and lower water levels. When the float presses against either stop a U-shaped tripping lever attached to the float rod engages a pivoted weight arm and carries it upward and around past the vertical position. The weight arm then falls, engages an arm on the switch drum shaft, and snaps the switch open or closed according to the direction in which the weight arm is thrown. A buffer receives the force of the weight arm's fall. When the float rod is attached to the tripping lever, as shown in cut, the pump will be started when the float presses on the lower stop and hence is properly arranged for filling reservoirs. With the rod attached to the other side of the lever, the switch is adjusted for drainage purposes, as the motor will be started when the float presses against the upper stop. The switch is of the drum type, with renewable contacts and fingers.

The float and float rod are heavily galvanized and are enameled and baked. This finish effectually prevents rust. The standard float rod permits maximum variations in levels of six feet.

These switches are made in two styles—double-pole for direct-current and single-phase alternating-current motors, and three-pole for polyphase motors. The maximum capacity is 50 amperes at 550 volts. The motor is connected directly across the line and hence can be used only with motors that do not require reduced starting voltage.

Liquid Asphalt Atomizer

J. E. WARD & Co., 781 Pacific Electric Building, Los Angeles, Cal., manufacture Ward's liquid asphalt atomizer, which is used for constructing oil



INTERIOR OF SWITCH

macadam, gravel or dirt highways, for top dressing and oil-sealing rock, gravel or dirt highways and for oil spraying to prevent dust.

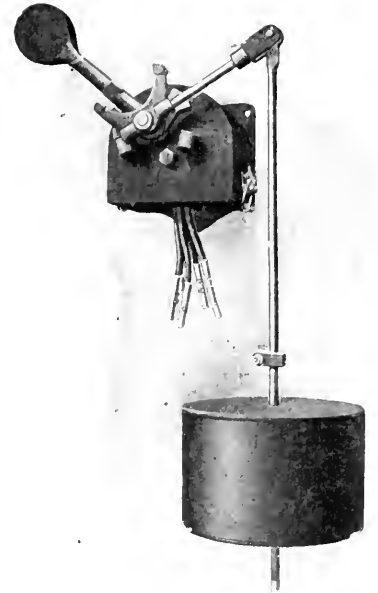
The difficulty which the machine is designed to overcome is mentioned in a recent report of the Los Angeles County Highway Commission, which reads as follows:

Our experience to date with the many gravity oiling machines in use has demonstrated the absolute necessity for uniformity in the application of oil and that this is the leading essential of good construction. It has been found that few if any of the present gravity oilers are capable of applying uniformly a quantity as low as a quarter of a gallon of oil per square yard and cover every particle of the road; also that the pressure in such oilers, being due only to the slight gravity head, is variable as the tank is emptied, which with change in temperature of oil results in considerable variation in rate of application. Frequently part of the openings will become clogged, leaving streaks in the work. It is also observed that the older oilers, having a width of only six feet, reach but a short distance beyond the wide gauge wagon being used, and unless the driving is perfect wagon wheels will lap on edge of previously oiled strip and pick up, or the second course of oil will fail to meet the first by a few inches. The slightest defect, streak or irregularity in oiling shows up after the road has been open to travel a few months and starts trouble, even though much care is given to "bucketing" and hand application to cover defects.

As a result of the past season's work, our specifications now require that all oil or liquid asphalt shall be applied with a machine which will apply the oil under pressure of not less than thirty pounds per square inch, and which is capable of perfectly coating every particle of the road with as small a quantity as one-eighth of a gallon per square yard. We also require that the oil distributor shall have a width of not less than eight feet. A temperature of 212 degrees Fahrenheit is required in applying.

The Ward machine is built in two different styles:

(1) With machinery mounted on a trailing wagon which is easily connect-



AUTOMATIC FLOAT-SWITCH

ed to any tank wagon or watering cart, and (2) with machinery mounted on the rear of a tank wagon.

The trailing rig consists of a rotary force pump operated by a gasoline engine, connected to the pump by a clutch; this allows the pump to be started or stopped at any time without shutting down the engine.

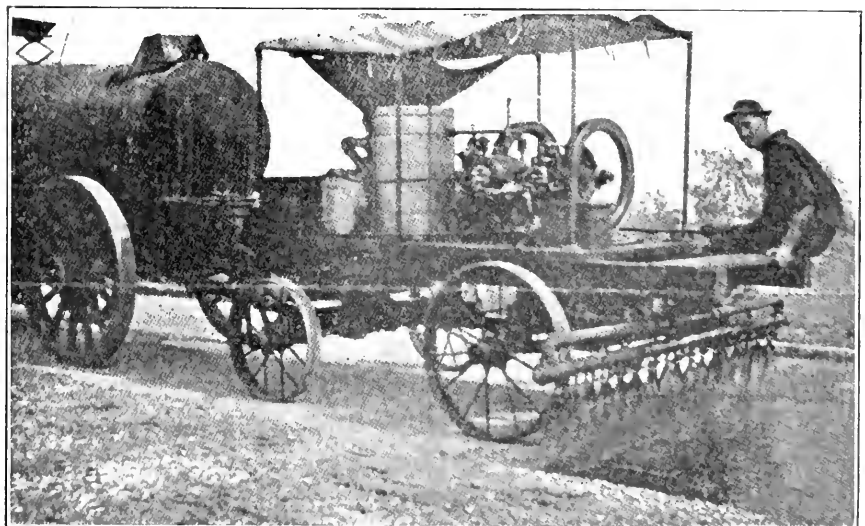
The suction pipe of the pump is connected to the tank wagon or watering cart by means of a flexible metallic hose.

The trailing wagon, on which the machinery is mounted, is provided with a short pole; this is hitched to the rear of the tank wagon, or watering cart.

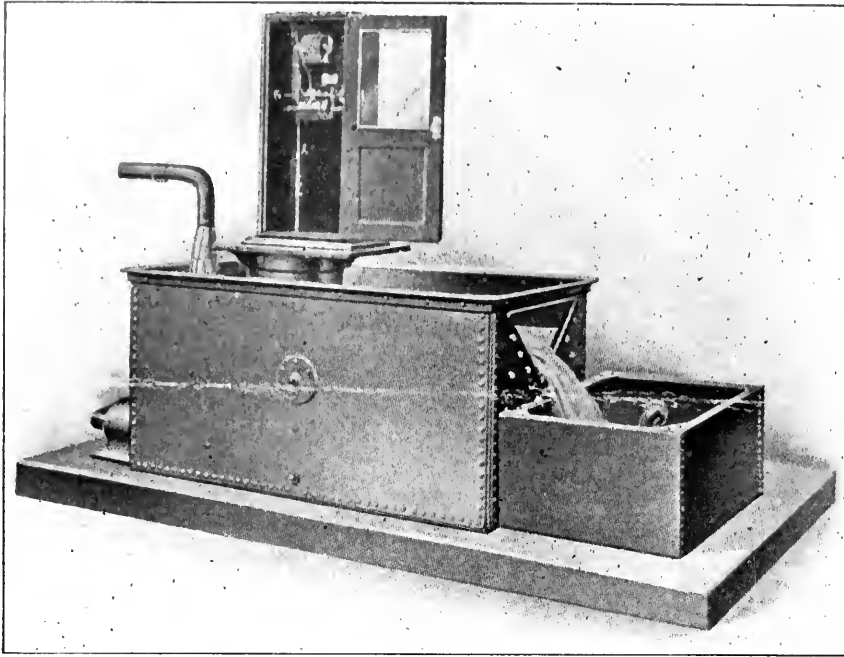
The pump draws the liquid from the tank wagon, which acts as a reservoir, and forces it through the nozzles of the distributor.

The liquid leaves the nozzles under a pressure of not less than 30 pounds per square inch, according to the amount being distributed; this is controlled by means of a by-pass between discharge pipe and suction of pump.

The nozzles are individually controlled; this allows a greater variation in width of surface being treated, and has proven very useful in preventing waste of material from overlapping,



WARD'S LIQUID ASPHALT ATOMIZER



SIMPLE DEVICE FOR MEASURING FLOW OF WATER

often caused by uneven driving, as well as the impossibility of regulating the width of distribution when the nozzles are controlled in series.

In the combination rig, shown in the illustration, the atomizing machinery is mounted on the rear of a tank wagon. This outfit is of special value where the liquid material does not have to be hauled a great distance. While light oils are used for dust laying this rig is to be preferred, or in any case where only one tank wagon is required to do the work.

The distributor is built in any width from 6 up to 10 feet, and any width of distribution can be obtained, varying by inches from two feet up to the maximum width. The distributor is easily disconnected from the discharge of the pump, so that it is out of the way when moving from one locality to another.

The quantities which the manufacturers state can be distributed vary from a minimum of $\frac{1}{8}$ gallon of heavy asphaltic oil, carrying 85 per cent of asphaltum, to a minimum of 1-12 gallon of oil carrying 60 per cent asphaltum up to a maximum of one gallon in each instance.

Outside Guided Triplex Power Pump

THE illustration of an outside guided triplex power pump is of the type supplied by W. & B. Douglas, Middletown, Conn., for the city of Norwich, Conn., under interesting circumstances. An emergency arose in connection with the Norwich water supply and additional pumping capacity was needed at once. The order was placed December 10, and on the following day a large triplex pump was shipped. Later on December 27 and January 7 two direct connected outfits were shipped as part of a permanent installation. The firm of W. & B. Douglas, by the way, are said to be the oldest pump makers in the world. For the past fifteen years, however, they have given special attention to power pumps suitable for small towns and private water works.

The pumps are made with plungers 8 inches in diameter and 10-inch stroke

(or smaller), 42 revolutions per minute, 273 gallons capacity, suction 5 inches, discharge 4 inches. The specifications for the pump follow:

Frame—Close grained iron cast in one piece with cylinders and guides making very rigid construction, and insuring constant alignment of working parts.

Crank Shaft—Open hearth steel casting of high tensile strength, accurately machined and polished on bearing surfaces.

Bearings—Crank shaft, pinion shaft and marine type pitman heads, best quality of babbitt metal, alignment secured by special jigs.

Gearing—Close grained cast iron, machine-cut from the solid—a gear guard covers the pinion and adjacent teeth of the gear. Ratio of gearing, 5 to 1; several other ratios can be furnished by special arrangement at reasonable extra charge.

Connecting Rods—Have marine type pit-

man heads. Strap head and wedge adjustment with bronze boxes at crank end furnished to order at reasonable additional charge. Bronze bushings at plunger end in all types.

Cylinders—Close grained iron, cast with housings or frame in one piece.

Plungers—Close grained cast iron, unless otherwise ordered.

Glands—Sizes up to and including 5" x 8" have screw type bronze glands, making binding impossible—larger sizes have bolted iron glands unless otherwise ordered. All are easy of access for adjustment and repacking.

Base and Valve Boxes—Close grained cast iron—large valve areas and ample, direct water ways—valves are all under front cover and easy of access.

Valves—Discs selected from proper mixture of rubber for cold water according to pressure, seating on bronze grids with cylindrically-wound phosphor bronze springs to ensure prompt closing. For hot water, bronze metal valves ground to seats unless otherwise ordered.

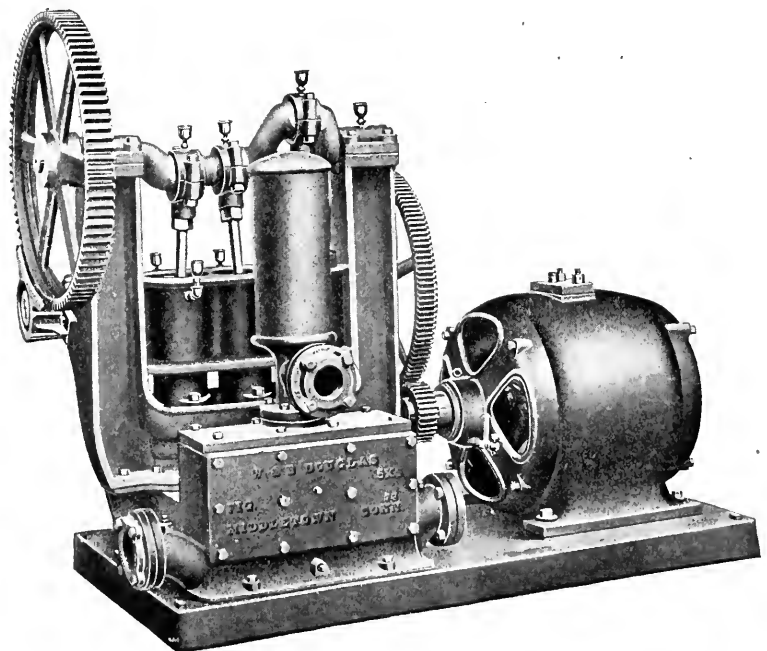
Air Chamber—Cast iron, thoroughly tested and of ample proportions—supplied with pump. Vacuum chamber to order.

Oil Cups and Wrenches—Supplied with pump; also special socket wrench to remove valve-stems and grids. Grease-cups, at same price, if preferred.

Special Construction—Phosphor bronze plungers. Bronze lined cylinders and glands. Rawhide or fiber pinion, etc., to order.

Water Flow Recorder

THE Lea water flow recorder shown in the illustration has been placed on the market by the Yarnell-Waring Company, 1109 Locust street, Philadelphia, Pa., for measuring the flow of water for boilers, from condensers, pump discharges, sewers and streams. The basis of measurement is simple because the flow from the outlet is directly proportioned to the head. The float is protected from disturbance by waves in the tank, as it is enclosed in a cylinder provided with suitable openings. The recording device is of an ordinary pattern. The recorders are said to be accurate to within $1\frac{1}{2}$ per cent by weight. The average error due to variations in temperature over a range of 50 degrees Fahrenheit does not exceed 0.5 per cent.



TRIPLEX POWER PUMP

NEWS OF THE SOCIETIES

American Society of Civil Engineers.—The forty-third annual convention of the society was held at Chattanooga, Tenn., June 13 to 16. More than one hundred members attended the meeting, a large proportion of them being from the Southern States. The first session was held in the assembly room of the Patten Hotel, where Mayor Thompson made the address of welcome. The reading of formal papers never is a conspicuous feature in the annual conventions of this society, and, as usual, the social entertainments took up most of the time not occupied by the business meetings. The Mayor mentioned the engineering work done during the Chattanooga campaign of the Civil War. As indicating one advance in engineering he said he supposed no engineer present would follow the plans of General Grant, who during the Peninsular campaign threw up the dirt on the inner side of the trenches. President Endicott in his annual address gave a brief historical sketch of the society. He mentioned the development of Chattanooga since the society met there twenty years ago. He alluded to the march of progress during the century and believed that there was never a step taken that an engineer was not in the van. "One of the definitions of civil engineering," said he, "is 'the construction of works of public utility,' and you will see that this definition applies fairly well to all branches of engineering. I like it better than I do some of those more labored which have been proposed from time to time, and you know there have been many fruitless efforts to find one that is short, comprehensive and correct. It expresses the result, for everything that the engineer does is directly or indirectly the production of works for the convenience, wealth, comfort, health, safety or happiness of mankind. If he destroys anything it is only that something better for the public may be constructed or established in its place. What a privilege, what an opportunity, is presented in these days for taking part in the accompaniment of these great public utilities."

The afternoon was spent on Lookout Mountain. There was a basket dinner prepared by the ladies of the local entertainment committee, served at the base of the New York monument. In the evening George E. Rowell, assistant engineer in charge of the work, gave an illustrated lecture on the lock and dam of the Chattanooga and Tennessee River Power Company.

Thursday, the second day of the convention, was taken up with an all-day excursion to the locks and dam at Hale's Bar in the Tennessee River, which furnished the subject of the lecture on the evening before. A special train left the Union Station early in the morning with about one hundred members of the society and about forty ladies. Colonel Bogard, chief engineer, was assisted in caring for the party by E. C. Lewis, chairman of the board of directors, and Chief Engineer Hunter McDonald, of the Nashville, Chattanooga & St. Louis Railway. After reaching Hale's Bar two steamboats were used in transporting the party to the west side of the river. The locks, which have recently been finished, were first inspected. About one-third of the dam has been finished, and this proved very interesting to the engineers as well as the large centrifugal pumps.

The power house was visited while the last roof truss was put in place. Altogether, nearly 1,800 men were at work in the construction. The contracting firm, Jacobs & Daines, served a lunch to the guests. In the evening there was a reception and dance in the Hotel Patten.

On Friday, the last day of the convention, the members divided into several parties. Some visited the Dixie Cement Works, Richard City, Tenn. More than fifty visited the Chattanooga water works. L. H. Bixby, resident manager of the company, was in charge of the party. After inspecting the plant a picnic was served in the grove. After luncheon a golf tournament was held at the Chattanooga Golf and Country Club.

North Carolina Good Roads Association.—The annual meeting was held at Winston-Salem June 15. The following officers were elected: H. B. Varner, president; Dr. J. H. Pratt, secretary; J. G. Brown, treasurer. As vice-presidents one member from each Congressional District was elected as follows: R. R. Cotten, of Bruce; J. L. Patterson, of Roanoke Rapids; R. L. May, of Trenton; M. C. Winston, of Trenton; P. H. Hanes, of Winston-Salem; E. MacEartham, of Wilmington; Leonard Tufts, of Pinehurst; P. B. Beard, of Salisbury; F. M. Shannohouse, of Charlotte, and E. C. Chambers, of Asheville.

C. H. Moorefield, United States Office of Public Roads, read a paper on "Sand-Clay Roads," which he recommended on account of low cost of construction and maintenance as well as their good qualities as roadways. He advised the construction of sand-clay roads in preference to macadam wherever the soil would admit of it. A. D. Batchelder, representing the American Organization of Automobileists, said that the organization of a State automobile association would do more to promote good road building than anything else. A paper by P. D. Gold, Jr., Raleigh, on "State Security for County Bonds" was read and ordered printed.

The opening of a question box and the discussion over the problems propounded was a feature of interest. It was the general sense of the assembly that State convicts should be taken off the farms and placed on the public roads; that each county requires a road engineer; that Beaufort, with its soil, should build sand-clay and not macadam roads.

Much of the practical work of the meeting was expressed in a series of resolutions, among which were the following: That Federal aid in road building be favored; that convicts be not leased to corporations, but employed on county roads; that the State should appropriate \$1,000,000 annually for roads; that those interested in the construction of highways make tours of inspection at such intervals as the promoters of each highway consider advisable; that county good roads associations be formed; that the Legislature be asked to establish a State Board of Trade.

A tour of inspection of the roads of Forsyth County was made and the members of the association witnessed a demonstration of Tarvia by the Barrett Company under the direction of its representative, Mr. Devine. The demonstration was made on about 75 feet of the road in front of Piedmont Park.

South Carolina Water Works Association.—The following program for the first annual convention to be held at Columbia, June 28-29, has been issued:

Wednesday, June 28, 3 P. M.

Call to order and introductory remarks, W. F. Stieglitz, Council Superintendent Columbia Water Works.

Address of welcome, Hon. W. H. Gibbs, Mayor of Columbia.

Response, Hon. Kenneth Baker, Mayor of Greenwood.

Election of temporary chairman.

Appointment of Committee on Organization.

Enrolling membership, active and associate.

Discussion on Advantages and Benefits of a Tri-State Organization, by Superintendent Figg of Savannah, Neave of Salisbury, McLure of Anderson, Ferguson of Augusta, Moffett of Charlotte, Barnwell of Yorkville, Barrow of Athens, Jones of Fayetteville, Easterling of Union.

Election of officers for the ensuing term.

Address on Relation of Water Supply to the Public Health and the Danger in the Use of Well Water, Dr. Wm. A. Boyd, Health Officer, Columbia.

General discussion, resolutions, etc.

Adjourn at 5.30 p. m. for refreshments at Irwin's Park and display of the Columbia Water Works.

8.30 P. M.—Address on Columbia's Water Supply, Past, Present and Future, Dr. J. W. Babcock, Superintendent State Hospital for the Insane.

Address on Relation of the Local Organization to the National Association, J. M. Diven, secretary American Water Works Association.

General discussion.

Thursday, June 29, 9.30 A. M.

Address on Ozone Treatment of Water, R. S. Mebane, president Republic Cotton Mills, Great Falls, S. C.

Short talks by representatives of water works supply houses and manufacturers.

Selection of next place of meeting.

New business and adjournment.

Information.

Firemen's tournament will be in progress during our meeting.

Hand reel and horse hose wagon races will be run on 28th and 29th.

A display of automobile fire apparatus will be made by the Columbia Fire Department.

Columbia's crack baseball team will battle with Charleston on 28th and 29th.

The arrangements for the entertainment of the visitors contemplate, in addition to the trip to Coney, automobile rides for the women members of the party Wednesday afternoon through the county parks and Friday morning to the suburbs. There will also be a theater party Wednesday night.

Society of Engineers of Rensselaer Polytechnic Institute.—The following officers have been elected: President, W. W. Rousseau, '05, Troy; vice-president, J. I. Shankley, '72, Haverstraw, N. Y.; treasurer, Frederick A. Burger, '13, Welland, Ontario; corresponding secretary, James A. Ryan, '13, New York; recording secretary, Wallace S. Shutz, '14, Marshall, Minnesota; librarian, Paul M. Kuder, '14, Seigfried, Pa.; trustees, J. A. Powers, '80, Troy; Virgil H. Heines, '81, New York; Ralph H. Chambers, '93, New York; Arnold H. Stutermeister, '94, Albany; Thomas H. Harvey, '98, Long Island City.

Rochester Engineering Society.—The annual meeting and election of officers of the society took place June 9 at Reynolds Library. The reports of officers were read, showing the society to be in a flourishing condition. The report of the secretary-treasurer showed an increase of 22 members in the past year and \$1,102.91 in the treasury. The society has now 236 members.

The result of the election was as follows: President, H. V. Norwood of the Taylor Insurance Company; first vice-president, H. W. Peck, Rochester Railway & Light Company; second vice-president, D. P. Falconer, New York State Railways; secretary-treasurer, Edward F. Davison, Rochester Electric Motor Company.

Mayors' Club of Massachusetts.—The annual meeting was held in Holyoke, June 12-13, the first meeting ever held outside of Boston. Trolley cars were provided and the guests, numbering about 40, were taken to Mt. Tom, where a banquet was given at 4 p. m., after a brief business session. Each guest was given an attractive souvenir program and menu. The book contained pictures of the first mayors' club of Massachusetts, the City Hall, Summit House on Mt. Tom, public library, State armory, post office, City Hospital, views of the Connecticut River, canals and the Holyoke dam. After the banquet a visit was made to Brightside. The second day was given to visiting points of interest in and about the city, including factories and municipal plants. An automobile sightseeing tour was made. In the afternoon the party attended the theatre. Each of the ladies attending the gathering was given a box containing samples of Holyoke products, stationery, silk goods, etc. The only formal address during the meeting was that of Rev. Dr. John S. Lyon, who described the great growth of cities as compared with country districts. He challenged the statement that the greatest problems in democratic government are in the cities.

Commission Government Mayors of Illinois.—Mayors of fifteen Illinois cities now ruled under the commission form of government met in the National Hotel at Peoria recently for the purpose of forming a permanent organization by which they hope to solve the present commission form of government law in a uniform manner, thereby preventing a difference in interpretation of its various clauses in different cities. The meeting was called to order by Mayor Martin R. Carlson, of Moline, who originated the idea of a permanent organization, and the Mayors of the following cities were present: Braceville, Carbondale, Decatur, Dixon, Elgin, Hillsboro, Jacksonville, Kewanee, Pekin, Rock Island, Springfield, Spring Valley, Wankegan, Rochelle and Moline.

Louisiana State Firemen's Association.—At the convention, Covington, La., May 27, the following officers were elected: J. T. Heaney, New Orleans, president, by a majority of 28 votes over R. B. Stone, Gretna; William Holmes, of Bogalusa, vice-president; William Kleinpeter, Gretna, secretary; Sidney Brown, Opelousas, treasurer, and J. C. Gibbs, Winnfield, statistician; Jacob Feller, Covington; S. Mouton, Lafayette, delegates to National Association; Chris O'Brien, of Shreveport, delegate to the International Association of Fire Engineers. Plaquemine secured the 1912 convention.

Society for the Promotion of Engineering Education.—The Tuesday and Wednesday sessions of the Pittsburg meeting, June 27-29, will be held at the School of Applied Science of the Carnegie Technical Schools. Thursday's sessions will be held at Thaw Hall of the University of Pittsburg. The papers to be presented are announced as follows: "Teaching English in Technical Schools," Prof. S. C. Earle, Tufts College; "The Preparation of Written Papers in Engineering Schools," Prof. F. N. Raymond, University of Kansas; "The Use of Logarithmic Diagrams in Laboratory Work," H. A. Gehring, Department of New York State Engineer; "Highway Engineering," Prof. H. H. Blanchard, Brown University; "Balance of Courses in Chemical Engineering," Dean C. H. Benjamin, Purdue University; "Chemical Education for the Industries," Prof. J. H. James, Carnegie Technical Schools; "All-Year Sessions, Individual Instruction: Renewed Suggestions," Dean W. G. Raymond, University of Iowa; "The Architecture of Engineering Schools," Prof. J. M. White, University of Illinois; "The Wentworth Institute," A. L. Williston, Director Wentworth Institute; "An Engineering Course for Underclassmen," Profs. W. A. Hillebrand and S. B. Charters, Jr., Stanford University; "Electrical Engineering Instruction," Prof. E. B. Paine, University of Illinois; "Teaching of Scientific Shop Management, with Use of Engineering School Shops as the Laboratory," Profs. H. Wade Hibbard and H. S. Philbrick, University of Missouri; "Technical Training from the Business Man's Standpoint," E. B. Raymond, vice-president Pittsburgh Plate Glass Company; "Adapting Technical Graduates to the Industries," C. F. Scott and C. R. Dooley, Westinghouse Electric and Manufacturing Company; "Co-operative System of Engineering Education at the University of Pittsburg," Dean F. L. Bishop, University of Pittsburg. Committee reports: "Teaching Mathematics to Engineering Students," Prof. E. V. Huntington, Harvard University; "Entrance Requirements," Prof. J. J. Flather, University of Minnesota, chairman. Presidential address on "The Engineering Teacher and His Preparation," A. N. Talbot.

Calendar of Meetings

- June 27-29, **Northwestern Indiana Volunteer Firemen's Association.**—Annual Convention, Winchester, Ind.—Chief Guy Way, Winchester, Ind.
- June 27-July 1, **American Society for Testing Materials.**—Fourteenth Annual Meeting, Hotel Traymore, Atlantic City, N. J.—Edgar Marburg, Secretary, University of Pennsylvania, Philadelphia, Pa.
- June 28-29, **South Carolina Water Works Association.**—Meeting for Organization, Columbia, S. C.—W. F. Steiglitz, Temporary Secretary, Columbia, S. C.
- June 28-30, **International Association for the Prevention of Smoke.**—Annual Convention, Newark, N. J.—R. C. Harris, Secretary, City Hall, Toronto, Ont.
- July 3-8, **South Dakota State Firemen's Association.**—Tournament and Convention, Lead, S. D.—Charles P. Coolidge, Lead, S. D.
- July 21-23, **Wisconsin State Firemen's Association.**—Annual Convention, Fort Atkinson, Wis.
- July 25-26, **Western New York Firemen's Association.**—Convention, Springville, N. Y.
- July 25-28, **Iowa Firemen's State Association.**—Tournament, Des Moines, Ia.—N. J. Francis, Secretary, Des Moines.
- July 25-28, **American Acetylene Association.**—Annual Convention, Atlantic City, N. J.

PERSONALS

BARCLAY, W. F., who has been Superintendent of Parks of Wilkes-Barre, Pa., for the past five years, has tendered his resignation.

CHAPMAN, P. P., has been elected Mayor of Manassas, Va.

EGAN, CHARLES, has been appointed Deputy City Treasurer of Oklahoma City, succeeding C. L. Butler, resigned.

GERHART, LOUIS, Mayor of Terre Haute, Ind., is making an extended Eastern automobile trip to get ideas and approve final specifications for a 1912 automobile fire and police apparatus. The trip will include visits to Boston, New York, Atlantic City, Harrisburg and Pittsburg, and is in the nature of a machine test, as Terre Haute proposes to supplant horses with motor cars in the city Police and Fire Departments before the expiration of three years.

FARNHAM, FREDERICK W., ex-Mayor of Louisville, Ky., has been appointed Assistant Engineer in the office of the City Engineer.

FISHER, E. A., City Engineer of Rochester, N. Y., delivered a lecture last week on "The Care and Paving of Streets" before the Board of Trade of Williamsport, Pa.

FOSTER, SAMUEL D., of Pittsburg, has been appointed Chief Engineer of the State Highway Department. Under the new road law the Chief Engineer must be a competent civil engineer and experienced in the building and maintenance of improved roads. Mr. Foster is now the Road Engineer of Allegheny County, a position he has held since 1909. He has had much experience in road building, and, it is said, was recommended by Highway Commissioner Bigelow. He is a graduate of Washington and Jefferson College.

MARKER, JAMES R., of Celina, Ohio, has been appointed Highway Commissioner by the Governor. Mr. Marker has been Chief Engineer of the Board of Public Works. He takes the place of James C. Wonders.

NISSLEY, J. E., is the new Mayor of Guthrie, Okla.

OLVANY, GEORGE W., an attorney-at-law, has been appointed Deputy Fire Commissioner for the boroughs of Manhattan, the Bronx and Richmond.

ROHDE, JACOB, has been appointed Chief of the Fire Department of Atlantic Highlands, N. J.

SCHERER, BENJAMIN J., of Milwaukee, has been appointed a member of the fire and police commission for four years to succeed Michael Carpenter.

SHEPPERD, W. H., has been elected mayor of South Boston, Va.

SHIELD, E. SOUTHARD, is the new mayor of Lexington, Va.

STETSON, FRANK L., a prominent lumber manufacturer and for thirteen years chief of the fire department of Minneapolis, has been appointed chief of the Seattle fire department to succeed John Boyle, resigned.

VAN LAKE, CHARLES, former sanitary officer for the city health department of South Bend, Ind., has been promoted to the office of city food inspector to succeed John T. Willett, resigned to become a state food inspector.

WEGNER, ERNEST, has been appointed Chief of Police of Galveston, Tex.

WHEELER, PROF. E., has been appointed Mayor of Montesano, Wash., to succeed Mr. Durdle, resigned.

WREN, G. J., has been elected Mayor of Modesto, Cal.

INDUSTRIAL NEWS

Cast Iron Pipe.—Chicago: Market is quiet. Quotations: 4-inch, \$25.50; 6 to 12-inch, \$24.50; 16-inch and up, \$24. Birmingham: Quite a number of inquiries for large lots of water pipe have been received, mostly from the Coast and Central West, all of which will, it is thought, result in new business. Quotations: 4 to 6-inch, \$22.50; 8 to 12-inch, \$22; over 12-inch, \$21. New York: Very few public lettings are coming out, and the demand from private buyers has again subsided to small proportions. Quotations: 6-inch, carloads, \$21 to \$22.

Lead.—While the demand for lead is not heavy the market has an upward trend and outside sellers are now demanding the price that the syndicate has held to since early in the year, which is 4.50c New York and 4.35c St. Louis.

Pumping Engine.—The Finance Committee of the Atlanta (Ga.) City Council has decided to recommend the acceptance of the proposition made by the Holly Manufacturing Company, of Buffalo, N. Y., which is to furnish two new cylinders for the water works pump at the river station at a cost of \$4,400. The city had entered suit against the company for \$8,500 on the ground that the two cylinders were defective, which caused them to crack. But the company contends that the city forced the pump to do extra duty above what the specifications required.

High-Pressure Pumps.—According to the New York Dept. of Water Supply, overdraft on the pumps was responsible for the water shortage during the Dreamland fire. In response to a request from W. E. Dickey, vice-president of the Goulds Manufacturing Company, Seneca Falls, N. Y., which supplied the pumps for the high-pressure fire service at Coney Island, Deputy Water Commissioner J. W. F. Bennett has written him a letter to this effect: "Mr. Dickey told the Department of Water Supply that the reputation of his firm had been damaged because, just after the Dreamland fire Fire Chief Lally gave out an interview criticising the high-pressure service. In answer, Deputy Commissioner Bennett said: 'The three high-pressure fire service gas-engine-driven pumps at the Coney Island station worked satisfactorily during the Dreamland fire. The overdraft on the pumps necessarily resulted in the reduction in pressure shown on the charts.'"

Motor Steam Fire Engine.—The Nott Fire Engine Company, Minneapolis, Minn., are constructing for the city of Bridgeport, Conn., a gasoline-propelled steam fire engine like that put in commission in New York City a few months ago. The engine will be delivered some time during the summer and will answer all alarms.

Industrial Development of City.—President C. A. Adams of the Cleveland Chamber of Commerce, Cleveland, Ohio, has appointed a new committee on industrial development, which will gather data regarding the industries of the city and determine new industries that are needed. The work of the committee in the past year brought some new manufacturing plants to the city. D. T. Croxon, president of the Cleveland Furnace Company, was reappointed chairman of the committee.

Spiral Riveted Steel Pipe.—The American Spiral Pipe Works, Chicago, Ill., have recently made some important extensions to their line of manufacture, and have greatly increased their facilities and have established one of the largest and most complete lines of piping in the country. In connection with their 3-inch to 42-inch spiral riveted pipe, they are now in position to furnish lap welded pipe from 12 inches to 72 inches in diameter up to 1¼ inches in thickness, and a number of types of forged steel connections have been added to meet each particular requirement.

Water Works Supplies.—It is said that the H. Mueller Manufacturing Company, Decatur, Ill., is contemplating the establishment of a Canadian branch factory at Port Arthur, Ont., for making plumbers' brass goods and water works brass fixtures.

Steel Manufactures.—The Carnegie Steel Company on July 1 will take possession of the warehouse and stock of the Bassett-Presley Company, Cleveland, Ohio, and will conduct a general jobbing business from that city. For the past few months the Carnegie Company has been doing some jobbing business in the Cleveland territory, making deliveries from its Pittsburg warehouse. The Bassett-Presley warehouse will be enlarged considerably, the Carnegie Company having acquired adjoining property for that purpose, as more room is needed for structural material, which the Bassett-Presley Company did not carry in stock. The warehouse stock of the Carnegie Company will include bars, plates, shapes, sheets and possibly other products. The Bassett-Presley Company will retain its name and will probably continue in business along other lines, although its plans have not yet been decided upon.

Reinforced Concrete Pipes.—Parmly & Wethercut, successors to Walter C. Parmly, Everett Building, New York, have issued a pamphlet describing and illustrating their system of reinforced concrete sewers, conduits, manholes and tunnels. They are built of concrete segments or blocks, hardened before laying. They are reinforced in rabbeted form of joints as they are built in place in trench. Reinforcement is also embedded in the blocks.

Announcement.—On June 1, 1911, the Fort Wayne Electric Works will be merged with the General Electric Company of Schenectady, N. Y. Its business will be conducted under the name of Fort Wayne Electric Works of General Electric Company. The same lines of apparatus and supplies will continue to be manufactured and sold under the immediate direction of the same individuals as heretofore, with Mr. F. S. Hunting in responsible charge as general manager. All correspondence should be sent to the Fort Wayne Electric Works at the same addresses as in the past. Bills and statements will be rendered from Fort Wayne, Ind., and all remittances should be made to Fort Wayne Electric Works, Fort Wayne, Ind. All outstanding contracts and other obligations of the Fort Wayne Electric Works will be carried out by the new organization. The offices of the Fort Wayne Electric Works of General Electric Company will be continued as heretofore.

Testing Cement.—The Universal Portland Cement Company, Chicago, Ill., has published in pamphlet form the standard specifications and uniform methods of testing and analysis for Portland cement, embracing the report of the committee on standard specifications for cement of the American Society for Testing Materials; the report of the committee on uniform tests of cement of the American Society of Civil Engineers, and the report of the committee on uniformity in technical analysis for limestones, raw mixtures and Portland cements of the Society for Chemical Industry, New York Section.

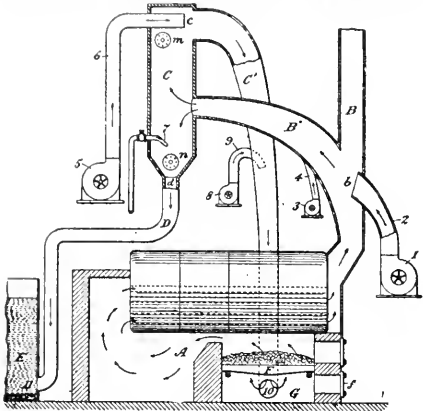
Empty Cement Sacks.—It is reported that the railroads west of Chicago will put in effect a new rule obliging railroad agents to refuse to accept a shipment of empty cement sacks unless they are properly bundled and tagged. East of Chicago this ruling has been in effect some time. West of Chicago, however, it has been the custom to charge double rates for poorly bundled shipments. The rules governing shipments are as follows: Each bundle of sacks shall be securely tied with not less than three separate wire ties, or three separate ties of rope, the latter to be at least 3-16 of an inch thick. Each bundle shall be marked with a linen tag showing the name and address of shipper and consignee, the tag to be securely fastened to the bundle by wire. Freight must be completely prepaid.

Consulting Engineers.—George W. Fuller, hydraulic and sanitary engineer, announces that he has associated with him as partners James W. Armstrong, James C. Harding and James R. McClintock, all of whom were formerly on the staff of Hering & Fuller. Mr. Armstrong had more than a dozen years' experience in general engineering practice, especially in railroad and structural iron work, and then for ten years he was on the staff of George G. Earl, General Superintendent Sewerage and Water Board, New Orleans, La., first in charge of the design of nine sewage pumping stations and later in the immediate charge of the design and construction of the New Orleans water purification plants and appurtenances. Recently he has had immediate charge for Hering & Fuller of the design of water purification plants for Grand Rapids, Mich.; Minneapolis, Minn., and Montreal, Province of Quebec. Mr. Harding spent some five years as assistant to Ernest Bowdich, and then for ten years was Assistant City Engineer of Pittsfield, Mass., in charge of the construction and operation of the sewerage system, sewage pumping station and sewage disposal works. Since 1907 he has been with Hering & Fuller, principally on sewerage work, and has had immediate charge of the design of sewerage and sewage purification works for a number of cities, and of investigations of typhoid fever epidemics. Mr. McClintock has been for the past five years with Hering & Fuller, partly on designing and partly on outside work, particularly with reference to water works appraisements and the construction of water filters. He was resident engineer on the water filtration plant of Burlington, Vt., and at present is in charge of extensive improvements to the water works and sewerage systems of Clarksburg, W. Va. The offices of Mr. Fuller and his associates will be at 170 Broadway, New York City.

PATENT CLAIMS

995,765. SMOKE-CONSUMING FURNACE. Bernard F. Brady, New York, N. Y. Serial No. 578,279.

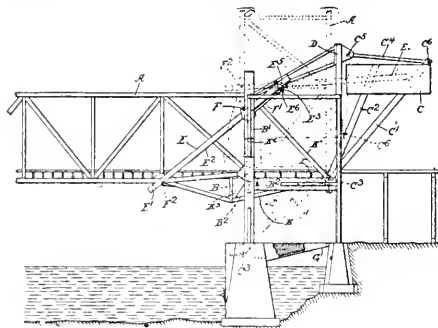
In combination with a furnace having an ash-pit and grate bars, smoke-flue B, eduction pipe 2 provided with projection b communicating with said smoke-flue B, separating-tank C, smoke-flue B' connecting said smoke-flue B with said separating-tank C, eduction pipe 4 communicating with said smoke-flue B', eduction pipe 6 provided with projection c, communicating with said separating-tank C, water jet 7 communicating with said separating-tank C, water-tank E, pipe D leading from said separating-tank C to said water-tank E, passage C' leading from said separating-tank C to the ash-pit below the grate bars,



eduction pipe 9 communicating with said passage C', said eduction pipes 2 and 4 being in communication with means for forcing the smoke and heavy unconsumed products of combustion through said smoke-flue B' into said separating-tank C, said eduction pipes 6 and 9 being in communication with means for forcing the smoke proper from said separating-tank C through said passage C' respectively into said ash-pit below said grate bars, and said water jet 7 being in communication with water supply for the purpose of forcing the heavy unconsumed products of combustion from said separating-tank C through said pipe D into said water-tank E, substantially as described.

995,813. BRIDGE. Joseph B. Strauss, Chicago, Ill., assignor to The Strauss Bascule and Concrete Bridge Company, Chicago, Ill., a Corporation of Illinois. Serial No. 292,208.

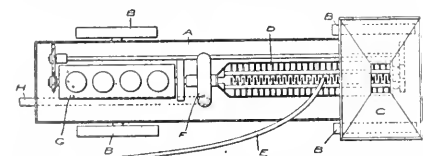
A bridge comprising a movable section, a counterweight therefore, a supporting device for the counterweight extending upwardly above the roadway, a pivotal con-



nection with the arc shaped recess in the disk, and adapted when within said recess to hold the retracting spring under tension, and time mechanism for actuating said rotatable device.

995,446. METHOD OF SNOW DISPOSAL. Cadwallader Evans, Jr., Pittsburg, Pa. Serial No. 615,557.

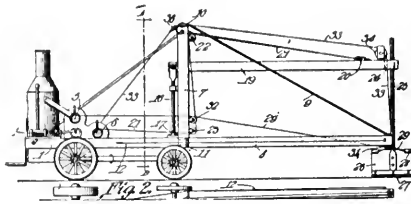
The method of removing snow from city streets comprising the following steps: 1st,



gathering the snow; 2nd, agitating the same; 3rd, forcing the agitated mixture to a distant point.

992,359. TRENCH-FILLING MACHINE. Carlos A. Kenney, Hammond, Ind. Serial No. 555,692.

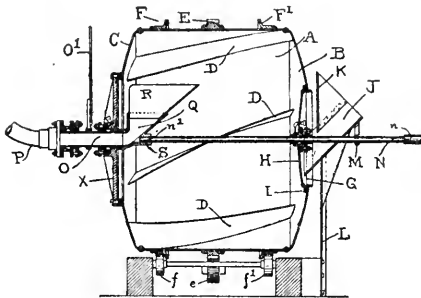
A machine of the class described including a portable structure, a scraping blade carried thereby, means for adjusting the



blade vertically, adjustable side members and means connected to said members for shifting the blade laterally therebetween.

995,422. APPARATUS FOR MIXING AND DELIVERING CONCRETE AND THE LIKE MATERIALS. St. John Clarke, Bogota, N. J., and Rudolph Welcker, Yonkers, N. Y. Serial No. 599,231.

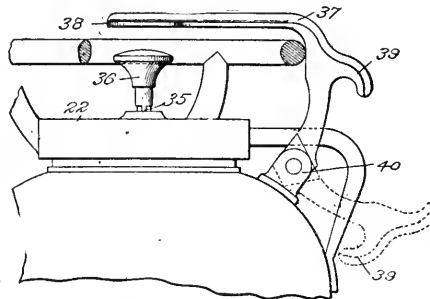
In an apparatus for handling concrete and the like materials, the combination of a closed mixer casing having a discharge port, with a hopper within and inclosed by



the mixer casing, and having its discharge end communicating with said port, and means for injecting a stream of air directly into the outlet of said hopper and directing said air toward the discharge port, said casing having means for feeding concrete toward the hopper.

995,833. FIRE-EXTINGUISHER APPARATUS. Harry M. McCaslin, Elmira, N. Y., assignor to American-L. France Fire Engine Company, Elmira, N. Y., a Corporation of New York. Serial No. 499,807.

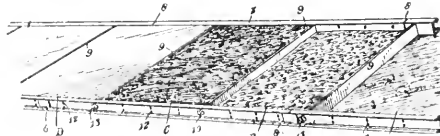
In a fire extinguisher, the combination with the operating member; of a guard member therefor movable into and out of



protecting position and having a hanger portion by which the extinguisher may be hung upon a suitable support to thereby maintain the guard member in protecting position.

995,620. KNOCKDOWN METAL FORM FOR CONCRETE SIDEWALKS. Harry M. Naugle, Canton, Ohio, assignor to The Berger Manufacturing Company, Canton, Ohio, a Corporation of Ohio. Serial No. 562,464.

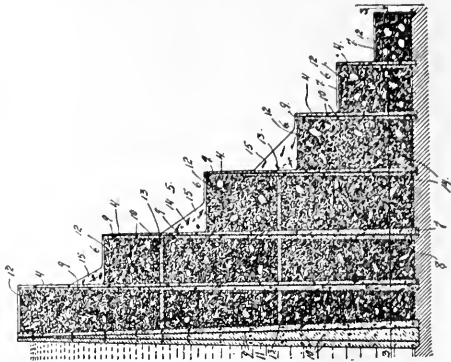
In a device of the character described a side piece and a division plate adapted to be locked to each other by a wedge, and a spring wedge for connecting said piece



and plate, said wedge formed of a plate of metal bent upon itself with its sides spaced from each other adjacent the bend and the free ends lying close together to form the thin end of the wedge.

994,666. DAM CONSTRUCTION. George J. Bancroft, Denver, Colo. Serial No. 571,562.

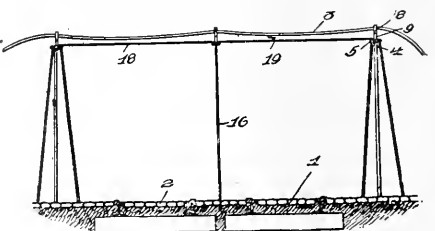
A dam consisting of a number or rows of cells or chambers, the walls of which are thickest at the base of the dam and



gradually decreasing in size toward the top, and a suitable filling contained within the said cells or chambers to form a solid mass of the dam, substantially as described.

995,940. HOSE-BRIDGE. John J. Armstrong, Pittsburg, Pa. Serial No. 583,409.

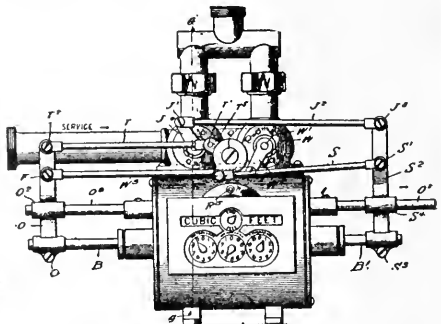
A hose bridge comprising a pair of outer supporting members, each of said members being provided with a head, a pair of legs supporting the head of the intermediate member, a series of legs supporting the heads of each of the outer members, each of said outer members further comprising a vertically-disposed yoke having a relatively long shank depending centrally therefrom and formed with a reduced end extending through the head of said member; means



engaging the reduced end of for securing the yoke to the head, each of said yokes having the inner face of each of its arms cut-away to provide a recess, a vertically-disposed removable bearing mounted in each of said recesses, a bearing roller having reduced ends journaled in said bearings and positioned above the bottom of the yoke, and means for pivotally connecting the legs to the head, and tie members having angle-shaped ends depending in the heads for supporting and connecting the supporting members together.

995,278. WATER AND GAS METER. James J. Mulhall, Albany, N. Y. Serial No. 583,478.

A gas and water meter comprising a cylinder with apertures in the ends thereof and having a plurality of compartments, a piston in each compartment having a stem movable through the aperture in the respective end of the cylinder, valve casings each having ports communicating with the respective compartment of the cylinder, a



discharge pipe communicating with said casings, a cut off valve in each casing, a meter register, a crank arm fixed to each cut off valve, a guide bar fixed to each piston stem and connections between said guide bars and crank arms, a rotatable register operating mechanism, pivotal rods connecting the latter and said guide bars, as set forth.

THE WEEK'S CONTRACT NEWS

Relating to Municipal and Public Work—Street Improvements—Paving, Road Making, Cleaning and Sprinkling—Sewerage, Water Supply and Public Lighting—Fire Equipment and Supplies—Bridges and Concrete Work—Sanitation, Garbage and Waste Disposal—Police, Parks and Miscellaneous—Proposals and Awards.

To be of value this matter must be printed in the number immediately following its receipt, which makes it impossible for us to verify it all. Our sources of information are believed to be reliable, but we cannot guarantee the correctness of all items. Parties in charge of proposed work are requested to send us information concerning it as early as possible; also corrections of any errors discovered.

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREET IMPROVEMENTS				
Ohio	Cincinnati	June 30, noon	Treating with tar Hillside ave. and Warsaw pike; oiling Springfield pike in Springfield township.	Stanley Struble, Pres. Bd. Co. Comrs.
Arkansas	Little Rock	June 30	Paving about 13,000 sq. yds. with creosoted block; 25,000 sq. yds. of macadam.	E. A. Kingsley, Engineer.
Arkansas	Argenta	June 30	Constr. about 30,000 sq. yds. creosated block pavement; 25,000 sq. yds. macadam.	Mayor Faucette.
Ohio	E. Liverpool	June 30	Improving various streets. Estimated cost \$30,600.	C. V. Beatty, Dir. Pub. Service.
Kentucky	Middlesboro	July 1	Constr. sidewalks, curb. and guttering in various streets.	E. S. Helburn, Mayor.
Georgia	Rome	July 1, noon	Grading, curbing and paving various streets with wood block vit. brick, Hassam, asphalt macadam, sheet asphalt and bitu.	J. R. Cantrell, City Clerk.
Indiana	Greencastle	July 1	Constr. about 40,000 ft. of macadam road in Putnam County.	D. V. Moffett, County Auditor.
Vermont	Middlebury	July 1, 3 p.m.	Constructing 2,000 sq. yds. macadam roadway.	Jos. M. Burke, Clerk.
Virginia	Richmond	July 1, noon	Constructing about 7½ miles gravel road.	P. St. J. Wilson, St. Hwy. Comr.
Ohio	Delaware	July 1	Improving Taylor Corporation Road 3,696 miles; and Link State Road 4.68 miles.	W. F. Whittier, County Surveyor.
Tennessee	Rutledge	July 1, 10 a.m.	Grading 16½ miles county highway.	A. M. Nance, Secy. Road Comn.
New York	Johnstown	July 3, 7:30 p.m.	Constr. about 2,946 sq. yds. asphalt block pav't; 1,244 lin. ft. curb reset, 30 lin. ft. new curb and appurtenances.	Grover E. Yerdon, City Clerk.
Pennsylvania	Northumberland	July 3, 8 p.m.	Constr. about 3,102 sq. yds. vit. brick pav't; 1,275 lin. ft. stone curb, 1,200 cu. yds. excavation.	Chas. H. Dodge, Clerk Council.
Indiana	Portland	July 3, 10 a.m.	Improving highway in Bearcreek township.	W. Lea Smith, County Auditor.
Indiana	Vernon	July 3, 11 a.m.	Constructing 3 mile pike road in Bigger township.	M. W. Brogan, County Auditor.
Indiana	Williamsport	July 3, 3 p.m.	Constructing highway in Mound township.	D. H. Moffitt, County Auditor.
Indiana	Newport	July 3, 10 a.m.	Constructing gravel road in line Helt and Clinton townships.	H. T. Payne, County Auditor.
Indiana	Franklin	July 3, 1 p.m.	Constructing a gravel in Union township.	W. B. Jennings, County Auditor.
Indiana	Versailles	July 3, 1 p.m.	Constr. macadam roads in Laughrey and Otter Creek townships.	Nicholas Volz, County Auditor.
Indiana	Salem	July 3, 1:30 p.m.	Constructing a road in Brown township.	F. S. Munkel, County Auditor.
Indiana	LaPorte	July 3, 10 a.m.	Constr. macadamized roads in Scipio and Cass townships.	F. A. Hausheer, County Auditor.
Indiana	Greenfield	July 3, 10 a.m.	Constr. of grades in Sugar Creek and other townships.	C. H. Troy, County Auditor.
Iowa	Corning	July 3, 7:30 p.m.	Grading, paving, curbing and guttering various streets, consisting of about 12,000 sq. yds. vit. brick paving; 2,373 lin. ft. combined concrete curb and gutter; 1,857 gutter; 2,650 yds. grading.	Wm. C. Chubb, City Clerk.
New Jersey	Westfield	July 3, 8:15 p.m.	Constr. about 3,200 sq. yds. bituminous macadam pavement, concrete culverts, drains and appurtenances; 1,000 cu. yds. ex.	Chas. Clark, Town Clerk.
West Virginia	Parkersburg	July 3	Paving with brick portions of 4 roads in Wood County.	C. S. Skidmore, County Engineer.
New York	Olean	July 5, 8 p.m.	Constr. about 9,800 sq. yds. of wire-cut-lug block pavement; 6,000 lin. ft. stone curbing.	John H. Gaynor, Engineer.
Florida	Tampa	July 5, 2 p.m.	Resurfacing about 1½ mile road in Hillsboro County with shell or its equivalent.	Bd. County Comrs.
Indiana	Vincennes	July 5, 2 p.m.	Constr. about 93,400 ft. of gravel roads in Knox County.	John T. Scott, County Auditor.
New Jersey	Jersey City	July 5	Paving the Plank road.	Bd. Freeh., Hudson County.
Pennsylvania	Jermyn	July 5, 7:30 p.m.	Constr. about 11,000 lin. ft. concrete curb, one half to be protected with steel bar.	John A. Loughney, Secy. Town C'cil.
Ohio	Cleveland Hghts.	July 5, noon	Grading, draining, sewerage, paving with macadam and constructing sidewalks in portion of Euclid blvd.	H. M. Canfield, Village Clerk.
Indiana	Fountain City	July 5, 1:30 p.m.	Constructing highway in Fulton township.	W. B. Gray, County Auditor.
Pennsylvania	Pittsburg	July 5, 10 a.m.	Constr. about 10 miles in Allegheny County.	R. J. Cunningham, County Compt. City Clerk.
Ohio	Youngstown	July 5	Paving various streets.	Joint Com. Co. Essex and Hudson.
New Jersey	Newark	July 5, 3 p.m.	Widening and improving the Newark Plank Road.	A. H. Wearn, City Clerk.
North Carolina	Charlotte	July 5, 8:30 p.m.	Paving 58,400 sq. yds. with bitulithic, sheet asphalt, bituminous macadam, vit. brick and wood block.	J. G. McMillan, County Surveyor.
California	San Jose	July 5	Improving Cochran Road and Gilroy Hot Springs Road.	C. A. Blackly, County Auditor.
Indiana	Valparaiso	July 5, 10 a.m.	Constructing 4 gravel roads.	Horace Blakely, County Auditor.
Indiana	Bloomington	July 5, 2 p.m.	Constructing a highway in Salt Creek township.	J. M. Stone, County Auditor.
Indiana	Rushville	July 5, 2 p.m.	Constructing a macadam road in Jackson township.	
Indiana	Wabash	July 5, 1:30 p.m.	Constr. 3 roads in Paw Paw twp., 2 in Noble, 2 in Chester; 2 in Town of North Manchester.	J. P. Nofziger, County Auditor.
Indiana	Logansport	July 5, 10 a.m.	Constr. a stone road in Boone twp.; gravel roads in Eel and Jefferson townships.	J. E. Wallace, County Auditor.
Indiana	Brownstown	July 5, 1:30 p.m.	Constr. the Medora and River Bridge road and the Sparkville Hill Road.	H. W. Washer, County Auditor.
Indiana	Sullivan	July 5, noon	Constr. gravel, bituminous macadam and stone roads.	Ben. C. Crowder, County Auditor.
Indiana	Muncie	July 5, 10 a.m.	Constr. roads in Union, Center and Mt. Pleasant twps.	Francis M. Williams, County Aud.
Indiana	Kokomo	July 5, 2 p.m.	Constructing 9 mile road in Clay township.	A. B. Easterling, County Auditor.
Pennsylvania	Shamokin	July 6	Paving 3 streets.	W. H. R. Smink, Chief Burgess.
Indiana	Logansport	July 6, 10 a.m.	Constructing a stone road bet. Deer Creek and Washington twps.	J. E. Wallace, County Auditor.
Indiana	Monticello	July 6, noon	Constructing a stone road in Honey Creek twp.	A. G. Fisher, County Auditor.
Indiana	Kentland	July 6, 1 p.m.	Constr. a macadam road in Iroquois twp. and system of stone roads in Grant, Iroquois and Jackson twps.	E. R. Bingham, County Auditor.
Pennsylvania	Wilson	July 6, 8 p.m.	Grading, paving and curbing portion of Fourth street.	J. O. Spence, Chm. St. Com.
Indiana	Evansville	July 6, 10 a.m.	Constructing, grading, and rocking a highway in Center twp.	Chas. P. Beard, County Auditor.
Illinois	Denison	July 6, 2 p.m.	Constructing 2 macadam roads.	Geo. Gray, Chm. Comrs. Hwys.
West Virginia	Huntington	July 6, 1 p.m.	Paving various streets with vit. brick, asphalt, bitulithic, tarvia or asphalt block.	A. B. Maupin, City Engr.
Oregon	Grants Pass	July 6	Constructing 30,000 sq. yds. of pavement.	F. E. Holston, City Engineer.
Mississippi	Meridian	July 6, 2 p.m.	Constr. 12.35 mi. Novaculite roadway; 2 mi. sand-clay road.	W. P. Moore, Chief Engineer.
New York	Olean	July 6, 8 p.m.	Constr. about 5,000 sq. yds. wire-cut-lug block pavement on concrete foundation; 3,500 lin. ft. stone curb.	John H. Gaynor, Engineer.
Ohio	Cincinnati	July 7, noon	Oiling Harrison pike in Harrison and Whitewater townships; also repairing Indian Hill avenue in Columbia township.	Stanley Struble, Pres. Bd. Co. Comrs.
Ohio	Mt. Gilead	July 7, 11 a.m.	Improving 7½ miles of country road.	Clifton Sipe, County Auditor.
North Carolina	Tarboro	July 7, 4 p.m.	Constr. about 25,000 sq. yds. of 8 in bituminous macadam paving; alternate bids on 8,000 sq. yds. vit. brick and 11,000 sq. yds. bituminous macadam; constr. sidewalks, drain, etc.	W. O. Howard, Mayor.
Indiana	Williamsport	July 10, 2 p.m.	Constructing a gravel road in Adams township.	D. H. Moffitt, County Auditor.
North Carolina	High Point	July 10, 1:30 p.m.	Grading, curbing and macadamizing various streets, estimated cost \$40,000.	Fred N. Tate, Mayor.
Indiana	Rockville	July 10	Constr. the Shonkwiller Road in Jackson and Union townships, Parke County and in Clinton and Madison townships, Putnam County.	County Commissioners.
Alabama	Andalusia	July 10, noon	Grading and surfacing with sand clay 9 miles of road.	D. K. Caldwell, County Engineer.
Ohio	Wadsworth	July 10, noon	Grading, curbing and paving with vit. brick about 9,500 sq. yds.	Louis F. Allen, Village Clerk.

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREET IMPROVEMENTS (Continued)				
Iowa	Greenfield	July 11, 2:30 p.m.	Constr. about 14,000 sq. yds. brick or cement paving; 4,500 lin. ft. curb; Iowa Engr. Company, Chase Block, Clinton, Iowa, Engineers.	Town Clerk.
Pennsylvania	Washington	July 12, 11 a.m.	Constr. various county roads with necessary culverts and small bridges, about 23 miles in all.	John H. Moffitt, County Compt. John H. Moffitt, County Compt.
Pennsylvania	Washington	July 12, noon	Furn. vit. brick to be used in constructing 162,000 sq. yds. pav.	Bd. Co. Comrs.
Ohio	Columbus	July 12	Resurfacing about 24,000 ft. of county road in Marion twp.	F. F. Pillett, City Engineer.
North Carolina	Wilmington	July 15, noon	Constr. 24,000 sq. yds. paving, curbing and guttering.	Norman Buckner, Twp. Clerk.
Michigan	Luther	July 15, 4 p.m.	Constr. 11½ miles gravel road in Newkirk and Ellsworth twps.	Bd. County Comrs.
Ohio	Greenville	July 15	Constructing the Althoff road in Patterson township.	T. W. Ragsdale, Mayor.
Texas	Bonham	July 15	Constr. about 4,538 ft. concrete curb; 22,645 sq. yds. paving; 4,000 sq. yds. grading; 670 ft. storm sewers.	W. M. Dunlap, City Comr. H. S. Michaud, County Auditor. Bd. Pub. Wks.
Tennessee	Johnson City	July 20, 6 p.m.	Constr. 23,000 sq. yds. paving, including bridges, sewers, storm water drain, concrete curb and gutter, consisting of about 5,000 cu. yds. excavation; 23,000 sq. yds. paving; 12,000 lin. ft. curb and gutter.	
Indiana	Decatur	July 21, 10 a.m.	Constr. macadamized roads in Allen, Root and Adams twps.	
Wisconsin	Racine	July 22	Paving Owen Avenue.	
SEWERAGE				
Ohio	Bucyrus	June 30	Constr. 7,700 lin. ft. of 10 to 20-in. vit. tile sanitary sewer; 6,700 lin. ft. of 4 and 5-ft. concrete and brick sewer.	F. L. Niederheiser, City Engr. E. L. Williams, City Clerk.
Wisconsin	Appleton	June 30	Constructing sewer in portion of Lawrence Street.	
Utah	Salt Lake City	June 30	Extending gravity outlet sewer from present outlet to Great Salt Lake.	H. G. McMillan, Chm. Bd. Pub. Wks.
Kansas	Parsons	July 1	Constr. sewers of double strength vit. pipe with septic tank of concrete and pumping station. Est. cost \$65,000 to \$70,000.	City Clerk.
Pennsylvania	Ligonier	July 1	Building sewage disposal plant, including sedimentation tank, sprinkling filter, sludge bed and pumping station; P. H. Shaw, Lancaster, Engineer.	I. F. Brandt, Boro. Clerk. Myron J. Tarble, City Engineer. E. W. Smale, City Clerk.
Illinois	Aurora	July 1, 2 p.m.	Constr. about 8 mi. vit. tile pipe and 1 mi. concrete pipe sewer.	
Iowa	Sheldon	July 1, 2 p.m.	Constructing sanitary sewers.	
Maine	Bangor	July 1	Constr. 300 lin. ft. reinforced concrete sewer 5-ft. 5-in. diameter inside, 600 lin. ft. sub drain 6-in. pipe.	W. R. Pattangill, Mayor.
New Jersey	Elizabeth	July 3, 8:30 p.m.	Constr. 665 ft. 24-in. pipe sewer; 510 ft. 20-in.; 510 ft. 18-in.; 560 ft. 15-in. house connections, and appurtenances.	N. K. Thompson, Street Comr. City Clerk.
California	San Jose	July 3	Construct septic tank for County hospital.	J. C. Ely, Dir. Pub. Serv. Fred Shane, Secy. Dept. Pub. Serv. George H. Waskey, Mayor. Fred N. Tate, Mayor. E. L. Thompson, Village Clerk.
Ohio	Dayton	July 5, noon	Constructing sanitary sewers in various streets.	
Ohio	Toledo	July 5, noon	Constr. sanitary sewers in various streets.	
South Dakota	Madison	July 6, 8 p.m.	Bldg. sewer system about 31,465 lin. ft. 6 to 18 in. vit. pipe.	
North Carolina	High Point	July 10, 1:30 p.m.	Constr. sewer and 1 water lines amounting to about \$50,000.	
Ohio	West Lafayette	July 10	Constructing storm water sewers. Est. cost \$16,000.	
Georgia	Macon	July 10, noon	Digging trenches and laying 5,003 ft. 12-in. pipe; 3,140 ft. 8-in.; 5,363 ft. 6-in. hydrants, valves, special castings etc.	John T. Moore, Mayor.
Massachusetts	Fitchburg	July 11, 3 p.m.	Constr. 2,928 lin. ft. earth excavation and re-filling in trench for 45-in. sewer; brick masonry, concrete masonry; 40,000 lbs. steel bars cor reinforcing concrete.	David A. Hartwell, Engineer. Wm. J. Blake, Jr., City Engr. Iowa Engr. Co., Clinton, Ia., Engrs.
New York	Newburgh	July 11, 5 p.m.	Constr. about 1,450 lin. ft. 15-in. pipe sewer and appurtenances.	
Iowa	Valley Junction	July 13, 7 p.m.	Constr. 5½ miles 8 to 20-in. sewers and a sewage disposal plant.	
Wisconsin	Rhineland	July 17, 2 p.m.	Constr. about 10,183 sq. yds. macadam pavement, combined cement curb and gutter.	Geo. C. Jewell, Chm. Bd. Pub. Wks.
WATER SUPPLY				
Minnesota	Minneapolis	June 30	Furnishing filter equipment and devices.	Henry N. Knott, City Clerk. Village Clerk.
Nebraska	Bridgeport	June 30	Constr. water works system. Est. cost \$17,500.	
California	Los Angeles	June 30, 2 p.m.	Furn. three 14-in. gate valves; six 10-in.; nine 18-in.; two 24-in. and five 26-in.	Horace B. Ferris, Secy. Bd. P. Wks.
Ontario, Can.	Ft. William	July 1	Selling equipment of municipal pumping and electrical generating plant, suitable for town of 5,000 inhabitants.	John Wilson, City Engineer.
Illinois	Homewood	July 1, 8 p.m.	Furn. and laying quantity of 6, 8 and 10-in. c. i. pipe, necessary valves and hydrants.	R. B. Harwood, Secy. Bd. L. Imp. City Clerk.
Illinois	Mendota	July 3, 7:30 p.m.	Constr. an iron and concrete roof on reservoir.	Wm. T. Patton, Town Clerk. C. A. Myhe, City Engineer.
Indiana	Rockville	July 3, 2 p.m.	Digging a well 8-ft. in diameter and 32 ft. deep, walled with con.	
North Dakota	Valley City	July 3, 8 p.m.	Constructing 732 ft. of 4-in. water main.	
Ontario, Can.	Toronto	July 3, noon	Laying about 3,500 ft. steel riveted pipe 6 ft. in diameter in Lake Ontario.	F. S. Spence, Acting Mayor.
Ohio	Cleveland	July 5, noon	Furn. a crane framework and track at Kirkland Pumping Station; furn. pipe and special castings for Water Dept.	A. B. Lea, Dir. Pub. Service. H. H. Canfield, City Clerk. W. D. Welsh, Mayor. H. C. Marmion, Town Clerk. City Clerk.
Ohio	Cleveland Hgts.	July 5, noon	Building 10-in. water main in Cedar Roads.	
Louisiana	Kentwood	July 6	Drilling artesian well.	
Iowa	Gilmore	July 6	Constr. water works system complete, est. cost \$15,000.	
Nebraska	Columbus	July 7, 8 p.m.	Constructing and installing a water works extension.	
Missouri	St. Louis	June 7, noon	Furn. 2 steam turbine-driven centrifugal pumping units complete with condensing apparatus and appurtenances.	Bd. Pub. Improvements.
New Jersey	Camden	July 10, 11 a.m.	Constr. pump house. Furn. gasoline engine, foundation, gasoline tank pump, connections and standpipe in position; generator with foundation and electrical equipment.	J. J. Albertson, County Engineer.
Ontario, Can.	St. Catherine	July 13, noon	Laying 5,000 ft. 24 and 30-in. c. i. pipe; 15,000 ft. 24-in. pipe; constructing auxiliary reservoir.	Alex Milne, Supt. W. W. L. N. Senecal, Secy. Bd. Comrs.
Quebec, Can.	Montreal	July 13, noon	Constr. final filters and appur. forming por. of filtration plant.	
Georgia	Macon	July 16, noon	Digging trenches and laying 5,003 ft. 12-in., 3,140 ft. 8-in., 5,363 ft. 6-in. pipe with hydrants, valves and spec. castings.	John T. Moore, Mayor.
BRIDGES				
Texas	Houston	July 1	Constr. a reinforced concrete viaduct over Houston ship channel about 1,650 ft. long and 60 ft. wide.	F. L. Dormant, City Engr. City Clerk.
Pennsylvania	Pittsburg	July 1	Constructing one concrete arch, estimated cost \$85,000.	Jos. Overfield, Clk. Bd. Co. Comrs.
Pennsylvania	E. Stroudsburg	July 3, 11 a.m.	Constructing 4 stone bridges.	
Kansas	Leavenworth	July 3, noon	Building Peterson Bridge, Tonganoxie Twp.; bridge on Limit St., Leavenworth; bridge across Little Stranger, High Prairie township.	J. A. Hall, County Clerk. P. St. J. Wilson, State Hwy. Comr.
Virginia	Richmond	July 3, noon	Constr. a bridge over Staunton River at Hary's Ford.	Henry A. Pfister, Clk. B. C. Sup.
California	San Jose	July 5, 11 a.m.	Constr. a pony truss bridge over Campbell Creek; also reinforced conc. add. to the abut. of Ford Road Bdge. over Coyote Creek.	
Ontario, Can.	Lindsay	July 5	Constr. 2 steel spans with concrete floors each 60 ft., 14-ft. roadway to carry a ten ton roller at least; one 120 ft. span same width and strength, piers, stone filling, etc.	I. R. McNeillie, County Clerk. P. J. Sater, County Auditor. J. E. Elder, County Auditor.
Indiana	Columbus	July 5	Constructing several bridges.	
Indiana	Rockville	July 5, 1:30 p.m.	Constructing and repairing various bridges.	
California	Santa Barbara	July 5	Constr. bridge over Santa Inez River, length 693 ft. roadway 18-ft., three-hinge reinforced concrete. Est. cost \$50,000.	Frank Flournoy, County Engineer.
Ohio	Cincinnati	July 7, noon	Constr. concrete bridge at intersection of German and Compton roads in Springfield township.	Stanley Struble, Pres. Bd. Co. Comrs.
Indiana	Richmond	July 8, 11 a.m.	Constr. a 24-ft. concrete span bridge in Green Twp.; an 18-ft. span on the Cart Road North of Richmond; constr. a concrete floor on the Canal Bridge at Hagerstown; constr. a concrete crete wa and carth filled approach of the Middleboro Bridge town township.	Demas S. Coe, County Auditor.
New Jersey	Trenton	July 11	Constr. a steel and conc. bridge over Herrontown Rd., Princetown township.	Frank J. Epple, County Engineer. Calvin H. Brown, County Auditor. John R. Goldenbogen, Clk. Bd. C. C.
Indiana	Ft. Wayne	July 12, 10 a.m.	Constr. a bridge over St. Joe River at Tennessee ave.	
Ohio	Cleveland	July 12, 11 a.m.	Constr. concrete bridge in Cleveland Heights twp. & retain. wall	

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
LIGHTING AND POWER				
Arkansas.....	England.....	July 1.....	Building and operating an electric light plant under a 30-year franchise.....	H. Galloway, Recorder.
New York.....	Buffalo.....	July 1, 11 a.m.....	Furn. and erecting power plant equipment at tuberculosis hospital at Perrysburg, N. Y.; power house and laundry; wiring to main building; constr. water supply system laundry machinery, ice machinery.....	Francis G. Ward, Comr. Pub. Wks.
Alberta, Can....	Stettler.....	July 3.....	Furn. one 125 KVA generator exciter and switchboard; one tandem compound steam engine, boiler, stack, poles, and pole line material; erecting pole line.....	David Mitchell, Town Clerk.
North Dakota...	Valley City.....	July 3.....	Furn. electric lumps, wires, carbons and other supplies in connection with light plant.....	M. J. Boly, City Auditor.
Australia.....	Brisbane.....	Jan. 30, noon.....	Designs, supply and erection at Mount Crosby Pumping Station of alternately one, two and three complete units consisting of power generating pumps and plants, etc.....	Geo. Johnston, Albert St., S.&W.Bd
FIRE EQUIPMENT				
Arizona.....	Douglas.....	July 3, 8 p.m.....	Furn. 500 ft. 2½-in. fire hose in lengths of 50 ft. together with couplings.....	D. F. Johnson, City Clerk.
New Jersey.....	Princeton.....	July 5.....	Furn. auto pumping engine.....	E. M. Updike, Chm. F. & W. Com.
South Dakota...	Gettysburg.....	July 11, 8 p.m.....	Furn. 750 ft. of 2½-in. fire hose; one service hose cart.....	R. L. Flickinger, City Auditor.
MISCELLANEOUS				
Ontario, Can .	Ft. William.....	June 30, 5 p.m.....	Constructing a reinforced concrete subway.....	John Wilson, City Engineer
Washington.....	Spokane.....	June 30.....	Constructing additions to county jail. Estimated cost \$40,000.....	Bd. County Comrs.
Illinois.....	Mendota.....	July 3.....	Constr. an iron and concrete roof on reservoir.....	City Clerk.
Iowa.....	Fort Dodge.....	July 3.....	Furn. street sweeper. Separate bids on dump and ordinary type.....	W. L. Tang, City Clerk.
Florida.....	Kissimmee.....	July 3, noon.....	Constr. county jail and sheriff's residence.....	E. L. Lesley, Chm. Bd. Co. Comrs.
New York.....	Long Island City	July 3.....	Disposing of garbage in 5th Ward, Boro. Queens.....	Lawrence Gresser, Boro. Pres.
Illinois.....	Gillespie.....	July 5, 5 p.m.....	Constructing new city building.....	G. W. Schmidt, City Clerk.
Indiana.....	Muncie.....	July 5.....	Constructing a new barn at County Infirmary, 40x50 ft.....	County Auditor.
Louisiana.....	Mansfield.....	July 5, 10 a.m.....	Erecting a two story and 1 basement, semi-fireproof Court house.....	Parish of De Sota
New Jersey.....	Garwood.....	July 5, 8 p.m.....	Constructing a borough hall.....	Wm. Darroch, Boro. Clerk.
Kansas.....	Hutchinson.....	July 7, noon.....	Erecting a municipal building.....	Edward Metz, City Clerk.
Pennsylvania...	Erie.....	July 10, 8 p.m.....	Constructing garbage disposal plant.....	Thomas Hanlon, City Clerk.
Minnesota.....	Caledonia.....	July 11.....	Constructing a brick and cement city hall.....	C. S. Trask, Village Clerk.
New Jersey.....	Camden.....	July 12.....	Furn. 124 ballot boxes 18-in. x 18-in. x 20-in.....	John T. Rodan, Chm. Elec. Com.
Rhode Island...	Providence.....	July 15, noon.....	Constructing 2 comfort stations.....	John H. Higgins, Chm. Com.
Florida.....	Orlando.....	July 17, noon.....	Improving the St. Johns River ferry at Geneva ave. crossing by deepening, widening and straightening cut-off channel.....	B. M. Robinson, Clk. Circuit Court.

STREET IMPROVEMENTS

Montgomery, Ala.—City Commissioners have instructed City Engineer Gilchrist to prepare estimates of cost of preparing Houston, Bell and South McDonough Sts. for oiling and estimates for final cost of oiling these streets.

Tucson, Ariz.—Board of Trustees of Pima County will soon ask bids for construction of speedway; work will consist of grading and oiling; road will be 23 miles long and 30 ft. wide.

Los Angeles, Cal.—Plans for boulevard to extend along northeastern side of Elysian Park have been submitted by the City Engineer to the Board of Public Works; two separate plans for the road are suggested, one of which is estimated to cost \$33,399 and the other \$44,619.

Monrovia, Cal.—Board of Trustees has passed several ordinances providing for extensive street improvements; Falling Leaf Ave. will be graded, oiled and curbed its entire length, a distance of fully a mile, and Orange Ave. will be improved in part.

South Pasadena, Cal.—Plans are being prepared for improvement of five streets with oil macadam at cost of \$300,000.

Colorado Springs, Col.—City Engineer T. L. Wagener has completed estimates of the cost of paving business section as follows: For asphaltic concrete, \$238,370; bitulithic paving, \$265,218; sarcalthic paving, \$229,420; sheet asphalt, \$239,477.

East Hartford, Conn.—Fire District Commissioners have decided to macadamize two streets.

Palatka, Fla.—Citizens will vote July 11 on \$15,000 bonds for paving.—H. A. Davis, Mayor.

St. Petersburg, Fla.—Citizens have voted \$35,000 brick paving bonds and \$5,000 for construction of steel crossing bonds.

Tampa, Fla.—Council is considering paving of West Tenth Ave., West Tampa.

Oglethorpe, Ga.—Macon County will vote on \$150,000 bonds for road construction.

Waycross, Ga.—Ordinance calling for expenditure of \$50,000 for paving sidewalks has been passed by Council. Alderman James Sinclair, Chairman of Finance Committee, will advertise for bids.

East Moline, Ill.—Board of Local Improvements has decided to pave State St. with brick at cost of \$53,000.

East St. Louis, Ill.—Board of Local Improvements has decided to pave Forty-second St. from Lincoln Ave. to Caseyville Rd. with brick.

Indianapolis, Ind.—Board of Public Works has adopted resolutions for ten street improvements to cost about \$60,000.

Mishawaka, Ind.—Board of Public Works has ordered paving of Bridge St.; material undecided.

Bangor, Me.—City is considering a proposition for widening Central St. and con-

structing retaining wall at the edge of the street along whole length of the thoroughfare from the foot of Hammond St. hill to Harlow St.; cost, \$300,000.—P. H. Coombs, City Engineer.

Grand Rapids, Mich.—Bids will be received July 3, 3 p. m., for \$108,000 street improvement bonds.—Jas. Schriener, City Clerk.

Monroe, Mich.—Council has decided to pave Washington St. at cost of \$18,000.

Butte, Mont.—Street and Alley Committee has recommended purchase of steam roller.

Belton, Mo.—Citizens have voted \$10,000 bonds to macadamize business streets.

St. Joseph, Mo.—Board of Public Works has decided to pave Quessame St. with sandstone blocks.—Alfred Meier, President.

Carson City, Nev.—Commissioners of Ormsby County have completed arrangements for building of new road in this county to connect with boulevard to be built in Washoe County from Reno to line of Ormsby County; work will be done by convicts and county will pay so much per man for convicts working on road.

Albany, N. Y.—Board of Contract and Supply will at once ask bids for improving Providence St. and paving Quail St.

Larchmont, N. Y.—Citizens have voted \$25,000 appropriation for sidewalks.

Lestershire, N. Y.—Citizens have voted \$21,000 bonds to improve Main St.

Wrightstown, N. Y.—New Hanover township has decided to issue bonds to build gravel road from Wrightstown through Pointville to township line on the road to Brown's Mills.

Burgaw, N. C.—Pender County will vote July 25 on road improvements.

Mars Hill, N. C.—Mars Hill Township voted \$10,000 toward construction of proposed central highway.

Cincinnati, O.—Plans and specifications will be prepared for widening and improving road from Hoover to Chudlaw Aves., Whitewater Township, at estimated cost of \$1,157.

Lisbon, O.—Construction of about 60 miles of brick paving on the main country roads is being considered.

Norwood, O.—Council has passed ordinance authorizing \$2,000 bond issue for extension of Ivanhoe Ave.

Frederick, Okla.—Council has decided to pave business district.

Muskogee, Okla.—Council is considering resolution calling for \$38,000 of paving with rock asphalt.

Beaver, Pa.—Citizens have voted \$20,000 bonds for street improvements.

New Brighton, Pa.—Citizens will vote July 22 on \$100,000 bonds to improve streets.

Sharpville, Pa.—Council has decided to pave Mercer ave., Shenango st. and Park Way.

Sumter, S. C.—Sumter County will vote Aug. 1 on \$150,000 bonds for road improve-

ments; \$30,000 is to be expended annually for five years.

Lexington, Tenn.—People of the western side of Henderson County have determined to build good road from Madison County line to a point 2 miles west of Lexington, regardless of any other road or highway that may be in contemplation.—Joe H. Holmes, Chairman.

Denton, Tex.—Lewisville Road District will vote July 29 on \$75,000 road bonds.

San Angelo, Tex.—Special Committee will recommend paving of business blocks with rock asphalt; \$100,000 available.—J. D. Hassell, Mayor.

Seymour, Tex.—Baylor County Commissioners are considering \$100,000 bond issue for road construction.

Dayton, Wash.—Council has decided to pave Main St. and portions of adjacent streets.

Spokane, Wash.—Bids have been rejected for paving Eighth Ave., Cannon to Chestnut Sts., with brick; plans will be changed to some other material.

Wenatchee, Wash.—Council is considering improvement of Methow St. at cost of about \$36,500.

Marinette, Wis.—City will build 30 miles of cement walk this summer.

CONTRACTS AWARDED

Troy, Ala.—To the C. B. Holt Contracting Co., Birmingham, for paving remainder of sidewalks of the city, 10c. per sq. ft.

Jacksonville, Fla.—Paving to Georgia Engineering Company, Riverside Ave., King to McDuff Sts., \$1.58 per sq. yd.; total amount of contract, approximately \$11,500; to Engineering & Paving Company, Third St., \$1.56 per sq. yd.; Hubbard St., \$1.56 per sq. yd.; Newman St., \$1.55 per sq. yd.; total amount of contract, approximately \$26,000; to George R. Foster, Jr., Riverside Ave., with asphalt, \$2.09½ per sq. yd.; total amount of contract, approximately \$70,000.

Chicago, Ill.—Paving various streets by the Board of Local Improvements: Alley Webster Ave., to P. J. O'Brien, 145 La Salle St.; alley 24th St., to Central Paving Co., 172 Washington St.; alley 31st St., to Central Paving Co., alleys, Hyde Park Boule., to Jno. A. McGarry Co., 188 Madison St.; N. Ashland Ave., to the American Asphalt Paving Co., 138 Washington st.; W. Chicago Ave., to the American Asphalt Paving Co.; Cottage Grove Ave., to Calumet Coal & Teaming Co., 2926 E. 95th St.; Ellis Ave., to the American Asphalt Paving Co.; Frankfort St., to the American Asphalt Paving Co.; N. 41st Ave., to Standard Paving Co., 1101 S. 48th Ave.; N. 43d Ave., to Standard Paving Co.; E. 56th St., to the Ryan Co., 131 LaSalle St.; Hillock Ave. to the American Asphalt Paving Co.; Lock

St. Louis American Asphalt Paving Co., Washburn St. to R. F. Conway Co., 138 Washington St., Perry St., to the American Asphalt Paving Co.; Rocher Ave. to R. F. Conway Co., E. 63d St., to the American Asphalt Paving Co.; E. 65th St. to the American Asphalt Paving Co.; S. Washburn Ave. to Coal & Teaming Co.; W. 20th St. to the American Asphalt Paving Co.; S. Washburn Ave., to Standard Paving Co.; Winchester Ave., to Calumet Coal & Teaming Co.; N. 12d St. to R. F. Conway Co.; No. 12d St. to the American Paving Co.; Dauphin Ave. system, to Farr Bros. Co., 356 West 11th St.; Clara Place System, to American Asphalt Paving Co.

Brookville, Ind.—Construction of two gravel roads to Sullivan & Mason, \$10,225.

Laporte, Ind.—Constructing macadam road in Spring Township by Bd. County Commissioners, John G. Young, \$18,000.

Logansport, Ind.—Wolford Rd. to E. E. Barnard, Delphi, Ind.; Richards Rd. to George Emery, Galveston, Ind.; Ireland Rd. to Fred T. Woods, Burnettsville, Ind.; Umbarger Rd. to Harry A. Barnes & Son, Logansport.

Mt. Vernon, Ind.—Construction of gravel roads in Posey County; To White & Pigenmann, Evansville, Ind., \$4,900 and \$5,941; to Mt. Vernon Construction Co., Mt. Vernon, \$7,950; to S. R. Adams & Co., Princeton, \$29,157; to Campbell & Harodins, Brazil, Ind., \$23,780; to S. A. Gano, Mt. Vernon, \$8,154.

Ft. Dodge, Ia.—Laying 7,500 sq. yds. concrete paving on 3d and 4th Aves. to James Tile & Mfg. Co., \$1,583 per sq. yd.

Osage City, Kan.—Paving four blocks of business section to McGuire & Stanton Paving Co., Leavenworth, \$1.94 per sq. yd. for "Fort Scott No. 1" brick.

Boston, Mass.—Building walks and drains in Boston common to Coleman Bros., \$8,788.35; other bidders: Andrew M. Cusack, \$10,105.40; Frank H. Cowin Company, \$12,178.10; building macadam roadway in Railroad St., West Roxbury, to West Roxbury Trap Rock Company, \$4,162; John Kelly & Co. bid \$5,481.80; engineers' estimate, \$7,200, which includes cost of the edgestones furnished by city; building brick block pavement on Hancock St., to F. S. & A. D. Gore Corporation, Bessemer block, \$17,909.60; other bidders: James Doherty, Mack block, \$18,459.70; Central Construction Company, Mack block, \$18,730.40; William J. Barry, Mack block, \$18,908.20; John F. O'Connell, Mack block, \$19,245.50; Frank H. Cowin Company, Porter block, \$19,058.60; Bessemer block, \$19,817.60; engineers' estimate, \$27,000.

Boston, Mass.—Building State roads: In Athol and Phillipston, 22,000 ft. of oiled macadam, to C. E. Horne, Milbury, at \$7,819; in Montague, 17,000 ft. of oiled macadam, to C. E. Horne, Milbury, at \$7,020; in North Adams and Williamstown, 28,000 ft. of oiled macadam road, to F. J. Magne, at \$12,343; only other bid was Frank Williams & Co., Boston, \$16,570; in Whately, 10,200 ft. of oiled macadam road, to Lane Construction Corp., Meriden, Conn., at \$4,631.

Detroit, Mich.—Paving Canton Ave., from Kercheval to Mack, with sheet asphalt, to Thos. E. Currie, McGraw Bldg., at \$29,233; Jones St., from Cass Ave. to Fifth St., with brick to F. Porath & Sons, Penobscot Bldg., at \$8,623.

Jackson, Miss.—Paving 20,000 square yards with asphalt to Southern Asphalt Paving Co., about \$50,000.

Elizabeth, N. J.—By Committee on County Roads of the Board of Freeholders for repairing of county roads to Weldon & Co.

Trenton, N. J.—To Peter K. Austin by Bridge Committee of the Board of Freeholders for building of two culverts on Pennington-Harbourton Rd., \$1,125; other bidders, John Ginder, \$1,250, and Thomas McGovern, \$1,180.

Woodbridge, N. J.—Laying macadam on Ridgedale ave., Mutton Hollow road and Halton st. and Cliff road, Sewaren, to J. C. F. Wler, of Sewaren.

Albany, N. Y.—Building State roads, Albany-Guilderland Road No. 5155, to B. D. Pierce, Jr., Company, Bridgeport, Conn., \$75,701; for Gilsonite; Olean-Hillsdale-Cuba State Highway No. 5137, Cattaraugus, 8.83 miles, to H. C. Bunks & Company, Olean, \$107,443, for residuum; Cutting-French Creek County Highway No. 939, Chautauqua Company, to Busch & Percival, Buffalo, \$78,989; Jamestown-Frewsburg County Highway No. 940, Chautauqua Company, 4.24 miles, to Thos. Maloney, Jamestown, \$76,337; other bidders, Lake Shore Construction Company, Dunkirk, \$76,907; John Swanson, Jamestown, \$81,637; Lancaster-Alden County Road No. 917, 1.11 miles, to Constantine Bros. Company, Buffalo, \$90,440; Batavia-Stafford State Road No. 5145 to F. J. Mumm, Buffalo, \$41,800, for residuum; Hope Center-Wellis, Part 1, State Highway No. 5133, Hamilton Company, 5.48 miles, to Brown & Lave, Schenectady, \$61,358, for residuum;

Water-town-Clayton Road, Part 1, No. 5149, 5.21 miles, to B. C. Miller, Wilkes-Barre, Pa., \$52,427, for residuum; Marcy Hill-Trenton County Highway No. 931, Oneida County, 12.07 mi., and Deerfield Corners-Marcy Hill County Highway No. 933, to O. T. Benedict, Pittsfield, \$143,000, for Bermudez and Trinidad; Monroe-Oxford State Highway No. 5141, Orange County, 3.31 miles, to Schunemunk Construction Company, Highland Mills, \$38,113, for residuum; Schenectady County Highway No. 935, Otsego County, 3.83 miles, to the Lane Construction Company, Meriden, Conn., \$35,910; Schenectady-Westford County Highway No. 936, 4.15 miles, to Lane Construction Company, Meriden, Conn., \$47,150; Wells Bridge-Otsego State Highway No. 5153, Otsego County, 4.61 miles, to Newport Construction Company, Newport, N. Y., \$51,556, for residuum; Hornell-Big Creek State Highway No. 5130, Steuben County, 1.16 miles, to Greenfield Construction Company, Brooklyn, N. Y., \$11,290, for residuum; Freeville-Groton County Highway No. 926, Tompkins County, 4.49 miles, to Amos D. Bridge's Sons, Hazzardville, Conn., \$39,729; Smith's Basin-Lime Kill County Highway No. 942, Washington County, 0.66 miles, to C. J. Reardon, Glens Falls, \$4,600; Scotia Village Road No. 5132, Schenectady County, 1.27 miles, to Dollard & Heeran, Albany, \$45,883; Dunhams Basin County Highway No. 720-A, Washington County, 0.24 miles, to C. J. Reardon, Glens Falls, \$2,317; Byram Lake-Bedford State Highway No. 5146, Westchester County, 3.34 miles, to Jas. Garafano, Mt. Vernon, \$43,985, for residuum; Warsaw-Pavilion Road No. 5134, Wyoming County, 3.59 miles, Part 2, to Fred J. Mumm, Buffalo, \$49,400, for residuum; No. Reading-Dundee, Part 2, State Highway No. 5128, Yates County, 2.68 miles, to Thos. J. Ford, Elmira, \$36,999, for residuum; Peekskill-Fishkill Road, Part 1, Westchester and Putnam Counties, No. 5147, 3.63 miles, to Samuel Beskin, Fishkill, \$51,850, for residuum.

Albany, N. Y.—Repaving Maiden Lane, North Pearl to James St., to P. W. Mulder, \$969.70.

Gloversville, N. Y.—Paving E. 8th Ave., Forest and W. Fulton Sts., about 13,000 sq. yd., with Clearfield brick on concrete, to Albert M. Banker, Gloversville; paving \$2.38 per sq. yd. and setting curb on concrete 30 cts. per lin. ft.; total cost about \$34,734.

Little Falls, N. Y.—Paving and curbing of Albany and Second sts., to Warren Brothers, Boston, \$27,081.74.

Lockport, N. Y.—Building cement walk on Pine St. to John Irwin, \$2,170.

Norwich, N. Y.—By Village Board of Trustees to the Tibbitts-Maher Co. for paving with repressed brick Birdsall St., \$25,700, and Hayes St., \$10,700.

Rochester, N. Y.—By Board of Contract and Supply for the construction of asphalt pavement in Winton Road to Whitmore, Rauber & Vincinus, \$34,964; Zimbrick st. brick pavement to F. V. Brotsch, \$4,201.

Syracuse, N. Y.—Paving Onondaga Ave. from end of present pavement to Cortland Ave. to the Warner-Quinlan Asphalt Company, \$25,564.15, by the Board of Contract and Supply.

Utica, N. Y.—Repaving Park Ave., Elizabeth to Lansing St., to Harry W. Roberts & Co., \$3,967.

Akron, O.—By Board of Control Saturday: Howe St. paving, \$14,294, to E. McShaffrey & Son; Bishop St. sewer to S. W. Parshall \$4,585; Jewett St. paving, \$653.80, to Matt McCourt and retaining wall, \$1,535.90, in Pleasant Park to J. V. Kidder.

Canton, O.—Paving Canton-North Industry Rd. for a distance of 2 1/2 miles to Frank A. Downs, Canton, \$29,397; other bidders: P. Dieffenbacher & Sons, \$29,730; Preston Campbell, \$30,276; William H. Stanton, \$33,794; Wise, Smith & Krabill, \$33,804; R. C. Roush, \$34,228; Pierce & Talerice, \$34,549; Peter Hahn & Son, \$34,421; engineer's estimate, \$30,893.

Cincinnati, O.—By County Commissioners for improvement of Loveland and Madeira road, from Remington to Camargo pike, to Van Camp Brothers, \$16,032.

Columbus, O.—Street paving: 14th Ave., from Summit St. on the Big Four tracks, Portsmouth Blk., with cement filler, 4400 yd., to George W. Patterson & Son, \$12,076; to George W. Patterson & Son, \$12,076; Kossuth St., from Bruck St. to Parsons Ave., Nelsonville Blk., with cement filler, 3600 yd., to Geigle Games & Co., \$8997; 19th Ave., from Summit to Fourth St., Trimble Blk., with cement filler, 1900 yd., to George W. Patterson & Son, \$5473.

Coshocton, O.—To Cleveland Trinidad Paving Co., Cleveland, to pave Park, Orchard and Sixth Sts., \$12,870.

East Liverpool, O.—Paving Thompson, Blakely, Vine and Pawcett Sts., to Hinton & Cunningham, East Liverpool, \$13,000; Railroad and First Sts., to Thomas McLaughlin, East Liverpool, \$12,400.

Perrysburg, O.—By Council for paving 7d St. with brick to T. J. Mulligan, Lima, \$38,335.

Portland, Ore.—Paving the Skidmore district with bitulithic pavement to the Warren Construction Company by City Executive Board, \$306,382.

Altoona, Pa.—Paving Washington Ave. to Bell-Boeckel Co., \$2.17 per sq. yd.; supplies for highway and sewer division; cement in carload lots to Standard Equipment Co.; ballast to L. W. Flanagan; broken stone to Canon-Knox Supply Co.; brick to Altoona Brick & Tile Co.; hauling to L. H. Fressle, 40c. per hour.

Beaver, Pa.—By Council to George B. Chifford, New Brighton, \$24,583, for paving Market St., from Fifth to borough line north.

Clarion, Pa.—Building 13,178 ft. of new State road in Clarion County, from the Richland Township line in Beaver Township through Monroe Township to Elairs Corner, to J. E. Francis, Punxsutawney, \$40,000; road is to be 10 ft. wide and will be of brick.

Johnsburg, Pa.—Paving Center St. to Applegate & Pascuzzi, approximately \$15,000.

Philadelphia, Pa.—To Barber Asphalt Company for original paving with asphalt of various streets in city and also for re-paving a number of asphalt streets.

Scottdale, Pa.—Paving portions of S. Chestnut and Stoner Sts., Grant and 4th Aves., requiring 6,734 sq. yds. vitr. brick or block, also vitr. hillside brick or block, 1,855 sq. yds., etc., awarded to Chas. H. Baldwin, Coraopolis.—J. B. Hogg, Connelville, Borough Engineer.

Salt Lake City, Utah.—Sidewalk extension No. 148 to McKee & Burt, \$3,871.35.

Norfolk, Va.—To F. J. McGuire to build road through Villa Heights, \$1.25 sq. yd. for roadway and 47c. per ft. for curb.

South Bend, Wash.—Paving Broadway, Water, Adams and Quincy Sts. to (a) C. L. Morris Constr. Co., Seattle, \$155,045; (b) Ollar-Robinson Co., 614 Bankers' Trust Bldg., Tacoma bid, \$169,298; 8,700 cu. yd. earth excav. (a) 50c., (b) 50c.; 3,534 cu. yd. rip-rap (a) \$1.25, (b) \$1.50; 19,200 lin. ft. 3-in. tile drain (a) 15c., (b) 10c.; 18,000 lin. ft. concrete curb (a) 45c., (b) 45c.; 179,177 sq. ft. concrete sidewalks (a) 14 1/2c., (b) 14c.; 10 catch basins (a) \$25, (b) \$35; 40 curb inlets (a) \$15, (b) \$14; 4,000 lin. ft. 6-in. vitr. sewer pipe (a) 60c., (b) 50c.; 55,690 sq. yd. asphalt pavt. 5-in. base (a) \$1.85, (b) \$2.09.

Spokane, Wash.—Paving Wall St. with Hassam concrete, Sumner to 14th Ave., estimate \$15,400, to Inland Empire Hassam Paving Co., the only bidder, \$15,509; side-walking Herow Ave., Crestline to Pittsburg St., estimate \$1,970; to Naylor and Norlin, \$1,734.

SEWERAGE

Clarksville, Ark.—City will construct sewer system; cost \$25,000; John M. Davis, D. Ward Dunlap and A. N. Ragon, Board of Commissioners.

Coalinga, Cal.—Citizens have voted \$40,000 bonds for construction of sewer system.

Oakland, Cal.—Council has accepted bids of the Oakland Bank of Savings for purchase of bonds totaling \$476,000, recently voted by residents of annexed territory for sewerage of four sanitary districts.

San Jose, Cal.—Citizens have voted \$110,000 bonds to build sewers.

Pacific Grove, Cal.—T. B. Hunter, Monterey, is preparing plans for proposed system of storm waterways; contract will soon be let; cost about \$62,000.

Colorado Springs, Col.—Council has decided to install five blocks of sewers.

Plant City, Fla.—City is considering construction of sewer system.

St. Petersburg, Fla.—Citizens have voted \$5,000 bonds for sewer extension.

Columbus, Ga.—Council is considering construction of new and complete sanitary sewer system.

Unadilla, Ga.—Citizens have voted \$15,500 bond issue for sewer construction.

Dayton, Ill.—Board of Local Improvement has selected F. L. Stone, of Ewing & Stone Co., Chicago, to design and supervise construction of complete sewer system.

Geneva, Ill.—Harry L. Wells, of Geneva, has been selected as engineer for sewer system to be constructed on west side of the city.—F. M. Marsteller, Mayor.

West Terre Haute, Ind.—Town Council is considering construction of water works.

Lawrence, Kan.—Council has passed ordinance authorizing asking of bids for construction of all sewers where contracts had not been let.

Mulvane, Kan.—City proposes to construct sewer system; cost \$6,000.—S. F. Field, Mayor.

Wichita, Kan.—City will construct sanitary sewer mains No. 20 consisting of 12, 15, 18, 30, 39, 42, 45, 48-in. concrete, brick or vitrified pipe sewer; trenching machine

with 15-ft. cut will be needed.—Bert Wells, City Engineer.

Waterville, Me.—City will construct reinforced concrete trunk sewer.—Harry E. Green, City Engineer.

New Bedford, Mass.—Plans by Metcalf & Eddy, Consulting Engineers, have been approved for proposed intercepting sewers to cost \$1,526,000; work includes sewer outfall, \$113,000; Acushnet & Clark's cove intercepting sewers, \$958,000; screen house, grit chamber and power station, \$86,000; pumping station and equipment, \$29,000; also second outfall, \$110,000, and two additional pumping stations and equipment, \$230,000.

New Bedford, Mass.—Committee on Roads and Sewers has recommended construction of sewers in Jouveite and Query Sts.

Grand Rapids, Mich.—Bids will be received July 3, 3 p. m., for \$45,000 sewer construction bonds.—Jas. Shriver, City Clerk.

Reed City, Mich.—Geo. Cadogan Morgan, Chicago, Ill., has completed survey and is now working on plans for proposed sewer system.

Eveleth, Minn.—Cost of installing sewers along Hayes, Cleveland and Garfield Sts. has been estimated at \$1,003.

Willmar, Minn.—No bids were received June 12 for constructing two purification plants and pumping stations; new bids will soon be received.—J. A. Rowat, City Engineer.

Bellevue, Neb.—Citizens will soon vote on bonds for erection of municipal sewer system and water works.

Hasbrouck Heights, N. J.—A. C. Austin, Mayor, desires correspondence with engineers in regard to installing proposed system of sewers.

Long Island City, L. I., N. Y.—Board of Estimate of New York City has decided to construct sewers in Stoothoff, Ridgewood, Hamilton Aves., Queens Boro. as extensions to Richmond Hill system now under construction, from Jamaica Ave. to Jamaica Bay, and the disposal plant; total cost, \$76,200; also authorized preliminary work on the following: Sewer in Flushing Ave., Maspeth; estimated cost, \$14,500; sewer in Fresh Pond Rd., Ridgewood; cost, \$29,900; sewer in Hancock St., Long Island City, 290 ft. north of Paynter Ave., and sewer in Troutman St., Ridgewood, and in Metropolitan Ave.; estimated cost, \$18,700.

Hillsboro, Ore.—Bids will soon be asked by Council for installing sanitary sewers in business districts.

McKeesport, Pa.—Ordinance for sewers in East End has passed.

Somerset, Pa.—Additional \$12,000 will be expended for water works improvements from plans of L. E. Chapin, Pittsburg.—Chas. J. Shaver, Borough Secretary.

Pawtucket, R. I.—Council has passed joint resolution appropriating \$15,000 for construction of sewer connecting systems of this city and Providence.

CONTRACTS AWARDED

Ft. Dodge, Ia.—To Jas. Benson to construct sanitary sewer on Fourth Ave.

Portland, Me.—To Wm. H. Doughty for construction of Robinson and Ocean st. sewers; 40c. per ft. and \$33 per manhole.

Boston, Mass.—To McCarthy & Walsh for sewerage works in St. Botolph St. extension from Gainsborough St. 310 ft. southwesterly, city proper, \$4,450.72; other bidders: Peter W. Hill, \$4,719.38; Antony Cefalo, \$4,840.40; R. J. Young & Co., \$5,102.47; A. M. Cusack, \$5,344.55; C. J. Jacobs Company, \$5,665.68; George J. Regan, \$5,684.38; engineers' estimate, \$4,668.50; to George J. Regan for sewerage works in Spencer St., Melville Ave., River, Flint and Bay Sts., Dorchester, \$1,822.10; other bidders: Murphy & Dolan, \$2,017.23; Daniel E. Lynch, \$2,064.70; William J. Rafferty Company, \$2,071.75; M. F. Gaddis, \$2,200.07; John McCourt & Co., \$2,687.60; engineers' estimate, \$1,915; to Murphy & Dolan for sewerage works in Brinsley St., between Columbia Road and Washington St., Dorchester, \$2,314.65; other bidders: Antony Cefalo, \$2,406.10; A. M. Cusack, \$2,701.55; M. De Sisto & Co., \$2,733.60; George J. Regan, \$2,789.40; John McCourt & Co., \$2,888.95; Charles J. Jacobs Co., \$2,913.65; William J. Rafferty Co., \$2,915.30; F. H. Cowin Co., \$3,649.45; R. J. Young & Co., \$3,980; engineers' estimate, \$2,662.97.

Bessemer, Mich.—Laying 7,150 ft. vitr. pipe sewers, 2 ft. to 16 ft. deep; 1,835 ft. of 2 x 2½ ft. reinforced concrete sewer, 3 to 9 feet deep; 19 brick manholes, 5 concrete manholes, etc., from plans of W. G. Kirchoffer, of Madison, Wis., to Peter Becker, Bessemer, \$13,193.

Mt. Vernon, N. Y.—Building North Second Ave. sewer to Jas. Piro, \$1,098.

Eddystone, Pa.—By Council to Cantrell Construction Co. for sewer work, \$8,950.

Patton, Pa.—By Council to the Baker-Owen Construction Co., Johnstown, con-

tract for laying 9,117 ft. of 6 and 8-in. terra cotta sewer pipe under ten different streets of borough.

South Bend, Wash.—Construction of a system of drainage and sanitary sewers to the John Constr. Co., 507 Leary Bldg., Seattle, as follows: 118,680 ft. lumber, \$15; 268 30-ft. piles driven and cut off, \$5; 1,610 lin. ft. trunk sewer barrel, \$10; 90 6-in. Y's, \$1; 12 side sewer connections, each, 60c.; 5 manholes, each, \$20; 3 inlets, \$20; 1,325 lin. ft. 6-in. vitr. pipe sewer, 70c.; 1,960 lin. ft. 8-in. vitr. pipe sewer, 80c.; 1,360 lin. ft. 10-in. vitr. pipe sewer, \$1.20; 320 lin. ft. 15-in. vitr. pipe sewer, \$1.50; 63 6-in Y's, \$2; 74 8-in Y's, \$2.25; 75 10-in. Y's, \$3; 3 15-in. Y's, \$4.50; 15 manholes, each, \$40; total, \$26,066; totals of other bids: C. L. Morris Constr. Co., Seattle, \$26,178; Frank S. Misho, Seattle, \$26,603.

Cudahy, Wis.—To Rudyard E. Kerlin, Cudahy, for constructing sewer mains.—G. H. Wippler is City Clerk.

Montreal, Que., Can.—To L. Giguere & Co., sewer construction through Longue Point, Rosemount and St. Denis, \$263,247; sewer on Azilda Ave., \$43,880; sewer on Mercier Boule., \$33,200.

WATER SUPPLY

Clarksville, Ark.—City will construct water works; cost \$30,000; John M. Davis, D. Ward Dunlap and A. N. Ragon, Board of Commissioners.

Dunsmuir, Cal.—Improvements to cost \$75,000 will be made by the Dunsmuir Water, Power & Light Co.; 18 and 12-in. pipe will be laid from Mossbrae Falls to Dunsmuir.

Washington, D. C.—Report from American consul states that a decree has just been issued by President of Latin-American Republic authorizing local government to purchase three well-drilling machines and to employ competent men to operate them; the machines and operatives are to be rented to farmers at fixed rate for purpose of increasing number of artesian wells in the rural districts. Address No. 6840, Bureau of Manufactures.

Jesup, Ga.—Citizens have voted \$25,000 bonds for construction of water works.

Pocatello, Ida.—J. A. Jones has asked for franchise to install water system.

Arthur, Ill.—City has decided to construct water system at cost of \$151,000; about 4 m. of water main will be laid.—Claid James, Mattoon, Engineer; J. F. Martin, Mayor.

Herrin, Ill.—Citizens have voted \$33,500 bonds to start construction of water works.

Mishawaka, Ind.—Board of Public Works and the Committee on Water Works of Council are considering plans and specifications prepared by Superintendent of Water Works E. F. Crabill for new system of mains to be laid to carry pure water to various parts of city.

Bedford, Ia.—Burns & McDonnell, Scarritt Bldg., Kansas City, Mo., are preparing plans for installation of water works.

Des Moines, Ia.—Citizens have voted to give Council authority either to purchase or build waterworks plant.

Mt. Hope, Kan.—Election on bonds of water works is being considered.

Kentwood, La.—Citizens will vote on bond issue of \$50,000 for water and sewerage system.

Libertyton, Md.—Town is to have a water works of its own if the plans of the Volunteer Pipe Company materialize; orders have been given to Civil Engineer E. C. Crum to begin surveys latter part of next week, and the work will be pushed as fast as possible; a stream, called Town Branch, which runs through town, will be utilized for supply.

Rising Sun, Md.—Establishment of water works system is being considered.

Franklin, Mass.—Town has sold \$40,000 water bonds to E. H. Rollins & Sons.

Benton Harbor, Mich.—Citizens have voted \$50,000 bonds for water works.

Grand Rapids, Mich.—Bids will be received July 3, 3 p. m., for \$200,000 sand filtration bonds.—Jas. Schriver, City Clerk.

Eveleth, Minn.—Cost of installing water main on Elba Ave. has been estimated at \$1,397.15 and on Harrison St., \$319.60.

Grasson, Minn.—John Youngquist will prepare estimate on cost of installing water mains.

Culbertson, Mont.—Citizens have voted \$39,500 bonds for water works system.

Cabool, Mo.—Citizens will soon vote on \$9,000 bonds to install water system.

Milan, Mo.—Preliminary plans have been prepared by Hiram Phillips, Consulting Engineer, Third National Bank Bldg., St. Louis, for installation of a water works system; estimated cost is \$25,000; work includes construction of a reservoir.—John W. Boughen, Milan, is in charge.

Bellevue, Neb.—Citizens will soon vote on bonds for erection of municipal water works and sewer system.

Louisville, Neb.—Citizens have voted \$6,000 bonds for installation of water works.

Omaha, Neb.—Citizens will vote June 28 on \$8,250,000 water bonds.

Charlestown, N. H.—Town is arranging to construct small gravity water supply for village of North Charlestown; pipe, hydrants, etc., have been purchased and will be laid by the superintendent of the Charlestown Water Works.—Dudley & Sawyer, Manchester, Engineers.

Trenton, N. J.—George Johnson, of the firm of Johnson & Fuller, Consulting Engineers, who have in charge preparation of a hypochlorite sterilization plant for water department, has submitted plans to the Water Board.

Albany, N. Y.—State Water Supply Commission has denied application of the Monroe County Board of Supervisors for regulation of Genesee River, under Tiver Improvement Act, by construction of reservoir at Portage at cost of about \$5,000,000.

Selma, N. C.—City desires water works, with tanks of 50,000 to 100,000 gallons capacity; water supply from deep wells or Neuse River.—John A. Mitchener, Mayor.

Oak Harbor, O.—Citizens have voted \$35,000 bonds for water works improvements.

Bennington, Okla.—City will construct water works at cost of \$20,000.

McAlester, Okla.—City has advertised for bids for one duplex pump and 40,250 lin. ft. eight-in. black steel pipe, to be used in extension of city water works system.

Hermiston, Ore.—Walter B. Hinkle has been selected to prepare plans and superintend construction of proposed water system.

Monmouth, Ore.—Citizens have voted \$25,000 bonds for water works.

Glen Rock, Pa.—Jacob H. Brillhart, 31 N. Seventh Ave., Bethlehem, is preparing plans and specifications for additional water supply.

Ipswich, S. D.—Bids will be received about July 15 for the construction of water works from plans of the Dakota Eng. Co., Mitchell; cost about \$20,000.—E. J. Engler, City Auditor.

Galveston, Tex.—City Engineer A. T. Dickey, after inspection of city water works pumping station, has recommended increasing of compressed air pipe in each of the 30 wells a distance of 15 ft.

New Braunfels, Tex.—Citizens will vote July 11 on \$67,000 bonds to construct dam across the Guadalupe River and lay mains from dam to the Comal Springs, where pumping station will be installed to furnish city's water.

Rocky Mount, Va.—Citizens have voted \$75,000 bonds for establishment of water works, sewerage and municipal electric light plant.

Tacoma, Wash.—Installation of hydrants in various sections of the north end is being urged.

Wapato, Wash.—Engineer D. R. Redman has submitted to Council plans and specifications for a municipal water plant for city.

Melfort, Sask., Can.—T. Aird Murray, Consulting Engineer, Toronto, has presented report to the town regarding proposed installation of water works and electric light plant.

St. Boniface, Man., Can.—City will expend \$75,000 on the water works system this year; \$40,000 of which will be used for erection of reservoir.

CONTRACTS AWARDED

Gadsden, Ala.—Furnishing pipe and specials for extending water mains to American Pipe & Foundry Company; valves, lead and yarn to Crane Company, and hydrants to Ludlow Manufacturing Company.

San Francisco, Cal.—Completing the laying of pipe for an auxiliary water system to the Raichs Improvement Co., 199 Montgomery St., \$91,500.

Vallejo, Cal.—Construction of reservoir on Fleming Hill about 20 miles north of this city to the American Construction Co., San Francisco, \$35,925.

Greeley, Col.—To Foster & Doll, Denver, for doing concrete and iron work for filtration basin No. 3 at the city water works, \$7,565.

Evansville, Ind.—Contract for dirt fill to be made around filter plant at the city water works to Parsons & Rooney, contractors, 24½c. per cu. yd., to be made with wheel scrapers.

Frederick, Md.—Improvements to water works; furnishing and laying to 1013 tons c. i. pipe, to United States Cast Iron Pipe & Foundry Co., 71 Broadway, New York City, \$21,531; pipe, to R. D. Wood & Co., New York City, \$1,075; valves, hydrants, etc., to Charles Roy, Johnstown, Pa., \$79,641; for excavation and laying of pipe, to William H. Boardman, 426 Walnut St., Philadelphia, Pa.—Frank E. Tyerar, Superintendent.

Boston, Mass.—Relaying water pipe in five streets, Charlestown, to S. Canal, \$1,119.00; engineer's estimate, \$1,355; same in Intervale St., Dorchester, \$1,500; Road, Maple and Maxfield Sts., West Roxbury; Park Vale Ave., Miles and Tip Top Sts., Brighton; Cottage, Lucee and Orleans Sts., East Boston, to High McNulty, \$1,100.00; other bidders: John A. Costello & Co., \$1,321; Michael De Sisto, \$1,355.30; Thomas Burke, \$1,128.10; Daniel E. Lynch, \$1,790; engineer's estimate, \$1,432; same in Church, Fayette and Melrose Sts., city proper, to J. A. Costello & Co., \$1,155.05; engineer's estimate, \$1,937.50.

Two Harbors, Minn.—Furnishing 30-kw high efficiency transformer for water and light plant to Jos Beck.

New York, N. Y.—To the T. A. Gillespie Co., 50 Church St., for completion of Hudson system and part of the Hudson River division of the Catskill aqueduct in the towns of Cornwall and Fishkill, \$1,619,020.

Concord, N. C.—To Clarendon Construction Co., Wilmington, N. C., to install complete filter plant, \$26,000; to Glamorgan Pipe & Foundry Co., Lynchburg, Va., for c. 1. pipe, \$13,500.

Bradley, S. D.—Building water works to Joel McKee, city, \$12,722; other bidders: E. L. Dumchell, Laurel, Neb., \$14,589; Roberts & Fum, Brookings, \$14,405; Fraser & Danforth, Rochester, \$13,216; Des Moines Bridge & Iron Works, Des Moines, Ia., \$14,096; Cook Construction Co., Des Moines, \$14,459; L. W. Schruth, Fargo, N. D., \$13,864; and W. D. Lovell, Minneapolis, Minn., \$13,631.

Denison, Tex.—By City Commission to D. W. Rainey, Muskogee, to drill artesian well at new waterworks pumping station.

Ft. Ward, Wash.—To McInnis & Harington for constructing reinforced concrete reservoir Worden \$31,200; pipe line, \$5,100.

Redmond, Wash.—To Jeffery & Buffon, Portland, Ore., for proposed water works system at Clino Falls, \$24,500.

Snohomish, Wash.—To Atlas Construction Co., Everett, to lay 16 in. of wooden water mains.

BIDS RECEIVED

Geneva, N. Y.—Constructing reservoir in connection with water system improvement as follows: Lupfer & Remick, of Buffalo (2 bids), \$26,850 and \$22,900; Coughlin, Lowman & Bradley, Elmira, \$24,632; Simpson Bros. Cor., Boston, Mass., \$28,960; G. W. Thompson, Utica, \$30,250; Hennebique Construction Co., New York City, \$34,900; Gahren, Dodge & Maltby, New York City, \$38,865.

Fort Worth, Tex.—Building filtration plant: Texas Building Co., of Fort Worth, the New York Continental Jewel Filtration Co., and the Pittsburg Filter Mfg. Co., the last-named submitting two bids of \$62,207 and \$69,983, in accordance with different plans; highest bid, \$76,156.

Lexington, Va.—Furnishing material and work on gravity water supply: A. Wyckoff & Son, Elmira, N. Y., 41,600 ft. of wood pipe, \$18,503; U. S. Cast Iron Pipe and Foundry Co., Philadelphia, Pa., 16,800 ft. of 8-in. c.-1. pipe, at \$22.90 per ton, or \$8,931; Glamorgan Pipe and Foundry Co., Lynchburg, Va., 16,800 ft. of 8-in. c.-1. pipe, at \$23.50 per ton, or \$9,165; Lynchburg Foundry Co., Lynchburg, 16,800 ft. of c.-1. pipe, at \$23.65 per ton, or \$9,223; R. D. Wood, Philadelphia, Pa., 16,800 ft. of 8-in. c.-1. pipe, at \$24 per ton, or \$9,360; Central Foundry Co., 16,800 ft. of 8-in. Universal joint pipe, \$11,592. Trenching and pipe laying: H. C. Brooks, Clarksburg, W. Va., \$28,943; S. B. Bennington, Lynchburg, \$32,021; J. L. Meem, Lynchburg, \$28,386; Stamper Tagland & Co., Richmond, Va., \$25,090; Gallagher & Bryan, Baltimore, Md., \$22,537; Cantrell Construction Co., Parkersburg, W. Va., \$23,655; J. F. McGuire, Norfolk, Va., \$24,219; C. O. Ladd & Co., Germantown, O., \$19,960.

LIGHTING AND POWER

Berryville, Ark.—North Arkansas Power Company has been incorporated, capital \$100,000, to develop electricity from streams in Northern Arkansas for use for lights and power for factories, etc. J. R. Neff, E. Ingram, Ellis D. Munger and others, Directors.

Clarksville, Ark.—City will construct electric light plant; cost, \$20,000; will purchase wires and poles of E. T. McConnell's plant, destroyed by fire. John M. Davis, D. Ward Dunlap and A. N. Ragon, Board of Commissioners.

Cotter, Ark.—City has granted 30-year franchise to E. B. Griswold to operate electric light plant.

Dermott, Ark.—City is considering improving electric light plant; betterments will include installation of direct-connected generating unit.

Live Oak, Cal.—Metz & Berg have been granted permission to build electric light system.

Wilmington, Del.—Street and Sewer Commissioners have decided to remove all wires, poles and posts from Market st., which is to be beautified by the use of ornamental standards for lights and trolley wires.

Plant City, Fla.—City is considering construction of electric light plant.

Washington, Ga.—Citizens will vote July 14 on \$30,000 bonds for reconstructing electric light plant; will erect building 60x70 ft. mill construction; Westinghouse, Church, Kerr & Co., 10 Bridge st., New York, engineers.—E. A. Barnett, Mayor.

Elkhart, Ind.—Indiana & Muncie Electric Co. is preparing to ask for bids for rebuilding of dam in St. Joseph River and erection of power house.

Elkton, Md.—Council has granted franchise to Home Manufacturing Light & Power Company.

Easthampton, Mass.—Easthampton Gas Co. has applied for permission to issue \$125,000 additional stock; part will be expended for improvements.

Mansfield, Mass.—Town has voted to issue \$22,500 bonds for enlargement of municipal light plant.

Canby, Minn.—Installation of electric lights is being considered.

Coffeeville, Miss.—P. M. Woodall desires correspondence with manufacturers of machinery for electric light plant for town of 700 or 800 people; gas-producer type to burn lignite preferred.

Deeth, Nev.—Board of Commissioners has granted franchise to Deeth Mercantile Co. to build and operate electric lighting system.

Whippany, N. J.—No 50-year franchise to lay gas mains along Hanover Township Road will be given to the Public Service Gas Company, of Morristown.

Chaumont, N. Y.—Charter has been granted to the Chaumont Electric Light Co. with a capital stock of \$8,000. Edgar H. Merriman, of Adams Center, and Chas. N. Arnold and George Diefendorf, Chaumont, Directors.

Rochester, N. Y.—To Standard Underground Cable Company for 6,000 ft. of four-conductor cable for the Fire Alarm Telegraph System, 9 1-10 cts. per ft.

Selma, N. C.—City desires electric light plant.—John A. Mitchener, Mayor.

Valley City, N. D.—O. N. Guldin, Ft. Wayne, Ind., has petitioned for franchise to install gas plant.

Williston, N. D.—Lignite coal deposits of this region will be utilized in manufacture of gas through action of Col. A. B. Kerlin, of Devils Lake, and E. A. Wilson, of Fargo, who will act jointly in establishment of gas plant at early date.

Beaumont, O.—The Central Ohio Power Co. will soon be formed to construct electric power plant; C. W. Humphrey, Chicago, Ill., Architect.

Shawnee, Okla.—City is without light or power because of the burning of big power house of Shawnee Gas and Electric Company with loss of \$125,000.

Greenwood, S. C.—City desires gas plant; 8,000 population; would consider granting franchise. G. W. Gardner, care of Greenwood Journal, can be addressed.

Chamberlain, S. D.—Contracts will soon be let for the construction of proposed electric light plant for the Electric Light Co.—J. H. Kennedy, Secretary.

Corpus Christi, Tex.—Ordinance granting gas franchise to a syndicate composed of Joseph Hirsch, Royall Givens, M. T. Gaffney, Jacob Smith and others has been passed by Council.

Newport News, Va.—Citizens have defeated proposition to issue \$150,000 bonds for erection of municipal electric light plant.

Richmond, Va.—Committee on Electricity has authorized purchase of 16,000 ft. of wire for the municipal plant and four transformers to be used in Washington Ward; estimates have been asked for ornamental lights on Jefferson St., from Broad to Franklin.

Bluefield, W. Va.—Appalachian Power Co. has bought electric plant at Keystone and Welch.

Bluefield, W. Va.—T. George Carroll, Baltimore, Architect, has been selected to prepare plans for large retort house and apparatus rooms for Bluefield Gas & Power Co.; proposed building will be two stories high, of brick, with stone and concrete trimmings.

Menasha, Wis.—Council has voted to contract with Northern Hydro-Electric Co., Oshkosh, for current to supply municipal commercial lighting system; proposed to issue bonds to cover the cost of transmission lines and service connections.

Wausaukee, Wis.—Alex. Dufresne is planning to install electric light plant.

CONTRACTS AWARDED

Chicago, Ill.—Furnishing 25,000 ft. No. 6 B. & S. J. rubber-covered lead-encased electric light cable to the Simplex Electrical Co., 1144 Monadnock Block, Chicago, \$3,287.—Wm. Carroll, City Electrician.

Pittsfield, Mass.—Building 28 miles of high-tension transmission line from Pittsfield to Canaan, Conn., to F. T. Ley Co., Inc., Springfield, for the Berkshire St. Ry. Co.; 8 miles of this line will be on steel towers; contract also includes an addition to power house at Pittsfield and number of transformer stations along the line.

York, Pa.—Edison Electric Light Company to the Smyser-Royer Company to supply ornamental iron posts for use in Center Square; lights will be placed in position during the summer.

Richmond, Va.—Underground wiring on West Broad St. to W. H. Jenks, city, \$985.

Melville, Sask., Can.—Light and water improvement to Kilmor, Pullen & Burnham, Toronto, Ont., agents for General Electric Co., for generators, switchboards, exciters, pumps, motors and compressors, installed complete, \$7,438; the Northern Electrical & Mfg. Co., Ltd., Winnipeg, Man., for street lighting system, \$832, and for poles and all line material, \$2,947, and William Bross & Sons, Minneapolis, compression tanks, \$2,018; McAvity & Cons, St. Johns, N. B., for hydrants, and Stanley-Brook Co., Toronto, Ont., for mains and castings.

FIRE EQUIPMENT

San Jose, Cal.—Citizens have voted \$60,000 bonds to purchase new equipment for fire department.

Thompsonville, Conn.—Fire Chief W. J. Hines has recommended purchase of auto fire truck and installation of additional fire alarm boxes.

Indianapolis, Ind.—Board of Public Works is considering erection of three engine houses; \$95,000 available.—C. A. Schrader, President.

Ottawa, Kan.—Board of Control has recommended \$3,500 appropriation to purchase auto for Chief Graham.

Lowell, Mass.—Council is considering \$20,000 appropriation for erection of fire hose at Merrimack and Race sts.

Springfield, Mo.—Fire Chief Hiram McLaughlin has recommended erection of fire station and purchase of modern apparatus and hose.

Atlantic City, N. J.—Appropriation of \$25,000 has been asked Council by the Ventnor City Fire Co. to increase present fire fighting equipment.

Atlantic City, N. J.—Councils' Fire Committee is now actively at work on plans for the new fire station to be erected at Atlantic and California Ave.

Burlington, N. J.—Neptune Hose Company will erect fire house.

Marion, O.—Council has adopted \$22,500 bond ordinance for erection of fire station and \$15,000 for auto fire apparatus.

Norwood, O.—Council has passed ordinance authorizing \$2,500 bond issue for equipment of fire department.

Roff, Okla.—City is considering erection of \$10,000 fire station and city hall.

Milton, Ore.—Council has appointed committee to ascertain probable cost of hook and ladder and hose cart.

St. Johns, Ore.—Fire Commissioners will at once purchase three hose carts and 1000 ft. of hose.

East Mauch Chunk, Pa.—Fairview Hose Company is considering purchase of steamer.

Washington, Pa.—Special Committee has recommended purchase of combination auto chemical engine and hose wagon.

Salina, Utah.—Council has decided to purchase 1600 ft. of hose.

Wheeling, W. Va.—Fire Committee has recommended erection of chemical house, purchase of chemical hose at cost of \$500 and cotton hose at \$2,000; also minor equipment.

CONTRACTS AWARDED

Sacramento, Cal.—Furnishing aerial truck for Fire Department to C. Gray Company, \$6,000; two runabouts for Chief and Assistant Chief to Thos. B. Jeffrey Company.

Bayonne, N. J.—Furnishing 2000 ft. of fire hose; 700 ft., each at 90c. per ft., to the Fabric Fire Hose Co. and the Voorhees Rubber Co., 600 ft., at 90c. per ft., to Eureka Fire Hose Co.

Little Falls, N. Y.—To G. F. Andrews for building hose wagon, \$245.

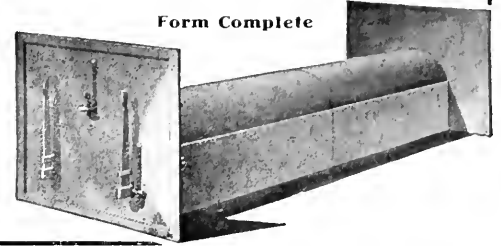
Lebanon, Pa.—To the C. C. C. Fire Hose & Rubber Co., for 1050 ft. Gold Standard special brand multiple woven hose, \$1.10 per ft.; to Eureka Fire Hose Manufacturing Co., for 1050 ft. Paragon 3-ply hose, \$1.10 per ft.



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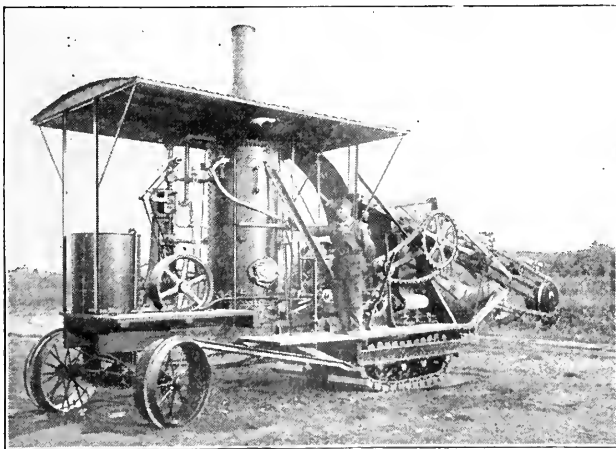
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- No. 00 digs 8 ft. deep, 15 to 27 in. wide.
- No. 000 digs 6 ft. deep 15 to 18 in. wide.

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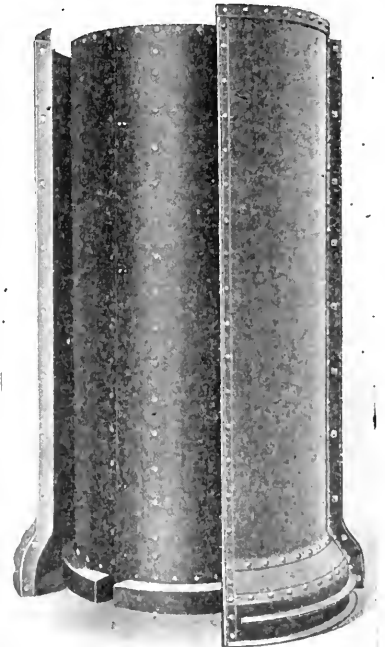
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BRIDGES

San Jose, Cal.—Citizens have voted \$55,000 bonds to repair and build bridges.
 New Haven, Conn.—Plans have been prepared by Frederick Law Olmstead, Archt., Boston, Mass., for stone bridge at Edgewood Park; plans call for stone arch bridge, rough-hewn, in old English style; cost about \$7,000.
 Clifton, Col.—Work will be started on the Clifton Bridge to connect with Orchard Mesa in near future.
 Chicago, Ill.—City's \$5,555,000 bond issues for construction of several new bridges and the payment of long standing judgments against city, which were authorized by the voters April 1, have been declared invalid.
 Peoria, Ill.—Orion Township has asked Board of Supervisors to erect three bridges at cost of \$1,550, \$600 and \$700.
 New Castle, Ind.—County Commissioners have accepted plans and specifications for five large concrete bridges to be erected in Henry County during the coming summer; total cost about \$8,000.
 Natchitoches, La.—Bids will soon be asked for erection of bridge across Cane River at Bienville.
 Beatrice, Neb.—Gage County Board of Supervisors has decided to erect concrete bridge on South Sixth st. road.
 Hinkley, N. Y.—Town Boards of Trenton and Russia are considering erection of \$12,000 concrete bridge over West Canada Creek.
 New York, N. Y.—Board of Estimate has approved plan for constructing viaduct in Park Ave.
 Altoona, Pa.—Plans have been submitted by the engineering department of the Pennsylvania Railroad Co. for proposed new Seventh St. bridge and they will be taken up at once by the Board of Public Works.
 Cheltenham, Pa.—Erection of \$6,000 bridge over Tacomy Creek has been recommended.
 Uniontown, Pa.—Fayette County Grand Jury has recommended building of joint county bridge over the Monongahela River, between South and West Brownsville.
 Superior, Wis.—Board of Public Works will at once ask for bids for building foot bridge at Newton Ave. on Seventh St.

Jacksonville, Fla.—Construction of concrete bridge spanning Miller's Creek on Atlantic Boule to the Logan Concrete & Engineering Company, city, as follows: 15 yd. excavating, 70c. per yd., \$10.50; bridge, \$1,290; 810 ft. filling, 18c. per ft., \$151.20; total cost, \$1,451.70; other bidders: A. J. Cassery Company, Jacksonville, \$1,680.00; Carolina Concrete Company, Greensboro, N. C., \$1,503.65.
 Clinton, Ia.—To the Joliet Bridge & Iron Co., bidding \$6,199, by Board of Supervisors, for the construction of bridges Numbers 8, 16 and 22.
 Towson, Md.—By Baltimore County Highways Commission to York Bridge Co., York, Pa., to construct drawbridge on Eastern ave. over Back River, \$1,995.
 Paterson, N. J.—Building steel and concrete bridge over Wesel brook on Central ave., Clifton, to the De Vogel Contracting Company by County Board of Freeholders.
 Scranton, Pa.—To W. H. Lyons, of Sunbury for the substructure of Mulberry St. viaduct; contract was awarded by the York Bridge Company, which secured the general contract for work.

Klamath Falls, Ore.—Citizens have voted bonds for erection of \$30,000 city hall; contract will be let at once.
 Ashley, Pa.—Reilly & Schweder, Wilkes-Barre, have prepared plans for erection of \$25,000 town hall.
 Beaver, Pa.—Citizens have voted \$30,000 bonds for erection of city hall.
 Philadelphia, Pa.—Bids will be received July 19, noon, for \$9,750,000 loan for erection of Convention Hall, payment of man-camuses, acquiring property along Parkway and improving same, improvements to Delaware and Schuylkill River fronts, repaving streets, completion of the high pressure fire main system in mill district; continuing work of improving League Island Park and Boulevard; construction of main and branch sewers; reconstruction of Co-hocksink sewer; erection of new bridges, grading streets, surfacing and resurfacing country roads, payment of damages for taking property for Cobb's Creek Park, for acquiring property and erection and improvement of buildings for police and fire purposes, purchase of police and fire apparatus and equipment, erection of buildings for the feeble minded and treatment of contagious diseases, improvement of South Broad St. Plaza, erection of a Soldiers' and Sailors' Monument and preparation of history, improvement and equipment of children's playgrounds, for replacing and reconstructing elevators in City Hall and improvements in Fairmount Park, Hunting Park and Pennypack Creek Park, and for opening streets under the Richmond Branch of the Philadelphia and Reading Railway, between Richmond St. and Kensington Ave.—John E. Reyburn, Mayor.

MISCELLANEOUS

Birmingham, Ala.—Site has been selected for erection of proposed \$40,000 city jail.
 San Jose, Cal.—Citizens have voted \$110,000 bonds to build bath house at Alum Rock Park, beautify reservation with bridges, erect buildings, etc.; \$50,000 for garbage incineration and \$2,000 for public comfort stations.
 St. Petersburg, Fla.—Citizens have voted \$15,000 bonds for reservoir lake and lake park improvements.
 Jesup, Ga.—City is considering \$5,000 bond issue to erect city hall.
 Moultrie, Ga.—Colquitt County is considering bond issue to erect jail.
 Topeka, Kan.—Construction of fire department headquarters building and remodeling of interior of city hall will begin as soon as City Board of Commissioners can make plans.
 Kirkwood, La.—Erection of \$5,000 city hall is being considered.
 Grant, Mich.—Special election will be held soon to decide whether village is to purchase a public park or not.
 Boonville, Mo.—Cooper County has voted \$115,000 bonds for erection of court house.
 Chickasha, Okla.—Citizens are considering \$75,000 bond issue to establish park system.
 Roff, Okla.—City is considering erection of \$10,000 city hall and fire station.

CONTRACTS AWARDED

Willows, Cal.—Building city hall to Graham & Jensen, contractors, Willows and Merced, \$24,987.
 Middlesboro, Ky.—To L. A. Galyon & Co., Knoxville, to build new city hall, \$46,034.16.
 Rochester, N. Y.—Erection of the peristyle, which is to connect the Administration Building and the proposed Art Building at Exposition Park, by the Board of Contract and Supply to A. W. Hopeman & Sons Company, \$21,364.
 Ebensburg, Pa.—To John L. Elder, Jr., Ebensburg, for erection of annex to Alms-house, \$19,769.
 Wheeling, W. Va.—Furnishing street signs to O. O. Gates Company, Schmulbach Bldg.

CONTRACTS AWARDED

Wilmington, Del.—Levy Court has awarded the contract to build Roseville bridge to the Nelson Meredith Company.

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BIDS ASKED FOR

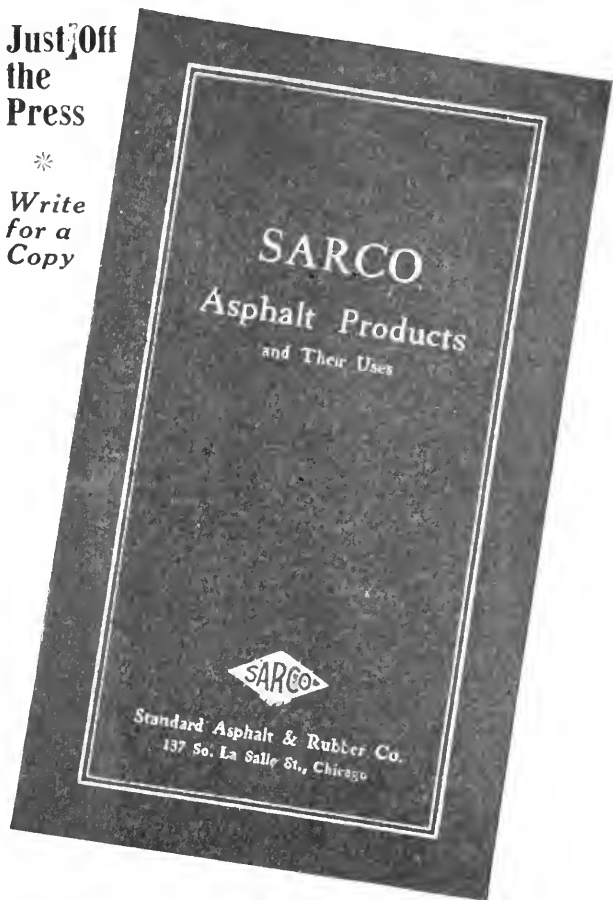
STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREET IMPROVEMENTS				
Michigan	Detroit	July 6, 7:30 p.m.	Paving three streets with sheet asphalt, asphalt block and reinforced concrete.	R. M. Ford, Clerk.
Louisiana	Crowley	July 1	Constr. about 300,000 sq. ft. concrete sidewalks.	R. J. Boudreaux, City Clerk.
New Jersey	Trenton	July 5, 8 p.m.	Paving one street with sheet asphalt concrete base; and one with macadam.	Harry B. Salter, City Clerk.
New Jersey	South Orange	July 6, 8 p.m.	Constr. cement curb and gutter in Richmond ave.; grading and macadamizing several streets.	Edward R. Arcularious, Town'p Clk.
Pennsylvania	Erie	July 10	Paving two streets.	Thomas Hanlon, City Clerk.
Florida	Jacksonville	July 21	Constructing about a mile of county road.	County Engineer.
Minnesota	Minneapolis	July 24	Constructing Superior Boulevard.	C. M. E. Carson, County Comm.
SEWERAGE				
Pennsylvania	Coraopolis	July 3, 7:30 p.m.	Constructing about 1,100 ft. of 15-in. sewer.	J. B. Hogg, Boro. Engr.
New Jersey	Trenton	July 5, 8 p.m.	Constr. san. sewers and house con. in 2 streets.	Harry B. Salter, City Clerk.
Alabama	Birmingham	July 5	Constructing a sewage disposal plant.	L. H. Salter, Sanitary Engr.
New York	Buffalo	July 7, 11 a.m.	Constr. 10 and 12-in. tile sewers in two streets.	Francis G. Ward, Comr.
Tennessee	Nashville	Aug 10, 3 p.m.	Constr. about 7 miles of circular brick trunk sewers, ranging in size from 30 to 111-in. in diameter.	Wm. W. Southgate, City Engr.
WATER SUPPLY				
New Jersey	Camden	July 10, 11 a.m.	Constr. pump house; furn. gasoline engine and foundations, connections and standpipe; generator and electrical equip.	J. J. Albertson, County Engineer.
LIGHTING AND POWER				
Pennsylvania	Wilkes Barre	July 6, noon	Lighting streets, lanes and public places of Wilkes Barre with gas or naphtha lights for period of 3 or 5 years.	Martin Barrett, Chm. Light Com.
FIRE EQUIPMENT				
Maine	Bangor	June 30, 7:30 p.m.	Furn. 2000 ft. 2½ in. double-jacket, rubber lined, woven hose.	W. S. Mason, Chief Engineer.
BRIDGES				
South Carolina	Newberry	July 1, 4 p.m.	Erecting a steel or iron bridge over Enoree river at Brazle-man's ferry.	L. I. Feagle, Chm. Co. Bd. Comrs.
Pennsylvania	Coraopolis	July 3, 7:30 p.m.	Constr. concrete culvert over McCabe's Run.	Ernest C. Harper, Boro. Secy.
New Jersey	Camden	July 10, 11:30 p.m.	Constructing two concrete culverts.	J. J. Albertson, County Engineer.
MISCELLANEOUS				
Louisiana	Baton Rouge	July 1	Furn. 13,000 ft. of 4-in. iron pipe, to be delivered at Angola.	W. W. Heard, Pres. Bd. Control.
New York	Buffalo	July 10, 11 a.m.	Erecting one story fireproof garage for Police Dept.	Francis G. Ward, Comr.
Connecticut	Hartford	July 10, 11 a.m.	Constr. new fire station.	Jos. Butts, Secy. Bd. C. & Sup.
Alabama	Decatur	July 11, 8 p.m.	Constructing a city hall.	H. A. Skeggs, Mayor.
Iowa	Oskaloosa	July 24, 5 p.m.	Constructing a city hall building.	T. H. Carlin, City Clerk.

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	Allis-Chalmers Co. 23	I
	Alvord & Burdick. 28	Indian Refining Co. 7
	American Asphaltum & Rubber Co. 31	International Association of Municipal Electricians. o.a.m.
	American Conduit Co. 31	Iroquois Iron Works.
	Amer. Water Softener Co. o.a.m.	J
	Artesian Well & Supply Co. o.a.m.	Johns-Manville Co., H. W. 19
	Austin Drainage Excavator Co. 19	K
	Austin-Western Co. 6	Kelly-Springfield Road Roller Co. 28
	Ayer & Lord Tie Co. 6	Kimberly, A. Elliott. 11
B		Kindling Machinery Co. 2
	Barber Asphalt Paving Co. 5	Knickerbocker Co., The. 2
	Barr Clay Co. o.a.m.	Koehring Machine Co.
	Barrett Mfg. Co. 1	L
	Bessemer Limestone Co. 32	Lamson, John, Jr. 4
	Bissell, The F. Co. 6	Leadite Co. Inc. 25
	Blaw Collapsible Steel Centering Co. 19	Lederle & Provost. 28
	Blome, Rudolph S., Co. 6	Lewis & Kitchen. 28
	Bond, Harold L., Co. 33	Lock Joint Pipe Co. 33
	Bowser, S. F., Co. 23	Luitweiler Pumping Engine Co. 36
	Boyd, James, & Brother, Inc. 23	Lynchburg Foundry Co. 23
	Brownell, E. E. 28	M
	Buckeye Engine Co. 35	McAvoy Vitrified Brick Co. o.a.m. 28
	Buff & Buff Co. 35	McCullough, Ernest. 23
	Buffalo Engine Co. 31	McWane Pipe Works. 2
	Buffalo Meter Co. 36	Marsh Co. 8
	Buffalo Steam Pump Co. 8	Menzies Street Cleaner Co. 25
	Buffalo Steam Roller Co. 28	Merritt & Co. 33
	Burgess & Long. 28	Metropolitan Paving Brick Co. 29
	Burns & McDonnell. 28	Modern Iron Works. 30
C		Monarch Typewriter Co., The. 28
	Caird, Jas. M. 28	Morse, C. H., & Son. 32
	Cameron Septic Tank Co. 28	Morse, W. F. 26
	Campbell, R. B. 28	Moss Photo-Engraving Co. 26
	Canfield, R. H. 12	Mueller, H. Mfg. Co. 19
	Carpenter, C. N., Supply Co. 12	Municipal Engineering & Cont. Co.
	Case, J. I., Threshing Machine Co. 7	N
	Central Westrumite Co. 26	National Paving Brick Mfgs. Assoc.
	Ceresit Waterproofing Co. 30	O
	Chicago Bridge & Iron Works. 28	Ohio Road Machinery Co. 12
	City Wastes Disposal Co. 36	Ohio Tractor Mfg. Co. 13
	Clarksville Pdry. & Mach. Co. 34	Okonite Co. o.a.m.
	Clay Products Publicity Bureau, The. 7	P
	Clearfield Brick Mfg. Co. 25	Pacific Flush Tank Co. 19
	Clearfield Clay Working Co. o.a.m.	Parmley & Nethercutt. 35
	Cochrane Chemical Co. 28	Pease, The C. F., Co. 28
	Collins, Chas. E. 36	Pease, F. A., Engineering Co.
	Columbian Iron Works. 19	Peerless Rubber Co. o.a.m.
	Concrete Form and Engine Co. 9	Pennsylvania Salt Mfg. Co. 36
	Continental Asphalt & Equipment Co. 4	Pittsburg Meter Co. 26
	Continental Hotel. 31	Pitometer Co. 14
	Cummer, F. D., & Co. 13	Port Huron Engine & Thresher Co.
D		Potter, Alexander. o.a.m.
	Decarie Incinerator Co. 31	Potts, Clyde. 28
	Deckman-Duty Brick Co. o.a.m.	Purinton Paving Brick Co. o.a.m.
	Deming Co. 31	R
	Destructor Co., The. 28	Rex, Geo. M. 26
	Diamond Rubber Co. 28	Rife Engine Co. 4
	Dow & Smith. 28	Riggs House. 8
	Duluth Engineering Co. 13	Roberts Motor Co. 4
	Dunn Wire-Cut Lug Brick Co. 4	Robeson Process Co. 8
	Dunning, W. D. 13	Ruggles-Coles Engineering Co.
	Dustolene. 30	S
E		Sanitary Street Flushing Machine Co. 14
	Early, Jos. N. 26	Seagrave Co. 20
	Eastern Mfg. Co. 10	Servus Rescue Equipment Co. 31
	East Iron & Machine Co. 30	Sieben System of Sanitation Co. 7
	Electric Railway Equipment Co. 948	Solvay Process Co. 4
	Engineering Agency. 27	Speare's Sons Co., The Aiden.
	Etnyre, E. D., & Co. 27	Springfield Sanitary Drinking Fountain Co. 21
	Eureka Fire Hose Mfg. Co. 4	Standard Asphalt & Rubber Co. 3
	Eureka Machine Co. 6	Standard Oil Co. 9
	Evans & Howard Fire Brick Co.	Standard Scale & Supply Co. 23
F		Standard Water Meter Co. 27
	Fabric Fire Hose Co. o.a.m.	Star Electric Co. 32
	Fibre Conduit Co. 35	Stary & Sons. 32
	Filbert Paving & Construction Co.	Steel Protected Concrete Co. 19
	Firestone Tire & Rubber Co. 27	Stewart, W. H. 25
	Flour City Ornamental Iron Wks. 30	Studebaker, The Corporation. 25
	Ford Meter Box Co. 26	Syracuse Chilled Plow Co. 25
	Fort Wayne Electric Works.	T
	Fuller, Geo. W. 28	Texas and Pacific Coal Co. 10
G		Texas Co., The. o.a.m.
	Gamewell Fire-Alarm Tel. Co., The. e.o.w.	Thornton Fire Brick Co. o.a.m.
	Gamon Meter Co. 23	Tide Water Iron Works. 10
	Gardner Crusher Co. 14	Tiffin Wagon Co. 25
	General Electric Co. 946	Tippett & Wood. 14
	Glauber Brass Mfg. Co. o.a.m.	Topping, Howell. 12
	Globe Asphalt Co. 13	Troy Wagon Works Co.
	Globe Foundry Co. 17	U
	Goodrich, B. F., Co. 4	Union Clay Products Co. 26
	Good Roads Improvement Co. 2	Union Water Meter Co. 8
	Good Roads Mch. Co. 35	Universal Road Machinery Co. 33
	Gurley, W. & L. E. 35	United States Marine Signal Co. 35
H		United States Tire Co.
	Hains-Weaver Concrete Mixer Co.	U. S. Wood Preserving Co.
	Hartford Rubber Works Co. 28	V
	Hatton, T. Chalkley. 28	Van Dorn Iron Works. o.a.m.
	Hauer, Daniel. 31	W
	Haywood Wagon Co. 28	Wadsworth Stone & Paving Co. 13
	Herring & Gregory. 14	Walsh, Thos. J. 3-9
	Hetherington & Berner. 23	Warren Bros. Co. o.a.m.
	Hill-Tripp Pump Co. 32	Wassall Brick Co. 12
	Holzboeg, Geo. H., & Bro. 25	Watson Wagon Co. 29
	Hooke, Robert. 25	Webb Motor Fire Apparatus Co. 30
	Hotchkiss Lock Metal Form Co. 25	Western Gardening & Forestry Co.
	Hotel Cumberland. 25	Western Valve Co. e.o.w.
	Hotel Victoria. o.a.m.	Wise & Watson. 28
	Howard, J. W. o.a.m.	Wyckoff Pipe & Creosoting Co.
	Hotel Victoria. o.a.m.	Y
	Hotel Victoria. o.a.m.	Yellow Pine Manufacturers Ass'n. 6

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STREET IMPROVEMENTS

Colton, Cal. City is considering \$250,000 expenditure for street improvements, including purchase of road outfit.

New Castle, Del.—William A. Kimmey, City Engineer, is now engaged in making inspections of different road materials preparatory to asking for bids for paving of streets.

Washington, D. C.—District Commissioners have ordered improvement of L St. S. E. at cost of \$3,000.

Newark, N. J.—Board of Works has decided to ask for new bids for paving Woodside Ave.

Syracuse, N. Y.—Surveys have been completed for proposed improved county highway in southeastern part of the town of Skaneateles; surveys have been finished also for Manlius-Oran road, and for about four miles on each Jamesville-Onatavia highway and road from the Collamer improved highway towards South Bay.

South Fork, Pa.—Portions of five streets in borough are to be paved this year.—W. O. Thomas, of Johnstown, Borough Engineer.

Lynnville, Tenn.—Board of Aldermen is considering building of new streets; also repair of present streets.

Spokane, Wash.—Paving plan for the Northwest boulevard has been recommended to the City Council by Commissioner Coates. Estimates of various kinds of paving for the job compiled by the City Engineer are: Asphalt, \$156,000; asphalt macadam, \$113,000; bitulithic, \$172,000; bitumass, \$129,000; granitoid concrete, \$178,000; standard concrete, \$178,600; Hasnam concrete, \$151,300; petrolithic, \$104,000; and wood block, \$187,000.

Superior, Wis.—Council has ordered repaving with permanent material of North Fourteenth St.

CONTRACTS AWARDED

Pasadena, Cal.—Grading, oiling, curbing and guttering of Catalina st., from Washington to north city limits, to W. A. Donatville, \$6,407.72.

Tampa, Fla.—To Edwards Construction Company for building 1 mile of shell paving in Seminole Heights for Seminole Developing Company.

Belvidere, Ill.—Macadam paving, grading and curbing of North Main, Van Buren, Menominee and Perry sts. for the distance about the city park, and for Huribut ave., to Fair & Taylor, Belvidere, \$22,495.

Holyoke, Mass.—Paving 6,100 sq. yds. with brick, to Shawmut Paving Brick Co., \$1,865 per sq. yd.; granite blocks, to Daniel O'Connell's Sons, \$54 per 1,000.

Newark, N. J.—To P. & P. Janaronne for paving South St. with granite; to MacMahon Construction Company for paving Clifton St.

Paterson, N. J.—By Freeholders for oiling about fifty miles of country roads, the total cost of which will be about \$11,000, to J. S. Sowerbutt and McKiernan & Bergen, lowest bidders.

Rochester, N. Y.—Inquois St. brick pavement to Thomas Hoahan, \$2,740; Court St. sewer to Henry Schoenfeldt, \$1,300; Blossom Road grading and walks to W. A. Margrander, \$8,721.50.

Cincinnati, O.—Building culvert on Betts Ave., College Hill, by County Commissioners to Wm. J. Flynn, \$1,255.

Norwood, O.—Oiling streets, to Citizens' Road Preserving Co., of Cincinnati, .2865 per sq. yd.

Grand Rapids, Mich.—To L. C. Hilding for paving Fountain St., \$6,977.40; other bidders: McDermott & Cooper, \$7,337.43, open; C. E. Williams, \$7,657.03, open; Carpenter & Anderson, \$7,254.85, standard; the engineer's estimate was \$7,017.20, open, and \$7,907 in the closed specifications; street will be paved either with asphalt or bituminous macadam.

Pittsburg, Pa.—Furnishing county with road roller to Kelly Springfield Road Roller Company.

Chattanooga, Tenn.—Paving Main st. with a 11-ft. vitrified brick center, flanked on each side by 11-ft. strip of California asphalt, to Southern Paving & Construction

Co., \$67,098.73; asphalt used will be the Maltha brand.

Dallas, Tex.—Paving North Akard st., to Crosfoot Wood Block Paving Co., \$3.29 per sq. yd. for 4-in. crossfooted wood block.

Lockhart, Tex.—To Van Flowers, to lay six miles of macadamized roads between Luling and Prairie Lea.

Chehalis, Wash.—By City Council for planking number of streets in the eastern part of the city, to Albers & Son, about \$6,950.

Tacoma, Wash.—Various Improvements. To Ollar Robinson & Co. for paving East 26th st. in local improvement district No. 453 with brick, \$25,800; Lister Construction Company, for grading and planking Portland ave. and constructing sidewalks along the thoroughfare, \$23,800; Engineer's estimate was \$27,294; to Tignalli & Paine, for grading North 25th st. from Proctor to Stevens in local improvement district No. 767, \$5,540; Engineer's estimate was \$7,011; nine other bids were received, the highest being \$6,946; construction of sanitary sewer in local improvement district No. 1100, to Salatino & Chiappetta, \$2,375; to the Kasal Construction Company, for laying water mains in local improvement district No. 578, which includes the Hunts Prairie, Latschaw, Mechanics, Travers Oak Grove and Hays' additions, \$3,306; the local improvement district No. 572 for laying mains through Opie's Tacoma ave., Gray's Tacoma ave., the Belmore, Cottage Home and Pewey's First additions, to Tignalli & Paine, \$4,950; estimate, \$5,484; contract includes laying a 12-in. wood main along Park ave. from 72d to 76th sts. and 6-in. c.-i. and wood mains along 73d, 74th and 75th sts.

SEWERAGE

Mishawaka, Ind.—Board of Public Works has passed resolution for construction of sewer on North Race St.

Holyoke, Mass.—Board of Public Works has decided to ask prices for 2,400 ft. of sewer pipe; the City Engineer will submit plans for extension of Franklin st. sewer.

Libby, Mont.—Citizens have voted \$20,000 bonds to install sewers and take up outstanding warrants.

Binghamton, N. Y.—City Engineer John A. Giles finished survey for Pennsylvania and Park Ave. sewers.

Chattanooga, Tenn.—Town Commissioners of St. Elmo have contracted with engineering firm of Cushman & Fairleigh to make plans and supervise construction of sewerage system.

WATER SUPPLY

Prairieburg, Ia.—Citizens will soon vote on installation of water works system at cost of \$4,000.

South Stillwater, Minn.—Bids will be received July 5, 8 p. m., for \$5,000 bonds to improve water works.—C. A. Anderson, Recorder.

Blairsville, Pa.—Council is now investigating gravity system of water supply.

Dallas, Tex.—Purchase of three large air compressors, two pumping engines, the necessary 8 to 16-in. water pipe and other fixtures for immediate use in Water Department has been authorized by Board of City Commissioners.

CONTRACTS AWARDED

Cincinnati, O.—Furnishing two electric current generators for filtration plant of the waterworks, by Director Sundmaker to the Fort Wayne Electric Works, \$1,635.

Muskogee, Okla.—To United States Cast Iron Pipe & Foundry Co. for pipe for new water works system, \$83,000; to Wrenslor Co. to supply the valves and hydrants, and to John B. Clow fittings.

FIRE EQUIPMENT

Bay City, Mich.—Fire Committee will soon ask bids for purchase of proposed auto fire apparatus.

Matteawan, N. Y.—Architect C. B. Van Slyck has prepared plans for erection of

truck house on Main st. for W. H. Mase Ladder & Truck Company.

Barberton, O.—Council has decided to purchase fire engine.

Alpine, Tex.—Volunteer fire company is being organized.

Spokane, Wash.—Citizens will vote July 18 on \$100,000 bonds to erect fire station.

CONTRACT AWARDED

Beaumont, Tex.—Furnishing automobile combination chemical and hose wagon at a cost of \$5,500, to American La France Fire Engine Co., Elmira, N. Y.

BRIDGES

Hoquiam, Wash.—Council has instructed its Clerk to call for bids for construction of a wooden bridge across Hoquiam River at Ramer ave.; cost \$15,000.

CONTRACT AWARDED

Pittsburg, Pa.—Bridge work to the Universal Portland Cement Company for 5,000 barrels of cement; repairing county bridges according to specifications of the County Engineer to S. B. Little, Paumeister & Smith and Eli Crum; repairing joint bridges between Westmoreland and Allegheny Counties to J. C. Marshall, Eli Crum and S. B. Little; to Farris Bridge Company for cross-tied wood block for 18 county bridges, \$16,794; furnishing lumber to L. S. Hodli, W. T. McNeal and A. M. Bell.

MISCELLANEOUS

Springfield, Ill.—Plans by Architect Conway have been accepted for erection of bathing houses at two parks; cost, \$500 and \$700 each.

South Bend, Ind.—Board of Public Works has asked for bids for erection of boat house in Leeper Park to shelter police motor boat.

Fort Dodge, Ia.—City Health Officer Dr. C. J. Mulrone has recommended need of garbage incineration plant.

Louisville, Ky.—Plans by Architects D. X. Murphy & Bro. have been approved by Board of Aldermen.

Newark, N. J.—Board of Works has directed Chief Engineer Sherrerd to prepare data on installation of municipal garbage disposal plant.

Cincinnati, O.—Bids will be received July 11, noon, for \$300,000 bonds to erect and equip hospitals and pest houses.—E. Von Bargen, City Auditor.

Toledo, O.—Appropriation of \$2,000 has been voted by Finance Committee to Service Department to be used to begin work on comfort station at the Steadman monument, Summit and St. Clair Sts.

Philadelphia, Pa.—City will erect police station at 1251 N. Twenty-sixth St.

Sharon Hill, Pa.—Citizens have passed \$7,000 loan bill to make improvements.

El Paso, Tex.—County has voted to issue \$30,000 bonds to purchase poor farm.

Spokane, Wash.—Citizens will vote July 18 on \$650,000 bonds to erect City Hall.

CONTRACTS AWARDED

Holyoke, Mass.—Erecting shelter at Maple st. playground, to O'Connell's Sons, \$2,395.

Andrews, Tex.—Erecting court house, to F. M. Knight & Son.

Spokane, Wash.—Furnishing 100 refuse cans for street intersections, to Spokane Corrugated Culvert and Tank Company, \$640.

BIDS RECEIVED

Indianapolis, Ind.—Collecting and disposing of garbage: Indianapolis Sanitary Company, present contractor, \$63,000 year for five-year contract and \$62,000 for ten-year contract; Gemmer & Henry, \$68,000 year for five-year contract and \$63,000 year for ten-year contract; bids of the Indianapolis Sanitary Company are same as the bids the company submitted a month ago, while bids of Gemmer & Henry are \$1,000 a year less than their former bids.



Hand-Wiped
Joint

or lead flange, in from one
to eight branch.

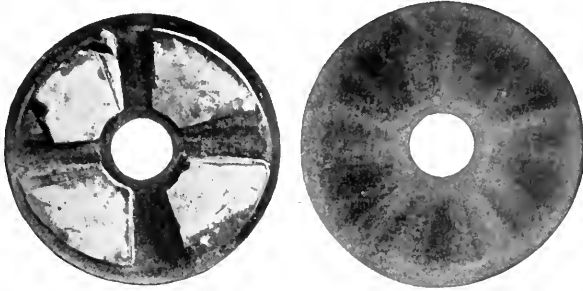
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ALL SIZES—ANY STYLE—FOR ANY MACHINE
GET OUR PRICES BEFORE PLACING ORDERS

Glauber Brass Mfg. Co. Cleveland

Rotary Valve Seats

will increase life of rubber valves
300 per cent.



Two rubber valves pumping raw water under 167 lbs. pressure

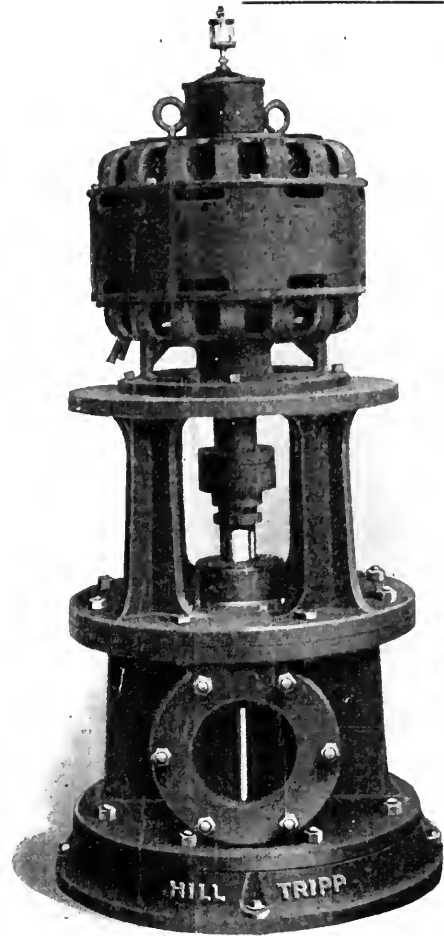
There is shown here a photographic reproduction of a rubber valve used for 41 days on a common straight port seat. It will be noticed how deeply the rubber has been cut to the shape of the openings in the seat while in service.

This print was made from a rubber valve of the same brand and manufacture as that shown on opposite cut. It was taken from same pump fitted with our Rotary Valve Seats, after service of 136 days. It proves clearly that wear was uniform throughout. It was in good condition and fit for much longer service.

Increase your pumpage, save fuel and valve replacements by adopting them.

Correspondence solicited.

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25th & WHARTON STS., PHILADELPHIA



This is the Pump that Established the World's Record for Deep Well Pumping at the Municipal Water Works Station at the City of Chicago Heights, Illinois

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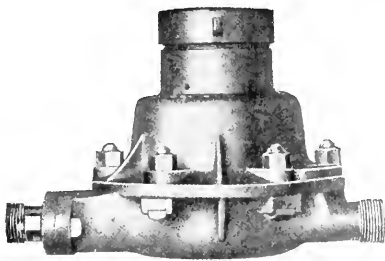
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Cannot be stopped up.

Hot water or excessive heat will not affect them.

Built like a watch. Jewelled Bearings.

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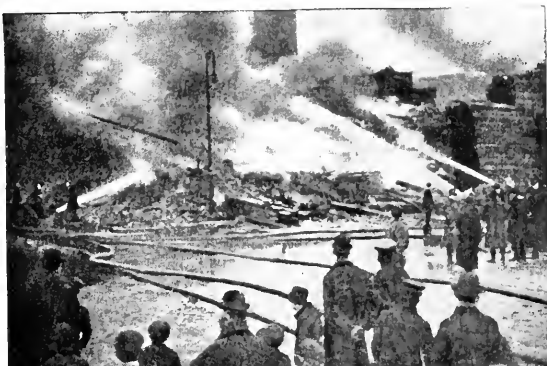
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PROPOSALS

SEWAGE CLARIFICATION TANK AND SLUDGE DRYING BED

Winchester, Ky.

Sealed proposals addressed to S. B. Tracy, City Clerk of the City of Winchester, Ky., and endorsed on the envelope: "Proposals for Sewage Clarification Tank and Sludge Drying Bed," will be received until 7:30 P. M., July 7, 1911.

For making all excavations, back filling and grading, furnishing all materials and constructing complete a sewage clarification tank and sludge drying bed in accordance with the plans and specifications prepared by Chas. E. Collins, Consulting Engineer, Philadelphia, Pa., and now on file in the office of S. H. Rutledge, City Engineer.

Proposals shall be made upon blank forms to be obtained from the City Engineer. No proposal will be considered unless made upon the blank forms above mentioned, and unless accompanied by a certified check for the sum of Five hundred dollars on a national bank and payable to J. H. Hughes, Mayor.

The proposals will be opened publicly by the City Council at a regular meeting held in the Council Chamber, at 7:30 P. M., Friday, July 7, 1911.

The City Council reserves the right to reject any or all bids.

J. H. HUGHES, Mayor. S. B. TRACY, City Clerk.

H. B. SCRIVENER, Chairman, DR. M. S. BROWNE, J. T. STOKELY, Sewer Committee.

POLICE SIGNALLING SYSTEM, FIRE ALARM SYSTEM AND UNDERGROUND CONSTRUCTION.

Passaic, N. J.

By direction of the City Council proposals will be received by the City of Passaic from contractors for furnishing and installing a Police Signalling System, a Fire Alarm System and Underground Construction for the City of Passaic, in accordance with the general conditions, specifications and drawings on file in the office of the City Clerk, from whom blank proposal forms may be obtained.

Proposals will be received for

- (1) Police Signalling System. (2) Fire Alarm System. (3) Underground Construction. (4) General Proposal including Police Signalling System, Fire Alarm System and Underground Construction.

All proposals must be accompanied by a surety bond or a certified check payable to the City of Passaic in a sum equal to at least 2 per cent. of the amount of the bid.

The successful bidder will be required to give a surety bond in a responsible surety company for the full amount of the contract for the faithful performance of the contract and for indemnity against suits or claims for infringement of patents and as security that he will guarantee all workmanship and materials for a period of five years.

Every bidder must furnish satisfactory evidence of his experience and equipment, together with list of similar systems installed.

All bidders must state number of working days required to complete work, and damages of ten dollars per day will be stipulated in the contract for every day's delay over the time agreed upon for the completion of the work.

Bidders will be required to submit samples of the following apparatus and set up same to simulate service conditions at

PROPOSALS

Fire Headquarters when directed by the Committee. Failure to comply with this requirement will disqualify bidder.

- One automatic time and date stamp. One take-up reel. One central station flash-light equipment. One police box. One flash-light. One flash-light controller. One fire alarm box.

All bids must be enclosed in a sealed envelope bearing the name and address of the bidder and endorsed on the outside, "Proposal for (followed by the title of that portion of the work or the entire work as given above)" and must be delivered to the City Clerk or his deputy on or before the 12th day of July, 1911. No bid will be received after 8.00 p. m.

The City of Passaic reserves the right to reject any or all bids.

M. B. MATTHEWS, Chairman Committee on Public Safety. THOMAS R. WATSON, City Clerk. (28-5)

BRIDGE

Fitchburg, Mass.

Sealed proposals, addressed to the Board of Street Commissioners of the City of Fitchburg, Mass., and endorsed "Proposals for the Construction of the Fifth Street Viaduct," will be received by the said Board of Street Commissioners at the office of the City Engineer, Clerk of the Board, Fitchburg, Mass., until 5 p. m., of Monday, the 17th day of July, 1911, and on that day, at 7.30 p. m., will be publicly opened and read. The entire work is to be let in one contract.

Each bidder must make a personal examination of the location of the site of the viaduct.

Each bid must be accompanied by a certified check for five thousand dollars (\$5,000), payable to the City of Fitchburg; said check to be returned to the bidder unless he fails to execute the contract, should it be awarded him.

A bond for twenty-five thousand dollars (\$25,000) will be required for the faithful performance of the contract, the surety to be a substantial surety company, satisfactory to the Board of Street Commissioners and authorized by law to do business in the State of Massachusetts.

Prices proposed must cover all the expenses incidental to the completion of the works in full conformity with the specifications and contract.

The engineer's estimates of the quantities of work to be done are as follows:

Table with 2 columns: Description of work and Quantity. Includes items like Earth excav., Rock excav., Cinder filling, Gravel fill, Steel bars for concrete reinforcement, Structural steel, Concrete 1:3:5 Class A, Concrete 1:3:5 Class B, Concrete 1:2 1/2:4 1/2 Class C, Concrete 1:2 1/4:4 1/2 Class D, Concrete 1:2 1/4:4 Class E, Hand rails, Scrubbing concrete surfaces, Painting concrete surfaces, Storm water inlets and drain pipes, Electric conduits, Lamp posts, Electric wiring.

These quantities are approximate only, and the City of Fitchburg expressly reserves the right of increasing or diminishing the same as may be deemed necessary by its engineer.

Plans may be seen and specifications and forms of proposals obtained at the office of Timothy J. Sheehan, City Engineer, Fitchburg, Mass., and at the office of James H.

PROPOSALS

Fuertes, Consulting Engineer, 140 Nassau Street, New York City, upon making a deposit of twenty-five dollars (\$25). This deposit will be given back to the bidder upon the return of the plans and specifications in good condition.

Duplicate bids must be filed at the office of the City Auditor, Frank D. Page.

The Board of Street Commissioners reserves the right to reject any or all bids should they deem it to be for the interest of the City of Fitchburg to do so.

T. J. SHEEHAN, Clerk. (28, 5, 15)

REINFORCED CONCRETE RESERVOIR

Americus, Ga.

Sealed proposals will be received by the Mayor and City Council of Americus, Georgia, until July 17, 1911, for the construction of a reinforced concrete reservoir, sixty feet in diameter by thirteen feet in depth. Plans and specifications on file at the office of the City Engineer. No bid will be considered unless accompanied with certified check for five per cent of the bid as evidence of good faith. The right is reserved to reject any or all bids.

T. N. HAWKES, Clerk and Treasurer. J. B. ANSLEY, City Engineer. (26-5-12)

HELP WANTED

WANTED:—Ten Dump Wagon Salesmen.

Must have experience in selling contractors and dealers, are required to go any place in the country where business develops. Good salary to the right parties. In answering this ad. state age, where now employed or where formerly employed and reason for quitting or wanting to quit; experience, if any, in selling or using dump wagons; salary expected; when can go to work. If know any one to whom can now sell dump wagons, give names. Give three references and state if you can give bond, personal or otherwise. Don't expect reply from us unless your answer to this is complete and your record will show you a successful salesman.

THE TROY WAGON WORKS CO., Troy, Ohio.

CAPITAL WANTED

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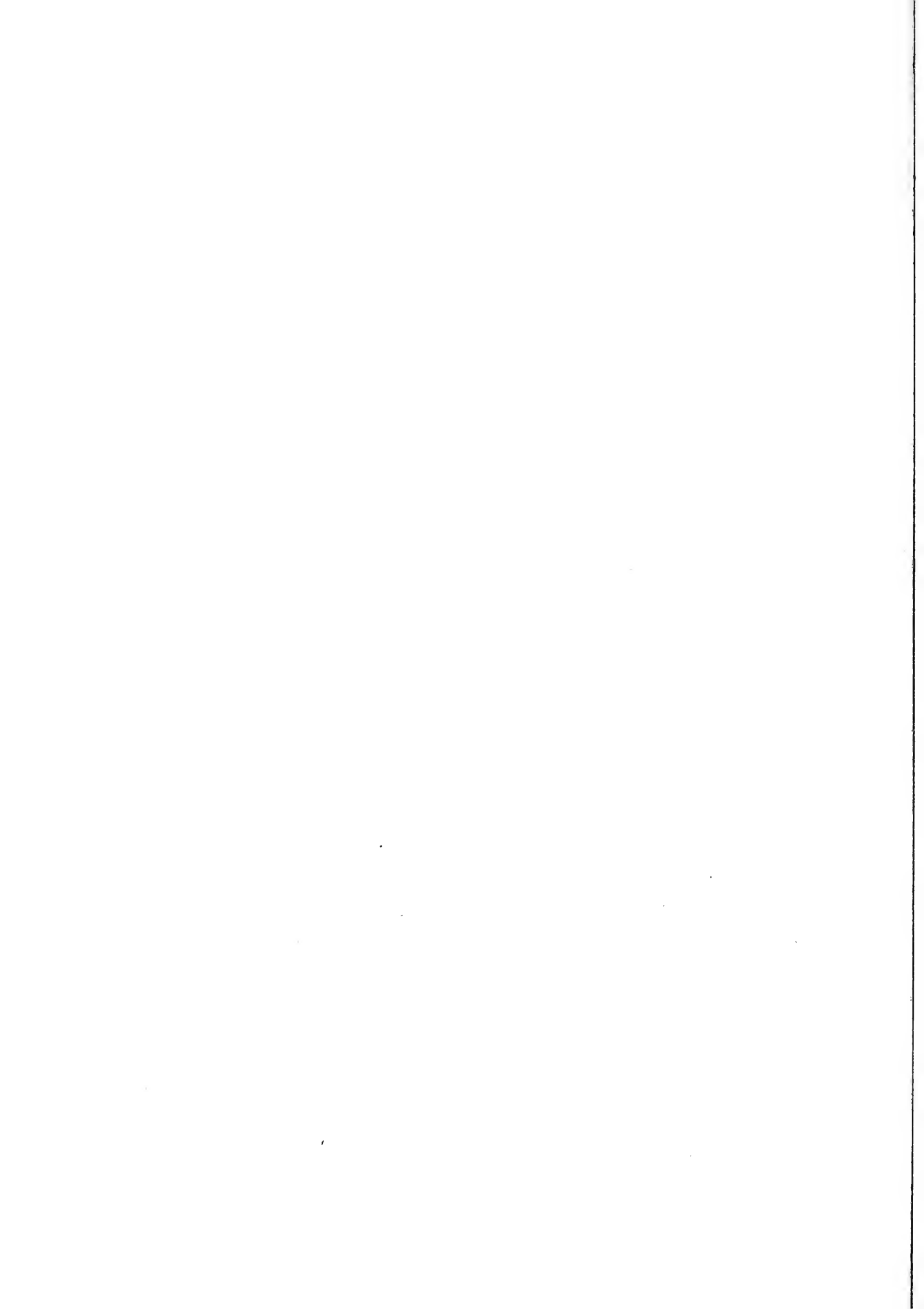
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